CACHUMA LAKE

Final Resource Management Plan / Environmental Impact Statement

May 2010

United States Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
South-Central California Office

RECLAMATION
Managing Water in the West

MISSION STATEMENTS

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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Prepared by

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May 2010

FINAL
ENVIRONMENTAL IMPACT STATEMENT
CACHUMA LAKE RESOURCE MANAGEMENT PLAN

Lead Agency: U.S. Department of the Interior, Bureau of Reclamation (Reclamation), Mid-Pacific Region, South-Central California Area Office, Fresno, California

This Final Environmental Impact Statement (Final EIS) has been developed for the new Resource Management Plan (RMP) for the Cachuma Lake Recreation Area (Plan Area) in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended. The RMP is a long-term plan that will guide future actions in the Plan Area and is based on a comprehensive inventory of environmental resources and facilities and input from local, state, and federal agencies, and the general public. The Final EIS is a program-level analysis of the potential environmental impacts associated with adoption of the RMP. The development of the RMP is based upon authorities provided by Congress through the Reclamation Act, Federal Water Project Recreation Act, Reclamation Recreation Management Act, and applicable federal agency and United States Department of the Interior policies. The RMP will have a planning horizon of 20 years.

The purposes and objectives of the proposed RMP are:

- Ensuring timely delivery of high-quality water to water users while enhancing natural resources and recreational opportunities
- Providing recreational opportunities to meet the demands of a growing, diverse population
- Ensuring recreational diversity and the quality of the recreational experience
- Protection of natural and cultural resources, while educating the public to their value and good stewardship
- Providing the framework for establishing a new management agreement with a managing partner

The purpose of the RMP is to provide a program and set of policy guidelines necessary to encourage orderly use, development, and management of the reservoir and the surrounding lands. The plan will identify outdoor recreational opportunities, enhanced by Cachuma Lake and its shoreline, compatible with the surrounding scenic, environmental, and cultural resources. In addition, this RMP will propose uses that will be compatible with operation of the reservoir for water delivery.

Reclamation has considered comments on the Draft EIS during the public review period that concluded on October 31, 2008, and included public hearings on August 26 and October 8, 2008. The Final EIS includes editorial and technical changes, factual corrections, and clarifications made in response to public comments. Reclamation will not make a decision on the proposed action until 30 days after the release of the Final EIS and notice in the *Federal Register*, and will then complete a Record of Decision (ROD). The ROD will state the action to be implemented and will discuss factors leading to the decision.

For further information regarding this Final EIS, contact Mr. Jack Collins, U.S. Bureau of Reclamation, South-Central California Area Office, 1243 “N” Street, Fresno, California 93721-1813, (559) 349-4544 (TDD 559-487-5933) or jwcollins@usbr.gov.

The Bureau of Reclamation (Reclamation) developed the Cachuma Lake Resource Management Plan (RMP) to establish management objectives, guidelines, and actions for the Cachuma Lake Recreation Area (Plan Area). The Plan Area encompasses approximately 9,250 acres, including Cachuma Lake (3,043 acres at full level) and the surrounding shores and rugged hillsides. Santa Barbara County Parks Department manages the Plan Area pursuant to a contract between Reclamation and the County.

Most of the recreational facilities at the lake are located in a 375-acre County Park on the south side of the lake. Facilities include day use facilities, large group camping facilities, campsites, Live Oak Camp and Camp Whittier, a general store, a scenic overlook for Bradbury Dam, a marina and launch ramp, bait and tackle shop, amphitheater, trailer storage yard, recreational vehicle campsites, Nature Center, County Park Ranger Station, family center, swimming pools, snack shop, and maintenance and infrastructure facilities. The north side of the lake consists of open space that is leased for grazing and permitted equestrian use. The remaining open space area is closed to general public access.

The RMP is a long-term plan that will guide future actions in the Plan Area and is based on a comprehensive inventory of environmental resources and facilities and input from local, state, and federal agencies, Santa Barbara County, and the general public. The primary emphasis of the RMP is to protect water quality, water supply, and natural resources, while enhancing recreational uses in the Plan Area. The recreational uses must be compatible with the primary obligation to operate the reservoir for storage and delivery of high-quality water. The development of the RMP is based upon authorities provided by Congress through the Reclamation Act, Federal Water Project Recreation Act, Reclamation Recreation Management Act, and applicable federal agency and United States Department of the Interior policies.

The purpose of the RMP is to provide a program and set of policy guidelines necessary to encourage orderly use, development, and management of the Plan Area. The RMP will provide outdoor recreational opportunities, enhanced by Cachuma Lake and its shoreline, compatible with the surrounding scenic, environmental, and cultural resources.

The planning process for the Cachuma Lake RMP involves the integration of issues, opportunities and constraints, management actions, and management zones. It follows the guidance of federal planning mandates and proposed actions that balance recreation opportunities with natural and cultural resource stewardship. The following are the basic elements of the planning process:

- Define the overall goals and objectives.
- Describe the resource categories that group the issues.
- Identify the issues, opportunities, and constraints.
- Determine management actions to address the issues.
- Define the management zones for Cachuma Lake.

The environmental impacts of the RMP are assessed in a programmatic Final Environmental Impact Statement (EIS) that has been included as part of this joint RMP/EIS document. The environmental review focuses on the potential for management actions to cause adverse or beneficial environmental impacts to natural and cultural resources such as water quality, endangered species, and historic resources.

The Final RMP/EIS is the result of several planning and document preparation steps described above and in Sections 2.2, 2.3 and 2.4. This process includes:

- Identification of goals, objectives, issues, opportunities, and constraints
- Public and agency scoping
- Formulation of alternatives, management zones, and management actions associated with each alternative
- Preparation and issuance of public Draft RMP/EIS
- Public comment period
- Preparation of responses to comments
- Issuance of Final RMP/EIS

This Final RMP/EIS includes responses to all public comments received (Appendix B) and changes to the text of the Draft RMP/EIS as a result of public comments. This Final RMP/EIS also identifies the Preferred Alternative and the environmentally preferable alternative (both Alternative 2).

Prior to the issuance of the Draft RMP/EIS, three planning alternatives were formulated to address the issues, opportunities, and constraints in the Plan Area. The No Action and two action alternatives are as follows:

- No Action (Alternative 1)—This alternative manages land and activities with the continuation of current management practice.
- Enhanced Recreation (Alternative 2)—This alternative balances natural resource protection and recreation opportunities.
- Expanded Recreation (Alternative 3)—This alternative emphasizes expanded recreation opportunities.

Under the No Action Alternative, current resource and recreation management direction and practices for the Plan Area would continue unchanged. However, some infrastructure improvements would be implemented that are common to all the alternatives. The No Action Alternative provides the benchmark for making comparisons in the EIS between possible future changes under Alternatives 2 and 3.

The objective of Alternative 2 is to enhance current recreational uses and public access in the Plan Area to attract more visitors and increase recreational opportunities, while protecting natural resources with new or modified land and recreation management practices. These activities propose upgrades and improvements for many of the Plan Area's existing facilities and utilities.

Alternative 3 would expand recreational uses and public access by implementing new or modified land and recreation management practices. This alternative is included to demonstrate a scenario in which recreational uses in the Plan Area are substantially expanded while meeting the RMP goals for protection of natural resources to the extent feasible. Alternative 3 includes all of the management actions proposed for Alternative 2 as well as swimming.

Section 3, Existing Conditions, describes features that could be affected by the alternatives. Other topics such as climate and air quality are addressed to provide context, but less detail is provided because impacts to these resources would be less noticeable.

Much of the data collected to describe the existing environment are included in Geographic Information System format. Figures show areas with sensitive resources (i.e., biology and land use), hazard potential (i.e., erosion and geological hazards), and other conditions. These figures and the impact analyses provided in Section 4 are the basis of constraint analysis that would guide any plans for future development within the planning horizon.

Section 4, Environmental Consequences, describes the impacts of implementing the two action alternatives as well as the No Action Alternative. Future actions that might result in site-specific impacts will be addressed in project-specific plans and environmental documentation as they arise. Where possible, Best Management Practices (BMPs) and avoidance, minimization, and mitigation measures are provided to reduce the severity of each impact.

All impacts resulting from the No Action Alternative would be addressed through the implementation of BMPs, which would be subject to an environmental review and possible mitigation in subsequent project-specific environmental documents.

Each subpart of Section 4 identifies impact thresholds for the action alternatives and, where applicable, discusses impact methodology. Thresholds are generally expressed as follows:

- **Beneficial Impact:** This impact category would occur when an activity could result in the elimination, reduction, or resolution of a conflict.
- **No Impact:** This impact category would occur if an activity would result in no change over the existing condition.
- **Minor Adverse Impact:** This impact category would occur if an activity would result in deterioration or in a conflict.
- **Major Adverse Impact:** This impact category would occur if an activity would result in a dramatic deterioration or a severe conflict.

The impacts common to all alternatives are discussed, followed by impacts unique to each alternative, and impact summary and mitigation measures if applicable. Cumulative impacts are discussed at the end of each resource topic where applicable.

The impacts of each alternative to each resource topic are summarized in Table S-1. In some cases, a range of impact thresholds is indicated. The Cachuma Lake RMP/EIS is a program document and, therefore, not site-specific. Additionally, some impacts may vary depending on season. One example is for visitor access, where the effects of increased visitation on circulation depend on the season and time of travel to and from the Plan Area, resulting in a range of impacts. All mitigation measures reduce impact thresholds for the action alternatives to between minor adverse impact and no impact.

Table S-1
Impacts Summary

Impacts to Resources	Alternative 1	Alternative 2		Alternative 3	
	Impact Magnitude	Impact Magnitude	Impact After Mit.	Impact Magnitude	Impact After Mit.
WATER RESOURCES					
WQ-1: Pollutants due to motorized vehicle emissions	Minor	Minor	Minor	Minor	Minor
WQ-2: Erosion and turbidity due to construction/ maintenance of facilities, roads, and trails.	Minor	Minor	Minor	Minor	Minor
WQ-3: Pollutants from new portable restrooms/vault toilets not pumped/cleaned properly	Minor	Minor	Minor	Minor	Minor
WQ-4: Erosion and toxins due to cattle, horse, and human access to the lake from the north shore	Minor	Minor	Minor	Minor	Minor
WQ-5: Pathogens due to swim beach area/body contact	N/A	N/A	N/A	Major	Minor
WQ-6: Inadvertent introduction of invasive mussels from recreational watercraft use	Major	Major	Minor	Major	Minor
AIR QUALITY					
AQ-1: Dust from site maintenance and facilities construction with ground disturbing activities	Minor	Minor	No Impact	Minor	No Impact
AQ-2: Combustion emissions from accidental or prescribed fires	Minor	Minor	Minor	Minor	Minor
SOILS AND GEOLOGY					
SG-1: Ground disturbing construction and maintenance activities	Minor	Minor	Minor	Major	Minor
SG-2: Erosion, compaction and disturbance due to trail use and construction	Minor	Minor	No Impact	Major	Minor
SG-3: Compaction and erosion due to cattle grazing	Minor	Minor	No Impact	Minor	No Impact
SG-4: Erosion due to fires	Major	Major	Minor	Major	Minor
BIOLOGY					
BI-1: Expansion of recreation and more visitors would impact vegetation, wildlife, fisheries, aquatic communities, and special-status species.	Minor	Minor	No Impact	Major	No Impact
BI-2: Noise/harassment to breeding raptors and bald eagles due to RC airplanes and landing strip	N/A	N/A	N/A	Major	Minor
BI-3: Expansion/construction of trails and increase in visitation would impact vegetation, wildlife, and special-status species. Specifically, native plant species could be removed, seeds of invasive weeds may spread, pathogens may spread among plants or animals, and trail construction could remove and/or degrade the habitat of small-scale wildlife and special-status species.	Minor	Minor	No Impact	Minor	No Impact
BI-4: Increased boat use would impact	Minor	Minor	Minor	Major	Minor

Table S-1
Impacts Summary

Impacts to Resources	Alternative 1	Alternative 2		Alternative 3	
	Impact Magnitude	Impact Magnitude	Impact After Mit.	Impact Magnitude	Impact After Mit.
vegetation, fisheries, and special-status species.					
BI-5: Increase in fishing would impact fisheries and aquatic communities	Minor	Minor	No Impact	Minor	No Impact
BI-6: Increase in sedimentation runoff associated with increased camping, day use, and trail use would impact fisheries and aquatic communities.	Minor	Minor	No Impact	Minor	No Impact
BI-7: Potential for infestation of Lake by invasive mussels	Major	Major	Minor	Major	Minor
BI-8: Cumulative impacts to vegetation and wildlife will occur from ongoing population increases, agricultural, and residential development due to habitat removal and fragmentation. Furthermore, the Cachuma surcharge project will increase lake levels, impacting oak trees.	Minor	Minor	No Impact	Minor	No Impact
CULTURAL RESOURCES					
CU-1: Construction of proposed facilities (i.e., ground disturbing activities) at Live Oak Camp and the County Park, where known cultural resources exist	No impact	Major	Minor	Major	Minor
CU-2: Wake erosion due to increased boating and increased access to cultural resources via kayaks	Minor	Minor	Minor	Minor	Minor
CU-3: Increased visitor activity due to new trails and camp sites will expose archaeological sites	No impact	Major	Minor	Major	Minor
CU-4: Impacts to known archaeological sites and unsurveyed areas due to grazing and fuel management (i.e., prescribed burns)	Minor	Minor	Minor	Beneficial	Beneficial
HAZARDOUS MATERIALS					
Not applicable	No Impact	No Impact	No Impact	No Impact	No Impact
VISUAL RESOURCES					
VR-1: Construction of structures diminish the natural visual resources	Minor	Minor	No Impact	Minor	No Impact
VR-2: Smoke from prescribed burns	Minor	Minor	Minor	Minor	Minor
VR-3: Increase in boat densities (BAOT)	No Impact	Minor	Minor	Minor	Minor
VR-4: Development on the north shore	N/A	Minor	No Impact	Major	Minor
VR-5: Cumulative Impacts of surcharging and the result of losing oak trees	Minor	Minor	Minor	Minor	Minor
LAND USE					
LU-1: Prescribed burning	Minor	Minor	Minor	Minor	Minor
LU-2: Conflicts between user groups on the north shore	N/A	Minor	No Impact	Minor	No Impact

Table S-1
Impacts Summary

Impacts to Resources	Alternative 1	Alternative 2		Alternative 3	
	Impact Magnitude	Impact Magnitude	Impact After Mit.	Impact Magnitude	Impact After Mit.
LU-3: Increased use of the trail system by multiple users	Minor	Minor	No Impact	Minor	No Impact
RECREATION					
R-1: Temporary construction activities at camping and recreation facilities	Minor	Minor	Minor	Minor	Minor
R-2: Management of BAOT levels to preserve WROS management zones	Minor	Minor	Minor/ No Impact	Minor	Minor/No Impact
R-3: Conflicts on trails	Major	Major	Minor	Major	Minor
R-4: Addition of new recreation activities	No Impact	Beneficial	N/A	Beneficial	N/A
R-5: Noise from RC airplanes	N/A	N/A	N/A	Major	Minor
R-6: Air quality and visibility impacts from prescribed burns	Minor	Minor	Minor	Minor	Minor
R-7: Safety issues from mixing swimmers with boaters and other recreational users	N/A	N/A	N/A	Major	Minor
VISITOR ACCESS AND CIRCULATION					
TR-1: Construction and maintenance activities	Minor	Minor	Minor	Minor	Minor
UTILITIES					
U-1: Demand on utilities/Water Supply	No Impact	Minor	Minor	Major	Minor

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Acronyms

ADA	Americans with Disabilities Act
BMP	Best Management Practice
BAOT	boats on the lake at any one time
BP	before present
BTEX	benzene, toluene, ethylbenzene, and xylene
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCRWQCB	Central Coastal Regional Water Quality Control Board
CDF	California Department of Forestry
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNPS	California Native Plant Society
COMB	Cachuma Operation and Maintenance Board
County	Santa Barbara County
County Park	375-acre County Park, south side of Cachuma Lake at Tequepis Peninsula
CRMP	Cultural Resources Management Plan
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
ID #1	Santa Ynez River Water Conservation District – Improvement District #1
M	Magnitude
MCL	Maximum Contaminant Level
Member Units	City of Santa Barbara, Goleta Water District, Montecito Water District, Carpinteria Valley Water District, and Santa Ynez River Water Conservation District – Improvement District #1
mg/L	milligram(s) per liter
mph	miles per hour
MTBE	methyl tertiary butyl ether
Mw	Moment Magnitude

NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historical Places
Plan Area	Cachuma Lake Recreation Area
PM_{10}	particulate matter 10 microns or less in diameter
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
RC	radio-controlled (airplane)
RD	Rural Developed
Reclamation	Bureau of Reclamation
RIA	Rangeland Improvement Association
RMP	Resource Management Plan
RN	Rural Natural
RV	recreational vehicle
RWQCB	Regional Water Quality Control Board
SBCAPCD	Santa Barbara County Air Pollution Control District
SBCFD	Santa Barbara County Fire Department
SCCAB	South Central Coastal Air Basin
SR	State Route
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
UCSB	University of California, Santa Barbara
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VMP	Vegetation Management Program
WROS	Water Recreation Opportunity Spectrum

1.1 BACKGROUND

1.1.1 History

The Cachuma Project was authorized in 1948 to provide irrigation, domestic, and municipal water supplies for Santa Barbara County (U.S. Congress 1948). The authorizing document also recognized the considerable value and benefits of recreation and fishing (U.S. Congress 1948, Sections 30, 34).

As part of the Cachuma Project, the Bureau of Reclamation (Reclamation) completed Bradbury Dam in 1956, forming Cachuma Lake (Figure 1-1). The dam was constructed under contract with the Santa Barbara County Water Agency on behalf of the Cachuma Project Member Units to provide irrigation, domestic, and municipal and industrial water supplies to the Member Units (Figure 1-2). The Member Units consist of the City of Santa Barbara, Goleta Water District, Montecito Water District, Carpinteria Valley Water District, and Santa Ynez River Water Conservation District – Improvement District #1 (ID #1). Over the past 45 years, the Cachuma Project has been the principal water supply for the Santa Ynez Valley and South Coast communities, delivering an average of 25,000 acre-feet per year. In addition to satisfying the Member Units' vested rights to divert surface flows, the Cachuma Project is required to provide unregulated flows necessary to recharge Santa Ynez River underflow and water in adjacent groundwater basins.

Reclamation owns all Project facilities and operates Bradbury Dam. Operation and maintenance of the Cachuma Project water supply facilities other than Bradbury Dam were transferred in 1956 to the Member Units, who formed the Cachuma Operation and Maintenance Board (COMB) to carry out these responsibilities. The Member Units are paying for the capital cost of constructing the Cachuma Project through a Renewal Master Contract with Reclamation. The capital cost will be fully paid by 2015. Reclamation holds the water permits from the State Water Resources Control Board (SWRCB) on behalf of the United States for diverting water from the Santa Ynez River for the Cachuma Project.

1.1.2 Downstream Facilities

Water from Cachuma Lake is conveyed to the Member Units through the Tecolote Tunnel intake tower (Figure 1-2). The lowest portal on the intake tower is at elevation 650 feet. Tecolote Tunnel extends 6.4 miles through the Santa Ynez Mountains from Cachuma Lake to the headworks of the South Coast Conduit (Figure 1-2). The tunnel has a diameter of 7 feet and a capacity of 100 cubic feet per second (cfs).

The South Coast Conduit is a high-pressure concrete pipeline that extends from the Tecolote Tunnel outlet to the Carpinteria area, a distance of over 24 miles, and includes the four regulating reservoirs described below. This pipeline distributes raw water to the Goleta Water District, City of Santa Barbara, Montecito Water District, and Carpinteria Valley Water District.

There are four regulating reservoirs along the South Coast Conduit: (1) Glen Annie Dam Reservoir (500 acre-feet), located on the West Fork of Glen Annie Canyon Creek below the outlet of Tecolote Tunnel in the Goleta Water District; (2) Lauro Reservoir (640 acre-feet), located on Diablo Creek outside the City of Santa Barbara; (3) Ortega Reservoir (60 acre-feet),

located within the Montecito Water District; and (4) Carpinteria Reservoir (40 acre-feet), located within the Carpinteria Valley Water District (Figure 1-2).

Water was originally delivered to ID#1 through the Bradbury Dam outlet works into the Solvang/Santa Ynez Conduit, a pipeline that terminated in Solvang. This pipeline has been converted to a delivery pipeline to convey State Water Project (SWP) water from the Central Coast Water Authority's Santa Ynez Pump Station to Cachuma Lake. Water is now delivered to ID #1 primarily through an exchange agreement with the other Member Units in which ID #1 receives SWP water directly in exchange for its entitlement to Cachuma Lake water. If necessary, ID#1 also can receive water directly through the Central Coast Water Authority pipeline, which is connected to Bradbury Dam, in the event SWP water deliveries cannot be made.

Reclamation operates Bradbury Dam, including the outlet works and spillway gates, and COMB operates and maintains the other project facilities. COMB is responsible for diversion of water to the South Coast through the Tecolote Tunnel, and operation and maintenance of flow control valves, meters and instrumentation at control stations and turnouts along the South Coast Conduit and at regulating reservoirs. COMB coordinates closely with staff of the Member Units to ensure that water supply meets daily demands. COMB staff read meters and account for Cachuma Project water deliveries on a monthly basis, and perform repairs and preventative maintenance on Cachuma Project facilities and equipment. COMB safeguards Cachuma Project lands and rights-of-way on the South Coast. COMB issues monthly Cachuma Project water production and use reports, operations reports, and financial and investment reports which track operation and maintenance expenditures.

1.1.3 Cachuma Lake Recreation Area

The Cachuma Lake Recreation Area (Plan Area) (Figure 1-3) encompasses approximately 9,250 acres, including Cachuma Lake (3,043 acres at full level) and the surrounding shores and rugged hillsides. Santa Barbara County Parks Department manages the Plan Area pursuant to a contract between Reclamation and Santa Barbara County (County). The 50-year contract expired in 2003 and will be extended to through the completion of the Resource Management Plan (RMP) process. Reclamation will develop a new management contract with a local managing partner using the RMP for guidance on future land, resource, and recreation management.

Most of the recreational facilities at the lake are located in a 375-acre County Park on the south side of Cachuma Lake at the Tequepis Peninsula (County Park). Facilities include day use facilities, large group camping facilities, campsites and temporary cabins, Live Oak Camp and Camp Whittier, a general store, a scenic overlook for Bradbury Dam, a marina and launch ramp, bait and tackle shop, amphitheater, trailer storage yard, recreational vehicle (RV) campsites, Nature Center, County Park Ranger Station, family center, swimming pools, snack shop, and maintenance and infrastructure facilities. The north side of Cachuma Lake consists of open space that is leased for grazing and permitted equestrian use. It is not open for general public access.

The Cachuma Lake RMP includes resource management alternatives for the reservoir and adjacent Reclamation lands as appropriate for recreation and natural resource management opportunities and water quality. All recreational uses and improvements at the lake must be consistent with the original purpose of the Cachuma Project. They must not interfere with reservoir operations, which are focused on providing a reliable annual yield of high-quality water

primarily for agricultural and municipal use. Recreational uses and improvements must also not interfere with protection of endangered species, particularly Southern California steelhead.

1.1.4 Endangered Species Protection

An understanding of an ongoing project at Cachuma Lake is necessary as additional background to the RMP. The project consists of potential modifications to Reclamation's existing water rights permits for diversion and storage at Cachuma Lake. Reclamation's existing permits are subject to the continued jurisdiction of the SWRCB for the protection of water rights and public trust resources on the Santa Ynez River downstream of Bradbury Dam. Independent of the release requirements for downstream water rights under the existing permit conditions for the Cachuma Project, Reclamation recently modified its operations to allow for additional releases to protect and enhance habitat for the steelhead in the river below Bradbury Dam. In 1997, the National Marine Fisheries Services (NMFS) listed the Southern California steelhead Evolutionarily Significant Unit as an endangered species under the federal Endangered Species Act. In September 2000, NMFS issued a Biological Opinion (BO) that contains mandatory terms and conditions that Reclamation must observe to protect the species, including new water releases from Bradbury Dam (NMFS 2000a).

The Biological Opinion requires Reclamation to meet interim and long-term target flows at two locations on the mainstem of the Santa Ynez River. The objective of the flows is to improve summer rearing habitat conditions for steelhead in the upper mainstem below Bradbury Dam, as well as in lower Hilton Creek, a tributary of the Santa Ynez River south of State Route (SR) 154 and west of Bradbury Dam (Figure 1-2). The target flows will be produced by a combination of natural runoff and releases from Cachuma Lake.

Reclamation, in cooperation with the Santa Ynez River Water Conservation District, has operated water rights releases conjunctively with fish water releases since 1994, and proposes to continue this operation in the future. That is, when releases are being made for water rights, the water from this source will be used to continue to meet the mainstem target flows as well as the habitat flow requirement in Hilton Creek. Currently, water rights releases are made from the outlet works at Bradbury Dam and a Hilton Creek watering system that is designed to deliver water to three release points: two along Hilton Creek and one in the "stilling basin" below the spillway of Bradbury Dam.

The exact flow regime needed for Reclamation to satisfy the requirements of the Biological Opinion as well as downstream water rights in accordance with SWRCB orders has yet to be determined. In August 2003, the SWRCB prepared a Draft Environmental Impact Report (EIR) that analyzed seven operational alternatives to satisfy requirements for fisheries protection and water rights. As a result of public comments, the Draft EIR was revised to evaluate two additional alternatives and recirculated for public comment in July 2007 (SWRCB 2007). As of May 2010, publication of a Final EIR is pending. The environmental process for the proposed flow modifications is separate from the evaluation presented in this document, which is limited to the implementation of a Resource Management Plan for Cachuma Lake.

The operating plan that Reclamation proposed as part of the consultation required under Section 7 of the Endangered Species Act, and the plan that NMFS evaluated in the Biological Opinion,

included releases of water for fish and surcharging of Cachuma Lake. Surcharging is a term used to describe the overflow amount left after a reservoir has been filled to capacity. The alternative analyzed in the SWRCB Draft EIR for the maximum surcharge evaluates a 3-foot surcharge (raising the lake level from 750 feet to 753 feet). To comply with the Biological Opinion, Reclamation constructed the spillgate modifications allowing a surcharge of 1.8 and then 3 feet to be implemented.

In 2004, the County of Santa Barbara, the Santa Barbara County Water Agency, the Cachuma Conservation Release Board, and ID #1 entered into an MOU[1] to provide for a phased surcharge increase over a 5-year period. The phased surcharge allowed the County to protect certain Plan Area facilities to avoid effects from wave run-up or inundation as a result of the 3-foot maximum surcharge level. In 2005, the Cachuma Member Units constructed a gabion basket barrier wall around the water treatment facility as a temporary protection measure, and in 2007 County Parks completed construction of a new boat ramp. The water treatment facility will ultimately be reconstructed at a higher elevation. Other facilities that are not compatible with being submerged for extended periods have either been moved or provisions have been made to protect them.

For planning purposes and consideration of any future new facilities addressed in this RMP, the maximum 3-foot surcharge with an additional safety buffer for wave run-up of 7 feet was assumed (lake level 760 feet). Any potential recreational facilities proposed in this RMP must be therefore be located above the surcharge zone (760 foot lake level elevation) or be compatible with being submerged for extended periods.

1.2 OVERVIEW OF THE RESOURCE MANAGEMENT PLAN

The Cachuma Lake RMP is a long-term plan that will guide future actions in the Plan Area. The RMP has been developed based on a comprehensive inventory of environmental resources and facilities; input from other federal agencies (such as the U.S. Fish and Wildlife Service [USFWS] and U.S. Forest Service [USFS]); and input from the County, COMB, and the general public. The primary emphasis of the RMP is to protect water supply, water quality, and natural resources, while enhancing recreational uses at the lake.

The Cachuma Lake RMP addresses the Plan Area, including Cachuma Lake and all government land surrounding the lake. The objective of an RMP is to establish management objectives, guidelines, and actions to be implemented by Reclamation directly, or through its recreation contract, that will:

- Protect the water supply and water quality functions of Cachuma Lake.
- Protect and enhance natural and cultural resources in the Plan Area, consistent with federal law and Reclamation policies.
- Provide recreational opportunities and facilities consistent with the original Cachuma Project purposes, Reclamation policies, and state water policies.

[1] Memorandum of Understanding (MOU) Regarding the Surcharge of Cachuma Lake and the Protection of Recreational Resources at the Lake (February 2004; amended April 2005).

The development of the RMP is based on authorities provided by Congress through the Reclamation Act, Federal Water Project Recreation Act, Reclamation Recreation Management Act, and applicable federal agency and Department of the Interior policies. The RMP includes recreation in accordance with Congressional policy, as stated in the Federal Water Project Recreation Act (Public Law 89-72, 89th Congress, S.1229, July 9, 1965, 79 Stat. 213, 214; as amended by Public Law 93-251, March 7, 1974, 88 Stat. 33, Sec. 77; and Public Law 102-575, October 30, 1992, 106 Stat. 4690, Title XXVIII), that "full consideration shall be given to the opportunities, if any, which the project affords for outdoor recreation and for fish and wildlife enhancement." The Act makes recreation an approved, primary purpose of Reclamation projects (Memorandum: Authorization and Cost Share Requirements for Facilities Provided for Under PL 89-72, U.S. Department of the Interior, Office of the Solicitor, January 27, 1995).

The environmental impacts of the RMP are assessed in a programmatic Environmental Impact Statement (EIS) that is included as part of this joint RMP/EIS document. The environmental review focuses on the potential for management actions to cause adverse environmental impacts to natural and cultural resources such as water quality, endangered species, and historic resources. This analysis is programmatic. Any future actions that would result in new facilities, ground disturbances, or environmental impacts beyond the programmatic analysis provided would be subject to subsequent environmental review. Alternative management actions are considered and compared.

1.3 PURPOSE AND NEED

As required under National Environmental Policy Act (NEPA), a proposed action, i.e., the RMP, requires a statement of the proposed action's purpose and need.

This RMP will have a planning horizon of 20 years. The planning horizon will begin when a Record of Decision is issued. Needs that the new RMP will address include:

- Ensuring timely delivery of high-quality water to water users while enhancing natural resources and recreational opportunities
- Providing recreational opportunities to meet the demands of a growing, diverse population
- Ensuring recreational diversity and the quality of the recreational experience
- Protection of natural and cultural resources, while educating the public to their value and good stewardship
- Providing the framework for establishing a new management agreement with a managing partner

The purpose of the RMP is to provide a program and set of policy guidelines necessary to encourage orderly use, development, and management of the reservoir and the surrounding lands. The plan will identify outdoor recreational opportunities, enhanced by Cachuma Lake and its shoreline, compatible with the surrounding scenic, environmental, and cultural resources. In addition, this RMP will propose uses that will be compatible with operation of the reservoir for water delivery.

1.4 MANAGEMENT OBJECTIVES

The following management objectives fulfill the purpose of the RMP:

- Identify the current and most appropriate future uses of land and water resources within the Plan Area, taking into account the maximum surcharge lake elevation of 753 feet and a safety buffer to 760 feet for future new facilities.
- Develop and implement a comprehensive land use strategy considering uses of Plan Area and adjacent lands.
- Identify long-term resource programs and implementation policies to manage and develop recreational, natural, and cultural resources.
- Determine the opportunities for new or enhanced recreation facilities needed based on demand and carrying capacity limits.
- Ensure a balance between fish and wildlife resources and recreational opportunities.
- Identify opportunities and develop partnerships for managing recreational and natural resources.
- Develop strategies and approaches to protect and preserve the natural, recreational, aesthetic, and cultural resources.
- Establish policies for providing appropriate public access to Plan Area resources.
- Develop comprehensive education and stewardship programs to inform the public of the recreational opportunities and natural/cultural resources available in the Plan Area.
- Provide adequate public safety and security measures for protection of visitors and resources.

As described in the *Resource Management Plan Guidebook* (Reclamation 2003), an RMP is a document that provides management direction consistent with authorized Reclamation project purposes while recognizing the rights and interests of existing contracts, legislation, and other entities for an identified land area that is under the jurisdiction of Reclamation. An RMP identifies measures necessary to achieve a desired future condition of the resources within a management unit covered by the RMP. Management direction is set forth in the form of goals, objectives, standards, and guidelines. These, in turn, set the stage for management actions, activities, and uses that affect management frameworks and partnerships, water resources, recreation and visual resources, natural and cultural resources, and land management. The management direction can be both, general in nature to the management unit (areawide), or unique to a portion of the management unit (site specific).

2.1 SECTION ORGANIZATION

This chapter first describes the planning process and planning influences that led to the formulation of alternatives for the Cachuma Lake RMP. Then the No Action Alternative and two action alternatives developed for this RMP are identified and described (Sections 2.6 through 2.8).

The planning process for the Cachuma Lake RMP involves the integration of issues, opportunities and constraints, management actions and management zones. As discussed in Section 1, the RMP follows the guidance of federal planning mandates and proposed actions that balance recreation opportunities with natural and cultural resource stewardship. These planning process elements are discussed in Section 2.2.

The goals identified in Section 2.3 will provide overall guidance for the RMP management direction and actions. A variety of planning influences should be considered in the planning process leading to alternative formulation, including such items as systemwide planning, regional planning, demographics, and public concerns. These influences are addressed in Section 2.4. As numerous influences are involved in the planning process for the RMP, infrastructure and operational improvements that are important to different stakeholders are identified in Section 2.4, and the common management actions are assessed in Section 2.5. The degree to which the various RMP alternatives meet these goals varies as described in Sections 2.6 through 2.8.

2.2 PLANNING PROCESS

The following are the basic elements of the planning process:

- Define the overall goals and objectives.
- Describe the resource categories that group the issues.
- Identify the issues, opportunities, and constraints.
- Determine management actions to address the issues.
- Define the management zones for Cachuma Lake.

More specifically, the development of the RMP alternatives followed the RMP planning process steps outlined in Reclamation's *Resource Management Plan Guidebook*. The steps in this process are described below.

- **Step 1: Identify Issues.** This step involves the identification of various resource and management issues at Cachuma Lake. These issues involve resource problems that need to be corrected and resources that need special protection. Management issues also include unrealized opportunities, unresolved conflicts or problems, efforts to implement a new program due to new regulations, or a value being lost.
- **Step 2: Identify Opportunities and Constraints.** This step involves the identification of opportunities and constraints at the lake. Opportunities include resources, programs, and management frameworks that can facilitate the implementation of the RMP. Constraints include laws, regulations, budgets, staffing, and environmental limitations. Steps 1 and 3 were completed by conducting public scoping in which public comments, suggestions, and ideas were provided to Reclamation through written comments and public scoping meetings in 2002 and 2003.
- **Step 3: Develop RMP Goals.** Reclamation developed RMP goals based on the issues identified in Step 1 and in consideration of the purpose of an RMP. These goals represent broad statements that provide overall guidance to the management direction and actions in the RMP alternatives. The management direction embodies an overall approach or strategy for managing resources and recreation.
- **Step 4: Planning Principles.** Reclamation then developed planning principles, which are short and concise statements that establish the "sideboards" and parameters for the development of the RMP alternatives. These planning principals were then used in formulating and selecting land uses and management actions to be considered in the RMP alternatives.
- **Step 5: Gather and Analyze Resource Information.** In this step, Reclamation collected information about the physical, biological, and cultural resources of the federal property. In addition, information about the recreation and land use was also gathered. These data were compiled into a Geographic Information System (GIS) to facilitate a display and analysis of multidisciplinary considerations. This step involves field studies, literature review, and interviews with the County Park staff, and Cachuma Lake users.
- **Step 6: Formulate RMP Alternatives.** This step involves the formulation of several RMP alternatives. Three alternatives were developed that provide a range of varying degrees of resource protection and recreational opportunities. The alternatives were designed to meet the overall RMP goals, although the extent to which they meet these goals varies.
- **Step 7: Conduct Environmental Impact Assessment.** Adoption of an RMP represents a federal action subject to NEPA's environmental review requirements. Under this step, Reclamation evaluated the environmental impacts of the RMP alternatives in a comparative manner. The results provide the basis for Reclamation to identify tradeoffs amongst various environmental resources, and between recreation and environmental resources.
- **Step 8: Issue Draft RMP and EIS for Public Review.** Under this step, Reclamation issued a Draft EIS for public review. The public was provided an opportunity to review the RMP alternatives, including a comparison of how well they meet the RMP goals and their environmental impacts.

- **Step 9: Prepare Final RMP and EIS.** After a review and consideration of public comments, Reclamation prepared this Final EIS on the RMP alternatives. A Record of Decision has also been prepared based on the Final EIS that identifies the preferred RMP alternative and explains the basis of the decision.
- **Step 10: Implement the RMP.** This step involves implementing the RMP actions in accordance with the guidance on priorities and schedules described in the RMP. The local managing partner implements most actions identified in the RMP.

2.2.1 Primary Issue Areas

Reclamation conducted several public scoping meetings in 2002 and 2003 to explain the scope and objectives of the Cachuma Lake RMP and to elicit comments from the public. Based on verbal comments at the meetings and written comments received after the meetings, Reclamation identified the following primary issue areas to be addressed in the RMP:

- Facility Management
- Recreation
- Water Quality
- Grazing Management
- Natural Resource Management and Protection
- Land Use Management
- Health and Safety and Administration

A summary of public comments for each issue area is presented in Table 2-1, which is included at the end of this section.

2.2.2 Planning Principles

RMP planning principles are short statements that provide basic guidance on how the RMP land uses and management actions should be developed. The Cachuma Lake RMP alternatives must be consistent with all of the following planning principles:

- Protect and maintain land and water for original Cachuma Project purposes, including water quality downstream of Bradbury Dam.
- Protect and enhance natural resources, including endangered fish species in the Santa Ynez River and Hilton Creek downstream of Bradbury Dam.
- Protect cultural resources.
- Recognize community concerns and values about Cachuma Lake.
- Encourage an appropriate range of recreational uses.
- Ensure consistency with federal policies, laws, and regulations.
- Protect public health and safety.

2.2.3 Opportunities and Constraints

The primary opportunities at the Plan Area are as follows:

- Good Condition of Natural Resources. The primary natural resources of the Plan Area include a large beautiful lake with clear blue water; a diverse mixture of mostly undisturbed native habitats such as oak woodlands, scrub, and riparian forests; and a picturesque natural setting and wide expanses of undeveloped open space. These resources are in good condition due to the protection from development afforded on federal lands, and a history of responsible stewardship by Reclamation and Santa Barbara County Parks Department over the past 50 years. Cachuma Lake provides a unique opportunity for a range of public access and enjoyment of the natural world in close proximity to urban areas.
- Abundant and Varied Wildlife. The combination of a water body and a large expanse of undeveloped land surrounding Cachuma Lake provide the basis for abundant and varied wildlife. The lake supports bald eagles and various water-associated birds that visit the lake during migration periods or for overwintering. Cachuma Lake provides a unique opportunity to see many birds that do not occur elsewhere in the County and to observe the diversity of wildlife that reside in the mixture of aquatic and terrestrial environments at the lake.
- Lake and Park Reputation. Cachuma Lake has a long history of providing public recreation to local residents and visitors from throughout southern and central California. The lake has a reputation for a beautiful setting with simple accommodations for campers and fishermen. The lake is well known by trout and bass fishermen. Cachuma Lake is distinguished by the quiet lake experience since waterskiing and jet-skiing are not allowed. Hence, most visitors are seeking a quiet, more natural experience than at other lakes in the region where more active recreation is allowed. The Plan Area also has a very well known and positive reputation for its natural history programs. Cachuma Lake's reputation provides an opportunity to increase awareness of natural resource protection, and of recreational uses that are supportive of natural resource conservation.

The primary constraints at Cachuma Lake are as follows:

- Project Purposes and Operations. Public uses of Cachuma Lake must be consistent with protecting water supply and water quality, including downstream of Bradbury Dam, and must accommodate the necessary reservoir operations and management needs.
- Fiscal Limitations. Implementation of the RMP management actions will be the primary responsibility of the local managing partner. The County Park is a revenue generating program, but has significant fiscal limitations due to ongoing operation costs, a backlog of deferred maintenance and capital improvement projects, competition for users, and fiscal policies within the County that limit the generation of discretionary funds. As such, the RMP management actions are constrained by limited funding from the local managing partner.
- Federal Laws, Regulations, and Policies. The RMP management actions must be consistent with various federal laws, regulations, and Executive Orders. Examples include the Archaeological Resources Protection Act, Endangered Species Act, Clean Water Act, Comprehensive Environmental Response, Compensation, and Liability Act, NEPA, National Historic Preservation Act, Migratory Bird Treaty, Resource Conservation and Recovery Act, Executive Order 11990 (Protection of Wetlands), Executive Order 12962 (Recreational Fisheries), and Executive Order 13186 (Protect Migratory Birds). The RMP must also be

consistent with the Land Resource Management Policies, Directives, and Standards in the Reclamation Manual.

- Physical Constraints. Many physical constraints limit management actions, particularly related to expanding public access and recreation. Access to the north shore of the lake is difficult at times due to high water in the Santa Ynez River and very steep cliffs along the shoreline. Access to the south shore is also very limited due to the steep terrain. In addition, ingress and egress from SR 154 to federal lands is very difficult because of the narrow roadway, high speeds, and poor sight distance. Finally, very steep hills and ravines, which would require road building and bridges to traverse them, limit access to the lake.

2.2.4 Public Input

Public input has been a critical element in identifying Cachuma Lake's opportunities and constraints and in developing the RMP alternatives. Reclamation has received public input through the public scoping process for the RMP and the public review and comment period for the Draft RMP/EIS. A summary of these processes is provided below.

2.2.4.1 Public Scoping

In 2002, Reclamation conducted four public scoping meetings to explain the scope and objectives of the RMP and to elicit comments from the public. Meetings were conducted as follows:

- March 12, 2002 - Solvang
- March 13, 2002 - Goleta
- March 14, 2002 - Santa Maria
- May 1, 2002 - Goleta

The scoping meetings began with an introduction by Reclamation staff, followed by a slide presentation by Reclamation's RMP technical consultant. The presentation covered the history of the Cachuma Project, current recreation at Cachuma Lake, and a description of the process to develop an RMP. The presentation was followed by public comments.

A total of 145 people attended the four public scoping meetings. Many attendees provided verbal comments. In addition, Reclamation received written comments and letters from agencies, organizations, and the general public. Comments were received from the following public agencies:

- Cachuma Operation and Maintenance Board
- Carpinteria Valley Water District
- County of Santa Barbara Planning and Development
- Santa Barbara County Parks Commission
- Santa Barbara County Parks Department
- Santa Ynez River Water Conservation District

- ID #1

Comments were received from the following nongovernmental organizations or representatives of such organizations:

- Cachuma Boat Rentals, Inc.
- Cachuma Lake Nature Center, Inc
- Central Coast Windsurfing Association
- Environmental Defense Center
- Santa Barbara Audubon Society
- Santa Barbara Radio Control Modelers, Tri-Valley RC Modelers, Lompoc Valley Flyers, and Vandenberg Wingbusters
- University of California, Santa Barbara (UCSB), Department of Physical Activities and Recreation
- UCSB Rowing Club

In June 2002, Reclamation prepared a public scoping report, which provided a summary of public comments and the issues that were raised. The report is incorporated by reference and includes a summary of written and verbal comments by agencies, organizations, and individuals (URS 2006a).

On December 9 and 10, 2003, Reclamation conducted public meetings on the RMP alternatives in Solvang and Goleta. Reclamation provided a brief overview of the RMP process and introduced the preliminary RMP alternatives. An open house was then conducted in which the public was able to view stations on each alternative and discuss their comments with Reclamation and the consultant team. Over 80 members of the public attended these meetings and provided both verbal and written comments. A summary of the comments on the preliminary alternatives is provided in the public scoping report (URS 2006a).

2.2.4.2 Public Review of the Draft RMP/EIS

The public review period for the Draft RMP/EIS began on July 25, 2008, and was initially set to end on September 23, 2008. Due to considerable public interest in the RMP, Reclamation extended the comment period through October 31, 2008, for a total review period of 99 days. Notice of the extension was issued by press release on September 11, 2008, by postcard to the project mailing list on September 17, 2008, and by notice in the Federal Register on October 9, 2008 (73 Federal Register 197: 59669).

During the comment period, the Draft EIS was available for review at the Reclamation Mid-Pacific Regional Library in Sacramento, CA; the Reclamation South-Central California Area Office in Fresno, CA; the Cachuma Lake Recreation Area park headquarters in Santa Barbara, CA; the Santa Maria Public Library in Santa Maria, CA; the Santa Barbara Public Library in Santa Barbara, CA; the Reclamation Denver Office Library, Denver, CO; Natural Resources Library, U.S. Department of the Interior, Washington, DC; and the project website (http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=283).

Written comments on the Draft EIS were submitted by federal, state, regional, and local agencies; organizations; and individuals. The comments, along with responses from Reclamation, are presented in Appendix B.

Two public hearings were held for the Draft RMP/EIS. The first was on Tuesday, August 26, 2008, from 6:30 to 9 PM at the Veterans Memorial Hall, 1745 Mission Drive, Solvang, CA. The hearing was advertised by public notices in the *Santa Barbara News Press* and the *Santa Maria Times*. Reclamation also sent notices to people who had signed attendance sheets at previous public meetings about the project (described in Section 2.2.4.1) or requested notification in writing.

The purpose of the hearing was to inform the public of the proposed actions and alternatives for the RMP and to receive public comments. A slideshow was presented to summarize the RMP and the NEPA process. Information stations staffed by personnel from Reclamation and their consultant URS were provided to describe the study area and WROS designations for each alternative, management actions for each alternative, and impacts for each alternative. Forty-three people registered on the sign-in sheet for the hearing.

Due to considerable public interest in the RMP, Reclamation in cooperation with the Carpinteria Valley Water District held a second public hearing on Wednesday, October 8, 2008, from 6:30 PM to 9 PM at the City of Carpinteria Council Chambers, Carpinteria, CA. The Carpinteria Water District coordinated public notification of the meeting. Three people registered on the sign-in sheet for the hearing.

Comments received from the public hearings are presented and responded to in Appendix B.

2.2.5 Management Zones

The Water Recreation Opportunity Spectrum (WROS) management tool was used to identify management zones and is discussed more fully in Section 3. The WROS zones are used as tools to assist planners in developing management actions appropriate for different recreational activities associated with water. While the WROS is specifically intended to address water-related recreation activities, the WROS management zones are appropriate to describe other adjacent natural resources and management actions in the Plan Area because the activities surrounding Cachuma Lake are closely associated with water, and the terrain limits the viewshed adjacent to the lake. For example, if a person on or near the lake is in a Rural Natural (RN) zone, similar development is visible in the immediate viewshed. A person on land in the same area would therefore experience similar physical and social surroundings.

Distinct management zones based on the WROS System have been identified for various portions of the Plan Area. Future classifications may vary, depending on the alternative selected and the management actions taken for those alternatives. These zones, and the actions associated with them, are not intended to provide all activities for all users. Rather, Cachuma Lake, when viewed with other lakes and reservoirs in the vicinity, can provide an opportunity for unique management actions. In the discussion of the alternatives, the management actions identified vary depending on the current WROS zone or on the intended future WROS zone. The two management zones that are used to describe existing conditions at Cachuma Lake are RN and Rural Developed (RD) (see Figure 2-1).

The western half of the lake is classified as RD. This half of the lake is less developed and more tranquil than an Urban/Suburban setting, but more developed than RN. RD areas provide occasional opportunities to see, hear, or smell the natural resources due to the level of development, human activity, and natural resource modification.

The eastern half of the lake is classified as RN, except for the very southeastern portion, which is also classified as RD due to the area's close proximity to SR 154 and Live Oak Camp. The RN designation also applies to both Cachuma and Santa Cruz bays. The RN zone is characterized by prevalent opportunities to see, hear, or smell the natural resources due to only occasional or periodic levels of development, human activity, and natural resource modification.

Opportunities and constraints in Cachuma Lake and the geographic areas surrounding the lake are summarized in Table 2-2, which is included at the end of this section.

2.3 GOALS

As determined by Reclamation, the managing partner, and the public input process, the primary goals of the Cachuma Lake RMP are listed below. These goals will provide overall guidance for the RMP management direction and actions. The degree to which the various RMP alternatives meet these goals varies, as described in Sections 2.6 through 2.8.

1. Promote responsible stewardship of federal land and water resources for the public benefit.
2. Protect and maintain water quality.
3. Protect and enhance the natural resources at Cachuma Lake.
4. Maintain the unique ambience of Cachuma Lake as a quiet lake with a beautiful natural setting.
5. Protect and maintain existing recreational uses and educational opportunities.
6. Provide for enhanced or new recreational uses and facilities that are compatible with other RMP goals.

2.4 FORMULATION OF ALTERNATIVES

2.4.1 Introduction

This section describes RMP alternatives designed to address the issues, opportunities, and constraints at the Plan Area. A broad range of management actions was developed to address alternatives that would represent the varied interests pertaining to the Plan Area. The No Action Alternative and two action alternatives are as follows:

- No Action (Alternative 1)—This alternative manages land and activities with the continuation of current management practice.
- Enhanced Recreation (Alternative 2)—This alternative balances natural resource protection and recreation opportunities.
- Expanded Recreation (Alternative 3)—This alternative emphasizes expanded recreation opportunities.

Section 2.5 describes the common management actions for all alternatives. Unique management actions for each alternative are detailed in Sections 2.6 through 2.8. Table 2-3, which is included at the end of this section, summarizes the common and unique management actions for the alternatives.

2.4.2 Roles of Reclamation and Local Managing Partner

Reclamation will negotiate an agreement with a local managing partner for the Plan Area. The local managing partner will have overall responsibility for managing public access, recreation, infrastructure and public services, and natural resources in the Plan Area, excluding Bradbury Dam and Tecolote Tunnel Intake. The RMP will provide the overall resource and recreation management direction and framework for the Plan Area. It will be a guidance document for the local managing partner for its day-to-day operations and long-range planning.

Reclamation will have overall responsibility for ensuring that all actions in the Plan Area by Reclamation and its local managing partner are consistent with the RMP. The local managing partner must ensure that its actions in managing the Plan Area and associated land, recreation facilities, and infrastructure, are consistent with the RMP.

The agreement with a local managing partner will require that the local managing partner to use the RMP as the primary land use, natural resource, and recreation management guidance document to be followed during the management of the Plan Area.

The RMP will be implemented through two types of management approaches: (1) specification of allowable land uses, and (2) recommendations for specific management actions and improvement projects. These approaches are described below.

2.4.2.1 Allowable Land Uses

The RMP will provide management guidance through a set of allowable uses designated in WROS zones. Specifying the allowable uses creates both restrictions and opportunities for recreation and natural resource management. Using this geographically based land use and recreation plan, the local managing partner will conduct its day-to-day operations and long-range planning within a comprehensive and predictable planning framework.

Types of use in the WROS zones in and around the Plan Area are presented in Table 2-3, which is included at the end of this section. Figures showing the WROS zones under each alternative are presented for each RMP alternative in this section.

It should be noted that the designation of allowable recreational uses in different geographic units of the Plan Area will not require the local managing partner to implement the designated uses. The RMP only indicates what lands are suitable for different recreation activities; it does not require the local managing partner to implement, facilitate, or encourage those activities. The local managing partner has the option of continuing existing uses or pursuing new or modified recreational uses based on considerations of the following factors: (1) sufficient public demand, (2) sufficient staffing and funding to manage the new or modified uses in accordance with the RMP, and (3) potential for increased public benefits and use.

New recreational uses or activities allowed under the RMP may also be discontinued in the future at the discretion of the local managing partner if demand decreases, the activity is not

economically viable, new security or safety considerations arise, and/or unforeseen significant environmental impacts occur that cannot be mitigated.

2.4.2.2 Management Actions and Projects

The RMP includes recommendations for various resource management actions and facility improvement projects. These are specific actions that may be implemented at Cachuma Lake Plan Area to meet the RMP goals. These management actions and projects are defined at a conceptual or programmatic level in the RMP. More detailed descriptions of the actions and project will be developed during the planning horizon of the RMP. The responsibility for funding, designing, and implementing (or constructing) the management actions and improvement projects will be specified in an agreement with the local managing partner.

It should be noted that the local managing partner will be required to conduct an appropriate site-specific environmental review (including analysis of potential water quality impacts) for most of the new or expanded recreational activities identified in the RMP such as new day use or camping facilities at Live Oak Camp or new boat launches. The environmental documentation would be prepared to meet NEPA requirements because the projects would occur on federal land, and may need to satisfy California Environmental Quality Act (CEQA) requirements if the projects are partially funded or managed by the local managing partner. Some of the new recreational uses and most of the natural resource management actions identified in the RMP may not require additional environmental review because (1) the environmental analyses of these actions are adequately addressed in this EIS, or (2) such actions are exempt from environmental review.

2.4.2.3 Coordination with COMB and the Member Units

Reclamation will encourage ongoing coordination with the COMB and Cachuma Project Member Units regarding RMP management actions and recreation projects. Reclamation will create a Coordinating Committee composed of representatives of Reclamation, the local managing partner, COMB, and one Member Unit (representing all Member Units). The committee will meet regularly to discuss mutual concerns related to recreation, resource management, and water supply operations.

2.4.2.4 Amendments to the RMP

Reclamation can amend the RMP at any time if the need arises. Conditions that may require an amendment could include, but are not limited to, (1) changed environmental conditions; (2) unforeseen events; (3) changes in policies and land use plans that have been determined to be infeasible, impractical, or have undesirable consequences; and (4) change in applicable laws and regulations. Reclamation would initiate the amendment process, which would include appropriate NEPA environmental review tiered from this document. The agreement with the local managing partner would be amended as necessary to address these amendments or changes to the RMP.

The RMP can be updated to reflect any changed environmental or institutional circumstances; and new laws, regulations, or policies; and changes in the Cachuma Project Operations.

Reclamation will conduct public meetings and an environmental review when updating the RMP.

2.5 COMMON INFRASTRUCTURE, OPERATIONAL IMPROVEMENTS AND MANAGEMENT ACTIONS FOR ALL ALTERNATIVES

Each of the alternatives has different components and management actions that would attain the direction of that alternative. However, several components and management actions are common to all alternatives. These are discussed in this section. The remaining management actions are discussed as they apply to each alternative in Sections 2.6 through 2.8. Table 2-3, which is included at the end of this section, summarizes the common and other management actions for each alternative.

2.5.1 Infrastructure and Operational Improvements

All RMP alternatives include the following infrastructure, facility, and operational improvements at the County Park and Live Oak Camp. County Park refers to the 375-acre south shore area on Tequepis Peninsula (Figure 1-3) with most of the major facilities such as campsites, marina and boat ramp, amphitheater, RV campsites, swimming pools, and ranger station. Live Oak Camp is a 40-acre facility approximately 5 miles east of the County Park that has camping (including for large groups), cabin rentals, and special events. It also is used as a temporary base of operations for emergency fire protection services or for other emergency personnel.

The improvements are organized below by goals for improving the infrastructure, facilities, and operational elements of the County Park and Live Oak Camp.

- Provide public services that are reliable and sufficient to meet current and future demand.
  - Operate, maintain, and upgrade or replace the wastewater collection system and treatment plant serving the County Park, as necessary, to meet demand and applicable state health requirements, and operate under all lake levels meeting health requirements.
  - Provide a potable water supply for the County Park and Live Oak Camp that will operate under all lake levels, meet drinking water and fire demands, and meet all applicable state health requirements.
- Provide facilities for water-based recreation under all lake levels (including surcharge events up to a maximum lake elevation of 753 feet with a safety buffer for wave runup to 760 feet) to ensure uninterrupted recreational uses to the public.
  - Modify marina shops, docks, and walkways to accommodate future surcharging.
- Ensure full access to the County Park and its recreational facilities during surcharge events (up to a maximum lake elevation of 753 feet with a safety buffer for wave runup to 760 feet) to maintain uninterrupted recreational uses at the lake.
  - Modify County Park facilities as necessary to accommodate future surcharging such as the marina overflow parking lot, Mohawk Road, Harvey's Cove picnic area, Harvey's Cove path, Barona Shores Trail, Teepee Island footbridge, Sweetwater Trail, Boat Works Shop yard, UCSB Crew Building and Ramp, and Mohawk Overflow Area and Road.

- Improve camping facilities at the County Park to increase visitor satisfaction; increase the variety of camping opportunities; meet future demands, including changes in the type of camping demand; and increase campground occupation rates and revenues.
    - Improve, upgrade, and replace as necessary campsites and facilities throughout the County Park. If a long-term demand is demonstrated, increase the number of camping opportunities.
- Improve the operation and overall appearance of the County Park facilities to increase visitor satisfaction, improve the quality of the visitor experience, ensure public safety, and enhance the reputation of the County Park as a clean, safe, well-operated, and attractive park.
- Provide day-use activities including full public access for hiking/bicycling on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; and shoreline fishing.
- At the County Park provide the following: full-day and camping uses; full range of camp sites, including yurts, RVs, RV campsites, and RV trailers; cabins; bathrooms; store; marina; shoreline fishing; paved roads that can accommodate bikes; playing fields; nature center; pool; classrooms; amphitheater; and music events.
- Improve general layout of County Park facilities over time such as consolidating similar activities, segregating potentially conflicting activities, and improving internal circulation for visitors.
- Incorporate Americans with Disabilities Act (ADA) accessibility in future improvements at the County Park and Live Oak Camp.
- Relocate the kiosk and reconfigure the entrance roadway system to prevent automobiles from backing up to SR 154 during holidays.
- Reduce the number of County Park residents to no more than two for park operations and one additional allocated for concessionaire operation. All residences in excess of this will be phased out over a 3-year period from execution of an agreement with the local managing partner.
- Continue organized recreational and educational uses by the lessee at Camp Whittier, a private concessionaire camp with full day use, permanent cabins, dining hall and kitchen, camp residence, and pool.

2.5.2 Lake Recreation

Under all the alternatives, boating (motorized and wind-driven) and fishing will only be allowed in accordance with local and state laws. No night boating will be allowed. No personal watercraft use (such as jet skis) or waterskiing will be permitted. Scheduled UCSB crew practice will continue to be allowed. UCSB may be required to relocate their crew facilities at the option of the local managing partner to accommodate camping and upgraded boat launch facilities. Allowable boat speed would be 25 miles per hour (mph) on the main body of the lake in RD zones but 40 mph in the Main Channel. (The location of the Main Channel is shown on the "Park Rules" brochure and in the "Boating" section of the County Parks Web site for Cachuma Lake Recreation Area.)

Beginning in March 2008, the Santa Barbara County Board of Supervisors established inspection, treatment, and quarantine protocols for boats launching at Cachuma Lake to prevent the introduction of invasive quagga or zebra mussels. Invasive mussels can multiply quickly and clog waterways and pipelines, affect lake ecosystems, and create costly maintenance issues. The mussels have been found in several lakes in Southern California. Section 3.9.2.2 outlines the current pre-launch protocols required to prevent introduction of invasive mussels from boats visiting Cachuma Lake. Potential water quality and biological resources effects related to invasive mussels are discussed in Sections 4.1 and 4.4.

On the south shore, day use will be permitted under all the alternatives, including full public access for hiking and bicycling on primitive and/or well-developed trails. In the County Park, full-day and camping uses will continue under all the alternatives, including the availability and maintenance of the store, bathrooms, the marina, shoreline fishing, paved roads that can accommodate bikes, playing fields, the nature center, the pool, classrooms, the amphitheater, RVs, and music/special events.

Storke Flats on the south shore will remain off-limits to public access under all the alternatives, and designated as a watershed area for fuel management and for oak tree restoration as mitigation for other projects by the Reclamation and Cachuma Member Units. The Live Oak Camp area will also continue to be used for special events under all the alternatives, including private day and night events, camping, cabin rentals, and music concerts for large groups. The Reclamation lands south of SR 154 will continue to be used as rangeland and for fuel management (i.e., prescribed burns) under all the alternatives, with limited or no public access, and grazing under lease agreements.

On the north shore, the westernmost area (Johnson Canyon) will be a watershed area under all the alternatives, with no public access, and used for fuel management only (e.g., vegetation thinning or prescribed burns). The Bradbury Dam area will remain off-limits to the public under all the alternatives.

The prohibition of hunting will continue (by local ordinance within the recreation area).

2.5.3 Trail System

Off-highway motor vehicles and downhill biking will continue to be prohibited under all the alternatives. Existing levels of trail use on the south and north shores of the lake will be maintained.

2.5.4 Facility and Utility Upgrades

Under all of the alternatives, the physical facilities will be improved to comply with laws and regulatory requirements, such as ADA, security measures, and law enforcement. The Santa Barbara County Capital Improvement Program will be implemented, dependent on funding, under all the alternatives. The program includes County Park road improvement and restroom remodeling (Santa Barbara County 2009a).

Any facility improvements would be designed to fit with the existing setting and use materials that blend with the natural setting of the lake so as to not diminish visual resources.

2.5.5 Natural and Cultural Resource Management and Protection

Under all alternatives, federal and state regulations will be adhered to for natural and cultural resources protection, wetland and riparian habitat, and endangered or sensitive species at the lake. Riparian areas will be protected where not affected by annual lake level fluctuations. Prescribed burns will be conducted annually (if possible) to support grazing and reduce vegetative fuel for fire.

Under all alternatives, the fish stocking program for Cachuma Lake will comply with the requirements of the NMFS Recovery Plan Outline for Southern California Coast Steelhead DPS (NMFS 2007) and the subsequent Recovery Plan, when it is published.

The public will be educated about the lake's natural resources and encouraged to visit the Nature Center under all the alternatives. Yearly weed eradication efforts will continue and will be integrated with Best Management Practices (BMPs).

Water quality will continue to remain a high priority for lake operations under all the alternatives, and water quality testing will continue.

2.5.6 Health and Safety

Under all the alternatives, activities and building management in flood-prone areas will be restricted according to Federal Emergency Management Agency guidelines or other federal regulations. The Park's Fire Plan is being updated and revised, and campers will be educated about fire dangers. The County Park's analysis of fire flow has resulted in a preliminary design that will be implemented and will include new, additional hydrants for the Park. As a sub-element to the Vegetation Management Plan, the feasibility of prescribed burn activities will continue to be evaluated and burns will be conducted, if possible. The Park will work with the USFS and California Department of Forestry (CDF; also known as Calfire) to establish an annual prescribed burn schedule.

Under all the alternatives, current federal and state regulations for handling, transporting and storing hazardous materials will be adhered to. Grazing leases will continue south of Cachuma Lake to supplement fire management. Special events will be allowed by special permit only, with set fees and restrictions.

Stretches of roads prone to flooding will be improved, especially the Park road that leads to Mohawk campground.

No public access will be available in the vicinity of the intake tunnel or Bradbury Dam.

The new design and relocation plan for the Park entrance will be implemented under all the alternatives, as well as the new Reclamation guidelines for concessionaires on federal land.

2.5.7 Visitor Services

Under all the alternatives, the Park will provide updated visitor information maps describing recreation activities at different parts of the lake and educational displays will be set up around the Park. Public education will be improved to emphasize water quality and other components of the natural resource environment. The need for adding more maintenance staff to address new/improved facilities will be evaluated as will the need for new maintenance equipment.

2.6 MANAGEMENT ACTIONS FOR ALTERNATIVE 1: NO ACTION (CONTINUE CURRENT MANAGEMENT)

2.6.1 Objectives

Under this alternative, the current resource and recreation management direction and practices at Cachuma Lake would continue unchanged. Habitat would be maintained at the current level of resource management. However, the local managing partner would manage the implementation of the infrastructure improvements listed in Section 2.5. This alternative is analyzed in the EIS to address certain public comments that the status quo should be maintained at Cachuma Lake. It also provides the benchmark for making comparisons in the EIS between possible future changes under Alternatives 2 and 3.

2.6.2 Allowable Land Uses and Management Actions

The WROS designations for the No Action Alternative are shown on Figure 2-2. Unique management actions are shown in Table 2-3, which is included at the end of this section. Under current operations, recreational uses are restricted to the County Park, the surface of lake where boating is allowed, the scenic overlook for Bradbury Dam, Live Oak Camp, Camp Whittier and along portions of the trails on the north side of the lake for limited equestrian uses under a permit program.

2.6.3 Lake Recreation

Total number of boats allowed in the lake at one time would range from 40 (minimum pool) to 120 (maximum pool), based on lake elevation. Boats must be of standard design, a minimum of 10 feet long, and a maximum of 30 feet long. Boating would be restricted by existing log booms in Santa Cruz Bay and the east end. Boating would be allowed in Cachuma Bay with a 5 mph speed limit.

Arrowhead Island would be preserved as a watershed area, with no public access, and used for fuel management only.

2.7 MANAGEMENT ACTIONS FOR ALTERNATIVE 2: ENHANCED RECREATION

2.7.1 Objectives

The objective of this alternative is to enhance current recreational uses and public access at Cachuma Lake to attract more visitors and increase recreational opportunities, while protecting natural resources with new or modified land and recreation management practices.

2.7.2 Allowable Land Uses and Management Actions

The WROS designations for the Alternative 2 are shown on Figure 2-3. These designations indicate what uses are suitable if the local managing partner seeks to enhance recreational opportunities at Cachuma Lake.

Facility upgrades would include added gates, security, cameras, and utilities. Marine docks and nearby signage would also be upgraded. If campsites or day use facilities are added, utilities would be expanded as needed.

The current grazing program on the North Shore would continue under this program. To prevent conflicts with recreational uses and grazing operations, access to some or all of the North Shore would be prohibited during cattle shipping operations as specified in an updated Rangeland Assessment and Grazing Management Plan. In addition, no recreational uses would be allowed at the existing corral facilities on the North Shore of the lake near Live Oak Camp.

Access to the North Shore would be restricted in the winter months during and immediately after rain events to reduce damage to trails. The local managing partner may also limit access to the north side during severe fire conditions when prolonged high temperature, winds, or other factors that may prohibit entry occur.

On the North Shore, Alternative 2 would allow limited hiking and biking on primitive trails. Permits issued by the local managing partner would regulate these uses. Users could be required to make advance reservations and pay a small fee for access to the north side of the lake. The Trail System Management Plan that would be developed under this alternative would specify the process for obtaining a permit.

Boat-in, primitive, self-contained camping in appropriate areas on the North Shore could be allowed with a permit or guide.

Access to the North Shore from Live Oak Camp would require crossing of the Santa Ynez River by foot or car. The entrance and exit road to Live Oak Camp would be improved to accommodate increases in vehicle traffic. During normal to wet winters, crossing may not be feasible during several months. All equestrian use, hiking, and biking would be restricted to daylight hours and would require a permit from the local managing partner.

Current equestrian use on the North Shore would continue, utilizing the current loop trail shown on Figure 3.9-7. Riders would enter from Live Oak Camp where horse trailers would be parked. Hikers would have access to the entire trail system on the North Shore east of Santa Cruz Bay. Individual hikers would only be allowed to enter from Live Oak Camp, which would require crossing the Santa Ynez River by foot. Organized hiking groups, such as organized group outings or educational classes, and groups holding permits from the local managing partner, would be allowed to use a boat to access the North Shore for day hikes. Landing would be restricted to the shoreline at San Fernando Flat, beyond the log boom and along appropriate areas in Santa Cruz Bay.

Mountain bike use would be allowed on the North Shore with certain restrictions and with a permit issued by the local managing partner. If the local managing partner decides to pursue this recreational opportunity, the following restrictions would apply:

- Bicyclists must remain on trails at all times. No off-trail mountain biking would be allowed.
- The local managing partner would develop a Trail System Management Plan to provide for use by hikers, horseback riders, and mountain biking, which could be modified over time based on observations of trail use and damage.

Full day use on Arrowhead Island would be allowed under Alternative 2, including public access for hiking on primitive and/or well developed trails; picnicking, bird watching; group events; shoreline access; and shoreline and dock fishing, in accordance with restrictions.

At the Santa Ynez Peninsula, Alternative 2 would allow low-impact, limited group day use with a guide, to avoid disruption to grazing operations. Access would be coordinated with the leaseholder. If the grazing lease were changed or discontinued, low-impact, boat-in limited camping and primitive self-contained camping at unimproved sites with permit or guide could be explored.

Kayaking and canoeing would be allowed on the lake under this alternative. Both open and close hull kayaks would be allowed on the lake. Users would need to pay a small fee for launching, which would be restricted to the marina. Kayaks and canoes would be subject to the same inspection, treatment, and quarantine protocols as those for motorized and wind-driven boats launching at Cachuma Lake. A Boating Management Plan would be developed and would specify details about protective gear, and the local managing partner or concessionaire would provide a health and safety education program to remind users that body contact with the water is not permitted and provide basic kayak safety instruction to ensure proficiency. No swimming from kayaks would be allowed. The local managing partner would also develop guidelines on acceptable conditions and times of day for kayaking in consideration of winds and currents. Kayaking would be modified during peak boating periods associated with trout fishing tournaments. At the east end of the lake, kayakers would be allowed lake access beyond the log boom, subject to access restrictions during the bird breeding season. Additionally, when entering areas that were previously restricted to boats, kayakers may be restricted from small scale buffer zones in order prevent the disturbance of sensitive wildlife in the area. Behavior of sensitive wildlife receptors such as foraging bald eagles will be observed during trial periods by naturalists at the lake and re-evaluated after an analysis of disturbance is conducted. At Cachuma Bay, boating, kayaking, and fishing would be allowed at speeds of 5 mph. At Santa Cruz Bay, kayaking past the log boom would be permitted with a 5 mph speed limit. Kayakers would be subject to the normal boating restrictions and the prohibition on landing along the shoreline.

The Boating Management Plan would include monitoring of visitor use, satisfaction, conflicts, and specification of buffer zones to protect wildlife and other natural resources. The plan should include provision for adaptive management.

Boats must be of standard design, a minimum of 10 feet long, and a maximum of 25 feet long. The use of nonconformant engines[2] would continue for 2 years, when all such engines would be phased out (see Section 3.1.2.1). The 2-year period would begin when Reclamation executes a managing agreement with the local managing partner. The total number of boats allowed in the lake at one time (excluding kayaks and canoes) would range from 40 (minimum pool) to 120 (maximum pool). Limited day use on designated shore areas at the north end of Cachuma Bay would be allowed with a Special Use Permit.

Management activities for habitat enhancement and preservation would be focused on the east end of the lake, past the log boom. This area will be dedicated to scientific and educational uses and disallow public landing. A Fisheries Management Plan would be prepared.

[2] Nonconformant engines are those that do not conform to marine engine emissions standards imposed by the California Air Resources Board (CARB) starting in 2001. For additional information, see Section 3.1.2.1.

A Vegetation Management Plan will be developed to address and integrate fire management and invasive noxious weed issues. The Rangeland Assessment and Grazing Management Plan (Sage Associates 2003) will be updated.

Under this alternative, full-day use and full camping facilities would be allowed at Live Oak Camp. Day use would include individual picnic and group picnic areas with barbecue pits. Overnight camping would be allowed, including primitive camping, RV camping, and permanent cabin camping. Playing fields, a nature center, a pool, an amphitheater, and shoreline fishing areas would be developed. These facilities would provide new recreational opportunities for the public in a more remote and picturesque area of the lake. The precise number and layout of day use areas and campsites, would be determined by the local managing partner through a separate planning, design, and permitting process. Certain restrictions would apply to the new camping opportunities at Live Oak Camp, as follows:

- Shoreline access will be carefully managed to discourage water contact and avoid removal of shoreline riparian and wetland vegetation that surrounds Live Oak Camp.
- The new picnic areas and camp sites will be located in portions of Live Oak Camp that have been previously disturbed or are part of current operations for special events (see Figure 3.9-3).

Radio-controlled (RC) airplane Float/Fly events will continue to be allowed with prior arrangements with the local managing partner.

2.7.3 Management Actions for County Park

Under this alternative, the following recreational enhancements and projects would be encouraged at the County Park area. The precise number, layout, and timing of the new facilities would be determined by the local managing partner through a separate planning, design, and permitting process.

- Increase the variety of camping opportunities in response to visitor demands and recreation outdoor trends.
- Improve the internal layout of recreational facilities in the County Park to enhance recreational experiences and improve operations. Potential actions: (1) Consider relocation of some day use areas on the "North Plateau" unit of the park (Figure 3.9-1) to the day use area in the "Southeast Plateau" where the pool and family fun center is located to help consolidate the day use activities in the park. (2) Relocate the Group Camp Sites in the "Southeast Plateau" portion of the park to the "North Plateau" portion of the park (Figure 3.9-1).
- A water park facility would be added.
- Ensure adequate capacity to meet future peak recreational demands. Potential action: camping and day use facilities should be expanded at Mohawk and Jackrabbit flats to accommodate more visitors.

2.8 MANAGEMENT ACTIONS FOR ALTERNATIVE 3: EXPANDED RECREATION

2.8.1 Objectives

The objective of this alternative is to expand recreational uses and public access to attract more visitors and increase recreational opportunities, while protecting natural resources with new or modified land and recreation management practices. This alternative is included to demonstrate a scenario in which recreational uses at Cachuma Lake are substantially expanded while still meeting the RMP goals related to protection of natural resources to the extent feasible. This alternative builds upon and is in addition to the management actions listed under Alternative 2.

2.8.2 Allowable Land Uses and Management Actions

The WROS designations for Alternative 3 are shown on Figure 2-4. These designations indicate suitable uses if the local managing partner seeks to enhance and expand recreational opportunities at Cachuma Lake.

This alternative would allow year-round day use and primitive camping on the north side of the lake, near Santa Cruz Bay and at Santa Ynez Point. The day use activities would include hiking, bicycling, fishing from piers, and picnicking. Motor vehicles would not be permitted on the North Shore. No sewer, water, or electrical service would be provided on the North Shore or at Santa Ynez Point.

Primitive camping would be allowed on the North Shore for organized groups on a permit basis only. A potential camping area is located at north shore east. In addition, primitive camping, full public access for boat-in hiking on developed trails, picnicking, bird watching, shoreline access, and shoreline and dock fishing would also be allowed on Santa Ynez Point. If the local managing partner decides to pursue this recreational opportunity, the following restrictions would apply:

- A representative of the local managing partner, or a qualified person designated by the local managing partner, must accompany the groups to ensure safety.
- No campfires would be allowed.
- Only nondestructive primitive tent and dry camping with nearby vault toilets would be allowed.
- The maximum size of the groups would be 15 people, and only one group would be allowed to camp on the North Shore at any time.

The local managing partner, through a planning, design, and permitting process, would develop the location, layout, and intensity of development to support these uses. The extent of the new facilities would be dictated by the demand for such opportunities. Access to the North Shore would be provided by the current seasonal crossing of the Santa Ynez River near Live Oak Camp, and by boat piers installed on the north shore at strategic locations.

Equestrian users have requested more trails with greater lengths around Cachuma Lake. Similar to the bike-riding enthusiasts, the equestrians also would like to see a loop trail around the lake, or a combination of extending existing trails (see Figure 3.9-7). However, only one rest stop is currently available (an outhouse), and it is often closed. Under this alternative, rest stops for equestrians would be implemented, including outhouses, water troughs, and improved picnic

tables at appropriate vistas. New trails will be developed, as appropriate, to minimize user conflict and increase trail opportunities. Six potential trails have been identified. Hikers, bikers, and equestrians would have use of these trails.

Under this alternative, full park and camping facilities would be allowed at Live Oak Camp, including camp sites, rustic cabins or yurts, picnic areas, a café and store, and educational or recreational buildings. The entrance and exit road to Live Oak Camp would be improved to accommodate additional vehicle traffic. The local managing partner, through a planning, design, and permitting process, would develop the location, layout, and intensity of development to support these uses.

Kayaking and canoeing would be allowed on the lake under this alternative as well. Both open-hull and closed-hull kayaks would be allowed on the lake. Users would need to pay a small fee for launching, which would be restricted to the marina. The local managing partner may allow concessionaires to take kayakers to remote portions of the lake using towboats. Kayaks and canoes would be subject to the same inspection, treatment, and quarantine protocols as those for boats launching at Cachuma Lake. As with Alternative 2, a Boating Management Plan would be developed and would specify details about protective gear, and the local managing partner or concessionaire would provide a health and safety education program to remind users that body contact with the water is not permitted and provide basic kayak safety instruction to ensure proficiency. No swimming from kayaks would be allowed. The local managing partner would also develop guidelines on acceptable conditions and times of day for kayaking in consideration of winds and currents. In addition, kayaking would be modified during peak boating periods associated with fishing tournaments. Kayakers would have access to the entire main lake. At Santa Cruz Bay, kayaking would be permitted past the log boom at 5 mph.

The Boating Management Plan would include monitoring of visitor use, satisfaction, and conflicts. The plan should include provision for adaptive management.

Boats must be of standard design, a minimum of 10 feet long, and a maximum of 30 feet long. The use of nonconformant engines would continue for 5 years, when all such engines would be phased out (see Section 3.1.2.1). The 5-year period would begin when Reclamation executes a managing agreement with the local managing partner. The number of boats allowed at one time on the main body of lake (excluding kayaks and canoes) would increase in capacity, totaling 160. Marina capacity would be expanded if needed. Boating, fishing, and kayaking would be allowed in Cachuma Bay with a 5 mph speed limit. At the east end, the log boom would be removed, and low-impact boating and fishing, as well as kayaks, would be allowed; however, a 5 mph speed limit would be imposed in no-wake zones, and boat access would be seasonally restricted during the bird breeding season. This alternative would also establish a boat-in picnic area with several sites, and a 1- to 2-mile walking loop trail on some of the old roadways at the upper end of Cachuma Bay. This alternative also calls for the removal of the “no landing” signs and change policy to “no landing unless posted open.”

Management activities focused on habitat enhancement and preservation would be focused on the east end of the lake, past the log boom. This area will be dedicated to scientific and educational uses (same as Alternative 2).

The current grazing program on the North Shore would be discontinued. The Rangeland Assessment and Grazing Management Plan (Sage Associates 2003) will be updated. The grazing on the south side of the lake would continue.

Day use and camping facilities would be expanded on the mesa east of Mohawk and Jackrabbit flats to accommodate more visitors.

Organized recreational and educational uses at Camp Whittier would continue under this alternative.

Windsurfing and kite boarders would be permitted under this alternative in nonswimming areas. However, windsurfers and kite boarders would be required to wear wet suits, and swimming would be prohibited in any designated windsurfing area.

Like Alternative 2, full-day use on Arrowhead Island would be permitted, and the activities allowed would include picnicking, group events, and shoreline and dock fishing.

The general public and numerous user groups at Cachuma Lake have demonstrated their desire and support for body contact (i.e., swimming) at the lake. As discussed in Section 3.9.1.2, several other lakes in the region allow body-contact sports such as swimming. Other lakes that are managed as drinking water reservoirs, however, also have restrictions on body contact or intensely managed and/or treated swim beaches.

Due to the fact Cachuma Lake is a drinking water reservoir, swimming would be a strictly managed recreational activity to maintain state and federal water quality standards (see Section 3.1). Therefore, swimming would be designated to a specific area where County Park staff could closely monitor and maintain the activity.

The main access to the lake is the peninsula on the southwest end of the reservoir. A swimming area would be located in an easy-access area for the public, somewhere near the recreation area peninsula (known as the Tequepis Peninsula). The beaches and coves that offer the most convenient access and swimming opportunities are discussed below (Figure 3.9-1).

2.8.2.1 Swimming

Harvey's Cove

Harvey's Cove, located on the southwest end of the Tequepis Peninsula, is a popular picnicking and fishing cove, with an ADA accessible fishing pier leading into the water from the day-use picnic area. The cove is just a short walk from the main recreation area to the east and is well protected from wind. Hiking trails border the east and west sides of the cove, and a parking lot and portable restroom support daily use at the cove. This location is well removed from the reservoir's intake station, which is located on the south side of the lake, across from Santa Cruz Bay; however, it has steep slopes that prohibit easy access to the water. This location would require modification of the shoreline for swimmer access.

Drake's Cove

Drake's Cove is located at the lower east end of the Tequepis Peninsula, just west of Mohawk campgrounds. Similar to Harvey's Cove, this area is well protected from wind and located in close proximity to the main recreation area. A short loop trail borders the eastern shore of the cove (Mohawk Mesa Loop Trail). However, the east and west slopes of this cove are also relatively steep. Even the south end of the cove drops off in a steep incline from the road, limiting access to the water. Drake's Cove is not as close to SR 154 as Harvey's Cove and therefore offers a more serene, park-like environment. However, the park's main access road into Mohawk campgrounds borders the south end of the cove. Due to the through traffic here, no

parking area is designated, and only limited area is available to create a parking area for a swimming beach. This cove is also further east than Harvey's Cove and located on the opposite side of the peninsula, therefore closer to the intake station, and more likely to impact water quality.

Mohawk Shores

Mohawk Shores is located on the eastern extremity of the Tequepis Peninsula. This area is relatively flat and open, unlike other lake access areas throughout the park. Due to the gradual descent to the water offered by Mohawk Shores, this area is a popular shore fishing area as well as a perfect launch area for the UCSB rowing team. Mohawk Shores has been identified as a future boat launch area. It is also one of the only locations that do not have an extremely rocky shoreline. Mohawk Shores is well removed from the highway and the main access roads in the park. Plenty of parking is available, as well as day-use picnic areas and portable restrooms. This location, however, is not as protected from the wind as Harvey's Cove and Drake's Cove, and is also the closest of the three to the water intake station.

2.8.2.2 Radio-Controlled Airplanes and Landing Strip

The local RC airplane enthusiasts are a very active group that previously had a landing strip at Cachuma Lake. These hobbyists seek a permanent landing strip at the lake. The area that offers the best opportunity for RC airplanes while minimizing impacts to native vegetation, wildlife, and special-status species is discussed below.

East End of Mohawk

This site is recommended as most suitable for RC airplane activities and a landing strip. The east end of Mohawk is easily accessible from the County Park area and SR 154. This site offers potential benefits to RC airplane enthusiasts because they would not have to travel through the park to access their site, and the location is fairly removed from the main high-use areas of the park. Plenty of parking area is available, as this location is also used as an overflow campground area. The land is relatively flat, with a very gradual slope down to the water, and a few large, open areas free of major obstructions. Two power lines cross over this location; however, strategically placing the landing strip could possibly avoid this obstruction. The area is already impacted and mostly denuded of vegetation, so minimal, if any, impacts to native vegetation would occur. Furthermore, the location is adjacent to SR 154, which already poses some noise pollution to the area, and therefore the site is not as highly regarded for its silence as other areas around the park; however, some additional noise disturbance to wildlife would occur from the RC airplanes. The RC airplane site would need to be located in an area that would not conflict with additional day use and camping. This action would also require a use compatibility study to evaluate overall compatibility with other recreation uses and potential conflicts with wildlife use.

2.8.3 Management Actions for County Park and Live Oak Camp

Under this alternative, the local managing partner would implement the infrastructure and facility improvements at the County Park and Live Oak Camp described in Section 2.6. In addition, the following recreational enhancements and projects would be encouraged for the

County Park. The precise number, layout, and timing of the new facilities would be determined by the local managing partner through a separate planning, design, and permitting process.

- Increase the variety of camping opportunities in response to visitor demands and outdoor recreation trends. Potential actions: (1) Increase number of yurts in the park and provide full-service "executive" RV campsites. (2) Remodel the mobile home area at the park to provide deluxe, full-service RV sites for extended stays. (3) RV sites with water and electricity only would be established at Barona Mesa, and in other areas of the "North End" portion of the County Park.
- Improve internal layout of recreational facilities in the County Park to enhance recreational experiences and improve operations. Potential actions: (1) Relocate the day use areas at the "North End" unit of the park (Figure 3.9-1) to the day use area where the pool and family fun center is located to consolidate the day use activities in the park. (2) Relocate the Group Camp Sites at the "Southeast portion of the park" to the "North End" portion of the park (Figure 3.9-1).
- Increase the variety and improve the quality of recreational opportunities at the County Park. Potential actions: (1) Construct a water slide/park for children and teens in the day use area near the pool to satisfy the demand for body contact water activities. (2) Provide opportunities in the day use area for nonwater activities—miniature golf, game arcades, basketball, baseball, football, soccer playing areas. (3) Modernize and enhance the existing Nature Center to offer more natural resource education opportunities to educate the public on water conservation, watershed management, and wildlife habitat values.
- Ensure adequate capacity to meet future peak recreational demands. Potential actions: (1) Camping and day use facilities should be expanded at Mohawk and Jackrabbit flats to accommodate more visitors. (2) Install yurts in a new camping and day use area east of Mohawk and Jackrabbit flats.
- Develop resort-like accommodations as an upgrade to permanent cabin camping provided in Alternative 2.

2.9 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

Some comments received during the project scoping and public review periods requested consideration of one or more alternatives that would reduce recreational opportunities in the Plan Area to protect water quality, water supply, and natural resources. Reclamation is subject to the Congressional mandate that "in investigating and planning any Federal … water resource project, full consideration shall be given to the opportunities, if any, which the project affords for outdoor recreation and for fish and wildlife enhancement" (PL 89-72, 79 Stat. 213-218). PL 89-72 makes recreation and fish and wildlife uses primary purposes of Reclamation projects, which allows a portion of the construction costs of the entire project, as well as a portion of the project water supply, to be allocated to recreation and/or fish and wildlife purposes. "This allocation of costs and water supply to recreation or fish and wildlife purposes allows these uses to be considered and planned for in their own right, rather than as incidental uses of facilities which are authorized for other purposes" (Memorandum: Authorization and Cost Share Requirements for Facilities Provided for Under PL 89-72, U.S. Department of the Interior, Office of the Solicitor, January 27, 1995.) Failure to consider opportunities for outdoor recreation would

violate Reclamation's Congressional mandate and would not satisfy the purpose and need of the proposed action.

Although this RMP does not include an alternative that specifically provides for less recreation than is currently allowed, the local managing partner would have flexibility in implementing management actions in the Plan Area. As stated in Section 2.4.2.2, the alternatives are essentially "recommendations for various resource management actions and facility improvement projects … that may be implemented." The language in Section 2.4.2.4 is intentionally broad to enable the local managing partner to modify recreation management actions for a number of reasons, regardless of which RMP alternative is ultimately selected. Further, as described in Section 2.4.2.4, Reclamation can amend the RMP based on changed environmental conditions; unforeseen events; changes in policies and land use plans that have been determined to be infeasible, impractical, or have undesirable consequences; changes in applicable laws and regulations; or other conditions.

The language in Section 2.4.2 therefore serves to balance the inclusion of existing and potential future recreation as mandated by PL 89-72 with protection of water quality, water supply, and natural resources.

Table 2-1
Public Comment Summary of Issues for Cachuma Lake RMP by Resource Category

Facility Management
The Marina operation needs improvement. • Upgrade or move snack bar • Improved security, lighting, electricity, and parking • Upgrade boat ramp • Replace log boom at main marina
Mohawk Recreation Area needs improvement. • Overflow boat launch and parking at Mohawk needs to be implemented/improved • New boat ramp at Mohawk
Facilities need to be upgraded to attract recreational groups. • Campground improvements and maintenance needs to be addressed • Evaluate the capacity and reliability of the wastewater treatment plant • Additional camping sites and RV sites • Implement campgrounds south of SR 154 • Electrical improvement at RV sites • Additional fishing docks • Seasonal or permanent concession facilities could be provided at both north and south shore recreation areas • More yurts • More signs to manage visitors better and more educational signs • Expand the food operation/concessionaire at the lake • Consider a water park at the Plan Area (consider insurance, liabilities, maintenance, etc.) • Use electric shuttles at the lake, and to access the lake, to reduce traffic and emission pollution
Trails/Roads need to be improved and/or expanded. • Multiuse as well as separate use trails could be provided. • New road easement to Live Oak Camp • Enable north shore access and uses (camping, hiking, mountain bikes) • Expanded horse trails • Expanded trails on South Shore
Boat speeds, types, and densities need to be managed in the various areas of the lake.
Visual resources need to be maintained or improved. • Relocate the long-term RV site and trailer storage area • Relocate the park offices • Consider the appropriateness of the trailer storage area and the mobile home parks • Reduce night lighting or any additional lighting at the park to keep the night skies dark
Utilities, including water, sewer, electrical, and telephone, need to be maintained or upgraded if recreation areas are improved or expanded.
Negotiate the new management contract. The County seeks a contract with Reclamation.
Recreation
Overall, recreation is recognized as an indirect benefit of the lake, and must be compatible with water supply needs and natural resource protection.
North Shore • Carefully manage public access to the north shore • Maintain current uses – grazing and limited equestrian use only • Expand passive recreational uses such as hiking and mountain biking • Allow remote camping • Address access issues • Equestrians are opposed to allowing hikers and/or bikers on the same trails • Expand current trails for equestrians

Table 2-1
Public Comment Summary of Issues for Cachuma Lake RMP by Resource Category

North Shore (cont'd.) • Manage new/additional recreation on the north shore through special permitting and fees • Continue grazing • Consider trespassing problems on San Fernando Rey Ranch and how additional recreation on the north shore may heighten that problem • A park ranger should be present on the north shore
Hiking and Biking • Expand hiking and biking opportunities around the lake – guided hikes • Consider compatibility with existing equestrian uses • Create primitive, low-intensity, hike-in-only campsites on the north shore • Improve and expand bike trails on the south shore • Establish a Class I bike path between the lake and the Santa Ynez Valley to allow bicyclists to avoid the dangerous SR 154 • Consider possibility of a paved family bike trail along the south side of the lake
Boating and Fishing • Switch to four-stroke engines, ban two-stroke engines • Increased motor boat activity, jet skiing, or waterskiing would not be appropriate at the lake and would conflict with human- and wind-powered recreation • Protect the excellent bass and trout fisheries • Allow access to the entire lake for fishing, including the eastern end • Areas for fly-fishing should be established on the far east end of the lake • Walking/wading fishing should be allowed off the west side of Live Oak Camp
Canoeing, Kayaking, Float Tubes • UCSB Rowing Club wishes to maintain use of the lake for training, and supports expanded the rowing opportunities to the public • Introduce kayaks, canoes and small sailboats to the lake • Consider requiring wetsuits to protect water quality • Designate safe areas for man-powered boats • Float tubing should be allowed in the bays or "narrows" where floaters are protected from motorboats
Windsurfing and Kite Boarding • Cachuma is ideal for windsurfing and kite boarding because of the strong afternoon winds and the quiet nature of the sport • Allow windsurfing and kite boarding near the dam where it would not conflict as much with fishing • Address access issues for windsurfers • Cachuma Lake is much closer for local windsurfers, kite boarders, and kayakers who must otherwise drive to Lopez Lake
Body Contact • Consider allowing body contact recreation (Red Rock recreation area is just upstream from the lake) • Allow full body contact at a swim beach OR limited and controlled contact associated with kayaking and canoeing • Consider locations for body contact, so as to avoid water quality impacts and/or the intake tunnel
East End of the Lake • Increased access for fisherman using shallow waters
Live Oak Camp • Expanded recreational uses and facilities/infrastructure at Live Oak Camp • More special events • Widen the access road • Consider individual horse camping

Table 2-1
Public Comment Summary of Issues for Cachuma Lake RMP by Resource Category

Radio-Controlled Airplanes • Continue the "Float/Fly" days • Implement a permanent RC airplane strip at or near the lake • Consider the Santa Ynez Peninsula as a location for the airplane strip • Address noise issues and terrain hazards associated with RC planes
Water Quality
Water quality should be a focus in the RMP. • Consider the impacts of allowing body-contact • Contamination from horse and cattle along the creeks and on the north shore needs to be addressed (repair fences on the north shore to keep the cattle out of waterways and away from the lake shore) • More development at the Park and/or Live Oak Camp means more pollutants in the water
Grazing Management
Grazing practices should continue and be closely monitored and a management plan that protects natural resources and uses the fire fuel-repression benefits should be in place. • The cattle on the north shore should remain seasonal, and compatibility of cows with hikers/bikers/campers needs to be carefully considered • Address the need for better water management to support grazing
Natural Resource Management and Protection
Need to protect federally and state-protected species and habitat, including wetlands and riparian areas.
Public needs to be informed about importance of natural resources and threatened and endangered species. • Consider possible adverse effects of increased recreation on bald eagles • Educate the public of the danger of mountain lions on the north shore
Invasive species, spread of pathogens, and noxious weeds should be eradicated and native plants incorporated.
Prescribed burning and grazing should be used in vegetation management.
Water resources need to be managed for supply and quality.
Air quality needs to be maintained per regional air district standards.
Areas of geologic hazards, unstable soils, or potential erosion areas need to be managed.
Health and Safety
Restrict activities based on current federal regulations for flood management.
Fire management activities, such as prescribed burns, visitor education, and agency coordination, need to be better implemented and managed.
Follow current federal and state regulations for handling, transporting and storing hazardous materials.
Land Use Management
Trespassing and use of private access to the lake needs to be controlled.
Permits for any new recreation and/or special events should be managed.
Traffic control and road issues need to be addressed. • Some roads need to be widened or upgraded • Parking may need to be expanded, if possible • Entrance station needs improvement
Park Administration/Public Information
Visitor services should include brochures, handouts, maps, interpretive signage, educational opportunities, and interpretive programs.
Increased patrol staff is needed seasonally, and on the north shore, if necessary.
Add administrative staff, maintenance staff, and another full-time resource interpreter, if possible.
Seasonal special events and activities should be promoted to a greater extent.
Concession management guidelines from Reclamation should be included in new contract language.
Exclusive use issues (equestrians) should be addressed.
Interagency coordination should be addressed, including emergency response issues.

Table 2-2
Opportunities and Constraints

Geographic Name or Description	Primary Constraints	Opportunities
Lake		
Main Lake	Boom around dam; steep shoreline; Main boat traffic through center of lake; high winds and waves; intake	Wind for windsurfing; good fishing; wetlands on South Shore; island
East end of lake	Shallow water and boat hazards	Diverse shoreline; possible landings
Cachuma Bay	Shallow water at upper end; waterfowl area	Wetland and waterfowl area; possible landings
Santa Cruz Bay	Shallow water at upper end; waterfowl area	Wetland and waterfowl area; possible landings
South Side		
Sweetwater	Steep shoreline cliffs; rugged terrain; moderately remote	Remote and natural setting; moderately challenging trail
County Park	Steep and eroding shoreline	Vistas; easy access; amenities for all users
East of Mohawk	Steep and rugged terrain; poor access	Moderately remote and natural setting, but near campgrounds
Intake Tunnel	No access	None
Storke Flats	Poor access from SR 154	Beautiful setting; flat land; remote
Santa Ynez Peninsula	Poor access from SR 154	Beautiful setting; flat land; remote
Live Oak Camp	Poor roads and dusty conditions in campground	Beautiful setting; existing facilities for special events; remote, but easy access; oak tree shade
SR 154 South/West	Rugged terrain with little to no access	None
SR 154/Camp Whittier	Rugged terrain	Good access from SR 154; existing camp
North Side		
Johnson Canyon	No access; steep, rugged terrain	Beautiful setting; high quality habitat; remote
North Shore West	Steep, rugged terrain; poor access; remote	Beautiful setting; high quality habitat; remote
North Shore East	Steep, rugged terrain; high erosion; poor access; remote	Beautiful setting; high quality habitat; views of lake; remote
Horse Canyon	Poor access; remote	Beautiful setting; high quality habitat; remote; live creek; views of lake
Bradbury Dam		
Bradbury Dam	No access	None

Table 2-3
Proposed Common and Unique Management Elements for Alternatives for Cachuma Lake RMP

Element	Alt 1 No Action	Alt 2 (Preferred Alt)	Alt 3
LAKE RECREATION Types of Use			
Main Lake (WROS RD4 – RN6)			
Boating			
Develop Boating Management Plan that would include monitoring of visitor use, satisfaction, and conflicts. Plan should include provisions for adaptive management.		•	•
Boating and Fishing in accordance with local and state laws.	•	•	•
No night boating.	•	•	•
Boat size minimum of 10 feet and maximum of 25 feet		•	
Boat size minimum of 10 feet and maximum of 30 feet	•		•
No personal watercraft and no waterskiing	•	•	•
Boat inspection, treatment, and quarantine protocols to prevent introduction of invasive mussels	•	•	•
Motorized boat density 40 (BAOT) at minimum pool; 120 BAOT at maximum pool.	•	•	
Motorized boat density 40 (BAOT) at minimum pool; 160 BAOT at maximum pool.			•
Kayak and Canoe use (with inspection, treatment, and quarantine protocols to prevent introduction of invasive mussels)		•	•
Boat speed 25-mph in RD Zones; 40 mph in Main Channel	•	•	•
2-year phase-out on nonconformant engines		•	
5-year phase-out on nonconformant engines			•
Other Uses			
Windsurfing and kite boarding with the requirement for wet suits and prohibition on swimming in designated windsurfing areas.			•
Preserve Arrowhead Island as a watershed area, with no public access; fuel management only.	•		
Full day use on Arrowhead Island, including public access for hiking on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline and dock fishing, in accordance with restrictions.		•	•
Swim beach managed by local managing partner staff.			•
East End of Lake (WROS RD6/RN6)			
Boating			
No boating beyond existing log boom.	•		
Kayaks only beyond log boom with restrictions during bird breeding season as well as during the non-breeding season.		•	
Log boom removed; low-impact boating and fishing including kayaks; no-wake zones (5 mph); and seasonal restrictions for boat access during bird breeding season.			•
Other Uses			
Special use with permit for UCSB Crew practice	•	•	•
Wildlife area; no public landing	•	•	
Habitat enhancement and management activities; scientific/educational uses		•	•

Table 2-3
Proposed Common and Unique Management Elements for Alternatives for Cachuma Lake RMP

Element	Alt 1 No Action	Alt 2 (Preferred Alt)	Alt 3
Cachuma Bay (WROS RN7)			
Boating			
Boating and fishing/5 mph speed limit.	•		
Boating, kayaking, and fishing at 5 mph		•	•
Other Uses			
With Special Use Permit, Allow Limited Day Use on a designated shore area at the north end of Cachuma Bay		•	
With Special Use Permit; Establish a boat-in picnic area with several sites and a 1- to 2-mile walking loop trail on some of the old roadways at the upper end of Cachuma Bay			•
Santa Cruz Bay (WROS RN7)			
Boating			
5 mph up to log boom/no access past log boom.	•		
Kayaking past log boom with restrictions and monitoring to avoid wildlife disturbance		•	•
Other Uses			
Establish guided overnight boat-in campsites managed by reservations and fees in Santa Cruz Bay. Increased management costs could be covered by a user fee system			•
SOUTH SHORE RECREATION			
Sweetwater (WROS RD)			
Day use; full public access for hiking/bicycling on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline fishing.	•	•	•
County Park (WROS RD)			
Full-day and camping uses; full range of camp sites, including yurts, RVs, and RV trailers; bathrooms; store; marina; shoreline fishing; paved roads that can accommodate bikes; playing fields; nature center; pool; classrooms; amphitheater; and music events.	•	•	•
Water Park facility		•	•
Nonwater Activities			
Provide opportunities for the day use area for nonwater activities – miniature golf, game arcades, basketball, football, soccer playing areas.			•
East of Mohawk (WROS RD)			
Day use; full public access for hiking/bicycling on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline and dock fishing.	•	•	
Full-day and camping uses; full range of camp sites; bathrooms; store; marina; shoreline fishing; paved roads that can accommodate bikes; playing fields; nature center; pool/water park; classrooms; amphitheater; RVs; music events.			•
Possible public RC airplane site.			•
Intake Tunnel (WROS RD)			
No access due to intake tunnel facility.	•	•	•

Table 2-3
Proposed Common and Unique Management Elements for Alternatives for Cachuma Lake RMP

Element	Alt 1 No Action	Alt 2 (Preferred Alt)	Alt 3
Storke Flats (WROS RN)			
Watershed area; no public access; fuel management only (e.g., vegetation thinning or prescribed burns).	•	•	•
Santa Ynez Peninsula (WROS RN)			
Rangeland; limited or no public access; grazing under lease agreement and in accordance with approved plan; fuel management and prescribed burns.	•		
Low-impact, limited group day use with guide.		•	
Low-impact, boat-in limited camping; primitive self-contained camping at unimproved sites with permit or guide, if grazing lease is changed or discontinued.		•	
Day use and primitive camping; full public access for boat-in hiking on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline and dock fishing.			•
Live Oak Camp (WROS RD)			
Special events; Full facilities for day and night events, including tent and RV camping and music concerts for large groups.	•	•	•
Full-day and camping uses; full range of camp sites; permanent cabin camping; bathrooms; store;; shoreline fishing; paved roads that can accommodate bikes; playing fields; nature center; pool; classrooms; amphitheater; RVs; music events.		•	
Resort development			•
SR 154 South/West (WROS RD)			
Rangeland; limited or no public access; grazing under lease agreement and in accordance with approved plan; fuel management and prescribed burns.	•	•	•
SR 154/Camp Whittier (WROS RD)			
Special camp/resort; private concessionaire camp with full day use; permanent cabins; dining hall and kitchen; camp residence; pool.	•	•	•
NORTH SHORE RECREATION			
Johnson Canyon (WROS RN)			
Watershed area; no public access; fuel management only (e.g., vegetation thinning or prescribed burns).	•	•	•
North Shore West (WROS RN)			
Rangeland; limited or no public access; grazing under lease agreement and in accordance with an updated Rangeland Assessment and Grazing Management Plan; fuel management and prescribed burns.	•	•	
Low-impact, limited day use; equestrian use, hiking, and biking on primitive trails with a permit, and in accordance with restrictions.		•	
Day use; public access in the Santa Cruz Meadows for hiking/bicycling and equestrian use on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline and dock fishing.			•
Dry camping: tent camping in designated primitive sites with nearby vault toilets.			•

Table 2-3
Proposed Common and Unique Management Elements for Alternatives for Cachuma Lake RMP

Element	Alt 1 No Action	Alt 2 (Preferred Alt)	Alt 3
North Shore East (WROS RN)			
Rangeland; limited or no public access; grazing under lease agreement and in accordance with approved plan; fuel management and prescribed burns.	•	•	
Equestrian use of existing trails by permit.	•		
Low-impact, limited day use; equestrian use, hiking, and biking on primitive trails with a permit, and in accordance with restrictions.		•	
Low-impact, limited camping; primitive self-contained camping at unimproved sites with a permit or guide, and in accordance with restrictions.		•	
Day use; public access for hiking/bicycling and equestrian use on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline and dock fishing.			•
Camping; tent camping in designated primitive sites with nearby vault toilets.			•
Horse Canyon (WROS RN)			
Limited or no access to rangeland; grazing under lease agreement and in accordance with approved plan; fuel management and prescribed burns.	•	•	
Equestrian use: equestrian use of existing trails by permit.	•	•	
Primitive camping with permit or guide		•	
Day use; public access for hiking/bicycling and equestrian use on primitive and/or well developed trails; picnicking; bird watching; group events; shoreline access; shoreline and dock fishing.			•
Camping; tent camping in designated primitive sites with nearby vault toilets.			•
Dam Site (D-1)			
No access; no public access on or within restricted zone around Bradbury Dam.	•	•	•
SERVICES/FACILITY UPGRADES TO BE IMPLEMENTED			
Marina and Boating Support			
Upgrade boat launch.	•	•	•
Add gates, security, cameras, and utilities. Upgrade marine docks, boat launch, and nearby signage.		•	•
Expand marina capacity.			•
Expand the interpretive boat program with additional natural, cultural and/or historic resource themes.			•
Remove the “no landing” signs and change policy to “no landing unless posted open.”			•
Other Service/Facility Upgrades			
Implement the Santa Barbara County Capital Improvement Program, dependent on funding	•	•	•
TRAIL SYSTEM			
Continued prohibition of off-highway motor vehicles and downhill biking.	•	•	•
Maintain existing level of trail use on south and north shores.	•		
Maintain trails for use by hikers, horseback riding, and mountain biking with a Trail System Management Plan. Develop new primitive trail for hiking and biking on north shore east and west for use with permit.		•	
Develop new trails on north shore east and west (6 potential new trails identified) and a Trail System Management Plan to manage trail usage.			•

Table 2-3
Proposed Common and Unique Management Elements for Alternatives for Cachuma Lake RMP

Element	Alt 1 No Action	Alt 2 (Preferred Alt)	Alt 3
UTILITIES			
Physical facilities will comply with laws and regulatory requirements, such as ADA, security measures, and law enforcement.	•	•	•
Expand utilities as needed if more campsites or day use facilities are added.		•	•
VISUAL RESOURCES			
New facilities designed to not diminish visual resources.	•	•	•
NATURAL AND CULTURAL RESOURCE MANAGEMENT AND PROTECTION			
Habitat/Natural Resource Protection			
Follow federal and state regulations.	•	•	•
Maintain habitat at current levels of resource management.	•		
Mitigation lands within the Plan Area may be needed if new facilities are built.		•	•
Conduct prescribed burns, as needed, to support grazing and reduce vegetative fuel for fire.	•	•	•
Update the Rangeland Assessment and Grazing Management Plan (Sage Associates 2003) to address grazing issues.		•	•
Develop a Vegetation Management Plan to address issues of invasive noxious weeds, native plant restoration, and fire management.		•	•
A Fisheries Management Plan would be prepared.		•	•
Fish stocking program in accordance with NMFS Recovery Plan	•	•	•
Threatened and Endangered Species			
Follow federal and state regulations. Restrict access to areas with endangered or sensitive species. Educate public about species.	•	•	•
Native Vegetation			
Encourage public to visit Nature Center.	•	•	•
Wetlands/Riparian Areas			
Follow federal and state regulations regarding wetlands and riparian habitats. Protect riparian areas where not affected by annual lake level fluctuations.	•	•	•
Invasive Species			
Continue yearly weed eradication efforts with integrated BMPs.	•	•	•
Water Quality			
Continue water quality testing practices in Cachuma Lake and at treatment plants.	•	•	•
Hunting			
Continue prohibition of hunting (by local ordinance within the recreation area).	•	•	•
HEALTH AND SAFETY			
Flood Management			
Restrict activities based on current federal regulations. Use Federal Emergency Management Agency floodplain maps and designations in management of facilities.	•	•	•

Table 2-3
Proposed Common and Unique Management Elements for Alternatives for Cachuma Lake RMP

Element	Alt 1 No Action	Alt 2 (Preferred Alt)	Alt 3
Fire Management			
Update fire plan. Educate campers about fire dangers. Incorporate the 2005 analysis of fire flow and conceptually designed new fire lines and supply new additional hydrants prepared by Santa Barbara County Parks Department for the park.	•	•	•
Continue to evaluate the feasibility of prescribed burn activities and conduct burns if possible. Work with USFS, CDF, and SBCFD to establish annual prescribed burn schedule. Integrate fire management with vegetation management in a comprehensive Vegetation Management Plan.	•	•	•
Hazardous Materials			
Follow current federal and state regulations for handling, transporting and storing hazardous materials.	•	•	•
Grazing Leases			
Continue grazing leases on the north shore to supplement fire management.	•	•	
Discontinue grazing leases on the north shore.			•
Special Events			
By special permit only - set fees and restrictions.	•	•	•
Roads			
Improve entrance/exit road at Live Oak Camp to accommodate increased use.		•	•
Fix stretches of roads prone to flooding, especially Park road that leads to Mohawk campground.	•	•	•
Park Entrance Access			
Implement new design and relocation plan for the Park entrance.	•	•	•
Concessions			
Implement new Reclamation guidelines for concessionaires on federal land.	•	•	•
VISITOR SERVICES			
Brochures/ Informational Handouts			
Provide updated visitor information maps describing recreation activities at different parts of the lake.	•	•	•
Educational Opportunities			
Set up educational displays around park. Improve public education to emphasize water quality and other components of the natural resource environment.	•	•	•
Maintenance			
Evaluate the need for adding more maintenance staff to address new/improved facilities. Add new maintenance equipment as needed.	•	•	•

BAOT = boats on the lake at any one time

The level of detail presented in this section to describe the affected environment is commensurate with the programmatic/planning nature of this document. Therefore, resources are described at a regional and management zone level of detail. Project-level environmental documents will be required for any projects developed under the alternatives.

This section emphasizes describing resources and features that could be affected by the alternatives. Other topics such as climate and air quality are addressed to provide context, but less detail is provided because impacts to these resources would be less noticeable.

Much of the data collected to describe the existing environment are included in GIS format. Figures show areas with sensitive resources (i.e., biology, cultural, land use) and potential hazards (i.e., erosion, geological hazards). These maps and the impact analyses provided in Section 4 would be the basis of constraint analysis that would guide any plans for future development within the planning horizon.

In this section as others, County Park refers to the 375-acre area on Tequepis Peninsula (south shore of Cachuma Lake) occupied by major facilities such as campsites, RV campsites, marina and boat ramp, amphitheater, swimming pools, ranger station, general store, snake shop, and Nature Center.

Biology, Cultural Resources, and Land Use/Fire Management technical reports have been prepared to support inventory information presented in this section (URS 2006b, c, d) and are incorporated by reference.

3.1 WATER RESOURCES

3.1.1 Regional Setting

3.1.1.1 Regulatory Background

Water resources and water quality in the State of California are regulated by various agencies including the California Department of Water Resources (DWR), SWRCB, Regional Water Quality Control Boards (RWQCBs), County Environmental Health Departments, and the California Department of Health Services.

The DWR is responsible for statewide water planning, including managing water supply and demand. The DWR performs this responsibility by preparing and updating the California Water Plan. The DWR also plans, designs, constructs, operates, and maintains the State Water Project; regulates dams, provides flood protection, and assists in emergency management; and provides technical assistance to help meet local water needs.

The RWQCB that regulates water quality in the Plan Area is the Central Coast Regional Water Quality Control Board (CCRWQCB) (Region 3). The basin plans prepared and adopted by RWQCBs consist of a designation or establishment for the waters within a specified beneficial use area to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives. Beneficial uses, together with their corresponding water quality objectives, can be defined according to federal regulations as water quality standards.

Beneficial Uses

Cachuma Lake is regulated by the Basin Plan for the CCRWQCB, dated September 8, 1994. The Basin Plan lists existing and potential beneficial uses for surface waters and groundwaters. The beneficial uses of any specifically identified surface water body generally apply to its tributary streams. The existing beneficial uses of Cachuma Lake include municipal, agricultural, groundwater, recreation, and biological uses.

Under the Reclamation Act of 1939 and Permits 11308 and 11310, water appropriated using Cachuma Project facilities may be used for municipal, industrial, domestic, irrigation, and recreation purposes. Reclamation completed construction of Bradbury Dam in 1956 and Cachuma Lake first filled and spilled in 1958. Initial water deliveries occurred in 1955, drawing from the Tecolote Tunnel infiltration only. The Cachuma Project provides about 65 percent of the total water supplies for the Member Units who provide water to an estimated 207,000 people along the South Coast and in the Santa Ynez Valley. Approximately 38,000 acres of croplands are irrigated by water from the Cachuma Project. Approximately 30 percent of total deliveries are used for irrigation and 70 percent for municipal and industrial purposes.

Water Quality Objectives

The Basin Plan specifies water quality objectives for surface waters and groundwaters of the Santa Ynez Hydrologic Unit. Surface water quality objectives applicable to Cachuma Lake

address the following parameters: Color, tastes and odors, floating material, suspended material, settleable material, oil and grease, biostimulatory substances, sediment, turbidity, pH, dissolved oxygen, temperature, toxicity, pesticides, chemical constituents, other organics, and radioactivity.

3.1.1.2 Surface Water

Watershed Delineation

The SWRCB and RWQCBs have taken a watershed management approach for water resources protection. Each RWQCB has identified the watersheds within its region and has developed Watershed Management Initiatives. Each Regional Board considers point and nonpoint source discharges, ground and surface water interactions, and water quality/water quantity in protecting water resources within a watershed context (CCRWQCB 1994). The hierarchy of watershed designations consists of six levels of increasing specificity: hydrologic region, hydrologic unit, hydrologic area, hydrologic subarea, super planning watershed, and planning watershed. Super planning watershed boundaries with the Cachuma Lake regional area are shown on Figure 3.1-1. Cachuma Lake is listed as a hydrologic subarea of the Santa Ynez hydrologic unit.

Santa Ynez River Watershed Surface Water Resources

The Santa Ynez River watershed encompasses about 900 square miles. The Santa Ynez River flows westerly about 90 miles to the Pacific Ocean, passing through Jameson Lake, Gibraltar Reservoir, and Cachuma Lake. Immediately above Cachuma Lake, the river passes through a narrow valley between the San Rafael and Santa Ynez mountains. Below Bradbury Dam, the river passes through the bottom of the Santa Ynez Valley. West of Buellton, the river flows through a narrow meandering stretch and emerges onto the broad, flat Lompoc Plain. The Santa Ynez River flows across the Lompoc Plain for about 13 miles where it empties into the ocean.

The flow of the Santa Ynez River downstream of the lake has been intermittent, both in the past and under current Cachuma Project operations. Winter flows were largely uncontrolled prior to the construction of Bradbury Dam with little or no flow in the summer months. Since diversions began along the river in 1953 during the construction of Bradbury Dam, the winter flows have been moderated by reservoir operations and previously nonexistent summer flows have been replaced with releases for downstream water rights and fish habitat. The average annual inflow to Cachuma Lake from the Santa Ynez River and other lake tributaries from 1953 to 2001 is 89,163 acre-feet per year.

The upper portion of the watershed is regulated by Juncal and Gibraltar dams, which regulate 14 and 216 square miles of the watershed, respectively. Cachuma Lake regulates about 417 square miles below these dams. A summary of the surface diversions along the river is provided below.

- Juncal Dam, completed in 1930, is owned and operated by the Montecito Water District. The original storage capacity of Jameson Lake (7,228 acre-feet) has been reduced to about 5,200 acre-feet due to siltation. Diversions of Jameson Lake regulated flows are made to Montecito on the South Coast through the 2-mile-long Doulton Tunnel. Flows from Alder Creek are seasonally diverted by flume and metered into Jameson Lake when turbidity conditions permit. The tunnel intake location also allows for minor diversions of downstream tributary inflow from Fox Creek.

- Gibraltar Dam was constructed by the City of Santa Barbara in 1920. Gibraltar Reservoir's constructed capacity of 14,500 acre-feet had been reduced due to siltation to about 7,600 acre-feet by 1947. The dam was subsequently raised 23 feet in 1948 to increase the capacity to 14,777 acre-feet. However, due to continuing siltation, Gibraltar Reservoir capacity has been reduced once again to about 7,100 acre-feet. Diversions from Gibraltar are made to the City of Santa Barbara through the 3.7-mile-long Mission Tunnel. Annual diversions to the City have ranged from over 9,000 acre-feet in very wet years to nearly zero in drought years.

Section 1.1.2 describes the conveyance facilities downstream of Bradbury Dam and Cachuma Lake. The minimum operating pool for Cachuma Lake can be as low as 12,000 acre-feet, but diversions to Tecolote Tunnel that occur when the lake is about 30,000 acre-feet require pumps to deliver water to South Coast Member Units. In 1995, Reclamation established an operation yield of 25,714 acre-feet per year.

The largest subbasin to Cachuma Lake is Mono Creek, which discharges to Gibraltar Reservoir, and then, to Cachuma Lake. Cachuma Lake receives direct runoff from three very large subbasins: Santa Ynez River below Gibraltar Dam (41,633 acres), Santa Cruz Creek (48,139 acres), and Cachuma Creek (17,735 acres) (Figure 3.1-1).

The subbasins draining into Cachuma Lake can be subdivided into smaller units near the lake (Figure 3.1-2). The tributaries on the north side of the lake are substantially larger than on the south side of the lake.

3.1.1.3 Groundwater

The general objectives for groundwaters within the CCRWQCB apply to tastes and odors and radioactivity levels. Groundwater objectives for municipal and domestic supplies add bacteria, organic chemicals, and chemical constituents as areas to control for water quality.

3.1.2 Plan Area Existing Conditions

3.1.2.1 Water Resources

Surface Water Quality

Water quality data collected by the City of Santa Barbara since 1995 (Appendix A, Part A-1) show that the average annual range of total dissolved solids (TDS) in Cachuma Lake is 527 to 636 mg/L (see Table 3.1-1). The average seasonal variation in TDS during the year is 109 mg/L.

Table 3.1-1
Historical Cachuma Lake Total Dissolved Solids

Parameter	Concentration (mg/L)
Average annual minimum	527
Average annual maximum	636
Average variation within a year	109

Source: Water quality data based on samples collected in Cachuma Lake at draft gate are from the City of Santa Barbara Public Works Department Annual Summaries for 1995 through 2008 (Appendix A, Part A-1). Conductivity data given in units of micromhos per centimeter (µmhos/cm) are converted into Total Dissolved Solids (TDS) data in units of milligrams per liter (mg/L) using the following relationship: Total Dissolved Solids [mg/L] = 0.7 * Conductivity [µmhos/cm].

The typical seasonal pattern of TDS is low TDS value in the winter due to fresh inflows, followed by an increase in TDS of up to 70 mg/L over the summer and fall due to evaporation. In wet years with high inflow, TDS in the reservoir will decrease to as low as 412 mg/L, a large increase in storage consisting of higher quality runoff occurs. Substantial decreases in TDS occur in wet years. The largest increase in TDS during the last 15 years occurred over the course of a dry period from 2001 to 2003. At the onset of the dry period in 2001, the TDS averaged about 525 mg/L. After the dry period ended, the average TDS had increased by nearly 100 mg/L to 622 mg/L in 2004. The TDS in the lake reached a maximum of 717 mg/L at this time.

Cachuma Lake follows a typical pattern of stratification during the spring and summer, with vertical mixing in the late fall and winter. Water temperatures at depths of 30 to 50 feet (Figure 3.1-3) decrease 10 to 25 ° F during the spring and summer as the lake stratifies. Vertical mixing is prevented by the temperature stratification. As surface water temperatures decrease in the fall, vertical mixing occurs and the lake turns over.

Over the course of a year, TDS does not vary substantially with depth in the lake and does not appear to be greatly affected by temperature stratification (Stetson Engineers 2001). TDS measurements were taken monthly from 1984 to 1999 at different intakes (and therefore, different depths) on Tecolote Tunnel during the year (SYRTAC 1997). The average difference in TDS amongst the different depths was only 4 percent. Available data from Tecolote Tunnel indicate complete vertical mixing relative to TDS in Cachuma Lake.

The Cachuma Project Member Units must periodically conduct a sanitary survey of the Cachuma Lake watershed to identify and address potential water quality problems that could affect public health because the lake is a drinking water reservoir (Summers Engineering 1995, 2000, 2006). The survey includes an assessment of water quality in the lake, including microbiological contaminants such as Giardia, Cryptosporidium, and enteric viruses. Due to logistic and financial constraints, water samples for microbiological testing are taken at the raw water intakes at the William B. Cater and Corona del Mar treatment plants on the South Coast rather than at the lake. The most recent sanitary survey (Summers Engineers 2006) showed very low levels of microbiological contaminants. Cryptosporidium data collected from the raw water intake to the William B. Cater Water Treatment Plant in 2007 and 2008 indicate very low levels of that contaminant (Appendix A, Part A-2).

Most of the watershed above Cachuma Lake is undeveloped and located within the Los Padres National Forest. The primary sources of microbiological contaminants are the Upper Santa Ynez River Recreation Area (a series of swimming and fishing pools between Gibraltar Dam and Paradise Ranger Station), and cattle grazing on the northeasterly side of the lake outside the Plan Area and National Forest.

In 1972-73, the National Forest conducted sampling in and below the Upper Santa Ynez River Recreation Area to determine levels of indicator bacteria. These data indicate that the highest concentrations occur in the summer when use is high. In general, the concentration of coliform bacteria is lower at the National Forest boundary, about 1 mile downstream of Red Rock, the most popular location for visitors. All of the measured concentrations of total coliform bacteria were below state body-contact health standards.

Boat Fuel Discharges

According to some studies, as much as 30 percent of the fuel used by carbureted two-stroke engines is discharged unburned into the water (Cal-EPA 2002). As a result, the use of personal watercraft and other conventional two-stroke engines has resulted in measurable water quality degradation in some of the nation's lakes and reservoirs. Also known as two-stroke engines, these motors intake a mixture of air, gasoline, and oil into the combustion chamber while exhaust gases are being expelled from the combustion chamber. Since the intake and exhaust processes are occurring at the same time, some of the unburned fuel mixture escapes with the exhaust. This expulsion of unburned fuel is the reason for the elevated levels of hydrocarbon emissions from carbureted two-stroke engines. Fuel components from these discharges to receiving waters typically include benzene, toluene ethylbenzene, and xylene (BTEX).

In Summer 1997 COMB Member Units decided to participate in a statewide survey of the occurrence of methyl tertiary butyl ether (MTBE) and other gasoline compounds. A sampling program was conducted in Cachuma Lake to test for the occurrence of MTBE and other gasoline compounds listed above (BTEX components). Sampling results showed very low levels of MTBE, toluene, and xylene. All were below California Department of Health Services Maximum Contaminant Levels (MCLs) used for drinking water standards (City of Santa Barbara 1997).

In addition to this sampling, raw water delivered from Cachuma Lake to the William B. Cater Water Treatment Plant is tested quarterly and annually for MTBE and other gasoline components (BTEX). Through 2009, no detections of BTEX compounds have been reported (Appendix A, Part A-3).

In 1998, the California Air Resources Board (CARB) adopted regulations to limit hydrocarbon and nitrogen oxide (NO_x) air emissions for marine outboard engines and personal watercraft. These regulations were implemented in three stages: 2001 exhaust emission standards for 2001–2003 engines, 2004 exhaust emission standards for 2004–2007 engines, and 2008 exhaust emission standards for 2008 and later engines. CARB requires each new engine to have a label that displays one to three stars. The number of stars indicates the exhaust emission standards with which the engine complies. One-star engines comply with 2001 exhaust emission standards, while three-star engines comply with the 2008 exhaust emission standards (CARB 2008). Marine engines that do not conform to the CARB exhaust emission standards for 2001 and later are referred to throughout this document as "nonconformant."

In response to the 1998 CARB regulations, the marine engine manufacturers introduced the direct-injection two-stroke engine and the four-stroke engine. The direct-injection two-stroke engines inject the fuel into the combustion chamber only after the exhaust valve is closed. For the four-stroke engines, the intake and exhaust valves are never open at the same time. These new technologies reduce the amount of unburned fuel that escapes from the combustion chamber and enters into the water.

A 2001 CARB study demonstrated that a direct-injection two-stroke engine will have a 75 percent reduction in BTEX emissions to water compared to a similar two-stroke carbureted engine, and a four-stroke engine will have a 94 to 96 percent reduction compared to a similar two-stroke carbureted engine (CARB 2001). The study was conducted to support the CARB regulatory effort adopted in 1998 for 2001 and newer engines (CARB 2001).

In addition, EPA 2008 air emission standards (EPA 2008a) and CARB 2008 exhaust emission standards (see Section 3.2.3.1) require more stringent controls on hydrocarbon and NO_x emissions. The EPA 2008 standards apply to 2010 and newer engines, and the CARB 2008 standards apply to 2008 and newer engines. These new regulations will likely result in even less unburned fuel released into the water as marine engine manufacturers improve their technology to meet air quality emission standards.

Personal watercraft are currently not allowed on Cachuma Lake and are not proposed under any of the alternatives; therefore, there will be no fuel discharges from personal watercraft. The boats for rent at the marina all have four-stroke (conformant) engines designed to meet 1998 CARB regulations. Currently, the only carbureted two-stroke (nonconformant) engines on the lake are on older boats. As these engines wear out, they will have to be replaced with the cleaner-burning engines to be in compliance with CARB and USEPA regulations.

3.2 AIR QUALITY

3.2.1 Regional Setting

Santa Barbara County is characterized by a Mediterranean climate of warm dry summers and cool rainy winters. Temperature patterns vary in the county because of geographical differences, causing inland valleys to have greater temperature ranges than the coastal areas. Cachuma Lake has a transitional climate between that of the coast and that of the inland area. Regional climate in the county is influenced by a persistent Pacific high pressure system, resulting in dry conditions during the summer and generally sunny conditions throughout the year.

Summers are foggy and cool along the coast and hotter and drier inland. July temperatures average 65° F along the coast and about 90° F in the interior. The daily mean maximum temperature at Bradbury Dam is 77° F. January temperatures along the coast are approximately 40° F and the inland average is about 30° F. The daily mean minimum temperature at Bradbury Dam is 43° F.

During the late spring and summer, when the Pacific High attains its greatest strength, onshore winds from the northwest generally prevail during the day. At night, as sea breezes die, weak winds flow down the coastal mountains and valleys to form light east to southeast breezes. In the fall, onshore surface winds decline and the marine layer grows shallow, allowing an occasional reversal to a weak offshore flow. In the summer and fall, the high pressure cell that periodically resides over the Great Basin (Utah and eastern Nevada) can produce hot dry northeast winds called Santa Ana winds, which increase hazards in the mountain areas.

The Pacific high pressure system that produces the onshore winds from the west also causes temperature inversions. During the months of May to October, it is possible for an inversion layer to form in the Santa Ynez Valley. Temperature inversions occur when upper level air masses are warmer than the air below (temperature increases with height). The inversion restricts vertical atmospheric mixing and can cap pollutants that are emitted below or within them.

Winters in Santa Barbara are clear, cool, and rainy. The greatest amount of rainfall occurs between December and March, with an average of 18 inches annually. Rainfall increases with elevation, causing the annual precipitation at San Marcos Pass to exceed 30 inches. The average annual precipitation at Cachuma Lake is about 20 inches; however, the probability of receiving

less than 20 inches each year is 75 percent. Rainfall varies considerably from year to year, ranging from 9 to 50 inches since the 1960s.

3.2.2 Plan Area Existing Conditions

Since 1994, Santa Barbara County has been designated as an attainment area for state standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, and hydrogen sulfide. The County is designated as a nonattainment area for the state 8-hour ozone standard and state particulate matter 10 microns or less (PM_{10}) standard. For particulate matter 2.5 microns or less ($PM_{2.5}$), the County is unclassified for the state annual arithmetic mean and unclassified/attainment of the federal annual arithmetic mean and 24-hour standards. Table 3.2-1 provides the complete 2009 attainment status summary for Santa Barbara County.

The automobile is the largest source of ozone precursors and of carbon monoxide. Thus, the principal pollutant source in the area of Cachuma Lake is traffic along SR 154. The annual average daily traffic in 2006 was 16,000 vehicles measured at the County Park entrance (Caltrans 2006). The sources of particulate emissions in the Santa Ynez Valley are estimated to be 48 percent from agricultural operations, 25 percent from mining, 11 percent from paved roads, and 10 percent from other sources including wildfires. Prescribed burning is not considered a major source of particulates because it only occurs periodically, usually involves a small acreage, and is conducted under weather conditions that better disperse pollutants. Pollutant levels are highest in May through October due to thermal inversion layers that prevent the dispersion of pollutants, as noted above.

3.2.3 Regulatory Setting

The Plan Area is subject to air quality planning programs required by the Federal Clean Air Act of 1970, its amendments of 1990, and the California Clean Air Act of 1988. Both the federal and state statutes provide for ambient air quality standards to protect public health, timetables for progressing toward achieving and maintaining ambient standards, and the development of plans to guide the air quality improvement efforts of state and local agencies.

3.2.3.1 Federal Requirements

The EPA oversees state and local implementation of Federal Clean Air Act requirements. In addition, the EPA sets emission standards for many mobile sources, such as new on-road motor vehicles, including transport trucks that are sold outside of California. The EPA also sets emission standards for various classes of new off-road mobile sources, including locomotives, that are sold throughout the country.

Table 3.2-1
Santa Barbara County Attainment/Nonattainment Classification Summary 2009

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone	8 hour	0.070 ppm	**N**	0.075 ppm	A
	1 hour	0.09 ppm (180 µg/m$^{3)}$	**A**	revoked	A
Carbon Monoxide	8 hour	9.0 ppm (10 mg/m$^{3)}$	A	9.0 ppm (10 m/m$^{3)}$	A
	1 hour	20.0 ppm (23 mg/m$^{3)}$	A	35.0 ppm (40 µg/m$^{3)}$	A
Nitrogen Dioxide**	annual average	0.030 ppm (56 µg/m^3)	A	0.053 ppm (100 µg/m$^{3)}$	A
	1 hour	0.18 ppm (338 µg/m^3)	A	--	--
Sulfur Dioxide	annual average	--	--	80 µg/m^3 (0.03 ppm)	A
	24 hour	0.04 ppm (105 µg/m$^{3)}$	A	0.14 ppm 365 µg/m^3	A
	1 hour	0.25 ppm (655 µg/m$^{3)}$	A	--	--
Particulate Matter (PM_{10})	annual arithmetic mean	20 µg/m^3	**N**	revoked	A
	24 hour	50 µg/m^3	**N**	150 µg/m^3	A
Particulate Matter - Fine ($PM_{2.5}$)	annual arithmetic mean	12 µg/m^3	U	15 µg/m^3	A
	24 hour	--	--	35 µg/m^{3**}	A
Sulfates	24 hour	25 µg/m^3	A		
Lead	calendar quarter	--	--	1.5 µg/m^3	A
	30 day average	1.5 µg/m^3	A	--	--
	Rolling 3-month average	--	--	0.15 µg/m^3	U
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m$^{3)}$	A	--	--
Vinyl Chloride (chloroethene)	24 hour	0.010 ppm (26 µg/m$^{3)}$		--	--
Visibility Reducing Particles	8 hour (1000 to 1800 PST)		A	--	--

Source: Santa Barbara County Air Pollution Control District (http://www.sbcapcd.org/sbc/attainment.htm); downloaded March 2010.
Notes:

** EPA strengthened the 24-hour fine particle standard from the 1997 level of 65 ug/m^3 to 35 ug/m^3 on September 21, 2006.
*** The state Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm.

A=Attainment; N=Nonattainment; U=Unclassified; U/A=Unclassifiable/Attainment; mg/m^3=milligrams per cubic meter; ppm=parts per million; µg/m^3=micrograms per cubic meter

Federal Recreational Marine Engine Standards

Hydrocarbons and nitrogen oxides (NO_x) are precursors to ozone (smog) formation, and recreational watercraft can contribute substantial emissions of ozone precursors. The EPA's "Final Rule for New Spark-Ignition Marine Engines" (EPA 1996) adopted exhaust emission regulations for hydrocarbons and NO_x from outboard and personal watercraft marine engines. The 1996 EPA regulations were phased in between 1998 and 2006, with the standard becoming more stringent as the phase-in period progressed.

The EPA recently adopted the "Final Rule: Control of Emissions from Nonroad Spark-Ignition Engines and Equipment" (EPA 2008a), which regulates air emission standards for hydrocarbons, NO_x, and carbon monoxide (CO). The new EPA regulations will be enforced for 2010 and newer outboard and personal watercraft engines (EPA 2009). The new EPA 2008 regulations estimate that by 2030, the volatile organic compounds (VOC) emissions for marine engines will be reduced by 70 percent and CO emissions will be reduced by 19 percent. The EPA 2008 regulations are also expected to achieve more than a 60 percent reduction from EPA 2006 exhaust emission standards for hydrocarbon and NO_x emissions (EPA 2008b).

The 2008 EPA emission standards for hydrocarbons and NO_x are consistent with the 2008 CARB hydrocarbons and NO_x exhaust emission standards (originally adopted in 1998). The EPA has also adopted CO emission standards for recreational marine and personal watercraft engines (EPA 2008b).

General Conformity

The Clean Air Act requires that nonattainment and maintenance areas (with respect to the National Ambient Air Quality Standards) prepare and implement State Implementation Plans (SIPs) to achieve the standards. Federal actions need to demonstrate conformity to any State Implementation Plans of the regional air basin. The General Conformity Rule (GCR) (Title 40 CFR Part 51.853) requires that the responsible federal agency of an undertaking make a determination of conformity with the SIP. Each action must be reviewed to determine whether it (1) qualifies for an exemption listed in the GCR, (2) results in emissions that are below GCR de minimis emissions thresholds, or (3) would produce emissions above the GCR de minimis thresholds applicable to the specific area, requiring a detailed air quality conformity analysis.

Santa Barbara County is considered a maintenance area under the federal ozone standard. The County prepared a Clean Air Plan in 2007 to chart a course of action for ongoing maintenance of the federal 8-hour ozone standard through the year 2014. Therefore, the GCR de minimis thresholds for the Cachuma Lake area are as follows:

- VOC: 100 tons per year (for maintenance areas outside an ozone transport zone)
- NO_x: 100 tons per year
- CO: Not applicable because the Plan Area is in attainment of federal CO standards
- PM_{10}: Not applicable because the Plan Area is in attainment of federal PM_{10} standards.

3.2.3.2 State and Local Requirements

Under California law, the responsibility to carry out air pollution control programs is split between the CARB and local or regional air pollution control agencies. The CARB shares the regulation of mobile sources with the EPA.

Cachuma Lake is located within the central section of the South Central Coast Air Basin (SCCAB). The SCCAB includes all of San Luis Obispo, Santa Barbara, and Ventura counties. The central section is under the jurisdiction of the Santa Barbara County Air Pollution Control District (SBCAPCD). The SBCAPCD establishes and enforces regulations for stationary sources in the Basin, and develops plans to accomplish attainment of the state and federal air quality standards. As required by both the California Clean Air Act of 1988 and the Federal Clean Air Act Amendments, the SBCAPCD has developed a Clean Air Plan to address attainment of state and federal ozone standards.

State Recreational Marine Engine Standards

In 1998, CARB adopted hydrocarbon and NO_x emission standards for marine outboard and personal watercraft engines. The standards were implemented in three stages: 2001 exhaust emission standards for 2001–2003 engines, 2004 exhaust emission standards for 2004–2007 engines, and 2008 exhaust emission standards for 2008 and later engines. CARB requires each new engine to have a label that displays one to three stars. The number of stars indicates the exhaust emission standards with which the engine complies. One-star engines comply with 2001 exhaust emission standards, while three-star engines comply with 2008 exhaust emission standards (CARB 2008).

In 2008, CARB proposed CO emission standards for marine outboard and personal watercraft engines that are currently under review and have not been adopted yet. The proposed CO emission standards are consistent with the EPA 2008 CO emission standards. The state CO emission standards will be required of 2009 and newer marine outboard and personal watercraft engines (CARB 2008).

Assembly Bill 32

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide greenhouse gas (GHG) emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493, which called for CARB to develop regulations that reduce GHGs emitted from passenger vehicles, be used to address vehicular GHG emissions. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state

achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Scoping Plans

The CARB is the lead agency for implementing AB 32, which set the major milestones for establishing the program. AB 32 requires the CARB to prepare a Scoping Plan containing the main strategies that will be used to achieve reductions in GHG emissions in California. On June 26, 2008, CARB staff presented the initial draft of the AB 32 Scoping Plan to its Board for review. CARB has been revising this draft Scoping Plan based on continuing analysis and public input, which resulted in the development of the Proposed Scoping Plan, released in November 2008. The proposed Scoping Plan was approved by CARB on December 12, 2008. The measures in the Proposed Scoping Plan will be developed over the next three years and will be in place by 2012.

Climate Change

Greenhouse gas emissions are being considered as a relatively new issue in environmental documents because of their impacts to climate change. Currently there are no standard, widely used methodologies or significance criteria to address climate change impacts from GHG emissions. At the state level, air districts have generally provided guidance on analysis methodologies and significance criteria for criteria pollutant and toxic air contaminant impacts, but they have not yet established guidelines for GHG emissions and their impacts.

Recently, CARB prepared proposed draft GHG significance thresholds, which are sector-specific in terms of what types of activities generate the GHG emissions. Included in the proposed draft document are industrial sources and commercial/residential sources. The CARB is still conducting workshops and soliciting comments regarding the proposed thresholds for these two sectors, but to date no significance thresholds have been adopted.

3.2.3.3 National and State Ambient Air Quality Standards

National and state ambient air quality standards have been established for six ambient air pollutants commonly referred to as "criteria pollutants." The state standards were established in 1969. The federal standards were established by the EPA after passage of the Clean Air Act of 1970. These pollutants include carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, lead, and particulate matter. The ambient air quality standards are developed to protect the public health and welfare, especially those most susceptible to respiratory distress such as asthmatics, the very young, the elderly, people weak from other illness or diseases, or persons who engage in heavy work or exercise. These standards specify the concentration of pollutants the public can be exposed to without experiencing adverse health effects. National and state standards are reviewed and updated periodically based on new health studies. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent.

Based on these standards, regional areas such as the SCCAB are given an air quality status "label" by the federal and state regulatory agencies for planning purposes. Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated as

"attainment areas" on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards, areas are designated as "nonattainment areas." An area that recently exceeded ambient standards but is now in attainment is designated as a "maintenance area." An area is designated "unclassified" if air quality data are inadequate to assign it an attainment or nonattainment designation. Nonattainment areas are further classified based on the severity and persistence of the air quality problem as "moderate," "severe," or "serious."

3.3 SOILS AND GEOLOGY

3.3.1 Regional Setting

Cachuma Lake is in the Santa Ynez River Valley, flanked by the Santa Ynez Mountains on the south and the San Rafael Mountains on the north. The topography of the Plan Area is complex, and ranges from gentle to very steep, as shown on Figure 3.3-1. The Santa Ynez Valley with alluvial stream terraces on each side of the river is now located beneath the reservoir. Hence, the lakeside topography is dominated by gentle to steep hills that are interrupted by deep side canyons associated with tributaries to the river. Three major side canyons on the north side of the lake exhibit very steep canyon walls - Johnson, Cachuma, and Santa Cruz canyons (Figure 3.3-1). Numerous small tributaries lie on the south side of Cachuma Lake (e.g., DeVaul and Tequepis creeks). However, the canyons associated with the creeks do not extend into the lake as they do on the North Shore.

Major topographic features of the Plan Area include the following:

- Santa Ynez Point – a large, flat peninsula at the east end of the lake
- Arrowhead Island – small peak that extends about 70 feet above the lake
- Storke Flats – a small, unlabelled alluvial terrace on the south side of the lake, west of Arrowhead Island
- Santa Cruz Point and Santa Cruz Bay
- Cachuma Point and Cachuma Bay
- Jackrabbit Flats – broad alluvial fan on the south side of the lake; current location of Mohawk Campground
- Tequepis Point – tip of large peninsula where the County Park is located
- Bradbury Dam – 279-foot-high, 766-foot-long earthen dam completed in 1956

Ground elevations at the Plan Area range from 740 feet (above mean sea level), the maximum lake elevation, to about 1,200 feet on both the North Shore (east of Santa Cruz Creek) and the South Shore (west of Tequepis Creek).

The terrain surrounding the lake is generally very complex, characterized by numerous narrow ridges and canyons. Most of the Plan Area contains slopes that are over 10 degrees or more, as shown on Figure 3.3-1. The steepest terrain is located on the north side of the lake where the Plan Area contains well-developed ridges and peaks. The terrain on the south side of the lake is much steeper and complex, but the Plan Area only includes a small portion of the foothills of the Santa Ynez River. Flat accessible areas of the Plan Area include the County Park, Jackrabbit

Flats, Storke Flats, Santa Ynez Peninsula, the unnamed peninsula to the east, a meadow next to the lake north of Horse Creek, and a large meadow on the west side of Santa Cruz Bay (Figure 3.3-1).

3.3.2 Plan Area Existing Conditions

3.3.2.1 Geology

The geomorphology of an area is created by complex interaction of climate, rock types, and tectonics. The geomorphology the Plan Area is characterized by large linear rugged mountain ranges to the north and south, separated by moderate topography in the Santa Ynez River Valley. The Santa Ynez Mountains to the south extend for over 50 miles from Gaviota Pass in the west to Matilija Canyon in the east. The highest peaks in this portion of the range occur directly south of Cachuma Lake - Santa Ynez (4,298 feet) and Broadcast (4,028 feet) peaks. The north flank of the Santa Ynez Range descends steeply to the Santa Ynez Fault, located at about 900 feet elevation near the base of the range. The Santa Ynez Mountains have been uplifted along the fault, creating dramatic relief of moderate to steeply dipping Tertiary sedimentary rocks incised by canyons and gullies.

The north flank of the Santa Ynez Range consists of deformed (folded and faulted) sedimentary rocks where significant erosion and canyon incision have taken place. A series of large alluvial fans consisting of boulder fanglomerates and landslide debris were shed downslope as the result of catastrophic, massive debris flows in the Late Pleistocene. Remnants of these fan deposits are visible today along the base of the range north of the Santa Ynez Fault on the south side of Cachuma Lake (Figures 3.3-2, 3.3-2a, and 3.3-3). The County Park is located on one of these fanglomerates.

The east-west trending Santa Ynez River Valley separates the Santa Ynez Range from the San Rafael Range to the north. Gentle to steep topography has resulted from a complex interplay among sea level change, tectonic deformation, sedimentation, and erosion. The valley has been shaped by downcutting of the Santa Ynez River, tectonic deformation, folding and uplift of the valley and the mountains to the north and south, and deposition of marine and nonmarine sediments in the intervening valleys and depressions.

Large-scale alluvial fans and alluvial aprons developed at the base of the San Rafael Mountains on the north side of the valley (Figures 3.3-2, 3.3-2a, and 3.3-3) as the result of strong uplift of this range in the Pleistocene. The resulting alluvial deposits have been uplifted and exposed today.

Numerous fluvial terraces of different ages are present along the north and south sides of the Santa Ynez River, as well as along Santa Cruz Creek. These terraces were formed during periods of prior floodplain deposition and have been preserved as the result of tectonic uplift and sea level changes. Figures 3.3-2, 3.3-2a, and 3.3-3 illustrate the geologic formations within the watershed.

3.3.2.2 Seismicity

The Plan Area is located in a seismically active area of California. The historical seismicity displays diverse styles of earthquake mechanisms showing strike-slip, reverse-oblique-slip, and

reverse-slip displacement. Based on various local and regional seismicity studies, the seismicity of the Plan Area is considered moderate.

The available historical and instrumental data indicate several earthquakes of greater than Magnitude 5 (M 5) in the onshore and offshore areas of the region since 1902. Several M 5-5.5 earthquakes occurred on the Los Alamos Fault in 1902 and 1915. Other significant earthquakes located in the site region include the 1927 Lompoc earthquake (M 7.0), and earthquakes centered in the Santa Barbara Channel in 1925 (M 6.3), 1941 (M 5.9), and 1978 (M 5.1). In addition to these relatively local earthquakes, the 1812 earthquake (M 7+) centered in the south-central Santa Barbara Channel and the 1857 Fort Tejon earthquake (M 7.9-8.2) located on the San Andreas Fault probably generated significant strong ground motion at the future site of the Plan Area.

The locations of significant historical earthquakes are generally coincident with the presence and distribution of major fault zones within the area. Major active or potentially active seismic sources in the region include the Hosgri, Santa Ynez, Santa Ynez River, South Branch Santa Ynez, Los Alamos-Baseline, More Ranch-Arroyo Parida, San Cayetano, and San Andreas faults.

The maximum credible earthquakes for the local seismic sources are: Moment Magnitude (Mw) 7.25 on the Santa Ynez Fault, Mw 6.75 on a blind thrust fault located about 3 miles from Bradbury Dam, and Mw 7.25 on the San Cayetano blind thrust fault located 12 to 2 miles beneath the dam (O'Connell, Ake, and Block 1995). These local seismic sources have the greatest potential to damage facilities and buildings within and near the Plan Area as the result of strong ground shaking.

3.3.2.3 Geohazards

Geohazards may affect structures in the Plan Area through landslides, subsidence, and earthquake-related effects such as surface fault rupture, ground shaking, and liquefaction. Existing and potential geologic hazards in the area include erosion, landslides, and rock fall. The granitic rocks and the basalt and andesite flow yield boulders that can roll downslope if pushed, triggered by an earthquake, or triggered by normal slope-degrading processes.

Earthquakes/Ground Shaking. California contains many active faults capable of generating damaging earthquakes. The major effects of earthquakes are ground shaking, surface rupture, and other forms of ground failure including liquefaction and subsidence. The U.S. Geological Survey (USGS) National Earthquake Hazards maps (Frankel et al. 2002) indicate the potential earthquake ground motions at Cachuma Lake. Figure 3.3-4 illustrates the ground shaking potential in the region.

Surface Fault Rupture. Surface fault rupture is defined as a slip on a fault plane that has propagated upward to, and offset or disturbed, the earth's surface. Areas subject to fault rupture hazard are zoned by state law under the Alquist-Priolo Earthquake Fault Zoning Act (Hart 1994). Maps of areas of potential surface faulting are prepared by and available from California Geological Survey. These maps depict the most recently active traces of faults and a zone around these traces within which future surface faulting might occur. Figure 3.3-5 depicts the major known faults in the region.

Mass Wasting. Mass wasting is downward movement of soils and rock under gravity, including landslides, rock falls, and debris flows. Mass wasting requires source materials, a slope, and a

triggering mechanism. Source materials include fractured and weathered bedrock and loose soils. Triggering mechanisms include earthquake shaking, heavy rainfall, and erosion.

3.3.2.4 Soils

The soils in the vicinity of Cachuma Lake are part of the Positas-Ballard-Santa Ynez Association (Figures 3.3-6 and 3.3-6a). This association consists of nearly level to moderately steep, well drained and moderately well drained fine sandy loams to clay loams on river terraces. The local soils formed in alluvium derived from the uplifted sedimentary rocks that surround the area. The soils are generally shallow to moderately deep over a clay or gravelly clay subsoil. Other areas have very deep soils. Soils are thin to absent on steep slopes, where erosion and runoff effectively precludes good soil development. Soils on steep slopes strongly reflect the constituents in the parent material on which they lie, and are often lost through erosion nearly as fast as they form through weathering of the parent material. A summary of the soils in the Plan Area is provided in Table 3.3-1.

3.3.2.5 Erosion

Erosion is a problem in the Plan Area and poses threats to the natural and cultural values in the study area. Erosion is the gradual wearing away of land by water, wind, and general weather conditions. Erosion is a natural geological process, but accelerated soil erosion results from poor land-use practices, leading to the loss of fertile topsoil and to the silting of water bodies such as Cachuma Lake. In the study area, shallow soils on steep slopes tend to easily erode, and any activity that alters natural soil conditions can cause significant erosion problems. The steep slopes within the recreation area (ten degrees or more) can be especially susceptible to erosion from volunteer trails and other surface impacts from recreation if not managed properly. The concentration of unstable slopes and landslide areas are found generally on the north shore of the lake across from Santa Ynez Point, and at Sweetwater Creek to the west of the County Park. Figure 3.3-7 shows the locations of landslides and unstable slopes around Cachuma Lake and the erosion potential of the shoreline around the County Park. The figure shows a high potential for erosion at the park on the east and west shorelines at the north end of the Tequepis Peninsula where slopes are 10 feet or greater in height.

The Zaca wildfire of 2007 burned through areas north of Cachuma Lake up to the San Rafael Wilderness ridgeline. The burned area has not been fully assessed due to the steep topography of the region. The extent of the geologic changes, including erosion and landslide, that have resulted from the fire is unknown due to the area's inaccessibility. The 2007 Zaca Fire Burn Area Emergency Recovery Assessment (USFS 2007) identified the watershed above Cachuma Lake as at-risk due to the increase of sediment and large woody debris. Immediate actions are planned to improve drainage functions, provide emergency storm patrol, restrict public access to burn areas, and mitigate risks for stream diversion and road damage. Emergency trail treatments will be implemented to minimize risks of trail failure through placement and maintenance of effective erosion structures.

Table 3.3-1
Summary of Soil Types in the Plan Area

Soil Series	Texture	Slope (percent)	Erosion Hazards	Runoff
Ballard	Fine sandy loam	2 to 9	Moderate	Medium
Ballard	Gravelly fine sandy loam	2 to 9	Moderate	Medium
Botella	Loam	2 to 9	Slight to moderate	Slow to medium
Botella	Clay loam	2 to 9	Moderate to high	Medium to rapid
Chamise	Shaly loam	15 to 45	Moderate to high	Medium rapid
Chamise	Shaly loam	45 to 75	High	Very rapid
Chamise	Shaly loam (eroded)	30 to 75	High	Very rapid
Chamise	Clay loam	30 to 45	Moderate to high	Medium to rapid
Cobbly alluvial land	Cobble, gravel, sand	0 to 5	High	Rapid
Diablo	Silty clay	30 to 45	Moderate to high	Medium to rapid
Elder	Sandy loam	2 to 9	Slight to moderate	Slow to medium
Elder	Loam	2 to 9	Moderate	Medium
Elder	Shaly loam	2 to 9	Moderate	Medium
Gaviota	Sandy loam	15 to 30	Moderate	Medium
Gaviota	Sandy loam	30 to 75	Very high	Very rapid
Gullied Land	Variable	variable	High	Rapid
Linne	Clay loam	9 to 15	Moderate	Medium
Linne	Clay loam	15 to 30	Moderate to high	Medium to rapid
Linne	Clay loam	13 to 45	Moderate to high	Medium to rapid
Lodo	Clay loam	30 to 75	High	Rapid
Lopez	Rocky loam	75 to 100	High	Rapid
Lopez	Shaly clay loam	15 to 75	High	Rapid
Maymen	Stony loam	45 to 75	High	Rapid
Metz	Loamy sand	0 to 2	Slight	Very slow
Metz	Loamy sand	2 to 9	Slight to moderate	Slow to medium
Positas	Fine sandy loam	2 to 9	Slight to moderate	Slow to medium
Positas	Fine sandy loam	9 to 15	Moderate	Medium
Positas	Fine sandy loam	15 to 30	High	Rapid
Positas	Cobbly fine sandy loam	2 to 15	Moderate	Medium
Riverwash	Cobbles, gravel, sands	0 to 2	High	Rapid
Salinas	Loam	2 to 9	Slight to moderate	Slow to medium
Salinas	Silty clay loam	2 to 9		
San Andreas-Tierra	Fine sandy loam	5 to 15	Slight to moderate	Slow to medium
San Andreas-Tierra	Fine sandy loam	15 to 30	Moderate	Medium
San Andreas-Tierra	Fine sandy loam	30 to 75	Very high	Very rapid
Sandy alluvial land	Gravel-sand	0 to 2	High	Rapid
Santa Lucia	Shaly clay loam	15 to 45	High	Rapid
Santa Lucia	Shaly clay loam	30 to 45	High	Rapid
Santa Lucia	Shaly clay loam	45 to 75	Very high	Very rapid
Santa Ynez	Gravelly fine sandy loam	2 to 9	Slight to moderate	Slow to medium
Santa Ynez	Clay loam	9 to 30	Moderate to high	Medium to rapid
Sedimentary rock land	Rock/sandy loam	6 to 75+	Severe	Very rapid
Shedd	Silty clay loam	15 to 30	Moderate to high	Medium to rapid
Shedd	Silty clay loam	30 to 45	Very high	Very rapid
Shedd	Silty clay loam	45 to 75	Very high	Very rapid
Shedd	Silty clay loam (severely eroded)	30 to 75	Very high	Very rapid
Sorrento	Loam	2 to 9	Slight to moderate	Slow to medium
Sorrento	Sandy loam	0 to 2	Slight to moderate	Slow to medium
Sorrento	Sandy loam	2 to 9	Slight to moderate	Slow to medium
Tierra	Loam (eroded)	15 to 30	Moderate to high	Medium to rapid

The introduction of invasive noxious weeds into areas disturbed by the Zaca fire has the potential to establish persistent weed populations. Noxious weed surveys are planned for roads, dozer lines, drop points, and safety zones. If any new or outlying populations are identified, a separate request for treatment will be made.

Constraints Due to Soils

In many instances, the soils and slope of the terrain interact to produce a physical constraint to construction. Based on these two considerations, constraints for septic systems, ponds and reservoirs, local roads and streets, dwellings without basements, campgrounds and picnic areas, and trails and paths can be mapped within the Plan Area. Most development constraints based on soils in the Plan Area are due to slope, porosity, rockiness, or depth to bedrock. In addition to these specific constraints, overall erosion hazard potentials should be considered. These constraints are based solely on soil type and slope. They do not necessarily preclude development, though they may limit development options in some instances. The constraints mean, however, that special design considerations and increased installation/maintenance costs may be involved in development of facilities.

3.3.3 Regulatory Setting

Several federal and state laws regulate actions involving soils, such as the Federal Farmland Protection Policy Act. The purpose of the act is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. The California Department of Conservation has developed the Important Farmland Inventory classification system, which uses soil and land use information to prepare and update important farmland maps and to monitor the conversion of agricultural land. The program classifies five categories of farmlands: Prime Farmlands, Farmlands of Statewide Importance, Unique Farmlands, Farmlands of Local Importance, and Grazing Lands. The Natural Resources Conservation Service is the agency primarily responsible for implementation of the Farmland Protection Policy Act.

The Office of Land Conservation, under the California Department of Conservation, maintains four programs that monitor and protect California's farmland and soil resources. Each of these programs must be considered in reviewing impacts to farmland soils and include the California Land Conservation Act of 1965 (Williamson Act), the Agricultural Land Stewardship Program, the Soil Resource Protection Program, and the Farmland Mapping and Monitoring Program. The relevant county/city general plan or the California Department of Conservation Farmland Maps should be reviewed prior to making changes in land management.

Several federal and state regulations govern seismicity in California. The federal regulations include the Earthquake Hazard Reduction Act of 1977, Executive Order 12699 on Seismic Safety of Federal Buildings, and the Uniform Building Code (superseded in California by the 2001 California Building Code). State regulations include the Alquist-Priolo Act, the Field Act, the 2001 California Building Code, the Seismic Hazards Mapping Act, and the Historic Structures Act (California Public Resources Code Section 5028). Some state agencies, including the California Department of Transportation (Caltrans) and the DWR Division of Safety of Dams, have their own regulations covering seismic and geologic hazards. In addition,

municipalities and counties can have general or specific plans that may include regulatory requirements.

3.4 BIOLOGICAL RESOURCES

3.4.1 Regional Setting

The Plan Area is located in Santa Barbara County north of the Santa Ynez Mountain range, along SR 154 approximately 13 miles north of U.S. Highway 101 (US 101). The Plan Area is within the south coast ranges of Central Western California according to the *Jepson Manual* (Hickman 1993). USGS 7.5-minute quadrangles covering the Plan Area include the Cachuma Lake and San Marcos Pass quadrangles.

The watershed of Cachuma Lake is an expansive area largely undeveloped national forest with scattered residential units or private ranch holdings. The Santa Ynez River is the main drainage to Cachuma Lake. The upper watershed of the Santa Ynez River, located within the Los Padres National Forest, includes the Gibraltar Reservoir, Alamar and Agua Caliente Canyon, and Jameson Lake in the uppermost section of the watershed. The immediate watershed on the south side of Cachuma Lake consists of several canyons on the north side of the Santa Ynez Mountains. Cachuma Creek, Santa Cruz Creek, and Horse Canyon Creek make up the immediate watershed on the north side of Cachuma Lake (see Figure 3.4-1). This section of the drainage is located within the Plan Area and extends 4 to 5 miles north into private land. The watershed further north crosses into the Los Padres National Forest extending 3 to 5 miles north to the ridgeline. Oso Canyon located within the National Forest due east of Cachuma Lake, drains into the Santa Ynez River.

3.4.2 Plan Area Existing Conditions

The Plan Area encompasses approximately 9,250 acres, including Cachuma Lake (3,043 acres at full level) and the surrounding shores and rugged hillsides. The Plan Area is composed of several large drainages including the Santa Ynez above and below the dam, DeVaul Canyon, Hot Springs Canyon, Windsor Canyon, Horse Canyon, Santa Cruz, Cachuma Creek, Hilton Canyon, and Tequepis Canyon (see Figure 3.4-1).

Data to describe existing conditions were gathered from biological field studies, existing reports, articles, and interviews with knowledgeable agency employees and professionals in the area. Primary sources of informational interviews and existing reports for the area were Reclamation and the County Park staff. A list of special-status species was compiled from queries of the USFWS online database, CDFG's California Natural Diversity Data Base (CDFG 2010), and California Native Plant Society's (CNPS') online Rare Plant Inventory database for the following USGS 7.5-minute quadrangles: Cachuma Lake, Goleta, Dos Pueblos Canyon, Santa Ynez, San Rafael Mountain, Figueroa Mountain, and San Marcos Pass.

3.4.3 Vegetation

The vegetation types of the Plan Area were identified, mapped, and characterized based on an analysis of low-altitude air photos and field surveys during Summer 2001 and Spring 2002. Inaccessible areas were mapped by determining vegetation signatures on aerial photography

based on previous surveys and information from USGS 7.5-minute topographical maps. Rare plant searches were performed in conjunction with summer and spring vegetation surveys, with additional focused rare plant surveys in Spring and Summer 2004. Plant nomenclature follows Hickman (1993) and Smith (1998), and vegetation types are based on Holland (1995).

Major vegetation types that occur in the Plan Area are listed in Table 3.4-1 and described below. Their general distribution in the Plan Area is shown on Figure 3.4-2 for all vegetation types, on Figure 3.4-3 for scrub and grassland types, and on Figure 3.4-4 for oak and riparian woodlands.

Table 3.4-1
Vegetation Types in the Plan Area

Vegetation Type	Acreage
Barren (No Vegetation)	127
Coyote Brush Scrub	57
Chaparral (including Mixed, Ceanothus, and Chamise)	1,183
Coastal Sage Scrub	1,204
Disturbed Area (including Ruderal Vegetation)	11
Freshwater Marsh	83
Nonnative Grassland	810
Native Grassland	5
Oak Savannah	696
Oak Woodland	1,879
Pine Woodland	29
Riparian Scrub (including Willow Scrub)	250
Riparian Woodland	233
Riparian/Oak Woodland	151
Total=	6,718
Developed Land Uses:	
Wastewater Plant	7
Residence	3
County Park	133
Bradbury Dam	54
Total =	196

Chaparral, coastal sage scrub, and oak woodland are the dominant vegetation types followed by oak savannah and nonnative grassland. Riparian vegetation dominates the lake edges and creeks. The most sensitive and uncommon habitat within the Plan Area is native grassland, a vegetation type that has been greatly reduced in the last century. Native grassland is mapped at a total of 5 acres; however, although it is generally limited in the Plan Area, additional locations were too small to map due to scale or are part of oak savannah. Blue oak woodland is also found in small patches within the Plan Area that were too small to map due to scale.

The vegetation communities present in the Plan Area are determined by a combination of various environmental factors, including slope aspect, elevation, topography, and soil type. Oak savannah and nonnative grassland are found in flat terraced areas around the lake. Chaparral and oak woodland are located on north-facing slopes while coastal sage scrub is typically found on south-facing slopes. Riparian vegetation dominates the lake edges and creeks.

Upland Habitats

Nonnative Grassland. Nonnative annual grassland is a major vegetation type in the Plan Area, occurring on relatively flat areas with deep soils. Most of the nonnative grasslands are dominated by rip-gut brome. Scattered native forbs are present including those species listed below found in native grasslands. Dove weed is conspicuous in late summer in dry open areas, especially where cattle have grazed extensively.

Native Grassland. The Plan Area has only a few reported patches of native grassland (Table3.4-1). They occur mostly on the north side of the lake in areas with moderate to no grazing by cattle; however, a few native grasslands are located south of SR 154. These areas generally have at least 25 percent cover (visually estimated) of purple needlegrass (*Nassella pulchra*). In some areas native grass species are present but not with enough cover to be considered native grassland. For example, flat terraced areas are called non-native grassland yet purple needlegrass is present. Common wildflowers, most of which bloom during the spring, include blue-eyed grass, Johnny-jump-up, Chinese houses, rusty popcorn flower, slender cottonseed, forget-me-not, miniature lupine, mountain dandelion, checkerbloom, narrow-leaved milkweed, fleabane, vinegar weed, California milkweed, and verbena.

Oak Savannah. The oak savannah at Cachuma Lake consists of a mixture of coast live oak and valley oak trees scattered in a large expanse of nonnative grassland and scattered forbs and shrubs. Skunk brush occasionally occurs in patches in the savannah and other forbs and annual flowers similar to grassland species occur in various densities. Mixed oak savannah is most abundant on the north side of Cachuma Lake occurring on the flat terraces above the lake.

Oak Woodland. Oak woodland is the most abundant vegetation type in the Plan Area. It is dominated by coast live oak trees in moderate to high densities and rarely small patches dominated by blue oak occur. Common understory species vary greatly from site to site, ranging from an open understory dominated by annual grasses to a shrubby understory dominated by coastal sage or chaparral. Within the Plan Area, the chaparral understory is most common. Poison oak is very abundant in oak woodlands throughout the Plan Area. Spring wildflowers are common within the oak woodland.

Pine Woodland. Gray pine dominated woodland occurs on both sides of Cachuma Creek and Santa Cruz Creek on the north side of Cachuma Lake. This vegetation type occurs in association with oak woodland and the species composition of the canopy and understory is similar to oak woodland. Gray pine towers over associated canopy trees as it is typically 30 to 50 feet higher than coast live oak.

Coastal Sagebrush Scrub. Coastal sage scrub occurs on dry south-facing slopes and is especially abundant on the steep slopes on the north side of Cachuma Lake. This dynamic community is often dominated by California sagebrush, purple sage, or deer weed. Native perennial grasses such as giant rye grass, purple needlegrass, and nodding needlegrass occur occasionally.

Coyote Brush Scrub. Small patches of coyote brush scrub occur in association with coastal sage scrub and grassland throughout the Plan Area. This vegetation type typically occurs along the margins of riparian scrub and in upper drainages. The dominant species is coyote brush. Subdominant species include mule fat and giant ryegrass in moister habitats, and ripgut brome and long-stemmed buckwheat in drier habitats. Grasses and other forbs are present in openings.

Mixed Chaparral. Mixed chaparral at Cachuma Lake encompasses a variety of different matrixes of hard chaparral species. Shrub height and crown cover vary considerably with age, last burn, aspect, and soil type. Possible dominant or co-dominant plant species in the mixed chaparral within the Plan Area include mountain mahogany, greenbark ceanothus, blue oak, interior live oak, scrub oak, holly leaf redberry, buck brush, toyon, chaparral mallow, and chamise. Blue oak occurs primarily on the west end of the lake, as well as along the terraces on the south side of the lake. Scrub oak is more common on the east side of the lake.

Chamise Chaparral. Chamise chaparral consists of a monoculture of chamise plants and occurs in very dry and steep slopes with thin soils. It is a common vegetation type in the Plan Area.

Ceanothus Chaparral. Ceanothus chaparral is dominated by buckbrush or green bark ceanothus. This vegetation type forms a dense cover with an approximate 9-foot canopy height. Greenbark ceanothus is common on the cool rocky canyons. Buckbrush is more common on the dry chaparral in the terraces south of Cachuma Lake.

Disturbed Areas/Ruderal Vegetation. Ruderal vegetation is found in disturbed areas and is dominated by noxious nonnative weeds, usually one or more of the following species: milk thistle, bull thistle, Italian thistle, Russian thistle, Russian knapweed, Bermuda buttercup, birdfoot trefoil, horehound tocalote, tree tobacco, cheeseweed and sweet fennel. Road shoulders, disturbed areas, and campgrounds are often dominated by ruderal vegetation. These areas are often too small and scattered to map.

Riparian and Wetland Vegetation

Scale Broom Scrub. Scale broom scrub occurs within and along the margins of streams and on stream terraces. It typically consists of widely scattered scalebroom plants on dry, cobble terraces. Associated species include mule fat, black mustard, red brome, California buckwheat, and *Gnaphalium* sp. This vegetation type is too small to map due to scale.

Riparian Woodland. Riparian woodland is the most common riparian vegetation along stream courses throughout the Plan Area. It includes two subtypes: mature riparian woodland and willow woodland. Dense mature riparian woodland is present along Santa Cruz Creek, Cachuma Creek, and the Santa Ynez River upstream of Cachuma Lake. Mature riparian woodland has a well-developed canopy consisting of mature willow, sycamore, oak, and cottonwood trees. This dense vegetation has developed as a result of the accumulation of fine sediments in these areas and high moisture availability. Sediment accumulation is facilitated by the lower stream gradient and resulting lower stream velocities. The understory is variable, ranging from almost bare areas (where light penetration is very poor) to dense herb or shrub thickets. Shrubs and subcanopy trees include narrowleaf willow, arroyo willow, pacific blackberry, California rose, and mule fat. Dense herbaceous understories are dominated by mugwort, white sweetclover, and stinging nettle. Understories with filtered light and semipermanent surface or shallow subsurface water contain several emergent wetland dominants such as umbrella sedge, rush, and spikerush species. Willow woodland consists of moderately open to dense forests dominated by multitrunk willow trees, including black willow, red willow, yellow willow, and arroyo willow. The understory is similar to the mature riparian woodland understory, but is typically less diverse.

Riparian Oak Woodland. Riparian oak woodland is present in small amounts in the Plan Area. Near streams, oak woodlands include new associated species such as California bay, blue

elderberry, poison oak, California rose, mule fat, California brome, hollyleaf redberry, melic, canyon sunflower, California goldenrod, morning-glory, and blue vervain.

Riparian Scrub. Riparian scrub is common throughout the Plan Area, growing along intermittent streambeds entering the lake and exposed sandy terraces as the lake subsides. Riparian scrub is dominated by mule fat and has associates including arroyo willow, mugwort and coyote bush. Scattered white alder is present in Santa Cruz and Cachuma Creek drainage. A phase of riparian scrub, called willow scrub, occurs at the mouths of streams entering the lake that have a wide floodplain. Willow scrub is dominated by narrowleaf willow, immature red willow, and cattail. This vegetation type typically forms a sparse canopy about 8 feet high.

Willow Scrub. Willow scrub occasionally occurs in the Plan Area, typically near the mouth of the lake within flat canyon bottoms. Willow scrub characterized by narrowleaf willow, immature red willow, and cattail occurs along portions of the drainages. This vegetation type typically forms a sparse canopy about 8 feet high. Subdominants include tamarisk, cattail, mule fat, and mugwort.

Freshwater Marsh. Freshwater marsh occurs along tributary streams to Cachuma Lake and along suitable portions of the shoreline. Common marsh species include narrow-leaf-cattail, California bulrush, watercress, chain speedwell and spike rush. The occurrence and quality of lakeside wetlands are dependent on the lake water level, the shoreline substrate, and the shoreline slope. A fine sediment substrate with a low gradient provides the most suitable opportunity for wetland vegetation, such as that found at Jackrabbit and Storke flats. The dynamics of freshwater marsh at Cachuma Lake are dependent on the lake level fluctuations. A barren zone develops along the shoreline as water levels drop during the spring and summer. As the year progresses, weedy annual species colonize the barren area. If the shoreline is exposed for several years due to low rainfall, mule fat and willow plants will become established. However, when lake levels raise these species die back due to excessive inundation. Thick, dense areas of bulrush (*Scirpus* species) become established and cover shallow inundated areas of shoreline at high lake capacity at the back of Cachuma Bay, on the west shore of the entrance to Santa Cruz Bay, and along the east and shores near Arrowhead Island. These areas become productive breeding areas for western and Clark's grebes, American coots, ruddy ducks, and other species.

Invasive Exotic Plants

Several invasive exotic species occur throughout the Plan Area primarily due to grazing and human disturbance. These are considered noxious due to their destabilizing effects on native ecosystems and threat to livestock, among other reasons. If not properly maintained, the County Park can serve as a source for noxious weeds to spread into natural areas. Eleven noxious species are known to occur within the Plan Area that are listed on California Invasive Plant Council's high alert list including: yellow star thistle (*Centaurea solstitialis*) found on grazed areas, (*Tamarix sp.)* found in riparian areas, Spanish broom (*Spartium junceum*) found in creek bottoms such as Santa Cruz Creek, giant reed (*Arundo donax*) at the east end, pampas grass (*Cortaderia selloana*) around the lakeshore prior to inundation from rising lake levels, a small amount of scotch broom (*Cytisus scoparius*) in the riverbed near Live Oak Camp and likely to spread from the SR 154 population, veldt grass (*Ehrharta calycina*) on sweetwater trail and along SR 154 west of the County Park entrance, perennial pepperweed (*Lepidium latifolium*) at east end last seen in July 1960 by Clif Smith, cheatgrass (*Bromus tectorum*), location unknown, red brome (*Bromus madritensis* ssp. *rubens*), which is widespread and fairly common, and sweet fennel

(*Foeniculum vulgare*), which is scattered in disturbed areas, and grassland and shrub habitats. California Invasive Plant Council describes species on the high alert list as follows:

> These species have severe ecological impacts on ecosystems, plant and animal communities, and vegetational structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. These species are usually widely distributed ecologically, both among and within ecosystems.

When the lake level is low, the exposed shoreline is often dominated by invasive species such as bull thistle (*Circium vulgare)* and italian thistle (*Carduous pycnocephalus).* In addition various invasive species skirt the perimenter of campgrounds.

3.4.4 Wildlife

Cachuma Lake is situated within the Santa Ynez River valley between the San Rafael Mountains to the north and Santa Ynez Mountains to the south. Many of the habitats and wildlife occurring within this region are present at the Plan Area. In 1988, CDFG conducted extensive wildlife surveys in the Plan Area. In addition, comprehensive field surveys for birds in the Plan Area were conducted from August 2001 through March 2003. A summary of the types of wildlife observed is provided below. Birds are discussed first due to the abundant amount of data gathered during field surveys, with the remaining wildlife listed in taxonomic order followed by a discussion of game species.

3.4.4.1 Birds

The bird life of the Plan Area is rich and diverse. Since the construction of Bradbury Dam in the 1950s, many birds have come to depend on the lake's open water, protected bays, vegetated shallows, and freshwater marsh habitats. The riparian areas along the Santa Ynez River and Horse, Santa Cruz, and Cachuma creeks support a variety of breeding species, as well as migrant and wintering land birds. Cachuma Lake is an important inland site for many bird species. As the largest inland body of water in the Santa Barbara County, it hosts some species that occur nowhere else inland in the county. Other species occur here in larger numbers than anywhere else in the county.

The field studies conducted to characterize bird life with the Plan Area included year-round, seasonal, and special issue field investigations including waterfowl surveys on the lake; riparian surveys along major tributary streams (Cachuma, Santa Cruz, and Horse creeks) and along the upper Santa Ynez River; an annual census of Western and Clark's grebes on the lake; and surveys of reedy marshes around the lake perimeter.

Avian Habitats in the Plan Area

Deep Water. The deeper parts of the lake (125 to 150 feet deep) are generally those areas furthest from shore in the main body of the lake. However, in some areas, as in the waters just off Tequepis Point or at the marina, the lake is deep very near shore. Shallower divers (e.g., diving ducks, American coots, pied-billed grebe) seem to prefer water of less than 30 feet in depth at Cachuma Lake. For the purposes of this discussion, deep water will refer to areas of greater than 30 feet in depth. The deep-water areas do not support as great a variety of species and very few if any species are truly dependent on water more than a few meters deep. However, these areas are

still important food sources for the deeper divers at Cachuma Lake, species that use these areas to hunt for fish and aquatic invertebrates. Of all species, the one most consistently found in deeper waters around the lake is the common loon, a wintering bird at Cachuma Lake. Western and Clark's grebes also can be found in the deeper areas around the lake, sometimes in large numbers. Of all species, the three most consistently found in deep waters around the lake are the common loon, a wintering bird at Cachuma Lake; and western and Clark's grebes, present year-round, including the breeding season. In winter, grebes can be found in large numbers around the lake.

Shallow and Medium-Depth Water. Areas less than 30 feet deep are the most productive for water-dependent birds around the lake. Large areas of shallow and medium-depth water habitats occur northwest of Bradbury Dam and in Santa Cruz Bay. Other similar areas are near Arrowhead Island, in Cachuma Bay, and at the east end of the lake. Numerous birds depend on shallow water in the lake. In addition to the variety of diving and dabbling ducks are various species that dive principally in medium-depth water: grebes, double-crested cormorant, and American coot. Herons and egrets use shallow water, stalking their prey along the edges of the lake and in very shallow water. Some of the species using shallow and medium-depth water occur at Cachuma Lake in great numbers (especially western grebe, lesser scaup, ruddy duck, and American coot).

In addition to its value to large numbers of birds that use such areas for feeding or resting, the shallows also provide breeding habitat for several species of grebe and for American coot, all of which nest in emergent vegetation in the shallows of the lake. Also, while these areas naturally attract large numbers of birds because of the food and breeding habitat they offer, the fact that some of the shallower parts of the lake (Santa Cruz Bay, the east end of the lake, and the area around the north end of Bradbury Dam) are off-limits to boaters, in part, accounts for the high numbers of birds in these areas.

Mudflats and Margins. Santa Cruz Bay and the east end of the lake provide very good shorebird habitat when low lake levels expose mudflats in those areas. Various species of shorebirds (plovers, avocets, stilts, sandpipers, and phalaropes) use mudflats and the margins of the water to search for invertebrates on or below the surface of the mud. The availability of shorebird habitat is variable at Cachuma Lake due to fluctuating water levels. Two shorebird species have been documented as breeders in the area around Cachuma Lake: killdeer and spotted sandpiper.

Reedy Marshes. Areas of extensive reedy marshes occur at the east end of the lake, at the mouth of Horse Canyon, on the south side of the entrance of the Narrows, the shoreline southwest of Arrowhead Island, the shoreline east of the intake tower, the west side of the mouth of Santa Cruz Bay, and the west side of Cachuma Bay (Figure 3.4-5). Along the lake margins, Cachuma Lake also supports marshes consisting of cattails and bulrushes. These areas dry up when the lake level is low, but can provide important habitat when the water from the lake reaches the cattails and bulrushes. Virginia rails and soras often inhabit some of the larger patches of cattails and bulrushes in the winter. Least bitterns have been recorded on the lake in these habitats, but are less common. Reedy marshes also sometimes provide habitat for roosting red-winged blackbirds and for some smaller passerines, such as common yellowthroat, song sparrow, and marsh wren.

Riparian Woodland. Well-developed riparian habitat is located along Santa Cruz, Cachuma, and Horse creeks and the Santa Ynez River upstream of the lake (Figure 3.4-4). A series of surveys

focused on these areas during May–June 2002. To quantify the relative quality of riparian habitat at Cachuma Lake, the abundance in each drainage was determined for four species: warbling vireo, yellow warbler, yellow-breasted chat, and brown-headed cowbird. Of the four major riparian areas surrounding Cachuma Lake, Santa Cruz Creek showed the highest level of species richness for each of three riparian breeders chosen for comparison.

Oak Savannah. A variety of species use the oak savannah habitats on the north side of Cachuma Lake. One of the species most strongly associated with this habitat in Santa Barbara County is the yellow-billed magpie. Most of the other species are songbirds, although raptors and turkey vultures can be found here as well. Many of the species using this habitat are those that prefer to forage on the ground in more open and grassy areas. Raptors and turkey vultures also take advantage of the clearings in such areas to find prey and carrion. Some species do make use of the mature trees in this habitat, either for nesting or foraging.

Oak Woodland. Dense oak woodlands occur on north slopes around the lake. The variety of birds breeding is not as great as in riparian woodlands, but these areas play host year-round to many of the common woodland species of Southern California, including California quail and a variety of woodpeckers.

Chaparral and Coastal Scrub. Chaparral and coastal sage scrub is widespread in the Plan Area. The species diversity of these areas is relatively low. Most of the birds using these habitats are common to fairly common species on the Pacific slope of Southern California, including the rufous-crowned sparrow, wrentit, California thrasher, and spotted towhee.

Rocky Cliffs. Rocky cliffs are important mostly as nesting sites for certain species. Various species take advantage of the seclusion of cliff faces, as well as the views they provide of the surrounding areas, and the access they provide to nearby foraging. Among the locations where these species have nested are the cliffs above the north bank of the Santa Ynez River just downstream of Live Oak Camp; the cliff face north of Arrowhead Island on the north shore; the cliffs east of Santa Cruz Bay, in Bobcat Bay, and between Bobcat and Cachuma bays; and those on the west mouth of Cachuma Bay. The intake tower provides artificial nesting habitat for at least one species. Also, the area between Clark and Johnson bays has potential for these cliff-dwelling species to nest. Species that nest on cliff faces include red-tailed hawk, great horned owl, white-throated swifts, and cliff swallows.

Bird Species of Interest in the Plan Area

The Plan Area is an important location for many bird species and for a variety of reasons. For several species, Cachuma Lake and environs is the only breeding location or one of only several breeding locations in Santa Barbara County. For a somewhat larger group of species, it is the primary location in the county where these species can be found, while a still larger group can be found here in greater numbers than at any other location in the county. Also, for a wide variety of species, Cachuma Lake is the primary or only inland location in Santa Barbara County where many bird species are found. Miscellaneous other rare or otherwise unusual species occur here, while one, yellow-billed magpie, is at the southern limit of its range in the Plan Area. Table 3.4-2 lists the species of special concern that occur at Cachuma Lake. The importance of Cachuma Lake to water-dependent birds, raptors, and federally listed species is summarized below.

Table 3.4-2
Importance of Cachuma Lake for Bird Populations in Santa Barbara County

Species	Criteria for Determining Importance				
	Only Breeding Location	One of Several Breeding Locations	Primary Location	Found in Highest Numbers	Primary or Only Inland Location
Red-throated Loon					x
Pacific Loon					x
Common Loon					x
Horned Grebe				x	x
Eared Grebe				x	x
Western Grebe	x				x
Clark's Grebe	x				
American White Pelican				x	x
Brown Pelican					x
Double-crested Cormorant					x
Least Bittern					x
Great Blue Heron		x			
Black-crowned Night-Heron					x
White-faced Ibis					x
Greater White-fronted Goose					x
Snow Goose					x
Ross's Goose					x
Canada Goose					x
Tundra Swan					x
Wood Duck				x	
Gadwall		x		x	x
Northern Pintail		x			x
Canvasback					x
Ring-necked Duck			x	x	x
Tufted Duck*			x		x
Greater Scaup			x	x	x
Lesser Scaup			x	x	x
Surf Scoter					x
Long-tailed Duck					x
Bufflehead				x	x
Common Goldeneye			x	x	x
Barrow's Goldeneye					x
Hooded Merganser			x	x	x
Common Merganser		x	x	x	x
Red-breasted Merganser					x
Ruddy Duck				x	x
Osprey			x	x	x
Bald Eagle	x		x	x	x
Peregrine Falcon					x
American Coot				x	x
Semipalmated Plover					x
Black-necked Stilt					x
American Avocet					x
Greater Yellowlegs					x

Table 3.4-2
Importance of Cachuma Lake for Bird Populations in Santa Barbara County

Species	Criteria for Determining Importance				
	Only Breeding Location	One of Several Breeding Locations	Primary Location	Found in Highest Numbers	Primary or Only Inland Location
Western Sandpiper					x
Least Sandpiper					x
Long-billed Dowitcher					x
Red Phalaope					x
Bonaparte's Gull					x
Mew Gull					x
California Gull					x
Herring Gull					x
Thayer's Gull					x
Caspian Tern					x
Forster's Tern					x
Black Skimmer					x

Water-Dependent Birds

This category of birds includes a variety of waterfowl and shorebirds. Based on the field surveys conducted in the Plan Area from 2001 to 2003, several important observations can be made regarding water-dependent birds at Cachuma Lake, as follows:

1. *Most water-dependent birds at Cachuma Lake concentrate in shallow areas.*
2. *Water-dependent birds in general tend to be more abundant during winter than summer.* However, numbers peaked in the late fall (November) during the surveys, while the lowest numbers came during the late spring. Numbers for water-dependent birds showed a gradual decline after November 2001, until reaching a low point in May 2002. The total individuals of all water-dependent species then rose abruptly over the next several surveys, rising again to a peak in November, before dropping slightly during each of the final two surveys.
3. *Changing lake level affected the locations of the highest concentrations of birds.* With the relatively dry conditions during the period of the waterfowl surveys, the level of the lake was lower during the winter of 2002–2003 than it had been the previous year. This lower level did not significantly affect the total number of water-dependent birds, which during November 2002–March 2003 were about the same as they had been during the same period the previous year, but did affect which areas supported the largest numbers of birds. As waters retreated from the back of Santa Cruz Bay, for example, the number of water birds here dropped as less open-water habitat was available.
4. *Despite the effect of changing lake levels, certain areas can be identified as particularly important.* In terms of average numbers of water birds for all surveys, the area northwest of the dam, Santa Cruz Bay, and Arrowhead Island were the most productive for water dependent birds. Despite lower numbers in Winter 2002–2003, the east end of the lake was still an important location for water birds overall. The east end, Cachuma Bay, and Santa Cruz Bay are all important as areas where grebes (particularly western and Clark's) breed.

Raptors

Red-tailed Hawk (*Buteo jamaicensis*). While the population of this year-round resident at Cachuma Lake holds no special significance, this species is notable as a common species of raptor at the lake. Nesting has been recorded (for example on the cliff face east of the mouth of Santa Cruz Bay in 1998; Mason 2003). It requires large trees or cliffs with crevices for nesting.

Osprey (*Pandion haliaetus*). A fish-eating hawk that is now common in winter at the lake. One or two usually remain at the lake during the summer as nonbreeders. Osprey are far more common at Cachuma Lake than at any other location in the county. Elsewhere in the county, they are rare in migration and very rare in the winter and summer. These birds use perches in trees and on snags near the ground and patrol all parts of the lake for their prey. A stable supply of fish is important to sustaining this population. Lehman (1994) states that six to eight osprey are present at the lake per winter (with a high of 14 in 1991), but numbers in recent years have been significantly higher. During Winter 2001–2002 and 2002–2003, high counts exceeded 20 (21 on 6 March 2002 and 22 on 15 November 2002). No evidence of osprey breeding has been found around the lake (or anywhere in Santa Barbara County), despite the installation of three nesting poles by Santa Barbara County Parks Department.

Bald Eagle (*Haliaeetus leucocephalus*). See Section 3.4.5.2 for a detailed description of the bald eagle in the Plan Area.

Key Bird Use Areas in the Plan Area

Key bird use areas are widely distributed around the Cachuma Lake (Figure 3.4-5). A brief summary of these key areas is provided below.

Santa Cruz Bay. This area is crucial to the bird life at Cachuma Lake year-round. As a restricted area and an area that includes extensive shallows at virtually any lake level, it hosts large numbers of water birds (grebes, pelicans, cormorants, ducks, coots), drawn here to feed and to seek refuge from human disturbances associated with the bay. Some species of duck (mallard, gadwall, common merganser, wood duck) have bred or have the potential to breed near the bay. Bald eagles are also drawn here. Several of their favored forage perches are around the bay, where they sit to survey the area, undisturbed by park visitors. This area also has at times hosted nesting western and Clark's grebes, which when conditions are right, may use the dead willows at the back of the bay to place their nests. When the water retreats to expose mudflats in the back of the bay, the area may host shorebirds following an interior migration route through the county or looking to winter inland. An extensive marshy area of cattails and bulrushes (*Typha* sp. and *Scirpus californicus*) occurs on the western shore at the entrance to the bay.

East End of the Lake. This area is important for many of the same reasons as Santa Cruz Bay, although the lake waters may not reach this area in some dry years. This area is shallow with restricted access and attracts many water birds when the lake level is high. Grebes, pelicans, cormorants, herons and egrets, ducks, and coots all favor this area under such conditions. Bald eagles may perch here at any time of year when water inundates the area. Wood ducks and gadwalls have bred in the area. Western and Clark's grebes have built their nests in the dead vegetation of the shallows. This area is also the best for shorebirds on the lake, when conditions are suitable. Over the years, various migrant species have been detected using exposed mudflats as the water retreats during the summer and fall. Wintering shorebirds are often found here as well. Extensive marshy areas are good habitat for rails and bitterns when water is high.

Bradbury Dam Area. This area is important mostly for the large numbers of waterfowl that often congregate in the shallows at the north end of the dam, particularly in winter. Large numbers of lesser scaup were found here during Winter 2001–2002 and 2002–2003, and smaller numbers of other ducks, especially diving ducks, were present. Large flocks of Canada geese have been present in past years. Species that are abundant lakewide—American coot and western grebe—are here in average numbers.

Cachuma Bay. This area is probably somewhat less important than Santa Cruz Bay for its shallows, although numbers of water birds—grebes, pelicans, cormorants, herons, ducks (especially ruddy ducks)—were relatively high here during the last three bimonthly waterfowl surveys, when water levels had dropped to approximately 725 feet (or about 25 feet below the elevation at capacity). The area proved a key area in Summer 2002, when the majority of breeding western and Clark's grebes bred in emergent vegetation at the back of the bay.

South of Arrowhead Island. Relatively large numbers of water birds (grebes, ducks, and coots) were present here during many of the surveys. This area is relatively shallow at all times. Immature bald eagles often perch on the south shore of the lake. American coots nested in the vegetation in the shallows in 2002. Rocky cliffs north of this area (on the north shore, north of Arrowhead Island) hosted breeding Cliff Swallows in 2002.

Santa Cruz Creek. Santa Cruz Creek consists of high-quality riparian habitat north of Santa Cruz Bay. Willow flycatchers were here briefly in June 2002 in habitat marginally suitable for the endangered southwestern subspecies. A male least Bell's vireo (an endangered taxa) once summered here, although no evidence of breeding was found. This area had the highest density of riparian obligates during surveys in 2002.

Cachuma Creek. Cachuma Creek has good quality riparian habitat upstream of Cachuma Bay that is relatively undisturbed. The area is not as extensive or productive as the habitat at Santa Cruz Creek.

Horse Creek. Horse Creek has very good riparian habitat in a very limited area just upstream of the lake, but poor riparian habitat further upstream. A record of California spotted owls here in 1992 is of interest, although it may be an anomalous sighting.

Upper Santa Ynez River. The upper Santa Ynez River is a broad river bottom with scattered riparian habitat near the San Marcos Golf Club property and Live Oak Camp. The habitat is currently in poor condition, but has very good potential. Rocky cliffs just west of Live Oak Camp may have hosted breeding white-throated swifts in 2002.

3.4.4.2 Fisheries and Aquatic Resources

Cachuma Lake and the upper Santa Ynez River are popular fishing areas that have been stocked with game fish by the CDFG and the County of Santa Barbara. The Santa Ynez River between Cachuma Lake and the National Forest boundary (about 3 miles upstream of the lake) dries up during the late spring and early summer, and perennial pools are absent. However, upstream of the Forest boundary to Gibraltar Dam, water is present in the river due to inflows from tributary springs. CDFG fishing regulations allow for trout fishing in and above Cachuma Lake with limits for keeping hatchery fish and the immediate release if any "wild" trout is caught. Trout may be caught year-round in Cachuma Lake and in all streams and tributaries above Bradbury

Dam with a license. The Santa Ynez River below Bradbury Dam is closed to trout fishing due to the presence of the endangered Southern California steelhead (*Oncorhynchus mykiss)*.

Rainbow trout in and above Cachuma Lake cannot migrate to and from the ocean due to the passage barrier represented by Bradbury Dam. Hence, these rainbow trout are not anadromous and therefore not considered to be within the endangered Southern California Distinct Population Segment (DPS), although they may be genetically similar. Current trout populations above Bradbury Dam are of uncertain genetic heritage due to the long history of hatchery stocking in the watershed to augment the native fishery. Genetic analysis has found no significant differentiation between trout populations above and below dams in the Santa Ynez River (Girman and Garza 2006), which seems to indicate that hatchery trout are having little to no impact on wild populations.

In 2007, NMFS published a Recovery Plan Outline for Southern California Coast Steelhead DPS (NMFS 2007) and is developing a Recovery Plan for Southern California Coast Steelhead DPS that will fully address the current status, impacts, and management strategies for the recovery of steelhead along the southern California coast. The Recovery Plan Outline (NMFS 2007) identifies priority actions to address threats to steelhead, including the elimination of stocking of hatchery-reared fish in anadromous waters and the requirement that sterile triploid fish be stocked in all waters where stocked fish may enter anadromous waters. County Parks stocks Cachuma Lake with trout from Calaveras Trout Farm that are not triploids. CDFG has halted stocking of trout within Cachuma Lake due to a pending lawsuit over the genetic makeup of hatchery trout.

Invasive Species

The two main invasive species of concern are the quagga mussel and zebra mussel. The quagga mussel (*Dreissena rostriformis bugensis*) and zebra mussel (*D. polymorpha*) are invasive nonnative species of fresh water mollusk that originated in Eastern Europe and are thought to have been first introduced into the Great Lakes region in the late 1980s through the discharge of ship ballast from a transoceanic vessel. Since then, the species have spread, either by boat or water movement, throughout the Midwest and the eastern United States. In January 2007, quagga mussels were detected in Lake Mead and the Colorado River water system; more recently, they were found in certain lakes in Southern California. The zebra mussel was detected in San Justo Reservoir in San Benito County in January 2008. To date, neither species has been observed in Cachuma Lake.

Research suggests that waterbodies in most of California may be at high risk for infestation because chemical parameters such as calcium levels allow invasive mussel species to survive and reproduce (Whittier et al. 2008). Invasive mussels could be inadvertently transported to Cachuma Lake by a number of means. Mussels can reside on anything that comes in contact with an infested waterbody, ranging from recreational watercraft to shoes and pets. Equipment exposed to infested waters—such as diving gear, nets, waders, and buckets—can also transport mussels or larvae. Further, mussels could be introduced from upstream areas outside of the Plan Area, such as by recreationists in the Santa Ynez River east (upstream) of Cachuma Lake.

Reclamation, in coordination with other state and federal agencies, is conducting research and field testing to prevent the spread of invasive mussels, as described in Section 4.1.7. Together with other Santa Barbara County agencies and the executive office, County Parks established and enforces strict boat launching criteria to prevent invasive mussel introduction. An early detection

monitoring program has been in place since summer 2007. Control measures currently in place at Cachuma Lake are described in Section 3.9.2.2.

Historic Conditions of Fisheries in the Plan Area

Before the construction of Bradbury Dam in the 1950s, the Santa Ynez River within the Plan Area included native species similar to those found in the upper watershed today such as the armored three-spine stickleback (*Gasterosteus aculeatus*), prickly sculpin (*Cottus asper*), arroyo chub (*Gila orcutta*), and steelhead. Since the 1930s, the CDFG has planted a variety of different rainbow trout strains (also *O. mykiss*) throughout the watershed above Cachuma Lake to support recreational fishing in the National Forest. Stocking above Gibraltar Dam was discontinued at least 20 years ago, as was the stocking of Cachuma Creek. Since approximately 1980, stocking has been primarily confined to the Santa Ynez River below Gibraltar Dam. Historical rainbow trout/steelhead stocking in the Santa Ynez River above Bradbury Dam was addressed in a 2004 report prepared under the directions of the Cachuma Project Adaptive Management Committee (Entrix 2004). Cachuma Lake was managed as a rainbow trout fishery until 1957 when largemouth bass, a warmwater species, were introduced into the lake, presumably by anglers. No records exist of bass stocking within Cachuma Lake; however, trout have been stocked by the CDFG and the County of Santa Barbara.

Fish Species in the Plan Area

At least 15 species have been identified in the lake including rainbow trout, prickly sculpin, largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieui*), bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), green sunfish (*L. cyanellus*), white crappie (*Pomoxis annularis*), black crappie (*P. nigromaculatus*), channel catfish (*Ictalurus punctatus*), black bullhead (*Ameirus melas*), threadfin shad (*Dorosoma petenense*), goldfish (*Carassius auratus*) carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis)*. Native fish species in Cachuma Lake include rainbow/steelhead trout, armored three-spine stickleback, and prickly sculpin. Key game fish include large- and small-mouth bass, bluegill, green and redear sunfish, and black and white crappie.

Cachuma Lake provides a variety of habitats for different fish species, including deep water areas, rocky drop-offs, shallow areas, and weed beds (wetland areas). The lake has been managed as a sport fishery by CDFG and Santa Barbara County Parks Department in a cooperative trout-stocking program.

Fishing occurs primarily by boat, and along the shoreline of the County Park. The entire lake is open to fishing with the exception of an area near the dam, Santa Cruz Bay, and the east end of the lake. Bass fishing (largemouth and smallmouth) is a large portion of the recreational fishing activity on the lake. Numerous bass tournaments are held throughout the year. Bass fishermen generally follow bass as they move to different habitats on the lake following prey and spawning. In the winter, bass can be found in deeper water, moving to these areas to forage on shad and crayfish. In the spring, bass can be found in shallower areas feeding on shad and also to spawn in the shallow weed beds.

3.4.4.3 Amphibians

Amphibians, a group that includes salamanders, frogs, and toads, require an aquatic environment at some point in their life cycle. They can easily become dehydrated in dry environments and

must lay their eggs in water. They are relatively common within the Santa Ynez River watershed, especially the upper watershed where perennial stream flows and pools are more common due to springs and groundwater sources. However, numerous tributaries and riparian areas surrounding the Cachuma Reservoir provide habitat for a variety of amphibian species. These habitat types include mature riparian woodland, willow riparian woodland, riparian oak woodland, riparian scrub, and willow scrub. The upper watershed above the Plan Area may present some of the better habitat areas due to more reliable water sources that are impacted at low levels due to the inaccessibility of the area.

In 1988, surveys were conducted by the CDFG in the Plan Area (CDFG and DWR 1988). The amphibian species found include Monterey salamander (*Ensatina eschscholtzi eschscholtzi*), California slender salamander (*Batrachoseps attenuatus*), western spadefoot (*Scaphiopus hammondi*), California toad (*Bufo foreas halophilus*), Pacific tree frog (*Hyla regilla*), and bullfrog (*Rana catesbeiana*). The most abundant amphibian was the California slender salamander, with Pacific tree frogs and bullfrogs also relatively common.

3.4.4.4 Reptiles

Reptiles include cold-blooded species with thicker skins, more protective scales or shells than amphibians, enabling them to live more independently of water resources. In California, reptiles include all turtle, snake, and lizard species. Reptiles may be found in a variety of habitats from grassland and scrub areas to wet riparian areas.

In 1988, surveys were conducted by the CDFG in the Plan Area (CDFG and DWR 1988). The most common reptile was the Coast Range fence lizard. Southwestern pond turtles, although listed as a federal and state species of concern, were relatively common in the reservoir. CDFG personnel observed more western skinks and southern alligator lizards than other lizards at the site. Other species were identified by the CDFG in this report as species that "may occur" but were not located on surveys.

3.4.4.5 Mammals

Mammal species occupy a wide variety of habitats with most being dependent on riparian habitat for foraging, breeding, and protection. Groups represented include bats, lagomorphs (hares, rabbits, and pikas), carnivores (bears, coyote, foxes, weasels, raccoons, and cats), rodents (chipmunks, squirrels, marmots, shrews, mice, and rats), and hoofed mammals (mule deer and wild pigs).

In 1988, the CDFG documented the occurrence of 24 mammal species in the Cachuma Lake vicinity. Additional species have been observed in the upper watershed (Dames and Moore 1987).

3.4.4.6 Game Species

The Plan Area is not currently used for hunting (it is prohibited by local ordinance, Chapter 26), although hunting on federal lands at Cachuma Lake has not been formally prohibited. The Plan Area contains suitable habitat for many game species, and is located adjacent to similar wildlands (on private property and in the National Forest) where hunting is allowed. Big game animals that occur in the Plan Area include mule deer, black bear, mountain lion, and wild boar.

Upland game species include quail, rabbits, gray squirrels, and band-tailed pigeons. A large number of these are dependent on riparian habitat for foraging, breeding, and protection.

The primary game species in the area is mule deer. They use areas with a mosaic of habitats that allows for movement, forage, and cover. Areas on the north east side of Cachuma Lake provide ideal habitat for deer. An active fire history has created a habitat mosaic of open oak savannah areas with adjacent areas of chaparral and riparian zones. The lack of public access to the area also encourages wildlife usage. The current County lessee of this area for cattle grazing has reported that high numbers of deer are frequently present, and subsequently a high number of illegal hunting incidents (Lauston 2002).

The CDFG enforcement division does not keep specific statistics on the number of reported illegal hunting incidents or the number of subsequent cases investigated. However, CDFG enforcement personnel have reported that any location with good resources supporting high numbers of wildlife typically has high numbers of reported poaching events. The Plan Area is such an area with high resource value and high numbers of wildlife, especially deer, and subsequently does have frequent incidents of poaching reported to CDFG personnel (CDFG 2002a).

Hunting regulations are administered by the CDFG and vary with the type of game species by geographic zone for different types of hunting (CDFG 2002b).

3.4.5 Special-Status Species

The following section discusses the special-status plant and wildlife species known to occur within the Plan Area, and those that have potential to occur in the Plan Area due to presence of suitable habitat and known occurrences near the Plan Area.

3.4.5.1 Special-Status Plants

Special-status plant species consist of plants listed as rare, threatened, and endangered by the CDFG, federally threatened or endangered by the USFWS, or listed as rare with the CNPS. Currently, seven sensitive plant species are known to occur in the Plan Area (see Table 3.4-3). Table 3.4-3 is not a complete list of rare plants known to occur in the Plan Area but is limited to the existing information and species observed in accessible areas during the 2001, 2002, and 2004 rare plant surveys.

Three rare upland species recently observed at the Plan Area and mapped on Figure 3.4-6 include the late-flowered mariposa lily (*Calochortus weedii* var. *vestus*), Catalina mariposa lily (*Calochortus catalinae*), and Plummer's baccharis (*Baccharis plummerae*). Three locally rare plants seen in isolated years depending on lake levels include fragrant flatsedge (*Cyperus odoratus*), dwarf spike-rush (*Eleocharis parvula*), and small pondweed (*Potamogeton pusillus*) Records indicate that these three rare lakeshore species have been observed at the east end of the lake; however the exact locations are unknown. Another locally rare plant that occurs in mudflats along the perimeter of the lakeshore is burhead (*Echinodorus berteroi*). Also, several species that are rare and uncommon in the Plan Area were observed during rare plant surveys and shown on Figure 3.4-6. These species include blue oak (*Quercus douglasii*), Brewer's groundsel (*Senecio breweri*), brook foam (*Boykinia occidentalis*), bush groundsel (*Senecio flaccidus*), chalk dudleya

Table 3.4-3
Rare Plant Species Known to Occur in the Plan Area

Scientific name	Common name	Family	CNPS Status	Bloom	Notes
Baccharis plummerae ssp. plummerae	Plummer's Baccharis	Asteraceae	4.3	May-Oct	Broadleaved upland forest, chaparral, and rocky coastal sage scrub
Calochortus catalinae	Catalina Mariposa Lily	Liliaceae	4.2	Feb-May	Chaparral and grassland habitats
Calochortus weedii var. *vestus*	Late-flowered mariposa lily	Liliaceae	1B.2	Jun-Aug	Chaparral, cismontane woodland, riparian woodland, often serpentinite
Cyperus odoratus	Fragrant flatsedge	Cyperaceae	Locally Rare	summer - early fall	Mud flats; annual herb
Echinodorus berteroi	Burhead	Alismataceae	Locally Rare	midsummer-fall	Mud flats and perimeter of lake shore; freshwater marsh; perennial herb
Eleocharis parvula	Dwarf spike-rush	Cyperaceae	Locally Rare	Jun-Sept	Mud flats; salt marsh, coastal; perennial herb
Potamogeton pusillus	Small pondweed	Potamogetonaceae	Locally Rare	spring-fall	Mud flats; perennial herb

Table updated using CNPS April 2010

Status Definitions
CNPS (California Native Plant Society) Status
1B = Plant species that are rare, threatened, or endangered in California and elsewhere
2 = Plant species that are rare, threatened, or endangered in California but more common elsewhere
3 = Plant species about which we need more information (a review list)
4 = Plant species of limited distribution (a watch list).
.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree of immediacy of threat)
.2 = Fairly endangered in California (20–80 percent of occurrences threatened)
.3 = Not very endangered in California (<20 percent of occurrences threatened or no current threats known)

(*Dudleya pulveruleuta*), chocolate lily (*Fritilaria biflora*), deergrass (*Muhlenbergia rigens*), giant chain fern (*Woodwardia fimbriata*), and Humboldt's lily (*Lilium humboldtii* ssp. *ocellatum*).

Sensitive species found closest to the Plan Area that are not known to occur but have a probability of occurring in the Plan Area include Santa Ynez false lupine (*Thermopsis macrophylla*) and Ojai fritillary (*Fritillaria ojaiensis*). Other species are found in the surrounding Santa Ynez and San Rafael mountains and are not known to occur and have a low potential to occur in the Plan Area.

Santa Ynez false lupine is listed by CNPS as a 1B.3. This rare lupine occurs in chaparral habitat on sandstone in open areas such as fuel breaks. It is a perennial shrub reaching heights of 6 feet and flowering April through June. It is a fire follower and germinates in large clumps after fires. Associated plants include manzanita (*Arctostaphylos glandulosa*), tree poppy (*Dendromecon sp.*), goldenfleece (*Ericameria arborescens*), tanoak (*Lithocarpus densiflorus*), oak trees (*Quercus* sp.) and yucca (*Yucca whipplei*). This plant is threatened by hikers' trail use and aggressive exotic grasses in the open areas.

Ojai fritillary (*Fritillaria ojaiensis*) is a CNPS 1B.2 listed plant. Ojai fritillary occurs in broadleaved mesic upland forest, chaparral, and lower montane coniferous forest on rocky sites, mostly on north slopes. This perennial bulb flowers March through May.

3.4.5.2 Special-Status Wildlife

Table 3.4-4 provides a list of special-status wildlife species known to occur in the region and within the Plan Area. Four federally or state-listed species and four other special-status species are known to occur in the Plan Area. Three federally or state-listed species and five other special-status species are not known to occur in the Plan Area, but known to occur in the region. Special-status species observed in the region with a low potential to occur in the Plan Area include California condor, California red-legged frog, foothill yellow-legged frog, southwestern arroyo toad, two-striped garter snake, and three bat species: greater western mastiff bat (*Eumops perotis*), California leaf-nosed bat (*Macrotus californicus*), and Townsend's big-eared bat (*Corynorhinus townsendii townsendii*) (Dames and Moore 1987).

The following is a description of each of the special-status species known to occur or with a potential to occur in the Plan Area in taxonomic order.

Southern California DPS Steelhead (*Oncorhynchus mykiss*). Steelhead within the Southern Distinct Population Segment (DPS) are a federally endangered species and state species of special concern known to occur in the Plan Area. Steelhead and rainbow trout represent distinct life-history forms of the same species. Steelhead are the anadromous (i.e., seagoing) form of rainbow trout; those that do not migrate to the ocean and remain in freshwater for the duration of their life are referred to as "resident" rainbow trout. Both forms can exist within the same population with no observable genetic distinction. Because of these similarities, both forms are discussed in this section.

Steelhead parr (premigrant rearing juveniles) are visually and behaviorally indistinguishable from nonanadromous rainbow trout parr. However, steelhead offspring may mature and spawn in the stream before or without migrating to the ocean, whereas resident rainbow trout offspring may undergo smoltification and migrate to the ocean. Only the anadromous form (i.e., steelhead) and resident rainbow trout that co-occur with the steelhead are currently subject to the federal endangered listing (50 CFR Parts 223 and 224, January 5, 2006). Resident rainbow trout populations that exist above long-standing natural barriers or artificial impassable barriers are not included in the listing. Only steelhead occurring in the Santa Ynez River below Bradbury Dam are included in this DPS. Many of the resident rainbow trout upstream of the dam are likely ancestors of anadromous steelhead; however. they have no special status and are not protected under the federal or state endangered species laws.

Table 3.4-4
Special-Status Wildlife Species in the Region and Plan Area

Scientific Name	Common Name	Status	Location	Notes
Oncorhynchus mykiss	Southern California DPS steelhead	FE, CSC	Plan Area	Anadromous steelhead are downstream of Bradbury Dam.
Bufo californicus	Southwestern arroyo toad	FE	Region	Only found in Upper Santa Ynez River, but low potential to occur in tributaries to Cachuma Lake.
Rana draytonii	California red-legged frog	FT, CSC	Region	Potential to occur in tributaries to Cachuma Lake. Note: Newly designated (March 17, 2010) Critical Habitat exists within the southern boundaries of the Plan Area.
Rana boylii	Foothill yellow-legged frog	CSC	Region	Potential to occur in tributaries to Cachuma Lake.
Thamnophis hammondii	Two-striped garter snake	CSC	Region	Potential to occur in tributaries to Cachuma Lake.
Actinemys marmorata pallida	Southwestern pond turtle	CSC	Plan Area	Known to occur in the Plan Area and in pools downstream of Bradbury Dam.
Pelecanus occidentalis	Brown pelican	Delisted (formerly FE)	Plan Area	Rarely observed at Cachuma Lake.
Strix occidentalis occidentalis	California Spotted owl	CSC	Plan Area	Observed in 1992 in oak woodland on the north side of the lake.
Gymnogyps californianus	California condor	FE, SE	Region	Observed in the nearby San Rafael Mountains. Low potential to occur in Plan Area.
Haliaeetus leucocephalus	Bald eagle	Delisted in 2007 (formerly FT); currently SE	Plan Area	Many winter visitors and one known breeding pair 1.35 miles northeast of the Plan Area.
Falco peregrinus anatum	American Peregrine falcon	Delisted in 1999 (formerly FE); Delisted (formerly SE)	Plan Area	Likely to frequent the Plan Area due to the presence of abundant prey.
Vireo bellii pusillus	Least bell's vireo	FE, SE	Plan Area	Only a few observations in riparian habitat in the Plan Area-breeding unlikely.
Empidonax traillii extimus	Southwestern willow flycatcher	FE, SE	Plan Area	Rarely occurs in the Plan Area in riparian habitat.
Eumops perotis	Greater western mastiff bat	CSC	Region	FSC applies to ssp. *californicus;* low potential to occur in Plan Area.
Macrotus californicus	California leaf-nosed bat	CSC	Region	Low potential to occur in Plan Area.
Corynorhinus townsendii townsendii	Townsend's big-eared bat	CSC	Region	Low potential to occur in Plan Area.

Table updated with February 28, 2010 version of the CNDDB

Status Definitions
FE = Federally endangered
FT = Federally threatened
SE = State endangered
SCD = State Candidate (Delisting)
CSC = State species of special concern

California Red-Legged Frog (*Rana draytonii*). California red-legged frog is listed as a federally threatened species with potential to occur in the Plan Area. It historically occurred in coastal mountains from Marin County south to northern Baja California, and along the floor and foothills of the Central Valley from about Shasta County south to Kern County. California red-legged frogs are confined strictly to aquatic habitats, such as creeks, streams, and ponds, and occur primarily in areas having pools 2 to 3 feet deep with dense emergent or shoreline vegetation. Although they may move between breeding pools and foraging areas, they rarely leave the dense cover of the riparian corridor. Major predators include introduced fish, bullfrogs, and native garter snakes.

California red-legged frogs are not likely to occur in Cachuma Lake due to the presence of predatory fish. However, they are likely to be present in tributaries to the lake. Historic reports of red-legged frogs in the upper Santa Ynez River watershed include Blue Canyon, Agua Caliente Canyon, Mono Creek, Indian Creek, Camuesa Canyon, Oso Canyon, and Santa Cruz Creek (Jennings 1993 as cited in Woodward-Clyde Consultants 1995a). Santa Cruz Creek drains directly into the Cachuma Lake; Oso Canyon drains into the Santa Ynez River above Cachuma Lake; Camuesa, Indian, and Mono creeks drain into Gibraltar Reservoir; and Agua Caliente and Blue Canyon drain into the Santa Ynez River above Gibraltar Reservoir.

The southeastern portion of the Plan Area, including Live Oak Camp, is within an area designated as critical habitat for the red-legged frog (USFWS 2010). By definition, only aquatic and upland areas where suitable breeding and nonbreeding habitats are interspersed throughout the landscape and are interconnected by unfragmented dispersal habitat qualify as critical habitat for the red-legged frog.

Foothill Yellow-Legged Frog (*Rana boylii*). The foothill yellow-legged frog is a state species of concern with a potential to occur in the Plan Area. It ranges from sea level to about 6,000 feet from western Oregon to Southern California. This frog prefers small pools and slow-flowing creeks with gravelly or sandy substrate, sunny banks, and open woodlands nearby. It breeds from March to May, when streams have slowed after winter storms. Egg clusters are attached to the downstream side of submerged rocks (National Wildlife Federation 2004). The 1988 CDFG survey noted that the foothill yellow-legged frog could occur in the Plan Area in the streams that flow into the lake. As with the red-legged frogs, the presence of foothill yellow-legged frogs may be limited due to high numbers of bullfrogs.

Two-Striped Garter Snake (*Thamnophis hammondii*). The two-striped garter snake is a California species of special concern with potential to occur in the Plan Area. It occurs from Monterey County south through the Coast Ranges to northern Baja California. It is a highly aquatic species that is typically found near slowly moving creeks and streams, ponds, and coastal lagoons where water is permanent and tadpoles, frogs, and small fish are present as a prey base. These snakes are often found in areas of barren soil or short grass near the aquatic sites, and may use large boulders for basking. The two-striped garter snake is reported to occur in the upper Santa Ynez River above Gibraltar Reservoir and elsewhere in the watershed. It is unlikely that the species occurs along Cachuma Lake, but it is likely to be found on some of the tributaries flowing into the lake.

Southwestern Pond Turtle (*Actinemys marmorata pallida*). The southwestern pond turtle is a California species of special concern known to occur in the Plan Area. They live primarily in freshwater rivers, streams, lakes, ponds, vernal pools, and seasonal wetlands but also seem to

have some tolerance for slightly brackish conditions. They may live in intermittent streams where permanent pools exist (Woodward-Clyde 1995a). The species requires slow moving water and appropriate basking sites such as logs, bands, or other suitable areas above water level. The hatchling period is a particularly vulnerable state, and requires shallow water (less than 30 cm) and abundant emergent vegetation (Woodward-Clyde 1995a).

Habitat for the southwestern pond turtle occurs in the Plan Area in Cachuma Bay, Santa Cruz Bay, and potentially in other areas. It also exists throughout the Santa Ynez River watershed including the main stem of the river below Bradbury Dam. Turtles have been observed in Salsipuedes Creek and in the main stem downstream of Buellton to the Long Pool just below Bradbury Dam (Woodward-Clyde 1995a).

Spotted Owl *(Strix occidentalis occidentalis*). The California spotted owl (*S.o. occidentalis*) was recently a candidate for federal listing. However, it was determined not warranted for listing by the USFWS in February 2003 and again in May 2006 (USFWS 2006). This species has been reported once in the Plan Area, when two adults with two juveniles in their care were found in the heavily canopied oak woodland on 19 June 1992 by a biologist experienced with this species (Sandburg 2002). The presence of spotted owl in the Plan Area may be underreported. Spotted owl responded to calls in a wooded canyon south of the Plan Area in December 2005 (Holmgren 2005).

This species apparently has declined in the county and in recent years has been found in very few of its former sites (it can still be found readily in the San Rafael Mountains at Bear Campground in the extreme upper Sisquoc and at Big Cone Spruce Campground on Manzana Creek). Although it may meet some of the habitat requirements of this species, Horse Creek is not typical of other sites in the county where spotted owl has been found. It seems unlikely that this species would become established at this site, given the owl's apparent disappearance from more appropriate sites. However, the continuing uncertainty of this species' status locally may leave open the possibility of presence.

Bald Eagle (*Haliaeetus leucocephalus*). The bald eagle was federally listed as endangered in 1967, downgraded to threatened in 1995, and delisted in 2007 (USFWS 2007). Bald eagles continue to be state listed as endangered.

Cachuma Lake is one of the few places in Southern California where the bald eagle can be reliably found in numbers during winter. Bald eagles have been historically recorded in the Plan Area since before Bradbury Dam was constructed in 1953; unpublished accounts by past Cachuma naturalist Neal Taylor note eagles foraging along the Santa Ynez River during the steelhead run. Bald eagle populations crashed throughout the lower 48 states in the 1950s due to eggshell thinning caused by DDT. Scattered sightings beginning around the lake during the 1960s and '70s increased to a count of 13 bald eagles in Winter 1979–1980 (Detrich 1989). Official midwinter bald eagle counts have been conducted annually at Cachuma Lake since 1989 and have recorded between 3 and 18 individuals each year (see Table 3.4-5). County Parks offers winter lake cruises during the "eagle season" from November through February. Up to seven sightings per cruise have been documented by park naturalists for many years.

Table 3.4-5
Cachuma Lake Mid-Winter Bald and Golden Eagle Surveys

Year	Adult Bald Eagles	Immature Bald Eagles	Adult Golden Eagles	Immature Golden Eagles
1989	2	16	0	1
1990	8	12	3	1
1991	-	-	-	-
1992	3	5	2	1
1993	-	-	-	-
1994	-	-	-	-
1995	4	10	1	1
1996	2	8	1	1
1997	2	3	2	1
1998	2	10	1	1
1999	2	4	1	1
2000	2	11	1	1
2001	2	6	1	0
2002	2	5	1	0
2003	2	5	1	0
2004	2	2	1	1
2005	2	3	0	0
2006	2	1	0	0
2007	3	4	1	1
2008	2	7	0	1
2009	2	5	1	0
2010	2	7	1	0

- = No data available.

Wintering eagles begin to arrive as early as mid-October and stay through March. In addition, the lake currently provides foraging habitat for one pair of adult bald eagles year-round that nest approximately 1.35 miles outside of the Plan Area.

The abundant forage base of Cachuma Lake is one of the primary attractants for this species. Bald eagles forage on the lake's established warm-water fish species, such as largemouth bass, smallmouth bass, crappie, and catfish, a diet augmented by large winter stocks of rainbow trout. Bald eagles have also been observed fishing along the Santa Ynez River and Santa Cruz Creek during trout spawning season (Detrich 1989). The American coot, plentiful on Cachuma Lake, is a well known prey item for bald eagles, and it is likely that the eagles also prey on shallow-water ducks, such as Mallards and Gadwalls, as well as small mammals and the occasional reptile or amphibian. The bald eagle's reliance on a prey base that depends on quality shallow-water habitat points to the importance of preserving the integrity of the vegetated flats and shallow bays of Cachuma Lake. Detrich (1989) describes a marked drop in waterfowl numbers on the lake following the exposure of previously inundated flats, due to drought conditions. He speculates that the bald eagles may have increased the percentage of fish in their diets to compensate for the decrease in waterfowl. If so, it may be possible that dietary concerns contributed to the low numbers of bald eagles present in Winter 2001–2002 and 2002–2003, when relatively low numbers of waterfowl were present.

In addition to providing important habitat and forage for wintering bald eagles, the area around Cachuma Lake supports one breeding pair of eagles during spring and summer months. The bald

eagle nest, first documented on private land approximately 1.35 miles north of the Plan Area in 1989, has been informally checked most years since its initial documentation, and has fledged an average of one young eagle per year (Lehman 1994; Mason 2002). Nesting was documented in 1989, 1990, 1992 (suspected), 1993, and 1994 (Lehman 1994). Since then, park naturalists documented one year of definitive breeding (chicks sighted in nest), and anecdotal evidence indicates breeding occurred in other, more recent years. Park staff does not have access to the nest, but individuals who have access have confirmed breeding.

The adult eagles have been observed not only leaving the nest and flying toward the lake (Mason 2002) but perched on dead limbs in large trees around the perimeter of the lake. The eagles continue to use the lake as a source of fish and waterfowl during the breeding season. Currently, bald eagle nesting is a rare event in Southern California, although bald eagles are seen regularly and at least two pair of eagles are nesting at the Santa Barbara Channel Islands, where an active reintroduction program is in effect. This larger recent population may be influencing the frequency of sightings at Cachuma Lake. Park naturalists have documented sightings of tagged bald eagles from Santa Cruz Island.

The presence of this continually successful bald eagle nest north of Cachuma Lake should signal the importance of protecting resources within the Plan Area and surrounding lands that support these breeding eagles and their young.

Other important requirements for this species are appropriate perching and roosting sites. Eagles use a number of favored perching sites around the lake, many of which are in the restricted areas of Santa Cruz Bay and the east end. They generally choose dead limbs in large trees for these sites. Also, in 1989, some bald eagles were found to use a site north of the lake for a winter nighttime roost (Detrich 1989).

Concern for the protection of bald eagles at Cachuma Lake by Santa Barbara County Parks Department personnel led to a study of eagles at the lake in 1989 by bald eagle expert Phillip Detrich of ECOS, Inc. Information compiled during this study paved the way for focused management efforts at Cachuma Lake for bald eagles. The Bald Eagle Management Plan of 1989 includes measures such as limiting public access to (and knowledge of) locations of favorite eagle perches, foraging areas, and roosting and nesting sites and strict guidelines regarding approach distance during naturalist-led wildlife cruises. For these reasons, the bald eagle nest is not identified on any maps prepared for this RMP. All future management decisions involving the Plan Area should continue to take this Plan into consideration.

Peregrine Falcon (*Falco peregrinus anatum*). The American peregrine falcon was formerly listed as federally endangered in the United States in 1970. It was delisted by the USFWS in 1999 and delisted by California in November 2009; however, the bird is fully protected in California. It occurs rarely in the Plan Area during the winter. One individual was sighted below Bradbury Dam on 27 December 2002. More recent data demonstrates that great variation in falcon presence can occur from year to year. County Parks naturalists recorded 16 individual sightings in winter 2003 and 41 individual sightings in winter 2004, including 12 occurrences of pairs. Over a two-week period in both 2003 and 2004, naturalists Mason and Pedersen observed a pair repeatedly alighting on a specific cliff and vocalizing, possibly indicating the pair may have been looking for nesting habitat.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*). This subspecies of willow flycatcher was federally listed as endangered in 1995 and state listed as endangered in 1991. A few rare observations of this species have occurred in the Plan Area. Its decline is probably due to loss and fragmentation of its habitat and brood parasitism by the Brown-headed Cowbird (Marshall and Stoleson 2000). The southwestern willow flycatcher breeds uncommonly on the Santa Ynez River in the Buellton area and near the river's confluence with Santa Rosa Creek as well as other scattered locations further downstream. Two sightings in the Plan Area included an obvious migrant at the Santa Ynez River upstream of Live Oak Camp (17 May) and two individuals at Santa Cruz Creek on 11 June at a site that was plausible breeding habitat for the species. The site of the second sighting possessed a complex canopy structure and dense herbaceous undergrowth, two important elements of this species' habitat. Critical to willow flycatcher habitat is the presence of still or low-flow surface water, or at least damp ground, an element that was missing for much of the season at the observed location of the pair in the dry conditions of 2002 (a small puddle of water at the flycatcher site observed on June 11 was gone by June 26). No flycatchers were detected at this location on June 26 and they were assumed to be gone. According to survey protocol for southwestern willow flycatcher, no flycatcher in the range of the *extimus* subspecies can be assumed to be *extimus* until after June 20 (Sogge et al. 1997). Thus, the sightings cannot be accurately classified, although the presence of a limited amount of suitable habitat leaves open a very small possibility of breeding at Santa Cruz Creek.

3.5 CULTURAL RESOURCES

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance. Numerous laws, regulations, and statutes, on both the federal and state levels, seek to protect and target the management of cultural resources. All activities in the Plan Area (i.e., under the aegis of Reclamation) that have a potential to affect cultural resources, must comply with Section 106 of the National Historic Preservation Act. Agencies that have management responsibilities for/on federal lands (through agreements or contracts) are required to follow federal law and regulation on federal lands. Any undertakings on Reclamation lands must follow, without exception, Reclamation's Section 106 cultural resources directives and standards manuals LND P01, LND 02-01, and LND 07-01. The Reclamation Mid Pacific Office (regional office) will serve as the point of contact for all cultural resource issues. This office will be responsible for directing the federal compliance processes on all undertakings on Reclamation lands.

The information provided below is summarized from the Cultural Resources Management Plan (CRMP, URS 2006c). Archaeological site locations are considered confidential; therefore, the CRMP is available only on a need-to-know basis.

3.5.1 Regional Setting

Cachuma Lake was formed with the construction of Bradbury Dam on the Santa Ynez River in 1953. The Santa Ynez River flows for a distance of approximately 90 miles from its headwaters on Old Man Mountain and Divide Peak westward to the Pacific Ocean. The watershed of the Santa Ynez River encompasses approximately 900 square miles. The south side of the watershed is formed by the Santa Ynez Mountains, which have crest elevations from 2,000 to 4,000 feet, while the Purisima Hills and the San Rafael Mountains, which range in elevation from 4,000 to

6,000 feet, form the north side. Prior to the placement of Bradbury Dam, the flow of the Santa Ynez River was subject to seasonal fluctuations in precipitation. During winter months increases in flow would occur with peak flows corresponding with winter storms while during summer months the river could virtually disappear (West and Welch 2001).

3.5.1.1 Prehistory

Archaeological data are increasing to support the hypothesis that prehistoric occupation of the California coast dates to over 10,000 years before present (BP) (Erlandson and Colten 1991). Such data include the recent dating of human bones from Santa Rosa Island at 13,000 years old (Ritsh 1999). This early Paleo-Indian occupation is not well understood, due to the paucity of archaeological data. The archaeological record does indicate that sedentary populations occupied the coastal regions of California more than 8,000 years ago. Several chronological frameworks have been developed for the Chumash region including Rogers (1929), Wallace (1955), Harrison (1964), Warren (1968), and King (1990).

Based on artifact typologies from a great number of sites, King was able to discern numerous style changes within each of the major periods, the Early, Middle, and Late periods. The Early Period (8,000 to 3,350 BP) is characterized by a primarily seed processing subsistence economy. The Middle Period (3,350 to 800 BP) is marked by a shift in the economic/subsistence focus from plant gathering and the use of hard seeds, to a more generalized hunting-maritime-gathering adaptation, with an increased focus on acorns. The full development of the Chumash culture, one of the most socially and economically complex hunting and gathering groups in North America, occurred during the Late Period (800 to 150 BP).

At the time of Spanish contact (1542), large Chumash villages typically contained sweathouses, storehouses, numerous homes, ceremonial areas, and extensive middens of residential debris. Villages were located near important resources in coastal, estuarine, and riparian habitats. Cemeteries typically were located near the villages; elaborate burial practices included the interment of grave goods such as beads, quartz crystals, red and yellow pigments, delicate soapstone bowls, sandstone mortars, and carved charmstones.

In comparison to Santa Barbara's coastal plain, the Santa Ynez Valley was sparsely populated throughout prehistory. Subsistence was based on a wide variety of floral and faunal resources. Acorns, pinyon nuts, and seeds from numerous grasses and forbs provided storable staples. Deer, quail, rabbit, and freshwater fish were consumed, as were marine fish, shellfish and sea mammals acquired through exchange or trips to the coast.

Ethnohistoric records indicate that the interior Chumash established summer and winter villages, individual sweat bath sites, short-term camps for gathering and processing acorns and pinyon nuts, isolated hearths and millingstone sites for roasting yucca and pounding and boiling islay bulbs, and caches for food and water in caves and rock shelters.

3.5.1.2 Ethnography

The project area lies within the historic territory of the Native American Indian group known as the Chumash. The Chumash occupied the region from San Luis Obispo County to Malibu Canyon on the coast, and inland as far as the western edge of the San Joaquin Valley, and the

four northern Channel Islands (Grant 1978). The Chumash are subdivided into factions based on six distinct dialects: Barbareño, Ventureño, Purisimeño, Ynezeño, Obispeño, and Island.

Cachuma Lake falls within the historic territory of the Ynezeño, whose name is derived from the mission with local jurisdiction, Santa Ynez. The Ynezeño are less documented than the coastal Chumash both in historical references and by archaeological research. It is known that their material culture was quite similar to the coastal Chumash, but their economy placed more emphasis on hunting and gathering then the maritime-oriented economy of the coastal tribes.

The Chumash were very advanced in their culture, social organization, religious beliefs, and art and material object production (Moratto 1984). Class differentiation, inherited chieftainship, and intervillage alliances were all components of Chumash society. The development of a highly effective maritime subsistence pattern, composed of exploitation of fish, shellfish, sea mammals, and waterfowl, enabled Chumash villages of nearly 1,000 individuals to cluster in areas along the coast. These were the most populous aboriginal settlements west of the Mississippi River (Moratto 1984). Permanent inland settlements subsisted from a variety of resources including acorns, seed plants, rabbits, and deer. The smaller inland villages were often economically allied with the larger coastal villages.

At the time of European settlement in the Santa Barbara Channel area, which began with the construction of the Santa Barbara Presidio in 1762, approximately 25 Ynezeño villages existed, eight of which were in the middle and upper Santa Ynez River Valley (Rudolph 1990). The villages were tied to together by marriage and each village contained from 40 to 280 people (West and Slaymaker 1987). Early European explorers, Spanish missionaries, the early ethnographer John P. Harrington, and modern anthropologists have described these villages. Marriage patterns, baptismal records, and genealogies are documented for many of the villages. Although Chumash society was decimated by epidemic diseases and missionization during the early historic period; today more than 500 living Chumash descendants trace their ancestry from the historic villages of the Santa Ynez River Valley (Woodward Clyde Consultants 1995b).

3.5.1.3 History

Early Exploration Period (1542-1782)

The initiation of the historic era in Santa Barbara County began with an exploratory voyage led by Juan Rodriguez Cabrillo in 1542-1543. Numerous European explorers passed through the Santa Barbara Channel, including Sebastian Rodriguez Cermeno in 1595, and Sebastian Vizcaino in 1602. In 1769, Gaspar de Portola and Fray Crespi departed the newly established San Diego settlement and marched northward toward Monterey with the objective of securing the port and establishing five missions along the route. They passed through present-day Santa Barbara County that same year. The 1769 Portola Expedition and the later De Anza Expedition of 1775 were preludes to systematic Spanish colonization of Alta California. These early maritime and overland expeditions brought the Spanish in contact with the natives of the Santa Barbara region, but it was not until the late 1700s the interior was penetrated.

Spanish Mission Period (1782-1820)

Along the Santa Barbara Channel, the Spanish Mission Period commenced with the foundation of the Santa Barbara Presidio in 1782, and 4 years later the Santa Barbara Mission was founded. In 1798, an exploring expedition was sent to the Santa Ynez Valley to find a location for a new

mission. Fourteen villages were mentioned within 12 leagues of a spot called Alajulapu, meaning corner. This spot, where Mission Santa Ynez was established, is next to the present-day town of Solvang. Father Estevan Tapis recorded the names of the valley's villages, their location in relation to Alajulapu, and the number of residence structures at each village. Tapis estimated four persons per structure. Two of these villages have been correlated with known archaeological sites in the vicinity of Cachuma Lake.

The village of Teqepsh (Tequepis, Teqeps - Chumash for "seed beater") was located on the west bank of Tequepis Creek near its confluence with the Santa Ynez River. This village was the first encountered on the expedition. This village site (CA-SBA-477) is now inundated by Cachuma Lake. Also noted by early explorers was the village of Elijman (CA-SBA-485) located on a terrace on the west side of the Santa Ynez River.

Fathers Jose Antonio Calzada and Jose Romualdo Gutierez established Mission Santa Inez on September 17, 1804. A cadre of neophytes from nearby missions was installed at Santa Inez to provide skilled labor and train subsequently proselytized natives. The first baptisms included children and 15 men. Among these were the headmen of the villages Calahuasa, Soctonocmu, and Ahuama.

Rancho and Anglo-Mexican Period (1821-1880)

With the successful revolt of Mexico against Spain in 1821, all mission lands passed from Spanish to Mexican ownership. Anxious to remove any sources of former Spanish power, the Mexican government in 1834 secularized the missions and began to sell or grant their former grazing lands. Cachuma Lake falls within the historic territory of two large Mexican land grants, Tequepis and Rancho San Marcos. Tequepis was granted to Antonio Maria Villa by Governor Pio Pico in 1845. William Pierce acquired it from Villa's heirs in 1868. The Rancho San Marcos, as described earlier, was originally part of the Santa Barbara Mission lands. Nicholas and Richard Den purchased the 35,500-acre rancho from Governor Pio Pico in 1846. As on other large, self-sufficient ranches in Santa Barbara County, cattle grazing and grain production were the principal economic mainstays on Tequepis and Rancho San Marcos.

In 1855, the Christian natives residing at Mission Santa Ynez were forced to take up residence at the site of the present Santa Ynez Indian Reservation. By this time, the Chumash population had been decimated by infectious diseases and had experienced massive social disruption due to European contact and missionization.

Americanization Period (1890–1960)

As more and more Americans emigrated to California to buy farm land, towns sprang up, roads and wharves were developed to take crops to market, and a stage coach system grew up to connect passengers and mail throughout the state. The Santa Ynez turnpike road was cut over San Marcos Pass by Chinese laborers in 1868, charging a toll for passengers traveling from Los Angeles to San Luis Obispo. Stages stopped at Cold Springs to change the driver and horses and allow the passengers to get food and water. The present Cold Springs Tavern is a survivor of those early stagecoach days. Additionally the stage stopped at Chalk Rock, now inundated by Cachuma Lake, and Ballard's adobe (County Landmark No. 20), 4 miles below Los Olivos.

Between 1874 and 1910, the towns of Lompoc, Santa Ynez, Los Olivos, Ballard, and Solvang were established. Settlers were attracted to the Santa Ynez Valley by good weather, water, and rich soil capable of producing wheat, barley, and a wide variety of fruit trees. Point Sal and

Lompoc wharves shipped the produce of these towns to markets up and down the coast. By 1887 the Pacific Coast Railway stop in Los Olivos provided Santa Ynez River Valley farmers an alternative way to get agricultural goods to market.

From mission times until the 20th century, Santa Barbara relied on the de la Guerra wells for domestic water supplies. Even with supplemental sources, the water supply was inadequate for the growing population. As early as 1888, the Santa Ynez River was recognized as a potential major source of water for Santa Barbara. The Mission Tunnel was drilled in 1902 to carry water, by gravity, from the Santa Ynez River to Santa Barbara. Planning for the Cachuma Dam (now Bradbury Dam) was started in 1941, construction commenced in 1949 and the dam was completed in 1953. The reservoir filled with enough water to go over the spillway on April 12, 1958. The Plan Area is federally owned land designated for recreational uses. It includes Cachuma Lake and approximately 6,200 acres of surrounding land.

3.5.2 Plan Area Existing Conditions

Archival research consisted of a review of ethnographic and historic literature and maps, archaeological base maps and site records, previous survey reports, and atlases of historic places on file at the Central Coast Information Center of the California Historical Resource Information System at UCSB. The Central Coast Information Center provided both the technical reports and archaeological site records referenced in this document. As a federal agency, Reclamation conducts formal government-to-government consultation with federally recognized Indian tribes. As part of Section 106, Reclamation also consults with interested parties and individuals, which may include nonfederally recognized members of the Native American community. With regard to Section 106, these nonrecognized groups and individuals do not have the same legal standing as federally recognized Indian tribes.

To further assist in securing information regarding known cultural resources located in or near the Plan Area, a request for information was submitted to the Native American Heritage Commission (NAHC). The Sacred Land Files of the NAHC did not indicate the presence of any cultural resources (i.e., traditional cultural properties) within the Plan Area. In addition to a review of their Sacred Land Files, the NAHC provided a list of Native American contacts. These groups and individuals were asked whether they had knowledge of, or concern for, any archaeological sites in the Plan Area. The groups and individuals were also asked to provide general comments for the CRMP. A response was received from Mr. Art Lopez, Chairman of the Tribal Elder's Council, Santa Ynez Band of Mission Indians. Mr. Lopez indicated that the Elder's Council had no knowledge of spiritual or ceremonial sites within the Plan Area. Mr. Lopez did, however, request that a Native American monitor be present when ground-disturbing activities are to occur.

3.5.2.1 Previous Archaeological Investigations

Numerous archaeological investigations have been conducted in the Plan Area. According to West and Welch (2001), the first recorded archaeological investigation in the Cachuma Lake area was conducted by Alexander S. Taylor in the 1860s when he excavated an ethnohistoric

Chumash village at Tequepis (CA-SBA-477[3]). In the 1870s, the Rev. Stephen Bowers also conducted excavations at Tequepis (West and Welch 2001). Other than the fact that two of California's earliest archaeologists investigated this particular site, little is known about the results of these nineteenth-century efforts.

The next archaeological investigations in the Plan Area did not occur until the mid-twentieth century, when the River Basin Surveys of the Smithsonian Institution surveyed and excavated archeological sites in the area to be inundated with the completion of Bradbury Dam (Baumhoff 1951). Albert Mohr and Martin Baumhoff with the University of California's Archeological Survey recorded 19 archeological sites, and according to Baumhoff (Baumhoff 1951), excavated test pits at both CA-SBA-477 and CA-SBA-485. Baumhoff subsequently conducted further excavations at these two sites. According to an unpublished manuscript, CA-SBA-477 is of the late prehistoric "Canaliño" period, while the age of CA-SBA-485 could not be determined (West and Welch 2001).

CA-SBA-485 was repeatedly subjected to archaeological investigation in the ensuing years, including in 1959 by W. Harrison and D. Miller, in 1965 by J. Ruby, and again in 1965 and then 1966 by Miller. The results of these investigations were summarized by M. Macko (1983) while completing his graduate degree at the University of California at Santa Barbara (UCSB).

In the mid-1980s, West and Slaymaker (1987) completed an archeological survey of the areas to be inundated with the enlargement of Bradbury Dam. For their study, it was determined that the lands between the lake level, at the time approximately 730 to 740 feet above sea level, and the 800 foot contour as depicted on the USGS 7.5' topographic quadrangles represented the area of potential effect for the dam enlargement project. This effort resulted in the identification of 15 new sites and eight isolated artifacts.

A number of smaller archaeological surveys were completed in the Plan Area in recent decades. These include Forrest (1986), Maki (1999, 2002), Osland (1992), West (1980), and West and Welch (2001). These studies resulted in the identification of additional sites within the Plan Area. With subsequent recordation and boundary refinements, approximately 40 recorded archaeological sites had been identified in the Plan Area as of 2006.

In addition to the surveys on Reclamation lands, archaeological inventories completed in anticipation of proposed improvements to SR 154 through the Plan Area have also been completed (Costello 1994; Farris 1992a, 1992b; Waldron 1989). Although SR 154 (San Marcos Pass Road) bisects the Plan Area, the highway is situated entirely on land owned by the State of California. These studies resulted in the identification of four additional sites that although recorded on state land, given their extremely close proximity to the Plan Area, may exhibit deposits and/or features within lands under Reclamation jurisdiction.

Colten, Gerber, and Osland conducted test excavations at CA-SBA-2464 with the goal of defining the site's boundaries, determining site eligibility for inclusion on the National Register,

[3] The cultural resource sites discussed in this section all have standard reference codes called "trinomials." The trinomial system is based on the Smithsonian Institution's inventory numbering system, which was created to maintain systematic control over all collected archaeological data. The trinomial code has three parts: CA, for California; SBA, for Santa Barbara County; and a number given in sequence from 1 to infinity within that county, which is unique to the site. In this example, CA-SBA-477, the number 477 indicates that the site was the 477th site recorded in Santa Barbara County, CA.

and assessing the effects associated with renovating the Cachuma Lake Nature Center (1995). The recovered artifact assemblage included glass trade beads, Tizon brownware, and a small concave-base projectile point. The presence of these artifacts suggested that the site dated to the protohistoric or historic periods. Although their efforts revealed that site integrity had been somewhat compromised by previous construction, landscaping, utility installations and rodent burrowing, they determined that the site was nonetheless eligible for inclusion on the NRHP.

According to West and Welch (2001), Michael Glassow and a team from UCSB conducted archaeological excavations at CA-SBA-485. Based on preliminary and as yet unreported analyses, Glassow believes that three different periods of occupation are represented, including 4000–6000 B.P.; A.D. 900–1100; and A.D. 1300 missionization (West and Welch 2001).

Several excavations of archaeological sites within the immediate vicinity of the Plan Area have also occurred. Those within the vicinity of the San Marcos Adobe are particularly relevant given the prominence of the adobe in local history as well as the extent of the investigations conducted. In 1978, a field class from UCSB investigated the San Marcos Adobe (CA-SBA-109/H). A number of artifacts were recovered during this effort, which was focused upon the mound in the central site area. According to the student report edited by Roderick McIntosh, the "sample of artifacts recovered from the San Marcos Adobe Rancho is not large enough to use to develop any but the most tentative hypotheses" (McIntosh ed. 1978:106). Perhaps the most important of these being that the aboriginal village located at the adobe appears to have been founded after the establishment of the rancho in the first few years of the nineteenth century.

Archaeological excavations were also conducted in the 1990s at CA-SBA-2203/H in anticipation of improvements to SR 154 (Mikkelsen and Jones 1998). Two prehistoric components were identified within the project's APE while a third, historic component was identified outside of the project's construction area. The lower of the prehistoric components represented a small occupational deposit assigned to the Millingstone Horizon. Overlaying this was a larger Early Period component which represented the major period of prehistoric occupation. The historic component consisted of a surface scatter of tile fragments and was determined to be associated with a wall surrounding the San Marcos Rancho vineyard that was constructed between 1804 and 1845.

Archaeological excavations and construction monitoring were completed at CA-SBA-109/H, -2200, -2201, and –2202 in 1995, 1996, and 1997 by a team from Science Applications and International Corporation (SAIC). Reported on by Stone et al. (2001), these investigations were conducted as a result of proposed resort and golf course construction in the vicinity in which these four sites are located. Results from CA-SBA-109/H were similar to those of the UCSB field school (McIntosh 1978). Historic debris associated with the operation of the Rancho San Marcos was recovered, as were some non-temporally diagnostic flaked stone materials. Most of the debitage was found in direct correlation with the historic debris, thus indicative of a historic aboriginal occupation at the site. Work in this area was also conducted by Craig et al. (1988) and Rudolph and Cole (1990).

At CA-SBA-2200, both prehistoric and historic components were identified. The prehistoric materials recovered were indicative of a Late Period occupation while the historic component was associated with Rancho San Marcos. Archaeological materials representative of Early, Middle, and Late Period prehistoric occupations, as well as historic materials from both the nineteenth and twentieth centuries, were recovered by SAIC at CA-SBA-2201. The SAIC report

(Stone et al. 2001) indicates that CA-SBA-2201 may be contiguous with CA-SBA-2203/H, the site excavated by Mikkelsen and Jones (1998) described above. Lastly, the SAIC team identified Middle and Late Period materials at CA-SBA-2202.

3.5.2.2 Previously Recorded Archaeological Sites

Table 3.5-1 summarizes the known archaeological sites within the Plan Area. A brief description of each site can be found in the CRMP (URS 2006c).

3.5.2.3 Previously Recorded Archaeological Isolates

In addition to the archaeological sites described above, the files of the Central Coast Information Center indicated that a number of isolated archaeological materials were identified within the Plan Area. Isolated finds lack a sufficient quantity of cultural material to be elevated to site status. In most instances, they likely relate to a single event such as the accidental loss or purposeful discard of a tool. In other instances, however, they may represent artifacts removed from their original deposition in an archaeological site by erosion or illicit collection and subsequently redeposited elsewhere. Table 3.5-2 summarizes the known isolated artifacts within the Plan Area.

3.5.2.4 Previously Recorded Historic Linear Resources

Two known historic period linear resources are within the project region and are summarized in Table 3.5-3. Both were identified, historically reconstructed, and subsequently recorded by Costello during her work along SR 154 (1994).

3.5.2.5 Summary

From the lists of known archaeological sites and isolated finds, it is evident that the Plan Area contains a wide and varied collection of archaeological resources. To date, the majority of systematic cultural resources inventory studies have been confined to the shoreline, for it is along the lakeshore that most projects have been proposed. The most extensive survey was the inventory of the lands to be inundated following the enlargement of Bradbury Dam (West and Slaymaker 1987). West and Slaymaker's survey area included the areas between the lake level, at that time approximately 730-740 feet above sea level, and the 800-foot contour as depicted on the Cachuma Lake and San Marcos Pass USGS 7.5' topographic quadrangles. It should be noted that some areas along the lake were deemed too steep to survey by West and Slaymaker (p. 39). These steep areas are primarily confined to the northern edge of the lake, in particular around Clark and Johnson Canyons.

Table 3.5-1
Previously Recorded Archaeological Sites

Site	Time Period	Description	Size	Condition	NRHP Eligible
CA-SBA-471	Prehistoric	Small midden; artifacts include chert flakes, a scraper and a steatite pebble	5,000 sq. ft.	Destroyed – relating to the construction for Cachuma Dam	Not Evaluated
CA-SBA-472	Prehistoric	Habitation site with a shallow midden; artifacts include chert flakes. A metate, and a stemmed projectile base fragment	50,000 sq. ft.	Destroyed – relating to the construction for Cachuma Dam	Not Evaluated
CA-SBA-473	Prehistoric	Midden; artifacts include a flake	Unknown	Destroyed – inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-474	Prehistoric	Shallow midden; artifacts include scrapers	10,000 sq. ft.	Destroyed – inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-475	Prehistoric	Lithic scatter; artifacts include chert flakes and scrapers	125,000 sq. ft.	Unknown – due to be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-476	Prehistoric	Lithic scatter; artifacts include chert flakes, a bifacial cresentric tool, a unifacial sandstone mano	2,500 sq. ft.	Destroyed – relating to the construction for boat launch	Not Evaluated
CA-SBA-477	Prehistoric	Habitation site with a shallow shell midden; artifacts include bowl mortar fragment, steatite sherd, pitted cobble and a scraper; one boulder with petroglyphs was also recorded; other artifacts included unifacial and bifacial sandstone manos, a sandstone pestle fragment, a pitted cobble, a core scraper and chert flakes	150,000 sq. ft. (when recorded in 1950); 120 m^2 (when recorded in 1987)	Unknown – due to be inundated by Cachuma Reservoir; partially destroyed by severe wave erosion	Not Evaluated
CA-SBA-478	Prehistoric	Habitation site with a small midden; artifacts include a dibble weight fragment, two manos, and a scraper	10,000 sq. ft.	Unknown – due to be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-479	Prehistoric	Lithic scatter; artifacts include a bifacial chopper and chert flakes	30,000 sq. ft.	Unknown – due to be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-480	Prehistoric	Habitation site with shell midden; artifacts include several chert flakes and a spire-lopped *Olivella* bead	16,000 sq. ft.	Unknown – due to be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-481 / CA-SBA-2101	Prehistoric	Small habitation site with midden; artifacts include manos, a pitted stone, hammerstones, and a basin metate fragment	1,770 sq. ft. / 1,875 m^2	Unknown – could be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-482	Prehistoric	Lithic scatter; artifacts include flakes, a blade fragment, and a scraper	4,000 sq. ft.	Unknown – could be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-483	Prehistoric	Habitation site with a rocky, clay-like midden; artifacts consisted of chert flakes, a chert biface, and fire-affected rock	250 m^2	Unknown	Not Evaluated

Table 3.5-1
Previously Recorded Archaeological Sites

Site	Time Period	Description	Size	Condition	NRHP Eligible
CA-SBA-484	Prehistoric	Habitation site with a lithic scatter; artifacts include a projectile point, two scrapers, and chert flakes	3,600 sq. ft.	Unknown	Not Evaluated
CA-SBA-485	Prehistoric	Large shell midden; artifacts include a scraper, a bowl mortar, and chert flakes; a house pit was also recorded	86,000 sq. ft.	Unknown – near proposed camp ground	Not Evaluated
CA-SBA-486	Prehistoric	Habitation site with a low mound; artifacts include a pestle, manos, grinding slabs, chert cores, a projectile point, several scrapers, a plummet-shaped stone, several slab metates, one stone bowl fragment and shell beads with a burial	15,000 m^2	Partially damaged – relating to bulldozer / construction activity	Not Evaluated
CA-SBA-487	Prehistoric	Habitation site with a dark, compact shell midden; artifacts include chert flakes, and a flat-bottomed mortar	12,500 sq. ft.	Unknown – small, round corral is built on site	Not Evaluated
CA-SBA-488	Prehistoric	Habitation site with groundstone; artifacts include four manos, and a fragment of a deep basined metate	3,000 sq. ft.	Unknown	Not Evaluated
CA-SBA-489	Prehistoric	Lithic scatter; artifacts consist of chert flakes	48,480 sq. ft.	Unknown – due to be inundated by Cachuma Reservoir	Not Evaluated
CA-SBA-514	Prehistoric	Shell and lithic scatter; artifacts include chert flakes, a retouched flake, and sparse marine shell fragments	3,750 m^2	Unknown	Not Evaluated
CA-SBA-849	Prehistoric	Lithic scatter; artifacts consist of retouched flakes	2,500 sq. ft.	Nearly destroyed – flooding from nearby creek	Not Evaluated
CA-SBA-888	Prehistoric	Lithic scatter; artifacts include chert flakes (some are retouched)	400 sq. ft.	Unknown	Not Evaluated
CA-SBA-891 / CA-SBA-2105	Prehistoric	Lithic scatter with groundstone; artifacts include chert tools, debitage, basin metates, a unifacial slab metate, manos, and a mortar Lithic scatter with groundstone; artifacts include debitage, tools and groundstone; further investigations revealed handstones, six basin metates, two pestles, several unifacial cobble tools, hammerstones, flakes, cores and a projectile point	Between 250m^2 to 15,000 m^2	Unknown – is affected by extensive erosion	Not Evaluated
CA-SBA-895	Prehistoric	Lithic scatter; artifacts include chert flakes, and mortars (which have been removed)	20,000 sq. ft.	Unknown	Not Evaluated
CA-SBA-897/H	Prehistoric / Historic	Initially recorded as a sparse lithic scatter; re-recorded as the remains of the Ilenstine homestead (ca. 1888), which include stone walls and artifacts	Prehistoric – Unknown Historic – 4,500 m^2	Prehistoric – destroyed by bulldozer Historic – "good condition"	Not Evaluated
CA-SBA-1198	Prehistoric	Sparse lithic scatter with groundstone; artifacts include a chert biface, scrapers, cores, a biface, and a sandstone mano fragment	4,500 m^2	Unknown	Not Evaluated
CA-SBA-2099	Prehistoric	Sparse lithic scatter with groundstone; artifacts include bifacial sandstone mano, a quadfacial sandstone mano, a chert core and fire-affected rock	300 m^2	Unknown – affected by disking activities	Not Evaluated
CA-SBA-2100	Prehistoric	Lithic scatter with midden; artifacts include chert flakes and fire-affected rock	900 m^2	Unknown – cattle graze on the site	Not Evaluated

Table 3.5-1
Previously Recorded Archaeological Sites

Site	Time Period	Description	Size	Condition	NRHP Eligible
CA-SBA-2102	Prehistoric	Described as a "possible millingstone campsite," artifacts include chert flakes, a core, manos, and metates	250 m^2	Unknown – portion of the site has been bladed for a road	Not Evaluated
CA-SBA-2103	Prehistoric	Lithic scatter; artifacts include a chert core, possible groundstone	20,000 m^2	Unknown – graded road crosses the site	Not Evaluated
CA-SBA-2104	Prehistoric	Sparse lithic scatter; artifacts include five large chert flakes, groundstone fragments, and fire-affected rock	500 m^2	Unknown - partially destroyed by severe wave erosion	Not Evaluated
CA-SBA-2106	Prehistoric	Large midden with millingstone component; artifacts include a leaf-shaped chert projectile point, numerous manos, chert flakes, a chert core, and fire-affected rock	3,125 m^2	Unknown - partially destroyed by severe wave erosion	Not Evaluated
CA-SBA-2107	Prehistoric	Large lithic scatter/midden with millingstone components; artifacts include two side-notched projectile points, three biface fragments, a quartizitic teshoa flake, several manos, a hammerstone, edge-rounded cobbles, two metates, & fire-affected rock	900 m^2	Unknown - partially destroyed by severe wave erosion	Not Evaluated
CA-SBA-2108	Prehistoric	Sparse lithic scatter; artifacts include chert bifaces, flakes, five projectile point fragments, a steep-edged scraper, and fire-affected rock	3,750 m^2	Unknown – highly disturbed by topsoil removal, surface erosion, and an existing campground	Not Evaluated
CA-SBA-2109	Prehistoric	Bedrock mortar site; artifacts consist of four bedrock mortars and a possible sandstone pestle	625 m^2	Unknown – area used by local girl/boy scouts	Not Evaluated
CA-SBA-2110	Prehistoric	Bedrock mortar	7.04 m^2	Unknown – possibly intact	Not Evaluated
CA-SBA-2114	Prehistoric	Lithic scatter; artifacts include three chert biface fragments and flakes	750 m^2	Unknown – graded road crosses the site	Not Evaluated
CA-SBA-2464	Prehistoric	Moderate density lithic scatter with shell midden; artifacts include debitage, cores, retouched flakes, biface fragments, Catalina Island soapstone bowl fragments, tarring pebbles, mano fragments, mortar fragments, a pestle fragment, *Olivella* shell beads, soapstone bead blanks and faunal remains	7,545 m^2	Unknown – trailer park partially built on portion of site; the Nature Center is built in center of site	Not Evaluated
CA-SBA-2510	Prehistoric	Lithic scatter with millingstone component (cupule rock); artifacts include two mano fragments, a quartzite hammer, flakes, and a fragment of fire-affected rock	966 m^2	Unknown	Not Evaluated
CA-SBA-2511	Prehistoric	Lithic scatter; artifacts include flakes, a metachert uniface and other unifaces, and retouched flakes	396 m^2	Unknown – portion of site destroyed by construction of SR 154	Not Evaluated
CA-SBA-2512	Prehistoric	Lithic scatter; artifacts include flakes, bifaces, and faunal remains	11,131 m^2	Unknown – damaged / bisected by SR 154	Not Evaluated

Table 3.5-2
Previously Recorded Isolated Artifacts

Number	Time Period	Description
ISO 37	Prehistoric	Monterey chert biface end fragment
ISO 38	Prehistoric	Monterey chert core
ISO 39	Prehistoric	Monterey chert core
ISO 40	Prehistoric	Double-sided metate edge fragment
ISO 41	Prehistoric	Cobble core hammer
ISO 42	Prehistoric	Bifacial fine-grained sandstone mano
ISO 43	Prehistoric	Thick sandstone bowl mortar fragment, a chert core, and quartizitic flakes
ISO 370	Prehistoric	Chert biface
ISO 473	Prehistoric	Green Franciscan chert secondary flake
ISO 474	Prehistoric	Sandstone bedrock grinding slick
ISO 667	Prehistoric	Light brown, edge-modified Franciscan flake

Table 3.5-3
Previously Recorded Historic Linear Resources

Site	Description	Time Period	Condition	NRHP Eligible
CA-SBA-2685/H	Recorded as the "San Marcos Pass Road," the primary transportation route within this region; composed of three features, the "Stagecoach Road," the "Stagecoach Road/County Road," and the modern SR 154.	1869 to present	Unknown	Not Eligible – lacked integrity
CA-SBA-2728/H	Recorded as the "Mission/Fremont Trail," this resource was identified, and historically reconstructed; is believed to have followed an old Chumash trail, and may have been used by Fremont when he marched into Santa Barbara in 1846.	1800 (?), 1846 (?)	No specific alignment or physical evidence of this route exists	Not Eligible – lacked integrity

As a result of West and Slaymaker's effort, it was determined that 24 sites would be directly or indirectly affected by the enlarged Bradbury Dam (West and Slaymaker 1987). Of these 24 sites, 15 were newly identified archaeological sites. In addition, eight isolated artifacts were discovered during the inventory.

Subsequent studies including those on Tequepis Point/Cachuma Lake County Park (Maki 1999, 2002; Osland 1992) have occurred in locations generally below the 800-foot contour line and thus within areas previously surveyed by West and Slaymaker (1987). The exception, however, was the archaeological survey of SR 154 (Farris 1992a, 1992b). This effort resulted in the identification of three additional prehistoric sites within the Plan Area.

Based on previous studies, it can be concluded that most of the accessible areas situated below the 800-foot contour, as depicted on the Cachuma Lake and San Marcos Pass USGS 7.5-

minute topographic quadrangles and the SR 154 corridor, have been previously inventoried for archaeological resources. Certain parts of the Plan Area, specifically lands above 800 feet in elevation and outside of the SR 154 corridor have not been previously inventoried. It is within these latter areas where it can be anticipated that the majority of undiscovered archaeological resources occur.

3.5.3 Regulatory Setting

The legal framework for addressing cultural resources at the federal and state level is generally equivalent. The four criteria for evaluation established by the National Register of Historic Places (NRHP), listed below, are identified in 36 Code of Federal Regulations (CFR) 60.4 and are in accordance with the regulations outlined in 36 CFR 800 established by the Advisory Council on Historic Preservation.

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

- Criterion A: resources that are associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: resources that are associated with the lives of persons significant in our past; or
- Criterion C: resources that embody the distinctive 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: resources that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Hence, these evaluating criteria are used to help determine what properties should be considered for protection from destruction or impairment (36 CFR 60.2).

Reclamation has developed a manual that discusses the application of cultural resource regulations as they apply to Reclamation properties. These regulations include the National Historic Preservation Act, Archaeological and Historic Preservation Act, Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, 36 CFR Part 800 (Protection of Historic Properties), 36 CFR 60 (NRHP), 36 CFR Part 79 (Curation of Federally Owned and Administered Archaeological Collections), Archeology and Historic Preservation: Secretary of the Interior's Guidelines, and the Secretary of the Interior's Standards for Rehabilitation and the Guidelines for Rehabilitating Historic Buildings.

3.6 HAZARDOUS MATERIALS

3.6.1 Regional Setting

Land uses within the region include Cachuma Lake and its dam, campsites, general store, marina and launch ramp, private docks, bait and tackle shop, horse campsites, rustic amphitheater, trailer storage yard, permanent and transient mobile home park, Nature Center, County Park Ranger

Station, Live Oak Camp, family center, swimming pools, and snack shop. The north side of the lake consists of open space that is leased for grazing and permitted equestrian use. It is not open to general public access. The marina and the general store both sell gasoline.

3.6.2 Plan Area Existing Conditions

An evaluation of potential recognized environmental conditions within the Plan Area and study area was conducted. The evaluation was conducted using readily available public information. The term "recognized environmental conditions," as defined by American Society for Testing and Materials Designation E 1527-00, means:

> [T]he presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimus* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimus* are not recognized environmental conditions. [American Society for Testing and Materials 2000]

The evaluation of hazardous materials in the study area was conducted through interviewing knowledgeable persons in the area. No hazardous sites are known within the Plan Area.

3.6.2.1 Interviews

The Cachuma park operations manager for Santa Barbara County was interviewed (Medeiros 2010). To his knowledge no recognized environmental conditions exist at Cachuma Lake. He stated the following hazardous materials are stored and used at the park, in accordance with state and federal regulations. These materials are: oxygen and acetylene for welding, paint (95 percent of the paint is water based), herbicides, and a 50 gallon aboveground diesel tank with its own self-containment center at the maintenance yard; gasoline for sale at the general store and at the marina; liquid chlorine for sanitizing pool water and drinking water, and muriatic acid to maintain pH levels in the pools.

Hypochlorite is used for water treatment at the Plan Area's water treatment facility. Owned and operated by the County of Santa Barbara, this plant supplies potable water to the County Park and Camp Whittier located 0.25 mile south of the County Park. The plant's storage and use of hypochlorite is regulated under California Department of Public Health and California Occupational Safety & Health Administration guidelines, which includes but is not limited to having a risk management plan, a contingency plan, alarms, and proper notification processes. Access to areas near the treatment plant is restricted.

3.6.2.2 Naturally Occurring Asbestos

According to California Geological Survey mapping, there is no naturally occurring asbestos or ultramafic rock in the vicinity of Cachuma Lake (California Geological Survey 2000).

3.6.3 Recognized Environmental Conditions

Based on the results of the investigation, no recognized environmental conditions were observed or discovered in the study area.

3.7 VISUAL AND SCENIC RESOURCES

3.7.1 Regional Setting

Cachuma Lake is located in the Santa Ynez River Valley, flanked by the Santa Ynez Mountains on the south and the San Rafael Mountains on the north. It is located north of Santa Barbara, in Santa Barbara County, off SR 154 along Paradise Road. The topography of the Plan Area is complex, and ranges from gentle to very steep. The Santa Ynez Valley with alluvial stream terraces on each side of the river are now located beneath the reservoir. Hence, the lakeside topography is dominated by gentle to steep hills that are interrupted by deep side canyons associated with tributaries to the river creating scenic vistas across the lake to the north. Three major side canyons on the north side of the lake exhibit these very steep canyon walls - Johnson, Cachuma, and Santa Cruz canyons. These canyons create dramatic views from the south shore and the lake. The numerous small tributaries on the south side of Cachuma Lake (e.g., DeVaul and Tequepis creeks) do not create as dramatic an affect.

Major visual and scenic features of the Plan Area include the following:

- Santa Ynez Point – a large, flat peninsula at the east end of the lake
- Arrowhead Island – small peak that extends about 70 feet above the lake
- Storke Flats – a small, unlabelled alluvial terrace on the south side of the lake, west of Arrowhead Island
- Santa Cruz Point and Santa Cruz Bay
- Cachuma Point and Cachuma Bay
- Tequepis Point – tip of large peninsula where the County Park is located
- Bradbury Dam – 279-foot-high, 766-foot-long earthen dam completed in 1956

SR 154 travels along the length of the south shore of Cachuma Lake and is designated as a scenic highway in Santa Barbara County. Views of the north shore of Cachuma Lake are visible from SR 154. No other byways or wild and scenic rivers exist in the vicinity of Cachuma Lake. The Santa Barbara County General Plan encourages development of scenic roads and protection of quality scenic landscapes visible from scenic roads.

3.7.2 Plan Area Existing Conditions

Scenic values are an important feature of Cachuma Lake. Overall, the existing visual quality of Cachuma Lake is high. The dominant visual attractions are scenic overlook for Bradbury Dam, the steep slopes along Cachuma Bay and Santa Cruz Bay and Johnson Canyon with the Los Padres National Forest in the background. These views are visible from the south shore of the lake, Cachuma County Park, Santa Ynez Peninsula, Arrowhead Island, and SR 154. These lands are within the Plan Area controlled by Reclamation and managed by Santa Barbara County. The Los Padres National Forest in the background is owned and managed by the USFS. The lands within the Plan Area and surrounding the lake are owned and controlled by the federal government or designated and zoned for open space or agriculture with a large parcel size (Section 3.8.1.1); therefore, it is unlikely urban or other development would encroach on these open lands and disrupt the scenic beauty.

Oak woodlands occupy most of the lands around the south shore of the lake. The oaks are denser near the Yurts, Barona, and Pawnee Plateau campgrounds. These oak woodlands provide a natural setting for the camping areas and a scenic focal point along the lake where single or small groups of oaks provide a unique point of interest. These areas are within federally controlled lands as well.

The Cachuma Project consists of potential modifications to Reclamation's water right permits for the Cachuma Project to provide appropriate protection of downstream water rights and public trust resources on the Santa Ynez River. Because this project has been initiated to satisfy a 1994 Memorandum of Understanding between Reclamation and various other government agencies and private parties, it is reasonable to assume that this project will occur within the 20-year timeline of this plan. The Cachuma Project includes Bradbury Dam, which impounds water on the Santa Ynez River in northern Santa Barbara County, forming Cachuma Lake. The Cachuma Project raises the level of the lake with up to a 3-foot surcharge. This surcharge level would result in the loss of oak trees along the margins of Cachuma Lake. The Draft Environmental Impact Report (EIR) prepared for the project estimates the loss of oak trees at 452 oaks within the 3-foot surcharge zone (SWRCB 2007). The Draft EIR has designated the loss of oaks as a significant impact under CEQA. The Cachuma Lake RMP is not responsible for mitigating the loss of oaks, but needs to evaluate the existing visual setting taking into account this potential loss of oaks around the margin of the lake. The Cachuma Project is mitigating for this impact with a phased 20-year planting and monitoring program designed to achieve a final 2:1 replacement ratio for all trees affected by the surcharge project.

3.8 LAND USE

3.8.1 Regional Setting

The Plan Area is located on federal lands within Santa Barbara County and regionally within the Santa Ynez River watershed. Within the Santa Ynez River watershed, lands are primarily in private ownership under the land use jurisdiction of the County of Santa Barbara. The Los Padres National Forest is located within the upper reaches of the watershed north, south and east of Cachuma Lake (see Figure 1-3). With the exception of recreational areas (campgrounds and day use areas) and associated access roads, lands within the National Forest boundary consist of undeveloped open space.

Along the Santa Ynez River from east to west (upstream to downstream) is the unincorporated community of Santa Ynez, the Santa Ynez Indian Reservation and the incorporated cities of Solvang, Buellton, and Lompoc (see Figure 1-1).

Existing land uses in the watershed include undeveloped open space, recreation, irrigated and nonirrigated agriculture, rural residential, urban, commercial, industrial, and mineral extraction (quarries, strip mines, and oil fields). Open space areas include the National Forest lands in the eastern area of the watershed and undeveloped lands in private ownership. These private undeveloped lands generally occupy the steeper portions of the watershed. Agricultural land uses occur throughout the watershed generally occupying the Santa Ynez River valley with cattle grazing extending on to the adjacent watershed slopes.

Higher density residential development is associated with the incorporated cities (Solvang, Buellton, and Lompoc). Rural residential and residential ranchettes border the cities and provide the transition into the agricultural areas. Commercial and industrial land uses within the watershed are also generally associated with the incorporated cities.

3.8.1.1 Regulatory Setting

As the Plan Area is in unincorporated Santa Barbara County, the Santa Barbara County Comprehensive Plan is the primary local planning instrument for land use. The Land Use Element of the Comprehensive Plan was adopted in 1980 and republished in May 2009.

While the Plan Area is composed of federal lands not subject to county regulations (Johnson 2010), the management elements of RMP planned activities are consistent with applicable Santa Barbara County planning policies and reinforce county goals for land use and preservation.

Land Use Designations

The Comprehensive Plan land use map for the "Santa Ynez Valley Rural Region" designates the majority of the Plan Area as Open Lands and a large portion of the South Shore as Recreation.

Open Lands. The Comprehensive Plan Land Use Element contains regional planning goals for Open Lands establishing their importance for grazing, watershed, wildlife habitat, mineral resources, recreation, and scenic qualities. The Open Lands designation applies to Cachuma Lake and all surrounding lands except for portions of the South Shore described below for the Recreation and AG-II designations.

Open Lands are mainly remnants of past land use designations that were not included in recent General Plan updates, and for the most part, are federal or state-owned lands (Pendl 2010). It is a general category of land uses, containing such uses as agriculture and mountainous areas. Policies encourage open lands conservation and preservation, utilization consistent with watershed protection, and recreational uses involving minimal environmental degradation.

The RMP Preferred Alternative (Alternative 2) would allow for land uses consistent with the goals of grazing, wildlife habitat, recreation and scenic qualities. The Preferred Alternative would include primitive trail development, minor clearing of brush, slope stabilization, and placement of small signage on the North Shore. It limits public access to watershed and rangeland areas and provides the public with low-impact, limited day use activities requiring permits and/or guides. Enhanced recreational uses could be offered at established activity areas

such as Live Oak Camp; however, none of the planned activities fall outside of the county's allowable land uses set forth in the Comprehensive Plan.

Recreation. The Recreation land use designation provides opportunities for various forms of outdoor recreation which require access to open spaces and natural settings for their realization. This designation applies to the South Shore between approximately Cachuma Dam and 1,000 feet southeast of the Intake Gaging Station east of Storke Flats, including the County Park and Camp Whittier.

While Comprehensive Plan policies make specific recommendations for the acquisition of additional sites and the development of existing sites to meet indoor and outdoor recreation needs identified, it does not provide site-specific design for proposed and existing sites which are not master planned. The Comprehensive Plan describes Cachuma Lake as one of only 2 sites within the Santa Barbara County Park System to provide camping and that expansion of facilities are possible and being explored in a new master plan for the area. Recreational uses in these designated areas include, but are not limited to: public parks containing facilities for picnicking, camping, riding, hiking, walking, biking, on a day or longer use basis; flood control easements providing access to and along stream channels and other drainage areas; and golf courses. Structures and other facilities are to be limited to those required to support the recreational activities of the area. These may include parking areas, corral, stables, picnic and camping areas, trails, water and sanitary facilities, safety and first aid stations, ranger stations, and limited concession facilities. The Plan states that other recreational structures and facilities of a more intensive nature, such as swimming and tennis clubs, may be permitted, but that more intense commercial recreational development shall be limited to areas classified as commercial.

The RMP Preferred Alternative is designed to offer enhanced recreational opportunities to users while protecting water quality and enhancing natural resources. The purpose and need for the RMP includes providing recreational opportunities to meet the demands of a diverse population. This objective is consistent with County's stated responsibility to provide recreational and other facilities to improve quality of life, and the Congressional policy that full consideration be given to any opportunities for outdoor recreation and for fish and wildlife enhancement (Federal Water Project Recreation Act (Public Law 89-72, 89th Congress, S.1229, July 9, 1965, 79 Stat. 213, 214; as amended by Public Law 93-251, March 7, 1974, 88 Stat. 33, Sec. 77; and Public Law 102-575, October 30, 1992, 106 Stat. 4690, Title XXVIII). The RMP is also consistent with county policy concerning potential environmental impacts associated with facilities that may be placed on these lands, and would require that the local managing partner conduct appropriate site-specific environmental review for most of the new or expanded recreational activities identified (see Section 2.4.2). None of the planned activities for the Recreation designated lands fall outside of the county's allowable land uses set forth in the Comprehensive Plan.

Other Applicable Land Use Policies. Additional Santa Barbara County land use policies relevant to the RMP project include those related to watershed protection, streams and creeks, flood hazard areas, parks, visual resources, and public facilities.

Hillsides, Watersheds, Stream and Creeks. Santa Barbara County Comprehensive Plan policies specifically related to hillside and watershed protection include minimizing alteration of natural terrain, preservation of natural features, erosion prevention, and protection of water quality from sediment and development related waste. Policies related to the protection of streams and creeks

state that all permitted construction within stream corridors shall be designed to minimize impacts from increased runoff, sedimentation, biochemical degradation, or thermal pollution.

Flood Hazards. Policies specific to flood hazard areas seek to avoid exposing new developments to flood hazards and reduce the need for future flood control protective works**.** The applicable Flood Insurance Rate Map indicates that the Plan Area falls within two zones, Zone A and Zone X. Cachuma Lake and Arrowhead Island are in Zone A, where no base flood elevations were determined. The lands surrounding Cachuma Lake are in Zone X. These areas have been determined to be outside the 0.2 percent annual chance floodplain (FEMA 2005). RMP activities would comply with the Santa Barbara County Flood Plain Management Ordinance as well as applicable state and federal regulations.

Parks and Recreation. Additional Santa Barbara County Comprehensive Plan policies relevant to Parks and Recreation encourage the provision, preservation, and improvement (wherever compatible) of bikeways, fishing, hiking, and equestrian trails in an effort to meet the needs of local residents.

The RMP preferred alternative shares these goals and seeks to offer these recreational opportunities while also enhancing natural resource protection in the Plan Area.

Visual Resources. Comprehensive Plan policies regarding visual resources in areas designated as Rural focus on the design of structures and signs being compatible with the character of the surrounding natural environment so as not to detract from scenic views. The development of public facilities is also discussed in plan policies as being necessary to provide public services within defined Rural and Inner-Rural Areas. Policies state that when a public agency proposes that a facility be located in a Rural or Inner Rural Area, conformity with the Comprehensive Plan is determined based upon whether the public interest and greatest public good require the project, balancing potential inconsistencies with other elements and policies of the Comprehensive Plan.

Zoning Designations

The Santa Barbara County Land Use & Development Code & Ordinance 661 zoning map for the "Santa Ynez Valley Rural Region" designates the Plan Area as General Agriculture (100-AG).

The 100-AG zoning designation that applies to the Plan Area has been replaced in other parts of the county with AG-I, AG-II, AG-III, etc. under the Ordinance 661 Consistency Rezone Project. The project involves Comprehensive Plan and Zoning Ordinance amendments that would rezone current Ordinance 661 zoned rural lands (100-AG and others) to a comparable agricultural zone district under the Land Use Development Code (LUDC). The county completed extensive 661 rezones in the Santa Ynez Community Plan boundary, but the area has not yet extended into the upper reaches of the Santa Ynez Valley, specifically those areas surrounding Lake Cachuma. A rezone of remaining 100-AG designated lands can be initiated by the County Board of Supervisors or owners of applicable lands.

While the residual 100-AG zoning designation does not describe recreational uses other than riding as allowable, the comparable agricultural zone district AG-II-100 allows for Rural recreation with accompanying Conditional Use Permit (CUP). Examples of low intensity recreational development within inland areas include recreational camps, hostels, campgrounds, retreats, guest ranches, trout farms, rifle ranges, and duck shooting farms.

RMP planned activities follow Santa Barbara County Land Use & Development Code CUP standards in offering recreational opportunities in character with the rural setting. The Preferred Alternative (Alternative 2) would improve and upgrade public facilities as well as entrance/exit roads to accommodate increased use while development of added campsites or day use facilities will be the option of the local managing partner as discussed in Section 2.4.2.1.

3.8.2 Plan Area Existing Conditions

Approximately 6,200 acres of land immediately surrounding Cachuma Lake comprise the Plan Area of this RMP. The Plan Area consists of federal lands owned by the Reclamation, which are administered by the Santa Barbara County Parks Department under contract to Reclamation. Land use/land cover within the Plan Area includes recreation, undeveloped open space (open lands and open water), and agriculture (grazing).

3.8.2.1 Rangeland and Open Space

The north side of the lake consists of open space that is leased for grazing and permitted equestrian use. It is not open to general public access. In fact, much of the Plan Area includes large expanses of undeveloped rangelands. Much of this land has steep terrain and is managed for open space, watershed, and wildlife habitat. However, the areas with gentle topography and grasslands have been historically grazed. The primary management issue is the selection of the most appropriate grazing practices to ensure sustainable grazing while protecting the watershed conditions and habitats. Grazing has many incidental benefits to the land, such as fuel reduction and protection from wildfires, maintenance of diverse mixtures of grasslands and scrublands, and ongoing presence in remote areas that discourage trespassing and poaching. However, poor grazing practices can harm soils and vegetation, and adversely affect water quality in the lake. The RMP management actions must balance the benefits of grazing with potential detriments.

3.8.2.2 Cattle Grazing

Four livestock grazing lease areas exist within the Plan Area as administered locally by the County of Santa Barbara. Lease 1 (Lausten Lease) is located north-northeast of Cachuma Lake and encompasses 2,956 acres. Leases 2 (Bacon Lease), 3 (Geremia Lease), and 4 (Carr Lease) are south of the lake and comprise 102 acres, 172 acres, and 220 acres, respectively (see Figure 3.8-1).

Cattle grazing distribution across the leases are quite variable due to topographic, soil, and vegetative cover variations and the sparse locations of permanent developed livestock water sources. Lease 1 has been traditionally used primarily as a stand-alone seasonal (November into June) cattle grazing operation while the other leases are grazed year-around, with no public access, as part of adjoining ranch operations. Horses are also grazed on part of the Geremia Lease.

Lease 1 (Lausten Lease) has a seasonal stocker cattle operation where approximately 330 to 350 head are brought onto the property sometime in the fall (usually November) and are removed in early summer (usually June). The actual number of head varies depending on rainfall and forage conditions. Livestock water sources are a limiting factor to cattle distribution. Stockponds, the major source of water, often dry up early in the season. Ranch horses are grazed year round in

the holding field on the northeast corner of the lease. Permitted equestrian uses on the north shore do not interfere with the existing cattle grazing operation (Lausten 2002).

Lease 2 (Bacon Lease) is grazed in combination with an adjoining 700-acre ranch. One small stockpond provides livestock water during adequate rainfall periods. Livestock water is currently provided from water troughs on the adjoining ranch. Both cattle and horses are grazed year-round on the west portion of Lease 3 (Geremia Lease), and the east portion is grazed seasonally by cattle. Lessee-provided water troughs within the lease boundary provide livestock water. Lastly, Lease 4 (Carr Lease) is also grazed year-round by cattle in conjunction with the private ranch to the south. No livestock water is available on the lease so water is provided from the adjoining ranch.

A Rangeland Assessment and Grazing Management Plan was conducted and produced in 2003 (Sage Associates 2003) to assess existing rangeland conditions and to identify suitable grazing areas (see Figure 3.8-2), operational management standards and improvements, and proposed master plan uses for the lease areas. The assessment found all the current lessee range and livestock management practices to be acceptable.

3.8.2.3 Fire History

The Santa Barbara County Fire Department (SBCFD) has records beginning in the early 1900s of the fires that have occurred within the Cachuma watershed (Figures 3.8-3 and 3.8-4). The records include the area, perimeter, acreage, date, and the cause of each fire. The most recent, the Zaca fire, began on July 4, 2007, and was the second-largest fire in California history. Caused by sparks from grinding equipment on private property, the Zaca fire burned 240,207 acres of the Los Padres National Forest, including area within the watershed of Cachuma Lake, before the fire was declared controlled on October 29, 2007.

Four natural fires have occurred within or near the Cachuma RMP area within the past 6 decades. These include the Brad Fire of 1979 (136 acres) on the southwest side of lake, the Cachuma Fire of 1977 (2,250 acres) approximately 7.5 miles north of the lake, the Refugio fire of 1955 (79,429 acres) on the southeast end of the lake, the San Marcos Fire of 1944 (12,190 acres) throughout the northeast and southeast ends of the RMP area. The wildfires that have occurred closest to the lake in the most recent past are the Janeway Fire of 1997 (445 acres), just north of the northern RMP boundary, above Cachuma Bay, and the Marre Fire of 1993 (43,800 acres), just over 6 miles north of the lake (Figure 3.8-4).

The SBCFD has detailed records of controlled burns conducted by the Rangeland Improvement Association (RIA) and the Vegetation Management Program (VMP) since 1989 (Figure 3.8-5). From 1989 to 1999, RIA planned 56 controlled burns, ranging from 80 acres to 9,050 acres. Twenty-eight controlled burns were completed and approximately 22,415 acres were burned. During the same decade, VMP planned 16 controlled burns, ranging from 320 acres to 7,500 acres. Only seven controlled burns have been completed by VMP since 1989, totaling approximately 11,890 acres.

3.8.2.4 Fire Management and Hazards

On July 10, 1953, the "Big Dalton" fire started near Cuyama and burned toward Santa Maria, burning over 73,000 acres. This fire was instrumental in initial formation of the RIA. Concerned

ranchers and cattlemen in the northern portion of Santa Barbara County founded RIA in 1955. Today the RIA is organized for the purpose of improving brush covered and other range areas in the county. Controlled burning, mechanical clearing, chemical treatment, and reseeding improvement are used to accomplish this purpose. Regular members are landowners and ranch operators in the County and associate members are anyone interested in the program; however, such members do not have the privilege of voting. Members must have a specific level of insurance that includes personal liability, medical coverage, broad form property damage, and contractual liability coverage. Community advisory committees are appointed as needed in representative areas.

The RIA coordinates with the Farm Advisor, County Fire Chief, CDF, USFS, and other interested agencies. The RIA has a published document of their bylaws and rules that specifies the association's purpose, directors and officers, their duties, and the duties of the executive committee and the members. Also included in this document are the crew's job and the responsibilities of landowners or ranch owners before and during burning. Lastly, the Application for Permit to Burn is included. The application must be submitted to SBCFD before the RIA can conduct the burn.

Although the USFS lands fall outside the boundary of the County-managed Reclamation's land around the lake where the RMP is focused, the National Forest is immediately adjacent to Reclamation lands. Due to the close proximity of the USFS lands, fires within the Los Padres Forest can directly impact the lake and the RMP area. The Los Padres Forest, which spans from Ventura to Monterrey, is divided into five separate districts: Monterey, Santa Lucia, Santa Barbara, Ojai, and Mount Pinos. Only one office serves the Santa Barbara Ranger District, which is located at 3505 Paradise Road, approximately 3 miles east of SR 154. This office also serves as a fire station. The Santa Barbara Ranger District spans from Figueroa Mountain to Ventura.

Fifteen fire stations are affiliated with the SBCFD. Fire Station 32, located on Airport Road in Santa Ynez, CA, is the station closest to Cachuma Lake and is also the station that responds to wildfires around the lake. Station 32 follows an "automatic response" when notified of any wildland fire in the area, despite the fact that the Reclamation Land's are not the ultimate responsibility of the SBCFD because they are federal lands as opposed to state lands. The initial automatic response from the SBCFD to the area around Cachuma Lake is as follows: Four Type III Engines, two Bulldozers, one water tender, one helicopter, one Chief Officer, and one hand crew from either CDF or Vandenberg if available. If the situation warrants, the Initial Attack Incident Commander orders additional alarms or equipment.

Access to the wildlands around Cachuma Lake is well defined and the response time is relatively fast (approximately 15 minutes) due to the close proximity of the fire station to the lake. The fire response team uses Happy Canyon and Alisos Canyon Roads from SR 154 to access the north side of the lake. The privately owned ranches on the north side of the lake coordinate with the SBCFD and the USFS to allow use of their private roads to access more remote areas north of the lake. Due to the fact that most of the ranchers in the area actively participate in the VMP and the RIA, which also assist in managing controlled burns in the area, they are supportive of the SBCFD and the USFS in managing fires.

U.S. Forest Service – Los Padres National Forest

USFS has seven fire stations in the Santa Barbara area. The stations are located on: (1) San

Marcos Pass, (2) Paradise Road (Los Prietos Station), (3) Airport Road in Santa Ynez (coincides with SBCFD), (4) Figueroa Mountain, (5) Foothill, (6) Rincon, and (7) Gibraltar, co-located with SBCFD at Montecito station. The USFS Fire Station on San Marcos is the closest station to the lake, and therefore would likely be the station to respond to a wildfire near the lake. The estimated response time from the San Marcos station is approximately 10 minutes. However, both the Paradise Road station and the Santa Ynez Airport station are also located nearby, and are available for response to wildfire near Cachuma Lake within 15-20 minutes.

When a wildfire does take place within the Reclamation's lands around the lake, the management agency with direct responsibility is the SBCFD. However, the Los Padres National Forest Headquarters follows a "mutual aid response" to areas where a mutual threat occurs, even if the fire is on county land. Therefore, when a fire occurs on county land, the USFS sends the following equipment by agreement with the SBCFD: Two type III engines, one hand crew (usually 20 people), one Chief Officer, and one air tactical group supervisor (air attack aircraft). If a wildfire occurs within the Los Padres National Forest, the response includes: Five type III engines, two Chief Officers, one hand crew, one patrol car (a small truck with a small back-up water tank and pump), three helicopters, one air tanker, one air attack supervisor, one dozer, and one water tender.

Access to fires in the USFS lands is obtained via Happy Canyon and Alisos Canyon Roads, along with permitted passage on ranchers' lands. San Fernando Rey Ranch is a privately owned ranch often used for access to wildfires north of Cachuma Lake as well as controlled burns in the area. Los Padres Forest also borders the south side of the lake, where several access roads are available directly from SR 154.

The CDF's Fire and Resource Assessment Program identifies emerging resource issues on wildlands, analyzes the results of different types of land use and management on wildland conditions, reviews and evaluates policies by federal, state, and local agencies as they relate to wildland protection, and identifies and analyzes policy options for the Board of Forestry and Fire Protection. The program has established a statewide GIS of biological physiographic, demographic, and other types of data needed to address CDF's mission, including information on vegetation, wildlife, soils, watersheds, fire behavior, and ownership.

CDF, through the Fire and Resource Assessment Program, has developed a methodology to assess and rank fuel (vegetation) for the California Fire Plan to identify and prioritize fuel management projects (to be conducted by VMP and/or other agencies) that reduce the potential for large catastrophic fire. The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). The procedure makes an initial assessment of rank based on an assigned fuel model and slope, and then refines ranks based on the amount of ladder and/or crown fuel present to arrive at a final fuel rank.

The vegetation types around Cachuma Lake have been determined (see Section 3.4.3); however, the vegetation structure around the lake has not been recently surveyed. Ladder and crown fuel indices are not available data to assess the fire hazard at Cachuma Lake. Therefore, the surface rank, determined by a fuel model class and slope, was used in a recent modeling effort, conducted by URS Corporation, to assess the potential fire hazard around Cachuma Lake.

The combination of vegetation (surface fuel model classes), fire history, slope and aspect resulted in a final "surface rank" map that depicts low, medium and high levels of fire hazard

around Cachuma Lake (Figure 3.8-6). The map demonstrates that the different factors taken into account for assessing fire hazard all play a role. The fire hazard assessment concludes that the areas around Cachuma Lake that appear to pose a high fire hazard are mainly areas that have not burned within the past 5-10 years, and areas with steep, south-facing slopes. The surface rank map depicts a relatively large concentration of high hazard areas on the northwest end of the lake, and west of Cachuma Bay, as well as immediately east of Cachuma Bay. These general areas, therefore, should be a focus point for fire management at Cachuma Lake.

3.8.2.5 Built Up Areas

Several portions of the Plan Area have more intensive land uses than agricultural/rangeland and open space. The 375-acre County Park is located on a peninsula on the south side of the lake. Facilities include paved roads throughout the Park, campsites, a general store, a marina and launch ramp, private docks, a bait and tackle shop, horse campsites, a rustic amphitheater, a trailer storage yard, a permanent and transient mobile home park, a Nature Center, a County Park Ranger Station, Live Oak Camp, a family center, swimming pools, and a snack shop. The County Park is a semiurbanized area with water, wastewater, electrical, recreational, and communication facilities. The infrastructure of the park is old and in need of repair and upgrading. Hence, a management issue is related to providing reliable public services and infrastructure that ensures public health and safety.

Live Oak Camp is located just east of Cachuma Lake, adjacent to the San Marcos Golf Course. With 20 acres of grassland and oak groves, it is ideal for festival events featuring overnight camping. The Camp can accommodate up to 1,500 campers in an “open site” fashion, and an additional 2,000 noncamping patrons on a daily basis. Live Oak also is open to exclusive getaways for clubs, organizations, and extended family reunions. A large kitchen and eating space with roof and concrete floor features a walk-in refrigerator, sinks, stoves, ovens, and large barbecue grills. Two-hundred fifty guests can be served at the picnic tables, and thousands more about the open grounds of the Camp. The Camp recently installed a new 25,000-gallon water well, as well as a leach field for a pending new shower/restroom facility. The Camp also offers an equestrian ring and chutes. Chemical restrooms, hot water showers, and a pay telephone are provided.

One-quarter mile before the entrance to the Plan Area is Camp Whittier. The camp is a nonsectarian camp operated year-round, 7 days a week, by United Boys & Girls Clubs of Santa Barbara County and is available to: Boys & Girls Clubs, youth groups, school retreats and conferences, organizational conferences and meetings, church groups, high school and college groups, family reunions and corporate groups. The private, tucked-away 55-acre resident camp is bordered by hiking trails and hosts an abundance of wildlife in an oak woodland area. Cachuma Lake and its amenities are within easy walking distance.

The Santa Barbara Outdoor School is located at Rancho Alegre Boy Scout Camp in the Santa Ynez Mountain Range, across from Cachuma Lake. The Outdoor School is an environmental education program owned and operated by the Los Padres Council, Boy Scouts of America. The Outdoor School was originally owned by the Santa Barbara County of Education and has been in operation for over 43 years. Primarily, the Outdoor School Program is education in the out-of-doors.

3.8.2.6 Indian Trust Assets

As a Federal land management agency, Reclamation is responsible for identifying and considering potential impacts of its plans, projects, programs, or activities on Indian Trust Assets. Indian Trust Assets are legal interests in property held in trust by the United States for Indian Tribes or individuals. The nearest Indian Trust Asset is a Public Domain Allotment approximately 6 miles southwest of the Plan Area (Rivera 2010).

3.9 RECREATION

The Plan Area encompasses approximately 9,250 acres, including Cachuma Lake (3,043 acres at full level) and the surrounding shores and hillsides that are federal (Reclamation) lands. Santa Barbara County Parks Department manages the Plan Area pursuant to a management agreement between Reclamation and the County. This agreement was to expire in 2003 but was extended through the completion of the RMP process.

Cachuma Lake is widely known for its natural, scenic qualities. It is also one of Southern California's favorite bass and trout fishing lakes. No body contact sports such as swimming or waterskiing are currently allowed. The 375-acre County Park is located on a peninsula on the south side of the lake (see Figure 3.9-1). Facilities include campsites, general store, marina and launch ramp, private docks, bait and tackle shop, horse campsites, rustic amphitheater, trailer storage yard, permanent and transient mobile home park, Nature Center, County Park Ranger Station, Live Oak Camp, family center, swimming pools, and snack shop. The north side of the lake consists of open space that is leased for grazing and permitted equestrian use. It is not open to general public access.

3.9.1 Regional Setting

The Plan Area is a small part of the larger Santa Ynez Recreation Area, managed by the Los Padres National Forest, located north of Santa Barbara off SR 154 along Paradise Road. The key feature is the Santa Ynez River, the longest stretch of free-flowing river with public access in Southern California. Picnicking, camping, fishing, hiking, and horseback riding are some of the area's popular activities. Campgrounds and picnic areas fill up on holidays and summer weekends, but weekdays are quieter. Several trailheads are located in the area, which are open to hikers, mountain bicyclists, and horseback riders. They are used for short day trips and for access to backcountry and wilderness campgrounds. Equestrians may reserve sites at Upper Oso and Sage Hill campgrounds, both of which have corrals and horse trailer parking.

3.9.1.1 Brief History

After Reclamation constructed Bradbury Dam, the County of Santa Barbara agreed to manage recreation at the federally owned reservoir. A 50-year contract between Reclamation and the County, titled Agreement to Administer Recreation Area (Contract No. 14-06-200-600) was executed in January 1953. According to the contract, the County would develop, maintain, and administer recreation according to a recreation plan, prepared by the County, and approved by the National Park Service and Reclamation. The original plan specified a 375-acre County Park on the south side of the lake. The contract allows modifications to the recreation plan by either Reclamation or the County provided both parties agree and the National Park Service approves

the modification. The contract prohibits the County from adding any additional service or facility to the Plan Area that is not included in the plan. Funding for operations, maintenance, and administrative costs at the Plan Area is the responsibility of the County. The contract has been extended through the completion of the RMP process.

According to this contract, the County is responsible for controlling and regulating all licenses and leases regarding recreation services and facilities, and for uses such as grazing and cultivation. The County is authorized to make and enforce rules at the Plan Area to prevent pollution, protect visitor health and safety, law and order, plants and wildlife, and to protect and conserve the scenic, scientific, aesthetic, historic and archaeological resources of the area. Rules and regulations made and enforced by the County at the Plan Area must be consistent with local, state, and federal rules and regulations.

The current contract requires the County to create a reserve fund from a portion of the net income derived from Plan Area operations. Reserve fund money is used by the County to develop and maintain the recreation area. Reclamation and the County agree upon the amount of money set aside in the reserve fund. In most years the County revenues have not exceeded expenditures.

3.9.1.2 Recreation Comparison (Other Lakes in the Region)

Other lakes in the region offer other water based recreation opportunities (see Figure 3.9-2). Three lakes are located south of Cachuma Lake within 120 miles that have recreation opportunities: Lake Casitas, Lake Piru, and Lake Castaic. To the north of Cachuma Lake four lakes are located within 200 miles with recreation opportunities: Santa Margarita Lake, Lake Lopez, Lake Nacimiento, and Lake San Antonio. An overview of these different recreational areas is provided below.

A comparison of the regional recreation opportunities is summarized in Table 3.9-1, and the differing special events and educational opportunities provided at each lake is summarized in Table 3.9-2.

Southern Lakes

Lake Casitas

Lake Casitas is located between Santa Barbara and Ventura below the Laguna Ridge of the Santa Ynez Mountains at elevation 1,500 feet. It is approximately 50 miles southeast of Cachuma Lake. The lake is formed by Casitas Dam, which creates approximately 2,500 surface acres of water. It has over 30 miles of fishable shoreline and 6,200 acres of oak trees and rolling hills. The lake is filled with trout, bass, catfish, crappie, and sunfish. During the winter months the lake is stocked with additional trout.

Casitas Municipal Water District manages Lake Casitas as a drinking water reservoir, and therefore no body contact is allowed. Boating, however, is allowed and rentals are available at the full service marina. Rentals include passenger motorboats, pontoon, and private mooring. Several large fishing docks give shore anglers access to the plentiful fish, and three fish cleaning areas are available. The north shore of the lake has 458 campsites, 141 of which have electric and water hookups for RVs. The park also has 12 picnic areas with tables, barbecues, running water and shelters.

Table 3.9-1
Regional Recreation Opportunities

Lake	Boating	Fishing	Camp	Picnic	Swim	Water Sports*	Hiking	Biking	Horses	Other
Cachuma	√	√	√	√			√	√	√	Swimming Pool, Miniature Golf Course
Lopez	√	√	√	√	√	√	√	√	√	Water Slide
Margarita	√	√	√	√			√	√	√	Swimming Pool 1 mile From Park
Nacimiento	√	√	√	√	√	√				None
San Antonio	√	√	√	√	√	√	√	√	√	None
Casitas	√	√	√	√			√	√	√	RC Airplane Airfield, Water Park, Swimming Facilities
Piru	√	√	√	√	√	√	√	√	√	None
Castaic	√	√	√	√	√	√	√	√	√	CSUN Sailing Lessons

*Body contact water sports, other than swimming, including waterskiing, windsurfing, personal watercraft, etc.

Table 3.9-2
Special Events/Educational Opportunities

Lake	Nature Walks	Bird-Watching	Wildlife Tours	Astronomy Programs	Fireside Theatre	Water Tours	Movies	Other
Cachuma	√	√	√	√	√	√	√	Jr. Ranger Program
Lopez	√	√	√			√	√	Fishing Clinic, Triathlons, Campfire, And Litter Prog.
Margarita								None
Nacimiento								None
San Antonio	√	√	√		√	√	√	None
Casitas	√	√	√			√		Center For Earth Concerns, small water park, swimming facilities
Piru	√							None
Castaic								Triathlons, Drag Boat Races, Boat Parades

Other than boating, kayaking, fishing, camping, and picnicking, a variety of other recreational activities is available at Lake Casitas. Bike rentals are offered near the main gate. Paved and dirt

roads that adjoin the 4 miles of campgrounds are excellent for leisure bike rides, as well as scenic SR 150 that leads along the west and north shores of the lake. Hiking is also an attraction, as the Ojai Valley trail is within 3 miles of the recreation area and runs 8.8 miles from Ojai to Foster Park in Ventura.

Lake Piru

Lake Piru is located in Ventura County, in the Los Padres National Forest next to the Sespe condor Sanctuary. The recreation area is less than an hour away from Ventura and approximately 100 miles from Cachuma Lake. The nearest town is Fillmore, located just 6 miles south from the lake. The natural setting of the area is mostly grassland and chaparral, with a few oak and pine trees. The lake is 4.1 miles long with an average width of 1 mile, which equates to 1,200 surface acres of water. The Lake provides water conservation, flood control, hydropower, seawater intrusion abatement, groundwater recharge, recreation, irrigation, municipal, and industrial water supplies.

In addition to fishing, waterskiing can also be enjoyed all year on the lake. Segregated areas exist for both high-speed boating and fishing. Day use picnic areas and camping are also offered. Swimming is restricted to the designated beach area on the northwest side of the lake.

Lake Castaic

Castaic Lake is the largest State Water Project reservoir in Southern California, located at the northern end of the Santa Clarita Valley, approximately 120 miles from Cachuma Lake. Built by the DWR and the California Department of Parks and Recreation, the 8,000-acre park is operated and maintained by the Los Angeles County Department of Parks.

The recreation facility consists of two separate lakes, the Main Reservoir and the Lagoon/afterbay. The main reservoir forms a V-shaped body of water, with approximately 29 miles of shoreline. The east arm of the lake is open to boating, fishing, and sailing, with a portion open to waterskiing and wakeboarding. The west arm is reserved for waterskiing and wakeboarding, with a special use area next to the dam for all personal watercraft. Fishing in the west arm is allowed only in the coves. Swimming is prohibited in the main reservoir; however, chlorinated swim beaches located on the west side of the lagoon are open on a seasonal basis. Gasoline-powered engines are not to be used in the Lagoon/Lower Lake, and any boats with gas engines must have the engine tilted up when the vessel is on Lagoon waters.

In addition to fishing, boating and water sports, other recreational opportunities include camping and picnicking. Designated hiking trails are open to bikers, hikers, and equestrians. Over 7 miles of trails are located on the west side of the Lagoon and Main Reservoir. The system of trails is a large loop with smaller loops accessible from the main trail. Often professional bike races are held on these trails.

Northern Lakes

Lopez Lake

Located approximately 120 miles north of Cachuma Lake, Lopez Lake is 10 miles east of Arroyo Grande off US 101. Recreational activities include fishing, camping, boating, water-skiing, sailing, picnicking, hiking, canoeing, or birdwatching. Completed in 1968 to provide domestic water for the Five Cities area of the Central Coast, the lake is fully stocked with game fish.

The recreation area on the east side of the lake has a camping area with 354 campsites, which fill to capacity most weekends during the spring through fall months. While no cabin rentals are available at the lake, primitive, electrical, and full hookup campsites are available. Fishing is the other major, year-around recreational activity at Lopez.

Another important recreation highlight at Lopez Lake is boating. Nearly one thousand acres of lake surface provides for waterskiing and jet skiing. Good winds also offer windsurfing and sailing opportunities, and canoeists enjoy calmer waters of the secluded upper Lopez Arm.

Santa Margarita Lake

Santa Margarita Lake was created by the construction of the Salinas Dam in 1941. The lake was originally designed to furnish water to Camp San Luis Obispo. Today it is a major source of drinking water for the City of San Luis Obispo. The park first opened for fishing and boating in 1957 and is still considered to be one of the best locations for fishing and relaxation found on California's Central Coast. The lake is located about 8 miles off US 101, just east of the community of Santa Margarita, a little over 100 miles north of Cachuma Lake. Santa Margarita is 7 miles long, has 1,100 surface acres, and has 22 miles of shoreline.

As a drinking water reservoir for the City of San Luis Obispo, body contact is forbidden and, therefore, no water-skiing or jet skiing is allowed on the lake. The result of these restrictions is a very quiet and natural atmosphere. The lake is also a fishing destination, open year-round, with good supplies of bass and catfish. It is surrounded by oak and pine covered hills, with interesting rocky crag formations. Just recently, camping has been allowed within the park boundaries, operated by San Luis Obispo County. Camping areas include four sites along the south side of the lake, and two primitive boat-in sites.

Lake Nacimiento

Lake Nacimiento is located west of US 101, 17 miles north of Paso Robles. It is approximately a 3-hour drive from Cachuma Lake, or about 160 miles north. The lake is close to 20 miles long, has 5,727 surface acres and 163 miles of shoreline. It was built for flood control and to provide farmers in the Salinas Valley with good summertime water. It is now a recreational resort. It is a privately owned and operated facility.

Many people visit Lake Nacimiento for boating and waterskiing and other water sports. Unlike the other lakes discussed here, Nacimiento has a primary focus on water sports. Good warm water fishing is available, but at times during the hot summer months, fishing can be disturbed by the amount of boating traffic. However, regulating the amount of boats on the lake would be difficult, because many private communities are located on the lake, each with their own boat launch. The lake has two public multilane launch ramps and a full marina featuring boat rentals, equipment rentals, fueling services, bait and tackle shop, and hardware and accessories.

The lake has six different campgrounds totaling over 345 sites, including remote tent sites, full RV hookup sites, and RV/tent combination sites. Due to the fact that this lake is mainly oriented toward water sports and camping, educational opportunities that are often offered at other lakes, such as nature walks, birdwatching, and wildlife tours appear to be lacking

Lake San Antonio

Lake San Antonio is located west of US 101, just north of Lake Nacimiento, between Paso Robles and King City. The lake is about 16 miles long, has 5,000 surface acres and over 60 miles

of shoreline. The shoreline is divided into a north shore and a south shore, the south shore having the most campsites and group facilities. The Monterey County Parks Department operates the lake. The location offers boating, fishing, swimming, hiking, and biking.

Lake San Antonio offers excellent warm water fishing. The South Shore Marina rents boats, motors, jet skis, bait, and tackle. Rentals include aluminum fishing boats, pontoons, ski boats, and tournament ski boats.

Over 4 miles of shoreline camping is available on Lake San Antonio's north shore, and three campgrounds with over 500 campsites are available for individuals, families, and groups at the south shore. Tent, electric, and full hookup sites are available. With over 600 campsites at the lake, this recreation area has the most intensive camping use of all the lakes discussed above. Trails are also available for hiking, biking, and equestrian use. The majority of the trails are around the south shore.

3.9.1.3 Data Collection

Recreation at Cachuma Lake is important to numerous user groups with diverse interests. To report on recreational uses at the lake, several study methods were conducted. Public hearings for the RMP were held in March and April 2003, where concerned user groups voiced their concerns and desires. In addition, several key users of the lake and its recreational resources were interviewed individually. Numerous letters and emails from the public helped to identify key issues and concerns to be addressed in the RMP (public issues and concerns regarding the Cachuma Lake RMP are summarized in the Public Scoping Report [URS 2006a]). Several meetings were held with the managing agency, Santa Barbara County Parks Department, where information about the history and demands of recreation at the lake was shared. User surveys were assessed (see Section 3.9.4.1), and other lakes in the region were visited to study Cachuma Lake recreation relative to other recreation resources in the area.

Recreation supply and demand data were collected from several existing literature sources. Demographic data for Santa Barbara and Los Angeles counties were reviewed, and projected trends for recreation use were described. The demand and supply data along with projected trends in recreation use are described in Section 3.9.5.

The WROS system was used to inventory the existing conditions of Cachuma Lake and the surrounding lake-related areas. This inventory was also used to assist in evaluating management alternatives for the lake, based on projected future use. Description of this tool and Cachuma Lake WROS inventory results are presented in Section 3.9.6.

3.9.2 Plan Area Existing Conditions

The Plan Area is a Santa Barbara County Park renowned for its natural beauty and variety of recreational opportunities. Located off SR 154 in the Santa Ynez Valley, Cachuma Lake is approximately midway between Santa Barbara and Solvang. With views of the Santa Ynez and San Rafael mountains and year-round activities available, the park supports an average of 650,000 visitors per year.

3.9.2.1 Camping

More than 520 campsites, 90 with full electrical, water and sewer hookups, and 38 with electrical and water hookups, can accommodate any size tent or RV. Each campsite includes a picnic table and barbecue pit, with hot showers, restrooms, and water nearby. An RV dump station is also available. Individual sites are available year-round on a first come, first serve basis. Group area camping sites for 8 to 30 vehicles are available year-round. Groups can reserve campsites in advance, and large groups can use Live Oak Camp, which holds up to 1,500 units (Figure 3.9-3).

Yurt camping is also offered. Three yurts are available; one is 16 feet in diameter and sleeps six people, while the 14-foot-diameter yurts accommodate five people. A picnic table, barbecue, fire ring, and parking for two cars are included amenities for each site (see Table 3.9-3).

Table 3.9-3
Cachuma Campsite Profile

Campgrounds	Sites	Facilities	Oak Tree Density (Low, Medium, or Dense)	Aspect
Northern Point	497-510	Picnic area	Low	0
Lanford Memorial	425-434, 440, 442-443, 445-447, 450-455, 459, 464, 466-467	Restroom, Picnic Area, Group Area	Low	0
Yurts	460-462	Electricity, Heat, Platform Bunks	Dense	NW
El Dorado	401-406, 408-424, 435-439, 441, 463, 465, 468-474	Showers, Playground, Picnic Area	Low	W
Chumash	366-370, 372, 373, 375-380, 382, 386-396,444, 476-491	Basic amenities	Medium	W
Dakota	353-365, 371, 374, 381, 383-385, 407	Group Area, Restrooms, Playground, Picnic Area	Low	0
Pawnee Plateau	322-343, 345, 348-352	Group Area, Fireside Theatre	Dense	SW
Barona	239-318	2 Group Areas, Restrooms, Dump Station	Low/Medium /Dense	N, W, S
Apache	179-238	Group Area, Restrooms	Dense	NE, E
East Entrance	125-176(W/E)[1], 177-178	Group Area, Showers, Restrooms, W&E[1] hookups	Low	0
West Entrance	1-121(W/E/S)[2]	Showers, Restrooms, W/E/S[2] hookups	Low	0
Mohawk	513-573	Showers, Restrooms, Group Area, Picnic Area	Medium/Dense	N

[1] Water and electric hookups
[2] Water, electric, and sewer hookups

3.9.2.2 Boating and Fishing

Rentals and Facilities

The marina rents 14 and 16-1/2-foot aluminum fishing boats with or without 5-, 8-, or 9.9-horsepower outboard motors (all motors are conformant four-stroke), on an hourly, daily, weekly, or monthly basis. Pontoon boats with covered patio decks for 10, 14, or 24 passengers

are also available for rent, as are paddleboats. A total of 87 rental boats are available. In addition to rental boats, the marina has 94 slips available for private docking. A boat launch and mooring facility for other private sail and motorboats sits adjacent to the Marina. Kayaks, canoes, and any vessels under 10 feet in length are not allowed, because the lake is a domestic water supply and body contact is prohibited. Boating regulations must be strictly adhered to. Numerous bays along the lake have specific speed zones and restrictions (Figure 3.9-4).

Cachuma Lake is considered to be one of Southern California's finest fishing lakes due to its rocky drop offs, shallow areas, and weed beds. Bass, bluegill, red ear perch, crappie, catfish, and trout are all fished at the lake (Figure 3.9-5). Each winter the lake is stocked with rainbow trout. A bait and tackle shop is located at the Marina, along with a fish cleaning station. Several fishing piers along the shoreline are also available, including one with handicap access at Harvey's Cove.

In 2007, County Parks constructed a new boat ramp that will accommodate the 3-foot surcharge that would result from the surcharge project (see Section 1.1.4). The boat ramp construction project was funded by the California Department of Boating and Waterways.

Inspection, Treatment, and Quarantine Protocols

Private watercraft are subject to inspection, treatment, and quarantine requirements to avoid introducing invasive quagga or zebra mussels into Cachuma Lake from other waterbodies, as described in Section 2.5.2. The requirements are consistent with California Fish and Game Code Section 2302 and vessel cleaning and inspection protocol recommended by the 100th Meridian Initiative, CDFG, USFWS, and the *Invasive Mussel Guidebook for Recreational Water Managers and Users--Strategies for Local Involvement* (California Resources Agency 2008).

The following procedures went into effect on March 25, 2008, and will remain in effect until further notice (Santa Barbara County 2009b). The County of Santa Barbara will prohibit access to Cachuma Lake County Park for any California-registered boat and trailer that violates any of the following requirements. These protocols are considered an adaptive management program and may be modified as more is understood about the risk of invasive mussels at Cachuma Lake. The protocol may also be changed at any time at the discretion of the local managing partner or Reclamation if new measures are considered necessary to protect water supply and/or the environment.

Visual Inspection

- Hours: 7 a.m. to 3 p.m. daily. No inspections will be conducted outside these times.
- Clean and Dry: All boats and trailers entering Cachuma Lake County Park will be inspected and must be clean and dry. (Clean and dry is defined as boat having no attached matter, vegetation, mud, dirt; and being completely dry to the touch. The outside of the hull is to be free of foreign matter, and the inside of the boat, including all bilges, live wells, integral coolers, and bait tanks are to be dry and free of foreign matter.) Boat hulls must be free of foreign matter. All bilges, live wells, bait tanks, integral coolers, or any other compartment within the boat must be clean and dry, including ballasts.
- All Drain Plugs Removed: All boats entering Cachuma Lake County Park must first have all drain plugs removed from the hull, bait tanks, live wells, integral cooler compartments, or

any compartment that has the potential to retain water. Any boat found with a plug installed upon entry will be turned away unless meeting certain criteria.

- Any boat which has residual water that discharges from the outboard motor or stern drive unit will be required to be started and flushed for a period of no less than 5 minutes
- Inspection Failure: Mandatory 7-Day Quarantine: Boats and trailers not conforming to the requirements above will be quarantined on or off site for 7 days. Owners of quarantined boats who intend to camp or enter the Park for day use may do so (Santa Barbara County 2009b).

Signed Affidavit and Vessel Registration

Owners of boats and trailers that pass the visual inspection must show current California vessel registration and sign an affidavit attesting that: 1) the boat and trailer have not been in waters infested by quagga or zebra mussels within the past 30 days; and 2) that no live bait other than commercially purchased worms and night crawlers are in their possession (Santa Barbara County 2009b).

Post-Inspection Treatment

Boats and trailers that pass the visual inspection will be required to be treated with a heated power wash prior to being cleared for launch in Cachuma Lake. Treatment will consist of high temperature washing of 140 degree water over the hull and trailer. If determined necessary by Park staff, areas of water storage such as bilges, live wells, and bait tanks may also require treatment (Santa Barbara County 2009b).

Mandatory 14-Day Quarantine

The following vessels require a mandatory 14-day quarantine:

- All boats that are 24 feet in length and longer (boats of 24 feet and greater have been identified as possessing the greatest risk of transmitting invasive mussels and therefore are specifically treated in a different manner)
- All out-of-state boats
- All boats with ballast tanks
- All boats registered in any counties in California that contain infected waters
- All boats that have been in quagga- or zebra-infected waters within the previous 30 days
- Any vessel that for unforeseeable reasons is determined to be a high-risk vessel

All quarantined boats and trailers that have passed inspection and have met all conditions above, may either enter an approved Parks Department Storage Yard or, if going off site, receive a security Boat Launch Tag (see below) for a period of no less than 14 consecutive days prior to being permitted to launch (Santa Barbara County 2009b).

Boats with a Santa Barbara County Boat Launch Tag

Santa Barbara County has developed a security system of tagging to expedite re-entry into Cachuma Lake. Upon leaving the water, boat owners may request the installation of a Boat Launch Tag that ensures that the boat has not been removed from the trailer, and thus, has not entered other water bodies after exiting Cachuma Lake. The system also expedites visual inspections and the clearing of launch requirements for many local boaters. It also allows for off-

site quarantine after vessels have passed inspection and met all conditions to launch. Returning boats without the tag intact are subject to the full inspection protocol.

Note: Vessels with a Boat Launch Tag (BLT) must be clean and dry. An attached BLT is not a guarantee of automatic launching privileges. Further, vessels with a BLT may be subject to the full inspection protocol if a Santa Barbara County Parks inspector deems it necessary (Santa Barbara County 2009b).

Rental Boats and Boats Residing in the Marina

Boats that meet the following criteria are allowed continued access to Cachuma Lake.

- Privately Owned Boats Moored at Cachuma Lake: Boats that are currently moored at the marina and are not removed from the Park, or boats that meet the above criteria to enter the lake and then are moored in the marina.
- Permanent Cachuma Lake Boats: Boats that are owned and operated by the County approved rental boat concessionaire that are permanently used and stored at Cachuma Lake.
- County-owned Boats at Cachuma Lake: Boats and trailers that are owned and/or operated by the Santa Barbara County Parks Department that reside at Cachuma Lake (Santa Barbara County 2009b).

Transportation of Live Bait

As an additional precaution to prevent the transport of invasive mussels, no live bait, other than commercially purchased worms and night crawlers will be allowed into Cachuma Lake. All other live bait including water born bait (minnows, crawdads, etc) are strictly prohibited (Santa Barbara County 2009b).

3.9.2.3 Trails

Trails and paths are key elements of the recreational environment at Cachuma Lake (Figure 3.9-6). However, many fragile areas within the recreation area are feeling the pressure of use and lack of maintenance. Maintaining trails means more than keeping them clear or marking them well so that people can find their way. Maintaining trails also means preserving them for future use, protecting the surrounding environment, and preserving a quality outdoor experience for all trail users. See Section 4.9 for recommendations on trail design and management at Cachuma Lake.

Five trails within and adjacent to the park are available to visitors. The trails range in length from 0.25 mile to 8 miles roundtrip. These trails can be either hiked or biked; however, no horseback riding is allowed on these trails. One trail is open on the north shore to equestrian use only (Figure 3.9-7 and Table 3.9-4).

Table 3.9-4
Existing Trails and Conditions

Existing Trails	Length (one way) (miles)	Primary User Group(s)	Grade	Views	Condition	Notes
Sweetwater Trail	2.5	P/B	1	Ex	1	Between Harvey's Cove and Bradbury Dam Overlook.
Oak Canyon Trail	0.5	P/B	0	En	1	Self-guiding brochure available at the Nature Center.
Mohawk Loop	0.25	P/B	1	L	2	Good birdwatching.
Tequepis Trail	4	P/B/H	2	L	2	Leads to Santa Ynez Mtn. Ridgeline. Trailhead off-site, across Hwy 154.
Mohawk Area	1.5	P/B	1	L	1	Informal trails meander east through fields and woods. Good birdwatching.
North Shore Trail	12	H	1	Ex	1	Open only to equestrians, the leasee and authorized vehicles.

Primary User Groups: H = horse, P = pedestrian, V = vehicle, B = bicycle
Grade: 0 = flat, 1 = gradual slope, 2 = moderately steep, 3 = extremely steep
Views from Trail: Ex = exposed, L = limited En = enclosed
Conditions: 1 = good, no erosion 2 = fair, some erosion, 3 = poor, eroded

3.9.2.4 Day Use and Other Recreation

As mentioned above, each campsite is equipped with a picnic table and a barbecue pit. A large area along the east shore of the park is designated solely to individual picnic sites, where no camping is allowed. Nine group picnic areas are located throughout the park. Landing or parking boats is permitted only along the designated campground shoreline that borders the park, therefore no picnicking is allowed on the other shores surrounding the lake.

A few miles east of Cachuma Lake are 40 acres within oak woodland known as Live Oak Camp. The area can accommodate 2,000 noncamping patrons on a daily basis. Due to its large kitchen facility and eating space with a roof, it offers an ideal picnic area.

Swimming/Water Sports

Cachuma Lake is a domestic water supply, and as such, swimming, waterskiing, windsurfing, or any other body contact with the water is prohibited. However, the Family Fun Center has a swimming pool. The pool is open from 10:00 a.m. to 4:00 p.m. from Memorial Day through Labor Day and it has a 120-person capacity.

Biking

Bikes are allowed throughout the park along the paved roads as well as along the numerous established trails both within and near the park. Bicycle rentals are available during the summer months at the Family Fun Center.

Equestrian Use

Trail rides and riding lessons are available from Rancho Oso Stables at Live Oak Camp. The minimum age for trail riding is 8; however, pony rides are offered for small children. Reservations are required and group trail rides are also available. Equestrian trails are only available outside of the park's boundaries.

Golf

San Marcos Golf Course is adjacent to Live Oak Camp, just a few miles down the road from Cachuma Lake. The grounds are very well kept and it is considered to be a challenging course. Miniature golf is also offered at the Family Fun Center within the park.

Live Oak Camp

Just east of Cachuma Lake, adjacent to the San Marcos Golf Course are 40 undeveloped acres that were once a campsite for cowboys. Today, with 20 acres of grassland and oak groves, it is ideal for festival events featuring overnight camping. The Camp can accommodate up to 1,500 campers in "open site" fashion, and an additional 2,000 noncamping patrons on a daily basis. Live Oak also is open to exclusive getaways for clubs, organizations, and extended family reunions. A large kitchen and eating space with roof and concrete floor features a walk-in refrigerator, sinks, stoves, ovens, and two 4- by 6-foot barbecue grills. Two-hundred and fifty guests can be served at the picnic tables here, and thousands more about the open grounds of the Camp. The Camp recently installed a new 25,000-gallon storage tank for the water well and leach field system. The Camp also offers an equestrian ring and chutes. Chemical restrooms, hot water showers, and a pay telephone are provided.

The Park Operation Supervisor of Cachuma Lake schedules the annual events at Live Oak Camp. The camp is rented to public and private parties for events that are too large for Cachuma Lake's County Park facilities. The annual events and groups that normally use Live Oak Camp include:

- Numerous Music Festivals
- Father's Day – largest music event of the year (approx. 3,500-4,000 people)
- Renaissance Fair (5 weeks during June/July)
- Girl Scouts ("Jamboree" Camping event, approx. 4,000 people in May)
- Afro-Fest (October)
- Chumash Pow-Wow (October/November)
- RV Groups ("Lazy Daze" Elks Club)

Numerous needs and upgrades necessary for proper maintenance, function, and safety of the Camp have been identified:

- Improve infrastructure.
- Main infrastructure need is electrical (The voltage drops dramatically during large events and camp hosts are continuously having electrical problems.).

- Portions of the road leading to the camp are narrow (18-20 feet wide; which is a major fire hazard, as it only allows vehicles to travel one way at a time.).

North Shore

The north shore of Cachuma Lake is closed to recreational use other than permitted equestrian use. Due to the managed grazing that takes place on the north shore and compatibility issues among hikers, bikers, and the existing cattle and horses, the land north of the lake is only used for grazing and horse back riding.

3.9.2.5 Nearby Camps and Outdoor Schools

Camp Whittier

Camp Whittier, located 0.25 mile before the entrance to Plan Area, is a nonsectarian camp operated year-round, 7 days a week, by United Boys & Girls Clubs of Santa Barbara County and is available to Boys & Girls Clubs, youth groups, school retreats and conferences, organizational conferences and meetings, church groups, high school and college groups, family reunions, and corporate groups.

The private, tucked-away 55-acre resident camp is bordered by hiking trails and hosts an abundance of wildlife in an oak woodland area. Cachuma Lake and its amenities are within easy walking distance.

Outdoor School

The Santa Barbara Outdoor School is located at Rancho Alegre Boy Scout Camp in the Santa Ynez Mountain Range, across from Cachuma Lake. The Outdoor School is an environmental education program owned and operated by the Los Padres Council, Boy Scouts of America. The Outdoor School was originally owned by the Santa Barbara County of Education and has been in operation for over 43 years. Primarily, the Outdoor School Program is education in the out-of-doors.

3.9.2.6 Special Events and Educational Opportunities

Nature Walks

Guided nature walks with a park naturalist are offered for viewing the oak woodland habitats and wildlife within the park. Oak Canyon Trail is often used for the nature walk, and self-guiding brochures are available at the Nature Center. One focus is on how the traditional Chumash people lived around the lake using the natural resources.

Birdwatching

Dozens of species of birds including bald eagles, Canada geese, buffleheads, teals, gadwalls, and loons spend the winter at Cachuma Lake. The 46-passenger "Osprey" cruise offers a 2-hour lake tour focused on birdwatching with a naturalist from November through February. Birdwatching onshore in the park is also offered both on an individual, self-guided basis as well as excursions led by a Cachuma Lake Naturalist.

Wildlife Tours

The "Osprey" pontoon boat offers wildlife cruises from March through October. Eagle cruises are offered October through March. A park Naturalist instructs participants about the history, geology, flora, and fauna of the area.

Programs for Kids

Junior Rangers is a program offered for children at the Cachuma Lake Nature Center. Kids learn about Cachuma Lake wildlife and earn a Junior Ranger badge. Participants are encouraged to bring a bag of litter or aluminum cans that have been collected from the park grounds.

The Nature Center has exhibits and hands-on displays for kids and adults featuring Chumash artifacts and lifestyle, history of recent settlers, the area's wildlife, birds, plant communities, and geology.

On summer weekend evenings, Fireside Theater programs are held at the park's outdoor amphitheater. Astronomy programs are also often held there, as well as movies.

3.9.2.7 Facilities

Cachuma Lake offers the following facilities:

- Marina
- Boat launch facilities
- General Store
- Family Fun Center / Nature Center
- Gift Shop
- Campsites
- Barbecue pits / Picnic tables
- Restrooms
- Yurt camping
- Showers
- Laundry
- Gas station
- Playgrounds
- Fishing piers
- Swimming pool
- RV hookups
- Outdoor amphitheater
- Temporary cabin camping

Cachuma Lake's marina is open year-round and offers boat rentals, launch facilities, a bait and tackle shop and a fuel dock. The Grill at the Marina overlooks the lake and serves a full breakfast and lunch menu. The General Store is also open year-round and is stocked with groceries, camping equipment, and souvenirs. Gasoline and propane are also available. Located behind the General Store is the Cachuma Nature Center. It features an intriguing array of Native American artifacts, plant, wildlife, historical and geological displays, and a gift shop where toys, jewelry, books, and souvenirs are sold. The Center is open year-round during daylight hours.

The Family Fun Center is open daily during the summer and includes a swimming pool, video games, miniature golf, bike rentals, and a snack bar. A coin-operated laundromat is also available there.

3.9.2.8 Overall Natural Experience

The Santa Ynez and the San Rafael mountains flank the north side of the lake, providing spectacular views of rugged cliffs and chaparral vegetation. Oak woodlands and grassland border the perimeter of the lake. Cachuma Lake is located at an elevation of 800 feet in the Santa Ynez Valley. It has 3,200 surface acres. The Santa Ynez River feeds this reservoir. The closest towns are the small community of Solvang approximately 12 miles west, and Santa Barbara, 25 miles southeast. The location gives the reservoir a removed and natural sense, yet with the convenience of a short drive into town. The facilities are fairly well kept and sufficient. For example, the restrooms are clean and well stocked, the boats are well managed, and the campsites are normally cleared of dead or overhanging vegetation that could pose a fire hazard.

3.9.3 Local Recreational and User Groups

A large number of local recreational groups and user groups have voiced their loyalties, concerns, and interests regarding the Plan Area (see Section 2.2.4).

3.9.3.1 User Groups Interests

Most groups and individuals concerned about recreation at Cachuma Lake recognize that recreation is an indirect benefit of the lake, and that recreation should be compatible with water supply needs and natural resource protection. Concerned users agree that a thorough impact analysis of any changes in recreation or resource use must be conducted, including any related impacts that may result outside of the RMP plan. All issues raised by these groups are listed in Table 2-1 and are summarized below.

The majority of the agencies, groups and general public that have voiced their input supporting increased recreation at and around Cachuma Lake, mainly in the form of man-powered and wind-powered boating, hiking, biking, horseback riding, and the use of RC airplanes. Also interest in the possibility of body contact at the lake and the potential development of a swim beach is significant. Several people pointed out that individuals are allowed to swim in the Santa Ynez River, which feeds the lake, and also that Santa Barbara County is one of the only counties that does not allow body contact recreation in any of its lakes or reservoirs. It was also emphasized that additional recreational opportunities will increase revenue as well. However, a comparable amount of the public expressed opposition to water and body contact. The recreational activities that received the most support in the letters and verbal comments received are windsurfing and kayaking/canoeing. Despite expressed interest in all forms of water recreation, the general consensus seems to be against noise-polluting activities, such as jet-skiing and water-skiing, with the exception of RC airplanes.

The local RC airplane enthusiasts are a very active group with a lot of supporting members. Claimed benefits of flying RC airplanes are related to aviation education, and the enthusiasts stress their high regard for the environment. The RC airplane supporters have targeted Cachuma Lake for years as an ideal spot for a permanent flying site due to the fact the lake is a protected, open area that is free from urban development and easily accessible to the public. The supporters also insist that the RC airplanes have no impacts on birds, as birds are accustomed to air traffic and the noise levels of today's RC airplane engines are constantly being reduced. They also point

out that the airplanes are no noisier than the motorboats at the lake, and the airplane engines do not use fuels that contain MTBE.

The comments from those encouraging man-powered and/or wind-powered boating emphasized their support for the natural environment and the fact that these types of boats are not noisy or polluting. Due to the noisy and polluting attributes of nonconformant two-stroke engines, many people request that these engines are banned, and replaced with four-stroke engines. However, one individual also points out that banning nonconformant two-stroke engines poses an unfair challenge to those who own and use two-stroke engines at the lake and do not have the money to upgrade.

It is recognized that Cachuma Lake offers a significant wind source. Windsurfing is a use that could take place on the lake when others would generally leave due to high winds, and it introduces only minimal body contact. It is generally agreed that with implemented guidelines, careful planning, and perhaps available professional instruction, man-powered and/or wind-powered boating could be introduced to the lake. Another safety measure suggests reserving a portion(s) of the lake for nonmotorized use only.

One individual suggests that kayaking allows the boater to be close to the water where the lake can be best appreciated and where the human presence is less of a perceived threat to wildlife. In fact, most letters and comments in support of nonmotorized boating stress the low-to-nonexistent level of impact on wildlife at the lake, in contrast to motor boats or other noise-polluting activities. Man-powered boating is also pointed out as a great family activity. Cachuma Lake is much closer for many local windsurfers and boaters who presently have to drive to Lopez Lake to enjoy their water sports. The Director of Recreational Sports at UCSB points out that Cachuma Lake is the only competitive rowing venue between Marina del Rey and San Francisco. The presence of the UCSB Rowing Club at Cachuma Lake should be considered as a public recreational resource of some distinction and unique character for this region.

In relation to boating, fishing activities are also highly supported. Several requests have been made to open the maximum area of the lake for full utilization of the fishery resource. One request is to open the back end of Santa Cruz Bay to fishing, and only close it during bass spawning, not year-round. Fishermen have also requested to have the eastern end of the lake opened. They claim that fishing does not disturb the sensitive birds or other natural resources, as proven by the history of boating and fishing at Lake Casitas.

Camping, hiking, and biking are other main interests. The potential of expanding primitive/low-intensity camping opportunities near Cachuma Lake is an interest. Offering remote “boat camping,” or campsites only reachable by boat, is another suggestion. If this idea is unacceptable to Reclamation or the County, then a walk-in camp area where motor vehicles and generators are not allowed is suggested as an alternative. Some also see a need for more yurts, as they are in high demand during peak camping season and for additional recreational cabins. Providing more campsites with electric hookups in anticipation of more RV camping in the future is also a priority.

More primitive camping sites are generally desired by all of the user groups at Cachuma Lake. Due to the fact the park is heavily used, many people would enjoy the opportunity to hike into more remote areas around the lake and camp in a primitive setting. Primitive camping is preferred, as it poses fewer impacts on the natural environment.

Many areas around the lake offer solitude and nice vistas perfect for camping. One trail that is not heavily used is the Sweetwater Trail, west of the park. The trailhead is located at Harvey's Cove and heads toward the dam. The trail offers great views of the lake and several open grassland areas under oak trees could be used for primitive campsites. The user groups also identify the north shore as a prime area for primitive camping. Due to the high plateaus above the lake and the open areas that would allow for easy camping areas, the north shore is an attractive location.

Several invested groups and individuals support more hiking and biking paths in the Plan Area. The enthusiasts point out that these are great family activities that may not disturb eagles or other sensitive resources if managed well. They are nonpolluting sports, and the potential impacts of trail enhancements or erosion can be analyzed and mitigated. Furthermore, the roadways in the Santa Ynez Valley are narrow and dangerous for bikers and trails around the lake would open up a safe opportunity for bikers and hikers alike. Two residents of Santa Barbara were published in the Santa Barbara News Press on March 21, 2002. In the articles, Reclamation is encouraged to develop a dirt trail that would encircle the lake and be open to mountain bikers and hikers, as well as a bike path that would run alongside the Santa Ynez River. A desire to see the existing trail system at Cachuma Lake increased is also expressed, while still preventing contamination of the water and protecting the natural resources.

It is suggested that special events be given greater attention at the lake, as to encourage more public participation. As many special events are held at Live Oak Camp, some individuals stress the need to improve the grounds and facilities there.

The north shore of Cachuma Lake is a valuable natural resource. It is presently used for grazing and permitted equestrian use only. It is the general consensus that public access to the North shore should continue to be carefully managed. Many letters and public comments encourage that new passive uses of the North shore should be considered and their compatibility and potential impacts should be analyzed. The present grazing activities on the north shore are generally accepted and encouraged to continue as a fire management tool; however, it is suggested that grazing impacts to natural resources is considered and practices should be modified if necessary.

A more or less equal interest appears to exist for opening the north shore to passive recreation such as hiking, biking and bird watching or keeping the north shore closed to uses other than grazing and equestrian use. The hiking and biking enthusiasts point out that it is a Santa Barbara County policy that all trails, to the extent feasible, be multiuse. They consider hiking and biking as nonpolluting and unobtrusive uses, and suggest limiting public access to a footbridge over the Santa Ynez River to access the north shore. It is suggested that a permit process be implemented to manage potential user conflicts, and that the trails are managed by the County to preserve existing conditions. However, equestrian users point out that hiking and biking resources are plentiful in the area. Many emphasize the fact that very few trails in the area are exclusively for equestrian use, and suggest that the trails on the north shore be expanded for horseback riding. In general, the equestrian users of the north shore do not consider hiking or biking to be compatible with horseback riding.

The bald eagle roosting habitat on the north shore, as well as habitat for many other migratory species and wildlife, is also an issue of concern. One individual claims that a management study on bald eagles conducted in 1989 emphasized that the eagles were found to be easily disturbed,

and therefore recreation near known perching, roosting, and nesting areas is discouraged. However, some individuals claim that bald eagles are found in areas with high recreational use and point out that with proper management the birds and other wildlife would not be disturbed by hiking and biking activities.

3.9.4 Visitation

3.9.4.1 Cachuma Visitation Survey

Santa Barbara County Parks Department Visitor Survey forms are distributed at Cachuma Lake. The following summarizes findings for survey efforts in 2000 and fiscal years 2003-2004, 2007-2008, and 2008-2009.

For 2000, visitor occurrence to the park was fairly evenly distributed among the following categories: frequently, occasionally, and first visit. Most visitors used the park for camping, and fishing was the second most preferred use. The other major uses were group picnics and recreation. The survey forms also inquire about the general appearance of the park, and whether or not it was clean. Cachuma Lake received very high ratings in these categories. It appears the picnic sites and campsites were also clean and in good repair. The restrooms received varied levels of cleanliness remarks; however, all the people surveyed claimed the staff were courteous and helpful and all but one family (out of 25) said they would come back again.

Survey results for fiscal year 2003-2004 indicated camping as the main purpose for visiting Cachuma Lake, with boating as the second most preferred use. Of the 71 respondents, 36 agreed that the experience met expectations, while 29 did not. Many written comments focused on the need for improved restroom and general facilities maintenance, while others enjoyed the natural setting and quiet family atmosphere. A few comments cited the need for round fire pits and one respondent requested that kayaks be allowed in the lake.

For fiscal year 2007-2008, camping was again reported as the primary use, with 8 of the 12 respondents rating the experience from "Good" to "Excellent." Respondents cited the need for upgrades to the restrooms, laundry area and appliances, campsite tables, trails and roads.

Camping was again indicated as the preferred use at Cachuma Lake in survey results for fiscal year 2008-2009. Almost half of the 25 respondents rated the experience as "Good" while close to half rated the experience "Poor." Written comments expressed visitor enjoyment of the Park, and several respondents cited the need to improve the restrooms.

3.9.4.2 Visitor Capacity

Visitor capacity is defined as the supply of appropriate visitor opportunities that can be accommodated in an area. Appropriate levels of visitor capacity serve as a tool to help provide quality recreation while sustaining natural and cultural resources.

Examples of visitor capacities that are relevant to Cachuma Lake include the number of visitor use-days per season, the number of boats at one time on the lake, the number of campsites, and the number of boat slips.

3.9.4.3 Visitor Use

Visitor use varies due to many factors, including time of day, day of the week, season, and holiday or vacation times. Typically, fishing activities occur early in the morning or later in the afternoon. Day use activities occur during the middle part of the day, and camping involves overnight use.

Cachuma Lake is most popular during the spring and summer seasons, and daytime and overnight use begins to increase as the weather warms. Daytime and overnight use is higher in the spring and summer and lower in fall and winter. Daytime use on weekends (versus weekdays) increases in all seasons. Overnight use is much greater in spring and summer, particularly on the weekends.

How this visitor use applies to boats on the lake is defined by the WROS management zones, and is summarized in Table 3.9-5 and discussed above in Section 3.9.3.

Table 3.9-5
Reasonable Boating Capacity Coefficients

WROS Classification	Low Range	High Range
Urban	1 acre/boat	10 acres/boat
Suburban	10 acres/boat	20 acres/boat
Rural Developed	20 acres/boat	50 acres/boat
Rural Natural	50 acres/boat	110 acres/boat
Semiprimitive	110 acres/boat	480 acres/boat
Primitive	480 acres/boat	3,200 acres/boat

Source: Aukerman and Haas 2004.

3.9.5 Recreation Situation

Demand and supply analyses are important tools for recreation forecasting decision making. Because people and circumstances change (e.g., personal tastes, fads, new technology, energy costs, and disposable income), using demand and supply analyses provide a variety of pieces of information for decision making (Haas 2002).

3.9.5.1 Recreation Demand

The measure of recreation demand should consider four types of data:

- Regional and state-level recreation activity participation rates
- Unmet or latent demand expressed by local or state residents
- Recreation participation trend projections at the local, state, or federal level
- Historic visitor use data for the area in question

3.9.5.2 Recreation Supply

Recreation supply is the measurement of the type and number of opportunities that are available for the recreating public. Supply can be measured in a variety of ways, such as by the number of parking stalls, miles of trails, number of developed campsites, number of boat slips, boat launches per time period, or the acres of closure due to security or resource concerns. Agencies can manipulate recreation opportunity supply by changing facilities, services, programs, or regulations (Haas 2002).

A comparison of recreation demand and supply identifies disconnects to help respond to public preference and desire. This comparison evaluates whether an agency provides recreational opportunities that are responsive with public demand.

Of over 1,400 reservoirs in California, 11 are larger than 1,000,000 acre-feet. An additional three have storage greater than 500,000 acre-feet. In addition, a few more are paired as parts of local systems and combine to store more than 500,000 acre-feet in one locality. Table 3.9-1 provides a regional comparison of recreation facilities at reservoirs within 200 miles from Cachuma Lake, and Table 3.9-2 summarizes special recreation facilities or services at these reservoirs.

3.9.5.3 Recreation Projections

Recreation demand and supply analyses depict the current situation. When these analyses are coupled with trends in the demographics of a recreation area, projected recreation use can be assessed. Both Santa Barbara and Los Angeles counties are projected to have growth rates lower than the state average. Detailed population data and growth forecasts are provided in Section 3.12.1.1.

3.9.6 Water Recreation Opportunity Spectrum Planning Tool

Reclamation's Office of Policy has coordinated with Colorado State University, through Aukerman and Associates LLC, to develop the WROS. The WROS is a planning and management tool designed to provide planners and managers with a framework and procedure to make better decisions for conserving a system of high quality and diverse water recreation opportunities. The objectives of the Cachuma WROS are to inventory and map the current recreation situation for Cachuma Lake and provide an expert-based recommendation for WROS zoning and the associated recreation management objectives for Cachuma Lake.

In December 2002, a WROS field inventory was conducted at Cachuma Lake involving a small group from Reclamation, California State Parks, URS, Santa Barbara County Parks Department, and local recreation experts. WROS represents a spectrum of six types of water recreation opportunities:

Water Recreation Opportunities

U	S	RD	RN	SP	P
Urban	Suburban	Rural Developed	Rural Natural	Semiprimitive	Primitive

The recreation opportunities range from a highly social experience involving many diverse visitors in a highly developed urban environment (i.e., Urban) to a solitude experience with few

if any people in a remote primitive setting with no built structures and little management presence (i.e., Primitive).

In the Cachuma Lake WROS inventory, several representative sites were chosen, and a quantitative scale was assigned to the physical, social, and managerial attributes of each site. Physical attributes are features that are relatively permanent or fixed within the landscape and are not likely to change. Social attributes are those features associated with visitor's activities, behaviors, and perceptions of the area. Management attributes are those features that are provided for, managed, and can be changed by the managing agency.

In situations like the Cachuma Lake setting where a finer level of assessment may be required, an 11-point scale in the Inventory Protocol offers a major advantage. An 11-point scale allows for a finer level of assessment than a 6-point scale and identifies areas where transitions, gradations, or "leanings" toward one WROS class versus another occur. It allows for a higher level of accuracy during the inventory stage and helps managers to consider alternative ways to manage the area in the future. Depending on the rating for an area (e.g., RN6, RN7, or RN8), the greater the probability that a small shift in one or more of the physical, social, or managerial attributes will cause a shift in the WROS class. In effect, an 11-point scale gives the expert team the option to indicate up to 16 gradations of recreating opportunities depicted as follows:

WROS INVENTORY SCALE

1		2	**3**		4	**5**		6	**7**		8	**9**		10	**11**
U			**S**			**RD**			**RN**			**SP**			**P**
U1	U2	S2	**S3**	S4	RD4	**RD5**	RD6	RN6	**RN7**	RN8	SP8	**SP9**	SP10	P10	**P11**

The six primary WROS classes are U1, S3, RD5, RN7, SP9, and P11. The other ratings reflect a transition or leaning between two primary WROS classes. For example, RD6 is a score to the right of the primary RD WROS class (RD5), suggesting that some attributes in this area are more typical of a RN setting and pull the overall rating from RD5 to RD6. Likewise, RN6 indicates that some attributes at the site are more typical of a RD WROS class and these attributes pull the overall rating from the primary RN WROS class of RN7 to RN6.

A major advantage of using an 11-point scale in the inventory stage is that it conveys more detail and suggests the feasibility of altering the management of an area from one WROS class to another.

A recreation opportunity map was developed, Figure 2-1, based on the physical, managerial, and social setting attributes of the lake. Examples of the attributes used to conduct the inventory include the degree of development, natural resource modification, public access, management presence, socialization and solitude, recreation diversity, visitor concentration and natural ambience.

Based on the 11-point scale described above, it was determined that Cachuma Lake is currently providing various gradations of RD and RN water recreation opportunities. The inventory revealed that some of the RD zone is approaching a Suburban-type opportunity and thus was labeled RD4, while other portions are approaching a RN-type opportunity and thus were labeled RD6 (Figure 2-1). The WROS definitions are offered as a starting place for the lake planners, managers, and stakeholders to define their desired recreation opportunity and to reflect the

special circumstances at the lake. The WROS classifications applicable to Cachuma Lake are described below.

Rural Developed

RD areas provide occasional opportunities to see, hear, or smell natural resources due to the level of development, human activity, and natural resource modification. The area is likely attractive for day-use and weekend visitors from local metropolitan areas or nearby communities, young families, large groups, and mass and adventure tourists within a day's drive or less.

Rural Natural

The area provides prevalent frequent opportunities to see, hear, or smell the natural resources due to only occasional or periodic level of development, human activity, and natural resource modification. The opportunity to relieve stress and to get away from a built environment is important. Moments of solitude, tranquility, and nature appreciation are important. The area attracts extended weekend and longer-term visitors desiring to experience the outdoors and be away from large number of other people.

3.10 VISITOR ACCESS AND CIRCULATION

3.10.1 Regional Setting

The Plan Area and the transportation systems that provide access to the Plan Area include a system of roads, bike trails, hiking trails, and pedestrian trails. The Plan Area is located within a relatively rural and even somewhat primitive environment, over 20 miles away from the City of Santa Barbara and approximately 10 miles from the small, rural towns of the Santa Ynez Valley.

The planning agencies of the local governments are responsible for design, construction, and maintenance of the county and local roads. SR 154, which leads from the City of Santa Barbara to Cachuma Lake is a state highway managed by Caltrans. Public transportation is managed by private, public, and quasi-governmental agencies at the local level. Currently, no ongoing public transportation to Cachuma Lake is offered from the City of Santa Barbara or Santa Ynez Valley, other than special education or senior citizen programs that are occasionally developed. Santa Barbara is served by an Amtrak route and Santa Barbara Airport, which is the main public and air transit in the immediate area.

The Plan Area is accessed from the nearby towns/cities of Santa Barbara (southeast of the lake) and Los Olivos/Santa Ynez (northwest of the lake) by SR 154 and US 101. Primary access to the Plan Area is from SR 154 from Santa Barbara, which connects with US 101 in two locations; in the City of Santa Barbara at the State Street/SR 154 exit, and approximately 30 miles north of Santa Barbara, near the City of Buellton. Several paved and dirt roads branch off from SR 154 leading to small residential communities and recreational destinations in the Los Padres National Forest.

3.10.2 Plan Area Existing Conditions

Park usage and the level of visitor access and circulation are seasonal. Rate increases are expected due to the predicted ongoing population increases in Santa Barbara County and Los Angeles County. Furthermore, the number of residents in the nearby towns and of other visitors from further areas is expected to increase. Population data and projections are provided in Section 3.12.1.1.

The annual average number of vehicles entering the Plan Area at Cachuma Lake County Park between fiscal years 2001-2002 and 2008-2009 was 174,869.[4] The highest number was 220,196 in fiscal year 2007-2008, and the lowest was 150,055 in fiscal year 2005-2006 (Medeiros 2010). The annual number of vehicles entering the Plan Area has been increasing since fiscal years 2004-2005 through 2006-2007, when annual totals dropped below approximately 170,000. The most recent vehicle count was for fiscal year 2008-2009, with a total of 204,446.

The annual average daily traffic on SR 154 at the Cachuma Lake County Park entrance (not entering and exiting the Plan Area) from 2002 to 2008 was 30,743 vehicles. The highest number was approximately 32,000 in 2005, 2006, and 2007, and the lowest was approximately 28,000 in 2002. In general, the annual average daily traffic on SR 154 is increasing except for a small drop in the most recent vehicle count in 2008, with a total of 31,200 (Caltrans 2010).

The condition of the roads within the County Park has declined. Santa Barbara County's 5-year Capital Improvement Program includes paving maintenance in the Plan Area. Maintaining roads within the County Park had been deferred over the last 10-15 years due to the lack of available funds. However, the Reclamation awarded two grants in FY 2004-05 ($172K) for paving at Cachuma Lake. Cachuma Lake road maintenance is planned for completion in 2010.

Several projects are pending and/or under way for improvement of infrastructure and utilities in the County Park. Details regarding these projects are provided in Section 3.11.

3.10.2.1 Roadways

SR 154 runs through the Santa Ynez Valley in Santa Barbara County along the south edge of Cachuma Lake. SR 154 intersects with US 101 in two locations, approximately 25 miles southeast of the lake, and approximately 20 miles northwest of the lake. SR 154 also intersects with SR 246 approximately 10 miles northwest of Cachuma Lake before the intersection US 101. SR 246 leads west through the wine country and small towns of Santa Ynez, Solvang, and Buellton of the Santa Ynez Valley.

SR 154 is a curvy two-lane road with narrow shoulders. Although cyclists often bike along the shoulders of the highway because of the high aesthetic quality of the area, it is locally known as a dangerous road. Sections of the highway often slough off and slide during the rainy season due to steep slopes. Figure 3.9-6 shows the main roadways.

The level of service on SR 154 varies at different times of the day and during different seasons. Commuters who live in the Santa Ynez Valley and work in the Santa Barbara area use the highway for their route to and from work in the mornings and evenings. The population has

[4] For 2002-2003 and 2004-2005, vehicle counts were only available for July 1 to March 31; therefore, the counts for those periods were interpolated to produce a fiscal year average.

doubled over the past 30 years in Santa Ynez Valley, as the cities of Solvang and Buellton are the second and third fastest growing cities in the county; thus, this traffic is normally heavy between 7 and 10 a.m. and 5 and 7 p.m. (Santa Barbara County website, "Explore the Santa Ynez Valley," 2006). Also, during the rainy season, the level of service often decreases dramatically, as the steep slopes above and below the highway often slide, causing road closures and delays.

Santa Barbara County Parks Department has developed a plan to further improve the entrance and staging area in the front of the park area. Although the current configuration serves the public adequately (Stone 2006), the area can be improved upon by relocating and constructing a new parking area and relocating the existing office and gatehouse. However, funding is the primary obstacle in implementing this plan.

3.10.2.2 Pedestrian/Bicycle Connections

Currently the only existing pedestrian trails and bike paths are within the County Park, with one longer equestrian trail on the north shore of the Plan Area. Five trails within and adjacent to the park are available to visitors. The trails range in length from 0.25 to 8 miles roundtrip. These trails can be either hiked or biked; however, no horseback riding is allowed on these trails.

The impacts of erosion and sedimentation on park trails are a concern. Cyclists and equestrians have both been targeted on the issue of erosion. Bikes and horses are sometimes assumed to cause too much damage to trails. However, it has been determined by studies that the impact of hikers, bikers, and horses is relatively similar, compared to the impact of building the trail in the first place. In reality, the impact of all users is significantly less than the impact of water on a trail. A poorly designed trail that gets zero use will erode more from water than a well-designed trail that receives heavy use.

3.10.2.3 Parking

During peak visitation, parking on paved areas is limited to a first come-first served basis. When the paved parking areas are full, vehicles park on nonpaved "overflow parking" areas, which are designated east of the County Park near Mohawk Campground and at Live Oak Camp at the far eastern end of the lake.

3.11 UTILITIES

3.11.1 Regional Setting

3.11.1.1 Water

A primary purpose of Cachuma Lake is water supply. The existing uses of Cachuma Lake water include municipal, agricultural, groundwater, and biological uses. Reclamation owns all project facilities and operates Bradbury Dam, although the Member Units will have paid off the capital cost for construction of the Project by 2015. Under the Reclamation Act of 1939 and Permits 11308 and 11310, water appropriated using Cachuma Project facilities may be used for municipal, industrial, domestic, irrigation, and recreation purposes. Through a Transfer of

Operation and Maintenance Agreement with Reclamation, the COMB was assigned the responsibility for operation and maintenance of the Cachuma Project facilities. COMB is made up of the Member Units holding entitlement to Cachuma water.

The Cachuma Project provides about 65 percent of the total water supplies for the Member Units who provide water to an estimated 207,000 people along the South Coast and in the Santa Ynez Valley. Approximately 38,000 acres of croplands are irrigated by water from the Cachuma Project. Approximately 30 percent of total deliveries are used for irrigation and 70 percent for municipal and industrial purposes.

The SWRCB is considering modifications to Reclamation's water right permits for the Cachuma Project to provide appropriate protection of downstream water rights and public trust resources on the Santa Ynez River. Reclamation holds the Cachuma permits on behalf of the Member Units.

3.11.1.2 Sewer System

The area around Cachuma Lake is agricultural grazing land and very low-density development, subsequently, no community wastewater treatment facility serves the area, aside from the sewer system serving the County Park at Cachuma Lake.

3.11.1.3 Fire Protection

The Santa Barbara County Office of Emergency Services is a division of the SBCFD, and is responsible for emergency planning and recovery for the Santa Barbara Operational Area. On a day-to-day basis, SBCFD is responsible for emergency planning and coordination among the Santa Barbara Operational Area entities, which are the Governor's Office of Emergency Services Mutual Aid Areas.

The primary focus of federal and state fire agencies is the control of wildland fires on a seasonal basis. The CDF is a state resource agency vested with fire protection responsibilities on wildlands that have been designated as State Responsibility Areas. Cooperative efforts via contracts and agreements among state, federal, and local agencies (such as the Los Padres National Forest of the USFS and SBCFD) are essential in response to emergencies like wildland and structure fires, floods, earthquakes, hazardous material spills, and medical aids. The CDF Cooperative Fire Protection Program staff is responsible for coordinating those agreements and contracts for the Department. It is because of these cooperative efforts that fire engines and firefighters from different agencies often arrive at the scene of an emergency, working under a unified command relationship. It is also because of these agreements that CDF may be the department responsible for providing dispatch, paramedic, fire, and rescue services in numerous cities and towns that are not designated as state responsibility throughout California.

3.11.1.4 Electrical and Telephone

Electrical service is provided to the region by Pacific Gas and Electric. Telephone service is provided by Verizon, which includes dedicated T1 Internet connections. Electrical infrastructure at Live Oak Camp is insufficient for the types of activities that occur at the campground. The County's Capital Improvement Program includes projects to improve this service.

3.11.1.5 Plan Area Existing Conditions

Current utilities at Plan Area consist of potable, irrigation, and fire protection water lines with water supplied from the County operated water treatment plant; sanitary sewer system operated by the County, electrical lines; and telephone lines. Other utilities include solid waste disposal, propane storage and distribution lines, and radio and telecommunication systems. The gas station and boat fueling facility are operated by concessionaires.

3.11.1.6 Potable Water

Potable water is provided by the water treatment facility owned and operated by the County of Santa Barbara. This plant supplies potable water to the County Park and Camp Whittier located 0.25 mile south of the County Park. The County Park is within the ID #1 service area, and water supply for the Park is purchased from ID #1. Potable water for the rest of the Plan Area is provided from Cachuma Lake as allocated to Santa Barbara County.

Separate from this RMP, funds are being sought and design is under way for the relocation of the water treatment plant. To avoid impacts from the surcharge required by the surcharge project (Section 1.1.4), the Cachuma Member Units constructed a gabion basket barrier wall around the water treatment plant at a finished elevation of 756 feet to protect the plant from potential wave run-up during surcharge periods.

3.11.1.7 Sewer System

A sanitary sewer system owned and operated by the County of Santa Barbara provides sewer water treatment services to the County Park and Camp Whittier located 0.5 mile from the main campground located along the south shore in the County Park. Ninety campsites are provided with sewer hookups along with public restrooms for the 450 additional campsites and other facilities. The treated sewer water from the plant provides irrigation water within their discharge permit area. At Live Oak Camp, a septic system serves the shower building, host site, and kitchen area.

The Sewage Treatment Plant and sewage lift stations are located above the surcharge zone. With the reservoir fully surcharged at a lake elevation of 753 feet (and with wave run-up), water will enter part of the 50-foot setback for the lift stations. A 2005 survey at a lake elevation of 753.18 feet demonstrated that the surcharge would not inundate sewage facilities at their current locations and elevations (Stetson Engineers 2005).

3.11.1.8 Chemical and Vault Toilets

Vault toilets are located at the Vista Point for Cachuma Lake. Approximately 14 chemical toilets are in use at the County Park, 12 at Live Oak Camp, and three floating facilities on the lake. One vacuum truck is owned and operated by the County to service these facilities.

3.11.1.9 Irrigation

Approximately seven freshwater irrigation lawn systems are in operation at Cachuma Lake. These systems provide irrigated water at park facilities for landscaping and recreational areas used by park visitors to the park.

3.11.1.10 Fire Protection

Fire Station 32, located on Airport Road in Santa Ynez, CA is the station closest to Cachuma Lake and is also the station that responds to wildfires around the lake. Station 32 follows an "automatic response" when notified of any wildland fire in the area. The initial automatic response from the SBCFD to the area around Cachuma Lake is as follows:

- Four Type III engines
- Two bulldozers
- One water tender
- One helicopter
- One chief officer
- One hand crew from either CDF or Vandenberg if available

If the situation warrants, the Initial Attack Incident Commander orders additional alarms or equipment. Within the County Park several hydrants are available and would be used should a fire occur in this area.

3.11.1.11 Electrical and Telephone Service

Electrical service to Cachuma Lake is provided by PG&E. Electrical lines from the grid to electrical pedestals in the campground are all aboveground. Telephone service for the County campground is managed by the inter-county department, which handles phone service for Santa Barbara County. Verizon supplies all other communication lines including the T1 line for Internet connection.

3.11.1.12 Other Utilities

Solid waste services are provided by Health Sanitation Services out of Santa Maria. Santa Barbara County General Services provides two-way radios for the park operations staff.

3.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.12.1 Socioeconomic Existing Conditions

3.12.1.1 Population

Table 3.12-1 presents population estimates and projections for the State of California, Santa Barbara and Los Angeles counties, two nearby cities (the City of Santa Ynez and the City of Goleta), and the two Census tracts adjacent to Cachuma Lake (Census tracts 18 and 19.06).

Table 3.12-1
State, County, and Local Population Estimates and Projections, 1990-2030

Location	1990 Population[1]	2000 Population[2]	2008 Population[3]	2020 Projected Population[4]	2030 Projected Population[4]
California	29,760,021	33,871,648	36,756,666	44,135,923	49,240,891
Santa Barbara County	369,608	399,347	405,396	459,498	484,570
Los Angeles County	8,863,164	9,519,338	9,862,049	11,214,237	11,920,289
City of Santa Ynez	4,200	4,584	Unavailable	Unavailable	Unavailable
City of Goleta	Unavailable	55,204	30,319	Unavailable	Unavailable
Census Tract 18	1,206	1,349	Unavailable	Unavailable	Unavailable
Census Tract 19.06	6,008	6,422	Unavailable	Unavailable	Unavailable

[1] Source: Census 1990 internet site.

[2] Source: Census 2000 internet site.

[3] Source: U.S. Census Bureau, 2008 American Community Survey

[4] Source: State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 2000-2050*. Sacramento, California, July 2007.

Between 1990 and 2000, all areas for which data is available show an increase in population. The rate of population growth for California (13.8 percent) was greater than that of Santa Barbara County (8.0 percent), Los Angeles County (7.4 percent), the City of Santa Ynez (9.1 percent), and both Census Tract 18 (11.9 percent) and Census Tract 19.06 (6.9 percent). No population data for the City of Goleta is available for 1990 comparisons (U.S. Census Bureau 1990 and 2000).

Between 2000 and 2008, the growth rate for California (8.5 percent) was again greater than Santa Barbara and Los Angeles counties, although during that period the Los Angeles County population increased at a rate (3.6 percent) that exceeded that of Santa Barbara County (1.5 percent). Although it appears that the population of the City of Goleta experienced a decrease in population during that time, the reported population counts do not represent the same geographic areas (U.S. Census Bureau 2000 and California Department of Finance 2009). The 2000 Census reported a total population of 55,204 for the Goleta CDP (Census Designated Place); however, when the City of Goleta was incorporated in 2002, a significant portion of the 2000 Census territory did not incorporate into the new city. The U.S. Census Population Estimates Program estimates the City of Goleta's 2000 population (adjusted with the legal boundary update) at 28,755. This results in an estimated growth rate for the period of 2000 to 2008 of 5.4 percent (U.S. Census Bureau Population Estimates Program 2008). No data beyond the year 2000 is available for the City of Santa Ynez or Census Tracts 18 and 19.06 (U.S. Census Bureau 2000 and 2008).

According to data from the California Department of Finance and the U.S. Census Bureau, the population of California is expected to grow by 20.1 percent between 2008 and 2020, reaching 44,135,923. During the same period, Santa Barbara and Los Angeles counties are expected to

experience population growth rates of 13.3 percent and 13.7 percent, respectively (California Department of Finance 2007 and U.S. Census Bureau 2008).

Between 2020 and 2030, the California Department of Finance data predicts that the State's growth rate (11.6 percent) will slow to approximately half of the previous decade's rate. The growth rates of both Santa Barbara and Los Angeles counties are also predicted to decrease significantly to 5.5 percent and 6.3 percent, respectively (California Department of Finance 2007).

3.12.1.2 Housing

Table 3.12-2 presents 1990, 2000, and 2008 housing data for the State of California, Santa Barbara and Los Angeles counties, the Cities of Santa Ynez and Goleta, and Census tracts 18 and 19.06. Between 1990 and 2000, Census Tract 18 had the greatest increase in the total number of housing units (11.0 percent) while housing units occupied only grew by 8.2 percent. The State had the second greatest increase in the total number of housing units available (9.2 percent) and the greatest increase in the number of housing units occupied at 10.8 percent for the same time period. Santa Barbara and Los Angeles counties experienced the lowest increases in the total number of housing units from 1990 to 2000 at 3.4 percent, and comparable figures for housing units occupied at 5.3 percent and 4.8 percent, respectively. The 1990 housing data for the City of Goleta is not available (U.S. Census Bureau 1990 and 2000).

Between 2000 and 2008, the State of California had the greatest increase in both the total number of housing units available (9.7 percent) and housing units occupied (5.9 percent). Santa Barbara County had the second-greatest increase in total housing units (6.2 percent) and housing units occupied (1.9 percent). Los Angeles County had the lowest increase in total housing units (3.5 percent) and occupancy rate (1.1 percent). No data is available for the City of Santa Ynez, or Census Tracts 18 and 19.06. The available 2000 Census housing data for the City of Goleta does not account for the 2002 change to the City's legal boundary. It follows that the housing units totals are inconsistent during this time however, it can be noted that the occupancy rates held almost constant in the area from 2000 to 2008 at approximately 97.5 percent (U.S. Census Bureau 2000, 2008 and California Department of Finance 2009).

3.12.1.3 Employment and Income

Employment 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. Table 3.12-3 provides labor force and employment data for the State of California, Santa Barbara County, and Los Angeles County. In 2008, the County of Los Angeles had the highest rate of unemployment at 7.5 percent, followed closely by the State at 7.2 percent. Santa Barbara County's unemployment rate was 5.4 percent for the same year (California Employment Development Department 2009).

Table 3.12-2
State, County, and Local Housing Estimates, 1990-2008

Location	Year	Total	Occupied	Percent Vacant
California	1990[1]	11,182,882	10,381,206	7.2%
	2000[2]	12,214,549	11,502,870	5.8%
	2008[3]	13,394,143	12,176,760	9.1%
Santa Barbara County	1990[1]	138,149	129,802	6.0%
	2000[2]	142,901	136,622	4.4%
	2008[3]	151,772	139,212	8.3%
Los Angeles County	1990[1]	3,163,343	2,989,552	5.5%
	2000[2]	3,270,909	3,133,774	4.2%
	2008[3]	3,385,983	3,168,362	6.4%
City of Santa Ynez	1990[1]	1,564	1,493	4.5%
	2000[2]	1,670	1,627	2.6%
	2008	Unavailable	Unavailable	Unavailable
City of Goleta	1990	Unavailable	Unavailable	Unavailable
	2000[2]	20,352	19,860	2.4%
	2008[4]	11,516	11,231	2.5%
Census Tract 18	1990[1]	557	427	23.3%
	2000[2]	618	462	25.2%
	2008	Unavailable	Unavailable	Unavailable
Census Tract 19.06	1990[1]	2,416	2,154	10.8%
	2000[2]	2,589	2,346	9.4%
	2008	Unavailable	Unavailable	Unavailable

[1] Source: Census 1990 internet site.

[2] Source: Census 2000 internet site.

[3] Source: U.S. Census Bureau, 2008 American Community Survey.

[4] State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark.* Sacramento, California, May 2009.

Table 3.12-3
State and County Employment Statistics, 2008

Location	Civilian Labor Force	Employed	Unemployed	Unemployment Rate
California	18,391,800	17,059,600	1,332,300	7.2%
Santa Barbara County	221,200	209,200	12,000	5.4%
Los Angeles County	4,972,000	4,598,300	373,800	7.5%

Source: California Employment Development Department 2008

Note: Employment data not seasonally adjusted.

3.12.2 Environmental Justice

To comply with Executive Order 12898, Federal Action to Address Environmental Justice and Low-Income Populations, data were complied for the ethnic composition and income and poverty levels of the State, Santa Barbara County (which contains Cachuma Lake), neighboring

Los Angeles County, and the two Census tracts that encompass Cachuma Lake (Census tracts 18 and 19.06).

3.12.2.1 Race and Ethnicity

A minority community is defined as a distinct population that is composed of predominantly one or more racial or ethnic group that is nonwhite. Table 3.12-4 presents racial/ethnic composition data for the State of California and Santa Barbara and Los Angeles counties. Nonwhites currently constitute approximately 46 percent of the population in Santa Barbara County and 73 percent of Los Angeles County. In both counties, the Hispanic population forms the greatest portion of the nonwhite population, 37 percent of Santa Barbara County's total population, and 48 percent of Los Angeles County's total population. The percentages of nonwhite and Hispanic populations have increased since 2000 and are projected to continue to increase (California Department of Finance 2007).

This trend toward a larger nonwhite percentage of the population, with Hispanics forming the largest nonwhite group, reflects State trends. The Hispanic population accounts for 37 percent of California's total population. By 2030, California is projected to have a nonwhite population of 67 percent, with 45 percent of the population forecast to be Hispanic (California Department of Finance 2007). Santa Barbara County's percentage of Hispanic residents is projected to increase to 42 percent by 2030 while Los Angeles County's Hispanic residents are projected to constitute 57 percent of the County's total population that same year. Percentages of nonwhite residents in California (67 percent) and Santa Barbara County (53 percent) are projected to be lower than Los Angeles County (81 percent) by 2030.

According to 2000 Census data, the two Census tracts adjacent to Cachuma Lake had a lower average percentage of nonwhites (24 percent) than did Santa Barbara and Los Angeles counties as a whole (67 percent). In 2000, Hispanics composed an average of 18 percent of the population of the two Census tracts, compared with 44 percent of Santa Barbara and Los Angeles counties as a whole (U.S. Census Bureau 2000)

3.12.2.2 Income and Poverty

The U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to determine which families are living in poverty. Poverty thresholds do not vary geographically but are updated annually for inflation using the Consumer Price Index. According to the U.S. Census Bureau, the poverty threshold in 2008 was $10,991 for an individual and $22,025 for a family of four.

Table 3.12-5 shows estimated median household income and poverty levels for the State of California and Santa Barbara and Los Angeles counties. While the percentage of the population of Santa Barbara County at income levels below the poverty threshold (12.4 percent) was lower than the State average of 13.3 percent, the percentage of Los Angeles County's population below the poverty threshold was higher (15.2 percent) than that of the State. The median household income for Los Angeles County ($55,499) was lower than that of the State and Santa Barbara County ($61,021 and $61,543, respectively) (U.S. Census Bureau 2008).

Table 3-12.4
State and County Population Ethnicity Estimates, 2000-2030

Year	White	Hispanic	Asian	Pacific Islander	Black	American Indian	Multi-race	% Non-White	Total
California									
2000	16,134,334	11,057,467	3,761,994	110,355	2,218,281	185,996	637,010		34,105,437
Percent	47%	32%	11%	0%	7%	1%	2%	53%	
2010	16,438,784	14,512,817	4,684,005	149,878	2,287,190	240,721	822,281		39,135,676
Percent	42%	37%	12%	0%	6%	1%	2%	58%	
2020	16,508,783	18,261,267	5,527,783	196,576	2,390,459	299,599	951,456		44,135,923
Percent	37%	41%	13%	0%	5%	1%	2%	63%	
2030	16,377,652	22,335,895	6,334,719	246,363	2,475,477	350,649	1,120,136		49,240,891
Percent	33%	45%	13%	1%	5%	1%	2%	67%	
Santa Barbara County									
2000	229,881	137,184	16,131	623	8,520	2,198	6,578		401,115
Percent	57%	34%	4%	0%	2%	1%	2%	43%	
2010	232,815	161,719	18,793	695	11,356	2,648	6,471		434,497
Percent	54%	37%	4%	0%	3%	1%	1%	46%	
2020	230,443	181,923	20,752	794	15,061	3,159	7,366		459,498
Percent	50%	40%	5%	0%	3%	1%	2%	50%	
2030	227,501	202,141	22,890	870	19,128	3,561	8,479		484,570
Percent	47%	42%	5%	0%	4%	1%	2%	53%	
Los Angeles County									
2000	3,045,819	4,273,914	1,165,096	24,489	910,077	27,187	132,378		9,578,960
Percent	32%	45%	12%	0%	10%	0%	1%	68%	
2010	2,913,695	5,079,973	1,397,967	29,522	877,423	31,089	184,994		10,514,663
Percent	28%	48%	13%	0%	8%	0%	2%	72%	
2020	2,622,397	5,905,060	1,582,652	34,636	822,305	34,640	212,547		11,214,237
Percent	23%	53%	14%	0%	7%	0%	2%	77%	
2030	2,299,502	6,793,557	1,759,129	39,221	749,018	36,044	243,818		11,920,289
Percent	19%	57%	15%	0%	6%	0%	2%	81%	

Source: State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 2000-2050.* Sacramento, California, July 2007.

Table 3.12-5
State and County Median Household Income and Poverty Levels, 2008

Location	Median Household Income	Percent in Poverty
California	$61,021	13.3%
Santa Barbara County	$61,543	12.4%
Los Angeles County	$55,499	15.2%

Source: U.S. Census Bureau, 2008 American Community Survey

No income or poverty data is available for the cities of Goleta and Santa Ynez, or Census Tracts 18 and 19.06 surrounding Cachuma Lake (U.S. Census Bureau 1990, 2000, 2008).

The Environmental Consequences section describes the impact of implementing each of the action alternatives (Alternatives 2 and 3) as well as the No Action Alternative (Alternative 1). The section is organized by resource topics with each of the alternatives as subtopics. Future actions, which might result in site-specific impacts, will be addressed in project specific plans and environmental documentation as they arise.

Before presentation of the impacts, impact thresholds are identified for the action alternatives and where applicable, impact methodology is also discussed. Thresholds are expressed as no impact, minor adverse impact, or major adverse impact. Then, the impacts of actions common to all alternatives are discussed, followed by impacts unique to each alternative and then an impact summary and mitigation measures if applicable. Cumulative impacts are discussed at the end of each resource topic where applicable.

All impacts resulting from the No Action Alternative would be addressed through the implementation of BMPs, which would be subject to an environmental review and possible mitigation in subsequent project-specific environmental documents.

The impacts of each alternative to each resource topic are summarized in Table 4.13-1, which appears at the end of Section 4. Impacts before and after mitigation are listed.

4.1 WATER RESOURCES

4.1.1 Introduction

Water resources include surface water and groundwater. Potential impacts to water resources could result from the following general types of activities associated with the RMP:

- Motorized vessel emissions
- Construction activities
- Human use and waste disposal
- Erosion from trail and road use
- Contamination from cattle and horses
- Recreational watercraft use

Section 4.1.3 also contains a discussion of climate change as it could affect the Plan Area.

4.1.2 Impact Thresholds

- **Beneficial Impact:** Impacts that are detectable and significantly and positively alter historical or desired water quality conditions. These impacts would contribute to the enhancement of park water resources, the public's enjoyment of water resources, or would advance park goals for water quality.
- **No Impact:** Water quality impacts that cannot be detected.
- **Minor Adverse Impact:** Impacts are detectable and are within or below regulatory standards or thresholds for water quality, and do not interfere with park goals or the purpose of the Cachuma Project.
- **Major Adverse Impact:** Water quality impacts that are detectable and substantially and negatively alter historical baseline or desired water quality conditions. These impacts would contribute to the deterioration of water quality in the Study Area and downstream, the public's enjoyment of park resources, or would interfere with goals for water quality in the Plan Area and downstream.

4.1.3 Impacts Common to All Alternatives

Motorized Vessel Emissions

Motorized vessel emissions would have minor adverse impacts on water quality in the Plan Area under all three alternatives. Impacts are considered minor because the annual testing to date for water quality has shown non-detections of MCL standards for BTEX compounds (see Section 3.1.2.1 and Appendix A, Part A-3). Motorized personal watercraft are not allowed under any of the alternatives, which reduces the number of motorized vehicles on the lake that have nonconformant engines. The marina's fleet is all conformant four-stroke engines, and the only remaining nonconformant engines on the lake are on the older boats, and likely will decrease in

numbers as they wear out and are replaced with cleaner four-stroke engines. However, since a large proportion of the nonrental boats have nonconformant engines, pollutants associated with these engines will be released into the lake until these engines are replaced.

Construction Activities

All three alternatives include some degree of site maintenance and facilities construction, which may include ground disturbing activities. Maintenance and construction activities would potentially result in minor adverse impacts to surface waters due to erosion and the resulting temporary increase in turbidity at localized areas.

When specific construction and maintenance activities are developed, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts to water quality would occur. If major impacts to water quality were to be identified, the proposed project would be modified or mitigation measures would be implemented to reduce these impacts to minor or no impact levels (see Section 4.1.7, Mitigation Measure WQ-2).

Erosion From Trail and Road Use

All three alternatives include either maintenance of existing roads and trails, or construction of new roads and trails. Road and trail maintenance and construction would potentially result in minor adverse impacts to surface waters due to erosion and the resulting temporary increase in turbidity at localized areas. Impacts of trail and road use and construction are similar to impacts of construction activities, discussed above.

To mitigate for impacts to water quality that result from road and trail construction, Mitigation Measure WQ-2 will be implemented. Mitigation would reduce these impacts to minor or no impact levels.

Human Waste Disposal

Human waste and its disposal is an issue necessitated by recreational use in the Plan Area. Possible sources of human waste pollution include developed campsites, primitive campsites, portable restrooms provided by contract, and private portable toilets. If portable restrooms and vault toilets are not pumped and cleaned properly, they could have minor adverse impacts on water quality. Proper waste disposal would mitigate for these impacts (see Section 4.1.7, Mitigation Measure WQ-3).

Contamination from Cattle and Horses

Cattle and horses travel along the creeks leading to Cachuma Lake, along with cattle grazing along the north shore, which provides opportunity for contaminants from the horse and cattle manure to leach into the lake. Sanitary surveys and other data indicate very low levels of microbiological contaminants such as Giardia, Cryptosporidium, and enteric viruses (see Section 3.1.2.1) that could be associated with animal waste; therefore, this is considered a minor adverse impact. Proper maintenance of fencing along the north shore and creeks would reduce these impacts to no impact levels (see Section 4.1.7, Mitigation Measure WQ-4).

Recreational Watercraft Use

No invasive mussels have been reported in Cachuma Lake as of April 2010. An infestation of invasive mussels resulting from recreational watercraft use at Cachuma Lake could affect water quality in the Plan Area. Invasive mussel infestations in other waterbodies have been documented to adversely affect water quality from the waste matter generated as part of the filter-feeding process. For example, the decomposition of waste particles from zebra mussels depletes oxygen, increases pH, and produces toxic byproducts such as ammonia and hydrogen sulfide (Snyder et al. 1997). Studies have also shown that zebra mussels can accumulate organic pollutants in their tissues to levels more than 300,000 times greater than concentrations in the environment (Snyder et al. 1997). If Cachuma Lake became infested with invasive mussels, water released from Bradbury Dam that is not subject to treatment could have impaired quality.[5]

In addition, mussels could cluster on and inside of water conveyance facilities associated with Bradbury Dam and downstream facilities, reducing or disrupting flows to water customers and requiring costly maintenance. A reduction or disruption in flows could prevent Reclamation from making scheduled releases from Bradbury Dam for water rights and downstream fisheries protection. A potential exists for adverse effects to species and agriculture in downstream areas. As described in Section 3.9.2.2 and Mitigation WQ-6, a vessel inspection and quarantine program is in place at Cachuma Lake, and additional measures could be considered based on best management practices as new information becomes available.

An infestation of invasive mussels transported from upstream of the Plan Area could also have a major adverse impact on water quality and water conveyance both in the Plan Area and downstream. However, no mitigation exists that would prevent the inadvertent transport of invasive mussels from potential sources outside of the Plan Area. To prevent infestation of Cachuma Lake by recreationists upstream of and outside the Plan Area would require Reclamation to have land use and access control over vast areas of the Santa Ynez River watershed (see Figure 3.1-1). Most of these areas are Los Padres National Forest lands, including reservoirs (Jameson and Gibraltar) and river areas where fishing is allowed; other lands are privately held. In the Santa Ynez Recreation Area, for example, rafting, tubing, kayaking, and other watercraft activities are allowed, and the river segment between Gibraltar Reservoir and Live Oak Camp at Cachuma Lake is a popular rafting run. However, no inspection or quarantine programs are in place to prevent the introduction of invasive mussels. Reclamation lacks authority to implement and enforce measures to prevent an invasive mussel infestation over an area of several hundreds of thousands of acres.

An infestation of invasive mussels, regardless of the source, would be a major adverse impact. It is unlikely that the source of the infestation could be identified. Continued implementation of the vessel inspection and quarantine program at Cachuma Lake would reduce the potential for inadvertent transfer of invasive mussels via recreational watercraft that are currently allowed

[5] Additional water treatment or other measures could be required for water customers of Goleta West and, in certain situations (emergencies, natural disasters, or failure of the State Water Project), ID #1. Water delivered to Goleta West by the Goleta Water District is chlorinated at the Goleta Sanitary District, but not filtered. Although bottled water is available to these customers, uninformed customers could consume unfiltered water that has been exposed to invasive mussels. In the situations listed above, unfiltered water may need to be delivered to ID #1 water customers from the historic Santa Ynez pipeline, which would result in delivery of unfiltered water that has been exposed to invasive mussels.

under all alternatives. Mitigation WQ-6 also addresses control and eradication if an infestation should occur. The residual impact would be minor.

Climate Change

A number of studies have discussed the potential for environmental impacts as a result of climate change. The discussion below addresses potential for climate change on the future environments in the Plan Area and if those changes could affect the implementation of the RMP.

California water planners are concerned about climate change and its potential effects on the state's water resources. There are many potential ways in which climate change can affect the water resources including changes to precipitation as well as increases in extreme wet and dry conditions, decreased snowpack; variability in annual runoff, sea level rises and ecosystem challenges. The California Department of Water Resources (DWR) is currently addressing the issues of global climate change and the impacts under the public draft of the *California Water Plan Update 2009* released in January 2009. This draft plan looks at emerging effects of climate change on the state's water resources and builds upon the managements strategies laid out in the *California Water Plan Update 2005.*

The DWR also released a technical memorandum report called *Progress on Incorporating Climate Change into Management of California's Water Resources* in July 2006. The technical memorandum looked at potential effects in regions in California close to Cachuma Lake, thereby providing an idea of what the potential effects on lake levels would be. In addition, the Climate Action Team (CAT) released a biennial report in April 2009 that used updated, comprehensive scientific research to outline environmental and economic climate impacts. The CAT report synthesized 37 research papers written by world-class scientists from prominent universities and research institutions

Based on the finding in the CAT report and the DWR report and technical memorandum, there are four potential climate change effects that could affect the environment and water levels at Cachuma Lake:

- Changes in precipitation and runoff
- Increased future demand for drinking water and agricultural needs
- Possible effects to the aquatic ecosystem and endangered species
- Increased risk of wildfires

There are direct correlations between decreased snowpack and global climate change laid out in the DWR technical memorandum. However, since the water in Cachuma Lake is not the result of snowpack this effect will not be an issue at Cachuma Lake.

Changes in precipitation and runoff

The DWR technical memorandum looked at statewide annual average precipitation from 1890-2002. According to this analysis, Cachuma Lake has experienced decreasing precipitation in recent years. It is difficult to predict what the future changes in precipitation at Cachuma Lake would be, however the data trend suggests that there might be a decrease in precipitation, and therefore a decrease in water levels due to global climate change.

Future Water Demand

A group of researchers at UC Davis as outlined in the CAT report investigated the effect of potential climate-induced reductions in water supply to the agricultural sector. One of their findings is that the lack of water could result in reductions in irrigated crop area contributing to the loss of agricultural lands in the Central Valley. Under the particular climate change scenario investigated, the researchers also found that changes in yields (mostly negative) and changes in water availability could result in gross revenue losses of up to 3 billion dollars by year 2050.

The DWR technical memorandum states that the domestic water use typically increases with increasing temperature. The water at Cachuma Lake is used for drinking water purposes. Global climate might cause an increase in drinking water demand, thereby possibly affecting the water demand and related levels at Cachuma Lake.

Aquatic Ecosystem Changes

The DWR technical memorandum revealed that increased air temperatures as the result of climate change will likely cause increases in water temperatures at California's lakes and waterways. Increased water temperatures might affect the aquatic ecosystem, especially for aquatic species that are sensitive to changes in water temperature. Increases in water temperature might also cause a decrease in dissolved oxygen demand concentrations, which would likely increase production of algae and some aquatic weeds.

Increased Risk of Wildfires

Scientists at the UC Merced and Pardee RAND Graduate School as outlined in the CAT report performed a novel analysis of wildfire risk in California. They estimated that wildfire risk due to impacts of climate change would increase throughout the end of the century.

The influence of global climate change on future environmental condition of Cachuma Lake cannot be predicted with any accuracy. The potential effects listed above may occur, but it is not possible at this time to estimate when they might occur or to what extent. It is therefore not possible to assess whether any changes in future environmental conditions would influence the implementation of the RMP. To address this uncertainty, the local managing partner will update the Fisheries Management Plan and the Vegetation Management Plan to periodically manage the potential effects of climate change if and when they occur.

4.1.4 Impacts Specific to Alternative 1 (No Action)

Motorized Vessel Emissions

The impacts of motorized vessel emissions on water quality are discussed in Section 4.1.3. Motorized vessel emissions would have minor adverse impacts on water quality in the Plan Area under Alternative 1.

Construction Activities

The impacts of construction activities on water quality are discussed in Section 4.1.3. Construction activities would have minor adverse impacts on water quality. Because the

Alternative 1 would implement fewer new construction projects than the other alternatives, these impacts would be less than the three action alternatives.

Erosion From Trail and Road Use

The impacts of road and trail use on water quality are discussed in Section 4.1.3. Road and trail use would have minor adverse impacts on water quality. Because Alternative 1 would not implement the construction of new roads and trails on the north shore, these impacts would be limited to road and trail development and maintenance practices on the south shore. Impacts would be less than for Alternatives 2 or 3 since no new trails or camping facilities would be built on the north shore under this alternative.

Human Waste Disposal

The impacts of human use and waste disposal are discussed in Section 4.1.3. Under the No Action Alternative, improper disposal of human waste would have a minor adverse impact on water quality in the Plan Area.

Contamination from Cattle and Horses

The impacts of cattle and horses on water quality are discussed in Section 4.1.3. Alternative 1 would allow for the continued use of the lands along the north shore for cattle grazing. Under Alternative 1, cattle and horse emissions would have minor adverse impacts on water quality in the Plan Area.

Recreational Watercraft Use

The potential impacts of an infestation of invasive mussels resulting from recreational watercraft use at Cachuma Lake on lake water quality, water delivery infrastructure, and downstream water quality are discussed in Section 4.1.3.

4.1.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Motorized Vessel Emissions

The impacts of motorized vessel emissions on water quality are discussed in Section 4.1.3. Motorized vessel emissions would have minor adverse impacts on water quality in the Plan Area under Alternative 2. Under Alternative 2 (the Preferred Alternative), the use of nonconformant engines would continue for 2 years when all such engines would be phased out. After the phase out, all recreational marine engines will be required to have a one-star, two-star, or three-star label (see Section 3.1.2.1). Enforcement measures will be specified in the Boating Management Plan. Monitoring and mitigation described in WG-1 would be applied until phaseout is completed.

Construction Activities

The impacts of construction activities on water quality are discussed in Section 4.1.3. Construction activities would have minor adverse impacts on water quality. Because Alternative 2 would implement more construction projects than Alternative 1 (i.e., more campsites, trails on the north shore), these impacts would be greater than Alternative1. By implementing mitigation measures, these impacts could be reduced to minor or no impact levels (see Section 4.1.7, Mitigation Measure WQ-2).

Erosion From Trail and Road Use

The impacts of road and trail use on water quality are discussed in Section 4.1.3. Road and trail use would have minor adverse impacts on water quality. By implementing mitigation measures, these impacts could be reduced to minor impact levels (see Section 4.1.7, Mitigation Measure WQ-2). Alternatives 2 and 3 include the development of a Trail System Management Plan, which will assess impacts of trail use on water quality and implement mitigation to reduce these impacts.

Human Waste Disposal

The impacts of human use and waste disposal are discussed in Section 4.1.3. Under Alternative 2, improper disposal of human waste would have a minor adverse impact on water quality in the Plan Area. Because Alternative 2 would allow cabin camping at Live Oak Camp and limited camping and primitive camping and day use on the north shore, which would include human waste disposal facilities, Alternative 2 would have increased impacts over Alternative 1. By implementing mitigation measures, these impacts could be reduced to minor impact levels (see Section 4.1.7, Mitigation Measure WQ-3).

Contamination from Cattle and Horses

The impacts of cattle and horses on water quality are discussed in Section 4.1.3. Alternatives 1 and 2 would allow for the continued use of the lands along the north shore for cattle grazing. Under Alternatives 1 and 2, cattle and horse waste would have minor adverse impacts on water quality in the Plan Area. By implementing mitigation measures these impacts could be reduced to minor or no impact levels (see Section 4.1.7, Mitigation Measure WQ-4).

Recreational Watercraft Use

The potential impacts of an infestation of invasive mussels resulting from recreational watercraft use at Cachuma Lake on lake water quality, water delivery infrastructure, and downstream water quality are discussed in Section 4.1.3.

4.1.6 Impacts Specific to Alternative 3 (Expanded Recreation)

Motorized Vessel Emissions

The impacts of motorized vessel emissions on water quality are discussed in Section 4.1.3. Until the phase-out of nonconformant engines in 5 years motorized vessel emissions would be similar to Alternatives 1 and 2 and would have minor adverse impacts on water quality in the Plan Area under Alternative 3.

Construction Activities

The impacts of construction activities on water quality are discussed in Section 4.1.3. Construction activities would have minor adverse impacts on water quality. Because Alternative 3 would implement the most construction projects compared to the other alternatives, these impacts would be greatest under Alternative 3. By implementing mitigation measures, these impacts could be reduced to minor impact levels (see Section 4.1.7, Mitigation Measure WQ-2).

Erosion From Trail and Road Use

The impacts of road and trail use on water quality are discussed in Section 4.1.3. Road and trail use would have minor adverse impacts on water quality. Because Alternative 3 would implement the most new trails compared to the other alternatives, these impacts would be greatest under Alternative 3. By implementing mitigation measures, these impacts could be reduced to minor impact levels (see Section 4.1.7, Mitigation Measure WQ-2). Alternatives 2 and 3 include the development of a Trail System Management Plan, which will assess impacts of trail use on water quality and implement mitigation to reduce these impacts.

Human Waste Disposal

The impacts of human use and waste disposal are discussed in Section 4.1.3. Under Alternative 3, improper disposal of human waste would have a minor adverse impact on water quality in the Plan Area. Because Alternative 3 would allow full-day and camping at Live Oak Camp and camping and tent camping at primitive sites with nearby bathrooms on the north shore, Alternative 3 would have the greatest impacts over the other alternatives. By implementing mitigation measures, these impacts could be reduced to minor impact levels (see Section 4.1.7, Mitigation Measure WQ-3).

Contamination from Cattle and Horses

The impacts of cattle and horses on water quality are discussed in Section 4.1.3. Alternative 3 would not continue cattle grazing along the north shore. Under Alternative 3, impacts from cattle would be less, but horse waste would potentially be higher with more equestrian only trails being developed than allowed under the other alternatives. Alternative 3 would have minor adverse impacts on water quality in the Plan Area. By implementing mitigation measures these impacts could be reduced to minor or no impact levels (see Section 4.1.7, Mitigation Measure WQ-4).

Swim Beach

Under Alternative 3, a swim beach would be considered by the local managing partner. Introducing body contact to the lake for the first time would pose some challenges to protecting water quality. Impacts to water quality could occur to potable water users at the park and certain other drinking water users outside the park.

Currently water delivered to Goleta West by the Goleta Water District is chlorinated at the Goleta Sanitary District, but not filtered. Although bottled water is available to these customers, uninformed customers could consume unfiltered water that has received body contact. This impact would be major.

In addition, through an exchange program with South Coast Member units, ID #1 now exchanges its Cachuma entitlement water for treated State Water Project water that does not originate from Cachuma Lake. In the case of emergencies, natural disasters, or failure of the State Water Project, unfiltered water may need to be delivered to customers from the historic Santa Ynez pipeline, which would result in delivery of unfiltered water that has received body contact. This impact would be major.

Recreational Watercraft Use

The potential impacts of an infestation of invasive mussels resulting from recreational watercraft use at Cachuma Lake on lake water quality, water delivery infrastructure, and downstream water quality are discussed in Section 4.1.3. The risk could be somewhat higher with Alternative 3 because it would allow higher boat densities.

4.1.7 Impacts Summary

The three alternatives would have minor to major adverse impacts on water quality due to the impacts of motorized vessel emissions, construction, human waste disposal, erosion from roads and trails, contamination from cattle and horses, and addition of a swim beach.

Impact WQ-1

Motorized vehicle emissions would have minor adverse impacts to water quality under all three alternatives.

Mitigation WQ-1

To monitor for adverse impacts from BTEX compounds, the existing water quality testing program at the William B. Cater Water Treatment Plant for raw water from Cachuma Lake would be used. Testing for volatile organic compounds is performed annually at the Cater Treatment Plant by the City of Santa Barbara. The testing is done on raw water before treatment and after treatment. MTBE is monitored monthly in water quality testing at Cachuma Lake (Appendix A). This overall monitoring program would be used to verify that BTEX compounds and MTBE remain below MCL standards as reported in 1997. If pollutants exceed state limits, an accelerated phase-out on nonconformant engines would be implemented for Alternatives 2 and 3. This phase-out would occur within 6 months from the time detectable pollutants are observed.

Impact WQ-2

Construction and maintenance activities associated with facilities, roads and trails would potentially have a minor adverse impact on water quality due to erosion and temporary increases in turbidity at localized areas.

Mitigation WQ-2

Measures in addition to BMPs may be required for Alternatives 2 and 3. Minor impacts could remain.

Impact WQ-3

If portable restrooms and vault toilets are not pumped and cleaned properly, they could have minor adverse impacts on water quality.

Mitigation WQ-3

Proper waste disposal would mitigate for these impacts. Minor impacts could remain. Park personnel and contract restroom suppliers will be trained in proper cleaning and disposal. Waste disposal stations will provide educational materials to the public on proper disposal.

Impact WQ-4

If cattle, horse, and human access to the lake are not controlled, they could have minor adverse impacts on water quality. To date, water supply in the lake has not been affected by microbiological contamination (Section 3.1).

Mitigation WQ-4

Proper maintenance of cattle fencing on the north shore and signage and educational materials to the public to regulate horse access to the lake would mitigate for these impacts. In addition, an annual report of grazing operations summarizing existing leases, grazing restrictions, and actual number of cattle allowed would be prepared. Minor impacts could remain.

Impact WQ-5

If a swim beach/area is approved under Alternative 3, human body contact would pose a major adverse impact to water quality for users described in Section 4.1.6.

Mitigation WQ-5

- A new potable water treatment facility, incorporated with the relocation of the County Park treatment plant, would provide sufficient treatment for body contact water consumed at Cachuma Lake.
- Upgrade treatment or notification mechanisms for water users in Goleta West would be required.

- During an emergency, ID #1 would need to notify customers that are receiving untreated water and would need to supply alternative water (e.g., bottled water). Swimming in the lake would be temporarily suspended.

These measures will reduce impacts to minor for park users, Goleta West, and ID #1 customers.

Impact WQ-6

Under all alternatives, impacts to Plan Area water quality, water delivery infrastructure, and downstream water quality could occur if recreational watercraft transport invasive mussels or their larva into the waters of Cachuma Lake. An infestation of Cachuma Lake would be a major adverse impact. Implementing Mitigation WQ-6 would reduce the potential impact to minor.

Mitigation WQ-6

Additional Prevention Measures. Additional best management practices could be considered to augment the vessel inspection and quarantine program at Cachuma Lake as new information becomes available. Continued implementation of the program would reduce the potential for inadvertent transfer of invasive mussels via recreational watercraft.

Control and Eradication. In the event that quagga mussels or zebra mussels are identified in Cachuma Lake, a number of control and eradication methods could be implemented. The California Science Advisory Panel report *California's Response to the Zebra/Quagga Mussel Invasion in the West* (May 2007) proposes eradication and control methods for quagga mussels in Lake Mead, where the invasive species was first detected in 2007. The report states that "several technically feasible eradication methods … would have a strong chance of success if they were promptly and diligently applied at an appropriate scale." The report proposes the following six distinct approaches for killing or removing settled mussels, ranked by their individual effectiveness (California Science Advisory Panel 2007):

- Dewatering: Mussels have been shown to die within 5 days of aerial exposure in warm conditions and within 15 days in cold, humid conditions (Ricciardi et al. 1995 in California Science Advisory Panel 2007). Even a limited drawdown of the lake would improve the effectiveness of other approaches by reducing the area or volume to be treated.
- Isolation and treatment: Mussel populations can be isolated behind barriers or under coverings and then killed with an appropriate biocide.
- Covering: Plastic mats laid on the bottom are routinely used to kill aquatic weeds. Field trials applying this technique to *D. polymorpha* produced over 99 percent mortality in 9 weeks. Covering *D. bugensis* on the bottom or tightly wrapping them where they occur on structures, could be an effective, biocide-free technique.
- Heating: Water heated to 104° F kills *D. polymorpha* on contact.
- Biocide treatment: Batch treatment means treating the entire infested area with a biocide—either an entire waterbody or a portion if it can be isolated by a temporary barrier. In 2006, the Virginia Department of Game and Inland Fisheries used potassium chloride to eradicate a zebra mussel infestation at Millbrook Quarry in Virginia (Virginia Department of Game and

Inland Fisheries 2009). Municipally treated drinking water may contain small concentrations of potassium, and potassium chloride is widely used in home water softeners.

- Mechanical removal: Various mechanical techniques have been used to remove mussels and other fouling from structures such as water intakes and pipes. These range from the use of handheld scrapers with attached suction hoses to abrasive blast cleaning using sand, grit, or carbon dioxide pellets. In some cases, the most efficient mechanical approach may be to just remove the affected substrate from the water. For example, in an infested marina, boats and floating docks could be removed from the water for a few weeks, which would kill any mussels on them and facilitate treatment of the mussels remaining on the bottom.

The California Science Advisory Panel 2007 report concludes that the most efficient program will likely include a combination of approaches. The largescale use of plankton tows in conjunction with these approaches would reduce the further settlement of mussels during the eradication effort and reduce the number of veligers transported downstream (California Science Advisory Panel 2007).

Additional Measures Under Development. If an infestation of Cachuma Lake occurred at some future date, additional methods could be available that would be considered for implementation. Reclamation, in coordination with other state and federal agencies, is conducting research and field testing in the following areas (Reclamation 2009):

- Field trials using *Pseudomonas fluorescens.* Research trials are under way for the use of a naturally occurring soil microorganism called *Pseudomonas fluorescens* to control quagga and zebra mussels. Both live and dead cells of the CL145A strain of *P. fluorescens* appear to be effective in killing adult mussels as well as planktonic larvae, without harming water quality or other aquatic organisms. Dead cells of this strain of *P. fluorescens* are the active ingredient in a biopesticide called Zequanox that is in development. Acute toxicity testing to assess potential human health risks is in progress, and regulatory agency approval of Zequanox is expected in 2010 (Marrone Bio Innovations 2009). Reclamation is developing a Cooperative Research and Development Agreement with the commercial developer of the product.
- Antifouling and foul-release coatings. Various commercially available protective coatings are being evaluated at Reclamation's Parker Dam. Promising coating solutions are being identified and the current understanding of the effectiveness of different coating systems to prevent invasive mussel fouling has improved.
- Filtration evaluations at Parker and Hoover Dams. Reclamation researchers are evaluating 40- and 80-micron self-cleaning filtration systems developed for ballast water applications to determine if filtration can be used to exclude mussels from, or prevent settlement in, water supply lines and cooling water systems.
- Ultraviolet (UV) treatment. Reclamation researchers are evaluating UV treatment at Hoover Dam to impede mussel settlement in water supply lines and potentially power plant cooling water systems. This treatment method would eliminate the need for conventional oxidizing chemicals and is a known effective treatment for other waterborne organisms in drinking water systems.
- Investigation of fish screening technologies to reduce mussel impacts. Recognizing the potential future impacts that invasive mussels could pose to fish protection facilities,

Reclamation is field-testing commercially available screen systems in mussel-infested waters along the lower reaches of the Colorado River.

- Controlling mussels with natural predators. A variety of potential natural predators exist for control of invasive mussel populations. Research is under way to identify species that may have application to water delivery systems and provide recommendations for future research toward implementation.
- Quagga mussel control using copper-ion generators. The use of copper-ion generators to prevent mussel settlement in water facilities has been identified as a potential treatment.

Alternative Drinking Water Sources. As stated above, additional water treatment or other measures could be required for Goleta West and, in certain situations (emergencies, natural disasters, or failure of the State Water Project), ID #1 water customers. Reclamation and the managing partner would work with the affected water district to provide bottled water or another source of drinking water to affected water customers.

Cost. The cost of implementing additional inspection and quarantine measures—or, if an invasive mussel infestation occurred, control and eradication measures—cannot be identified with certainty. The cost of implementing additional inspection methods could be nominal. The biocide treatment used at Millbrook Quarry in Virginia, along with bioassays and post-project monitoring, totaled approximately $420,000 (Virginia Department of Game and Inland Fisheries 2009). The cost of other treatments or combinations of treatments could theoretically be considerably higher.

In the event that invasive mussels were detected in Cachuma Lake or associated water delivery facilities, Reclamation and the managing partner will search for funding sources to implement control and eradication measures. Funding sources could involve Reclamation and/or the managing partner. Reclamation's ability to share costs would be subject to federal funding and congressional appropriations. Reclamation would cooperate with all involved parties in seeking funding and solutions.

Cumulative Impacts

An infestation of invasive mussels in the Santa Ynez River upstream of the Plan Area could have a major adverse cumulative impact on water quality and water conveyance both in the Plan Area and downstream. As described in Section 4.1.3, activities upstream of the Plan Area are not subject to the inspection or quarantine programs that are implemented in the Plan Area to prevent the introduction of invasive mussels. Reclamation lacks authority to implement and enforce measures to prevent an invasive mussel infestation over an area of several hundreds of thousands of acres.

As described above, an infestation of invasive mussels resulting from recreational watercraft use at Cachuma Lake could affect water quality at downstream facilities, reducing or disrupting flows to water customers and requiring costly maintenance. A reduction or disruption in flows could prevent Reclamation from making scheduled releases from Bradbury Dam for water rights and downstream fisheries protection. This would result in cumulative impacts to downstream water quality, water supply and aquatic species. This is considered a major impact. Mitigation Measure WQ-6 would reduce the impact to minor.

4.2 AIR QUALITY

4.2.1 Introduction

Three factors have the potential to impact air quality:

- Emissions from motorized vehicles and vessels
- Dust emissions due to motorized vehicles, construction or recreation
- Short-term combustion emissions due to prescribed burning

4.2.2 Impact Thresholds

- **Beneficial Impact:** Impacts that are detectable and significantly and positively alter historical or desired air quality conditions. These impacts would contribute to the enhancement of park air quality, the public's enjoyment of park resources, or advancement of park goals for air quality.
- **No Impact:** Air quality impacts that cannot be detected.
- **Minor Adverse Impact:** Impacts are detectable and are within or below regulatory standards or thresholds for air quality, and do not interfere with park goals.
- **Major Adverse Impact:** Air quality impacts that are detectable and significantly and negatively alter historical baseline or desired air quality conditions. These impacts would contribute to the deterioration of air quality in the Study Area, the public's enjoyment of park resources, or would interfere with park goals for air quality.

4.2.3 Impacts Common to All Alternatives

Motorized Vessel and Vehicle Emissions

Vehicle emissions, including automotive and boat traffic, would have minor adverse impacts on air quality in the Plan Area under the three alternatives. Although automotive and boat traffic would vary among the alternatives, none of the alternatives would result in levels of park visitation high enough to create heavy and sustained traffic patterns that would produce major air quality issues.

Criteria pollutant emissions, including ozone precursors such as NO_x, ROGs, and GHGs from boats and vehicles were estimated using CARB emission factors to determine air quality impacts to the Plan Area. Vehicle emissions were estimated using the CARB EMFAC 2007 on-road emissions model. The EMFAC model is the latest emission inventory model that calculates emission inventories for motor vehicles operating on roads in California. This model reflects the current understanding of how vehicles travel and how much they pollute. Emissions from boats were estimated using emission factors from the CARB Off-Road model. The CARB Off-Road model is an emissions estimation model for many classes of off-road vehicles including construction, mining, agricultural, and recreational equipment.

All boats were assumed to be gasoline-fueled, with engines between 50 and 100 horsepower. The emission factors in the Off-Road model are based on the inventory of vehicles or equipment

for a given county, air basin, or statewide, and incorporate all adopted regulations affecting the emissions. When the Off-Road model is run for future years, for example, the emissions would reflect the requirement that boats with engines newer than model year 2000 meet lower NO_x and hydrocarbon emissions. The Off-Road model calculates criteria pollutant, GHGs, and toxic air contaminant emissions.

Annual emissions were calculated for boats currently in use at Cachuma Lake and for projected increases for the planning period. According to Table 4.9-2, the maximum number of boats on the lake at any time is 131 boats per day (Existing Conditions, Total BAOT, Launch + Marina + Rental). This number represents a worst-case condition for emissions by assuming the highest recorded day use for boats would occur every day throughout the year. Future boat use is assumed to increase by 20 percent over existing conditions. This 20 percent increase is based on Table 3.12-1, which projects an approximate 20 percent increase in population in Santa Barbara and Los Angeles counties between 2008 and 2030. The 20 percent increase assumes that increases in boat use will be proportional to increases in population.

The average number of vehicles between fiscal years 2001-2002 and 2008-2009 was estimated at 174,869 (see Section 3.10.2). The vehicles were assumed to travel primarily from Santa Barbara and Los Angeles counties. Because the population of those counties is expected to increase by 20 percent between 2008 and 2030, it can be expected that vehicle miles traveled in those counties will also increase by 20 percent over current rates.

The projected future emissions relative to the GCR de minimis levels are summarized below in Table 4.2-1. Future-year (2030) emissions are projected to be below GCR de minimis thresholds and would not conflict with the goals in the Santa Barbara County 2007 Clean Air Plan.

Table 4.2-1
Future Vehicle and Boat Emissions from Cachuma Lake RMP/GP (tons/year)

	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	CO_2
Vehicle Emissions	1.78	12.38	0.93	0.37	0.22	0.04	4025.90
Boat Emissions	4.11	5.29	0.70	1.49	N/A	0.003	162.42
TOTAL	5.89	17.69	1.63	1.86	0.22	0.04	4188.32
GCR De Minimis Thresholds	100	NA	100	NA	NA	NA	NA

Notes:

1. There are no GCR de minimis thresholds for CO, PM_{10} and SO_2 because the area is in attainment for the federal CO, PM_{10} and SO_2 standards.
2. The EPA is in the process of developing a GCR de minimis threshold for $PM_{2.5}$.
3. There is no GCR de minimis threshold for CO_2 because GCR de minimis thresholds are only developed for criteria pollutants

The cumulative impacts of development in the Plan Area are discussed in Section 4.2.7.

Dust Emissions

Under all three alternatives, dust emissions would potentially cause minor adverse impacts on air quality due to motor vehicle traffic. Dust and particulate matter in the Plan Area are potentially generated via three sources. The first dust source is automobile traffic on dirt roads and unpaved

areas. The second dust source is recreational trail use, including hiking, horseback riding, and mountain biking. The third dust source is grading disturbance from facilities construction.

The dust generated by motor vehicles driving on dirt roads and unpaved areas would result in minor adverse impacts to air quality in the Plan Area. Vehicles could create dust clouds in localized areas. These minor adverse impacts would be similar under all three alternatives. Dust clouds would be created by vehicles traveling across unpaved areas, which may include dirt roads as well as nonvegetated areas near the water's edge that are sometimes used for parking. Such unpaved areas are only accessible late in the season (late summer and fall) when water levels in the reservoir are at their lowest point for the year. The timing of low water levels corresponds with low visitor levels. The number of vehicles driving on unpaved areas is unlikely, therefore, to vary among the three plan alternatives later in the year.

The dust generated by recreational trail use, including hiking, horseback riding, and mountain biking, would have no impact on air quality in the Plan Area. These types of recreational trail use are not usually fast enough or dense enough to create substantial dust clouds. Currently the Plan Area does not allow recreational use by off-highway motor vehicles, such as three- and four-wheelers, dune buggies, and dirt bikes. Off-highway motor vehicles can result in substantial dust clouds, and their use will not be allowed in the park under this RMP. The impacts of trail use on erosion are addressed in Section 4.1.7.

All three alternatives include some degree of site maintenance and facilities construction, which may include ground-disturbing activities that could generate dust. Maintenance and construction activities would potentially result in minor adverse impacts to air quality due to dust. When specific construction and maintenance activities are developed, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts to air quality would occur. If major impacts to air quality were to be identified from Alternatives 2 or 3, the proposed project would be modified or mitigation measures would be implemented to reduce these impacts to no impact levels (see Section 4.2.7, Mitigation Measure AQ-1).

Short-term Combustion Emissions From Prescribed Burning

All three alternatives include the potential for short-term and localized minor adverse impacts from wildfires and prescribed burning. Fires, whether accidental or prescribed, would result in temporary, localized increases in combustion emissions that would have minor adverse impacts on air quality. Prescribed burns could be timed to minimize impacts to air quality (see Mitigation Measure AQ-2).

Greenhouse Gas Emissions

Greenhouse gas (in the form of CO_2) emissions from boats and vehicles were estimated using the CARB Off-Road model and EMFAC 2007 emission factors. Table 4.2-2 presents the estimated emissions for existing conditions. Future (2030) conditions are based on projecting peak use day emissions for an entire year and represents worst-case conditions.

Table 4.2-2
Existing and Future Vehicle and Boat GHG Emissions from Cachuma Lake RMP – Projected Worst Case Scenario (tons/year)

	Existing GHG	Future (2030) GHG
Vehicle Emissions	3,379.92	4,025.90
Boat Emissions	135.35	162.42
TOTAL	3,515.27	4,188.32
GCR De Minimis Thresholds	NA	NA

Note: There is no GCR de minimis threshold for CO_2 because GCR de minimis thresholds are only developed for criteria pollutants

Cumulative impacts of GHG emissions are typically considered important because climate change is a global problem and all activities around the globe that emit greenhouse gases are contributing to climate change. However, without significance thresholds, evaluating whether or not one project itself will contribute significantly to climate change is speculative and is therefore not attempted in this document.

4.2.4 Impacts Specific to Alternative 1 (No Action)

The impacts of vehicle emissions, dust emissions, and combustion emissions under the No Action Alternative are discussed in Section 4.2.3.

4.2.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

The impacts of vehicle emissions, dust emissions, and combustion emissions under Alternative 2 are discussed in Section 4.2.3.

4.2.6 Impacts Specific to Alternative 3 (Expanded Recreation)

The impacts of vehicle emissions, dust emissions, and combustion emissions under Alternative 3 are discussed in Section 4.2.3.

4.2.7 Impacts Summary

On balance, the No Action and both action alternatives have similar impacts on air quality. Minor adverse impacts would be created by three components of Park management:

- Dust would generated by vehicle traffic on unpaved areas,
- Construction activities would have the potential to create dust,
- Prescribed burning or wildfires would release combustion emissions.

All of these impacts would be minor, localized, and temporary. Implementation of mitigation measures for Alternatives 2 and 3 would minimize some of these impacts.

Impact AQ-1

Under all three alternatives, site maintenance and facilities construction would include ground-disturbing activities that could generate dust. Maintenance and construction activities would potentially result in minor adverse impacts to air quality due to dust.

Mitigation AQ-1

When specific construction and maintenance activities are developed for Alternatives 2 and 3, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts to air quality would occur. Construction and maintenance activities for individual projects will comply with the required SBAPCD rules and regulations to mitigate for short-term construction emissions involving earthmoving, regardless of the project size and duration. The following mitigation measures are recommended by SBAPCD and may be implemented at the site on a project-by-project basis:

- During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever possible.
- Measures to reduce fugitive dust emissions to a level of insignificance for earthmoving activities:
  - Minimize the amount of disturbed area and reduce on site vehicle speeds to 15 miles per hour or less.
  - Gravel pads could be installed at all access points to prevent tracking of mud on to public roads.
  - If importation, exportation and stockpiling of fill material are involved, soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.
  - After clearing, grading, earth moving or excavation is completed, treat the disturbed area by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur.
  - The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the SBAPCD prior to land use clearance for map recordation and land use clearance for finish grading for the structure.
- Measures during project grading and construction to reduce NO_x and $PM_{2.5}$ emissions from construction equipment:
  - All portable construction equipment shall be registered with the state's portable equipment registration program OR permitted by SBAPCD by September 18, 2008.

- Diesel construction equipment meeting CARB's Tier 1 emission standards for off-road heavy-duty diesel engines shall be used. Equipment meeting Tier 2 or higher emission standards should be used to the maximum extent feasible.
- The engine size of construction equipment shall be the minimum practical size.
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensue that the smallest practical number is operating at any one time.
- Construction equipment shall be maintained in tune per the manufacturer's specifications.
- Construction equipment operating onsite shall be equipped with two to four degree engine timing retard or pre-combustion chamber engines.
- Catalytic converters shall be installed on gasoline-powered equipment, if feasible.
- Diesel catalytic converters, diesel oxidation catalysts and diesel particulate filters as certified and/or verified by EPA or California shall be installed on equipment operating on-site.
- Diesel powered equipment should be replaced by electric equipment whenever feasible.
- Idling of heavy-duty diesel trucks during loading and unloading shall be limited to five minutes; auxiliary power units should be used whenever possible.

Impact AQ-2

Fires, whether accidental or prescribed, would result in temporary, localized increases in combustion emissions that would have minor adverse impacts on air quality.

Mitigation AQ-2

Prescribed burns could be timed to minimize impacts to air quality. For example, burning should not be conducted on days when air quality is below normal conditions. Minor impacts could remain.

Cumulative Impacts

The management activities associated with the three alternatives would have less than significant impacts on air quality in the region. However, air quality in the Plan Area and the county will be affected by ongoing and future development activities, which will result in increased vehicle miles traveled (VMTs).

According to U.S. Census and California Department of Finance projections for 2030, there will be approximately a 20 percent increase in the populations of Santa Barbara and Los Angeles counties over the entire planning period as listed in Table 3.12-1. Therefore, these counties are expecting an increase in vehicle miles traveled (VMTs) based on the population growth.

However, it is difficult to predict if future visitor usage to Cachuma Lake will follow the projected population trends. The annual average number of vehicles entering the Plan Area between fiscal years 2001-2002 and 2008-2009 was estimated at 174,869 (see Section 3.10.2). The most recent vehicle count was for fiscal year 2008-2009, with a total of 204,446. The annual

number of vehicles entering the Plan Area has been increasing since fiscal years 2004-2005 through 2006-2007, when annual totals dropped below approximately 170,000. If future visitor use to Cachuma Lake continues to fluctuate as it has over the longer-term period of fiscal years 2001-2002 through 2008-2009, the three alternatives would not pose a significant cumulative impact to the Plan Area's air quality. However, if future visitor use continues to increase under the three alternatives, then there could be a potential cumulative impact since the Plan Area is considered a maintenance area for ozone.

Even if future visitor usage to Cachuma Lake and associated VMTs increase in accordance with the trends expected, future stringent CARB vehicle emission standards such as LEV II (described below) would reduce the county's emissions from VMTs in general and offset any increases in visitor use emissions. CARB introduced the Low Emission Vehicle (LEV) standards for automobiles for the first time in 1990. The LEV standards were introduced to reach the state's clean air goal through improved emission reductions for automobiles. The first LEV standards ran from 1994 through 2003. The new amendments known as LEV II regulations are running from 2004 through 2010 and have more stringent emission reductions. When LEV II is fully implemented in 2010, it is estimated that the statewide reduction will be 155 tons per day. (Fact Sheet: http://www.arb.ca.gov/msprog/levprog/levprog.htm.) Similar vehicle emissions reductions are expected in Santa Barbara and Los Angeles counties as well.

4.3 SOILS AND GEOLOGY

4.3.1 Introduction

Three factors have the potential to impact soils and geology in the Plan Area:

- Construction and maintenance of park facilities at existing locations
- Construction and maintenance of new camping facilities
- Recreational trails, including construction and use

Impacts of the RMP that result in erosion are more thoroughly addressed in Section 4.1.7.

4.3.2 Impact Thresholds

- **Beneficial Impact**: Impacts to soils or geology that are detectable and significantly and positively alter historical or desired conditions. These impacts would contribute to the enhancement of park resources, the public's enjoyment of park resources, or would advance park goals.
- **No Impact**: Impacts to soils and geology that cannot be detected.
- **Minor Adverse Impact:** Impacts to soils and geology that are detectable and are within or below regulatory standards or thresholds, and do not interfere with park goals.
- **Major Adverse Impact:** Impacts to soils or geology that are detectable and significantly and negatively alter historical baseline or desired air quality conditions. These impacts would contribute to the deterioration of soils in the Study Area, the public's enjoyment of park resources, or would interfere with park goals.

4.3.3 Impacts Common to All Alternatives

Construction and Maintenance

All three alternatives include some degree of site maintenance and facilities construction. The amount of new construction increases for each alternative, Alternative 1 having the least to Alternative 3 proposing the most new construction. Areas of geological hazards, unstable soils, or potential erosion hazards could affect location of facilities, including campsites, roads, and buildings. Depending on where these facilities are sited, construction and maintenance activities could have minor to major adverse impacts on soils resources. When specific construction and maintenance activities are developed, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts would occur. If Alternatives 2 or 3 were to result in major impacts to soils, the proposed project would be moved, modified, or mitigation measures would be implemented to reduce these impacts to minor adverse impact levels (Mitigation Measure SG-1). If avoidance of unstable soils is not possible, major adverse impacts could result from Alternative 3.

Recreational Trails

Areas of geological hazards, unstable soils, or potential erosion hazards could affect location of recreational trails. Trail use and construction could have minor adverse impacts on soil resources through compaction or erosion. New trails established under the action alternatives will be sited away from steep slopes, unstable soils or potential erosion hazards (Mitigation Measure SG-2). If avoidance of unstable soils is not possible, minor to major adverse impacts could occur, which will be discussed in greater detail for each alternative.

Land Management

The feasibility of prescribed burning to reduce fire-fuel build-up would be evaluated annually for all three alternatives. Not managing fire-fuel buildup could lead to larger wildfires that can leave soil without protective vegetation, which increases the possibility of soil erosion and loss of topsoil during heavy rains or high winds. This scenario has the potential to result in minor to major adverse impacts, depending on the timing and severity of the fire and rain events following the fires.

4.3.4 Impacts Specific to Alternative 1 (No Action)

Construction and Maintenance

Alternative 1 proposes the least amount of facility construction and no facility construction on the north shore where most of the unstable slopes are located (Figure 3.3-7). If avoidance of unstable soils is not possible, minor adverse impacts could occur. Projects would include BMPs to reduce these impacts.

Recreational Trails

Alternative 1 proposes the least amount of trail construction and no new trails on the north shore where most of the unstable slopes are located. Therefore, Alternative 1 would have the least impacts from recreational trails. Trail use and construction could have minor adverse impacts on soil resources through compaction or erosion under Alternative 1. Areas of geological hazards, unstable soils, or potential erosion hazards could affect location of recreational trails. If avoidance of unstable soils is not possible under Alternative 1, minor adverse impacts could result on the south shore, but no impacts would occur on the north shore.

Land Management

Changes in land management can have negative impacts on soils, such as increased erosion and compaction due to grazing. Grazing within the Plan Area on the north shore will continue under Alternative 1. Grazing has the potential to result in minor adverse impacts to soil resources. Coordination of grazing activities would include the use of grazing's fire fuel-repression benefits.

4.3.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Construction and Maintenance

Alternative 2 proposes a moderate level of new construction. Areas of geological hazards, unstable soils, or potential erosion hazards could affect location of facilities, including campsites, roads, and buildings. Depending on where these facilities are sited, construction and maintenance activities could have minor to major adverse impacts on soils resources. When specific construction and maintenance activities are developed, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts would occur. Figure 3.3-7 shows the location of unstable slopes and landslide areas within the Plan Area. More of these unstable areas are located on the lake's north shore. Alternative 2 proposes limited access to the north shore, allowing only low-impact limited day use. Very little construction and maintenance would be associated with this type of use, but would create more of an impact than Alternative 1 that would not include these uses.

Under Alternative 2, if major impacts to soils were to be identified, the proposed project would be moved, modified, or mitigation measures would be implemented to reduce these impacts to no impact levels (Mitigation Measure SG-1). If avoidance of unstable soils is not possible, minor adverse impacts could occur. Because Alternative 2 proposes only low-impact, limited day use, construction activities would be small and being able to locate the construction where soils are stable would be a reasonable assumption.

Recreational Trails

Trail use and construction could have minor adverse impacts on soil resources through compaction or erosion under Alternative 2. Primitive trails would be located on the north shore for equestrian riding, hiking, and biking with a permit. Areas of geological hazards, unstable soils, or potential erosion hazards could affect the location of these primitive recreational trails.

Construction activities associated with these primitive trails under Alternative 2 would be minimal (minor clearing of brush and low branches and slope stabilization with native rock, small signage). Because a permit would be required to use these trails, the use of these trails can be more closely managed to reduce impacts from over use and misuse (cutting switchbacks, going off-trail) of the trails. Very little construction and maintenance would be associated with this type of use, but would create more of an impact than Alternative 1 that would not include these uses.

New primitive trails will be sited away from steep slopes, unstable soils or potential erosion hazards (Mitigation Measure SG-2). If avoidance of unstable soils is not possible, minor adverse impacts could occur. Because Alternative 2 proposes only primitive trail development, construction activities would be small and constructing where soils are stable, or being able to stabilize soils would be a reasonable assumption.

Land Management

Changes in land management can have negative impacts on soils, such as increased erosion and compaction due to grazing. Grazing within the Plan Area on the north shore will continue under Alternative 2. Grazing has the potential to result in minor adverse impacts to soil resources. Coordination of grazing activities would include the use of grazing's fire fuel-repression benefits. This plan will also include management recommendations to minimize negative impacts to soils in coordination with a Vegetation Management Plan to reduce impacts on soil from wild fires to minor impact levels (see Mitigation Measure SG-3).

4.3.6 Impacts Specific to Alternative 3 (Expanded Recreation)

Construction and Maintenance

Alternative 3 proposes the most new construction. Areas of geological hazards, unstable soils, or potential erosion hazards could affect location of facilities, including campsites, roads, and buildings. Depending on where these facilities are sited, construction and maintenance activities could have major adverse impacts on soils resources under Alternative 3. When specific construction and maintenance activities are developed, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts would occur. Figure 3.3-7 shows the location of unstable slopes and landslide areas within the Plan Area. More of these unstable areas are located on the lake's north shore. Alternative 3 proposes the most access and development on the north shore, allowing full public access, boat camping, and tent camping on primitive sites with nearby bathrooms and water. Greater construction and maintenance would be associated with these types of uses, creating potentially more impacts than Alternatives 1 or 2.

Under Alternative 3, if major impacts to soils were to be identified, the proposed project would be moved, modified, or mitigation measures would be implemented to reduce these impacts to no impact levels (Mitigation Measure SG-1). Because Alternative 3 proposes full public access and construction activities requiring major ground disturbance (foundations, vault toilets, water lines) construction activity's avoidance of unstable soils may not be possible. If avoidance of unstable soils is not possible, and mitigation measures are not completely effective, minor adverse impacts could remain.

Recreational Trails

Trail use and construction could have major adverse impacts on soil resources through compaction or erosion under Alternative 3. Alternative 3 permits the construction of full public access trails on the north shore where most of the unstable slopes are located. Construction activities associated with these trails under Alternative 3 would be more intensive (grading, engineered slope stabilization, clearing of brush, signage, trail head construction). Areas of geological hazards, unstable soils, or potential erosion hazards could affect the location of these recreational trails, and avoidance of these unstable soils may not be possible due to the need to construct the trails for full public access.

New trails will be sited away from steep slopes, unstable soils or potential erosion hazards (Mitigation Measure SG-2). If avoidance of unstable soils is not possible, minor adverse impacts could remain depending on the effectiveness of the mitigation. Because Alternative 3 proposes full public access trails, construction activities would be greater than for the other alternatives, and being able to locate the construction where soils are stable, or being able to stabilize unstable soils to minor adverse impact levels may be difficult.

Land Management

Alternative 3 would discontinue grazing on the north shore due to potential conflicts with the development of camping and trails on the north shore. Alternatives to controlling fire fuel, including prescribed burns would need to be increased to replace the use of grazing. This increase would be implemented by the Vegetation Management Plan.

4.3.7 Impacts Summary

Alternative 1 (No Action) would have the fewest impacts and Alternative 3 would have the greatest potential for major adverse impacts on soils and geology in the Plan Area. Implementation of mitigation measures would likely reduce the minor and major adverse impacts of Alternatives 2 and 3 on soils and geologic resources to a no impact Level.

Impact SG-1

Construction and maintenance activities could have minor to major (under Alternative 3) adverse impacts on soils resources.

Mitigation SG-1

When specific construction and maintenance activities are developed, a site-specific environmental analysis would be conducted and a more focused assessment of the activity's impacts would occur. If major impacts to soils were to be identified, the proposed project would be modified and/or mitigation measures would be implemented to reduce these impacts to minor impact levels. In addition to routine BMPs, feasible mitigation measures for Alternatives 2 and 3 may include:

- Scheduling construction during periods of low water, thereby increasing the distance to the shoreline
- Scheduling construction during the dry season
- Use of silt fencing, water bars, or straw bales and wattles to prevent erosion runoff
- Development and implementation of Stormwater Pollution Prevention Plans for individual construction projects

Residual impacts would be minor.

Impact SG-2

Trail use and construction could have minor to major (under Alternative 3) adverse impacts on soil resources.

Mitigation SG-2

New trails established under the action alternatives will be sited away from steep slopes, unstable soils, or potential erosion hazards (Figure 3.3-7). If major impacts to soils were to be identified, the proposed project would be modified and/or mitigation measures would be implemented to reduce these impacts to no impact levels. Impacts from Alternative 3 may only be reduced to minor adverse impacts. Mitigation measures beyond routine BMPs that would be implemented during construction to prevent erosion may include the following measures:

- Scheduling construction during periods of low water, thereby increasing the distance to the shoreline
- Scheduling construction during the dry season
- Use of silt fencing, water bars, or straw bales and wattles to prevent erosion runoff
- Development and implementation of Stormwater Pollution Prevention Plans for individual construction projects

Impact SG-3

Cattle grazing with Alternatives 2 and 3 (on south shore) could have minor adverse impacts to soils resources through compaction or erosion.

Mitigation SG-3

The Rangeland Assessment and Grazing Management Plan (Sage Associates 2003, available upon request) contains grazing management recommendations to minimize negative impacts to soils on the north shore. The following guidelines from the plan would mitigate impacts from grazing to a level of no impact.

- The local managing partner will require sub-lessees to prepare grazing plans that incorporate the BMPs and performance standards in the Rangeland Assessment and Grazing Management Plan. The plans will be reviewed and approved by the local managing partner every 5 years.

- The timing, intensity, and duration of grazing on all leases will be adjusted to maintain enough cover to protect the soil from erosion; maintain the quality and quantity of forage; protect native grasses, riparian vegetation, and oak trees; and protect water quality. Grazing will be consistent with the Natural Resources Conservation Service's Rangeland Conservation Practices, and meet the minimum performance standards in the Rangeland Assessment and Grazing Management Plan.
- The local managing partner will require lessees to maintain fencing on Lease 1 (Lausten Lease) to exclude cattle from Cachuma Lake, Santa Cruz Creek, and Cachuma Creek. Continue to maintain fencing on Lease 4 (Carr Lease) to exclude cattle from Cachuma Lake.
- Lease 1 and east side of Lease 3 (Bacon Lease) will be grazed only seasonally, from fall to early summer to protect perennial bunchgrasses and oak seedlings. Lease 2 (Geremia Lease), the western portion of Lease 3, and Lease 4 may be grazed year-round provided access to off-lease water sources is continual. Ranch-use horses may be kept year-round in the Lease 1 holding field.
- An additional holding field may be constructed on Lease 1 per the Rangeland Assessment and Grazing Management Plan.
- The sub-lessee will establish an improved watering system on Lease 1 to improve livestock distribution, which will reduce impacts to springs and the Horse Canyon riparian zone; reduce soil erosion; and improve forage conditions. Recommended watering system improvements are described in the Rangeland Assessment and Grazing Management Plan.
- All salt and nutritional supplements will be placed away from springs and other natural water sources.
- All roads in grazing areas will be maintained by sub-lessees with BMPs to prevent erosion.
- The prescribed burning program on Lease 1 will continue in accordance with the RMP fire management objectives.

In addition to these guidelines, the Rangeland Assessment and Grazing Management Plan will be updated to state that grazing leases should address protocol for management of cattle trespass and fence breaches, animal-unit months, and duration and timing of seasonal grazing periods to include consideration of a rest rotation schedule. The Rangeland Assessment and Grazing Management Plan as well as the Vegetation Management Plan would contain adaptive management protocols.

Impact SG-4

Wild fires could have major adverse impacts to soils resources through erosion by leaving soil without protective vegetation.

Mitigation SG-4

The Vegetation Management Plan, which is part of Alternatives 2 and 3, will include fire management recommendations to minimize negative impacts to soils. Grazing on the north shore would not be included as part of Alternative 3. The following measures for wildfire protection would reduce impacts from wildfires to a minor adverse level.

- Ensure that fuel management, fire suppression, and fire response are consistent with Federal Wildland Fire Management Policy, and with the RMP water quality and natural resource objectives.
- Use prescribed burns to manage fuels, as feasible.
    - Continue use of prescribed burns on Lease 1 under the RIA and CDF's VMP to improve rangeland conditions, and provide incidental fuel management. The burns will be planned and funded by the lessee. A plan for the prescribed burns will be submitted to Reclamation for review and approval.
    - The local managing partner will assess the potential for the use of prescribed burns on the north side of the lake (outside of Lease 1), and on the south side of the lake, for fuel management purposes. Coordinate this assessment with appropriate public agencies and adjacent private landowners.
    - The local managing partner will seek partnerships with adjacent private landowners on fuel management, including the use of prescribed burns. Ensure that prescribed burns on adjacent private lands do not adversely affect water quality and sediment conditions in Cachuma Lake through such coordination and partnerships.
    - The local managing partner will coordinate with the Los Padres National Forest on the planning of prescribed burns and other watershed management actions related to fuel and fire management in the Forest, and ensure that Forest actions do not have adverse effects on water quality and sedimentation at Cachuma Lake.
- Ensure that any prescribed burns in the Plan Area will not adversely affect water quality. All plans for prescribed burns within the Plan Area will be reviewed to ensure that water quality is protected.

Cumulative Impacts

In general, the management activities associated with the three alternatives would have minor adverse impacts on soils and geology in the region, which could be mitigated to no impact levels. The overall contribution of the Cachuma RMP to the region's soils and geology is minimal.

4.4 BIOLOGICAL RESOURCES

4.4.1 Introduction

Four categories of biological resources exist in the Plan Area:

- Vegetation
- Wildlife
- Fisheries and aquatic communities
- Special-status species

Each of these biological resources is evaluated to determine the impacts associated with each alternative. Specific biological resources potentially subject to impacts include:

- Waterfowl, specifically breeding Clark's and western grebes
- Sensitive habitats: riparian corridors, oak woodlands, and native grasslands
- Bald eagle
- Other rare and sensitive plant and wildlife species

4.4.2 Impact Thresholds

The biological impact analysis focuses on the potential for impacts on vegetation, wildlife, fisheries and aquatic communities, and special-status species or their habitat from four potential impacts that may vary among the alternatives:

- Camping and recreation, including maintenance or expansion of camping and/or recreation facilities on the north shore, Arrowhead Island, east Mohawk, Santa Ynez Peninsula, Horse Canyon, and Live Oak Camp
- Trail use, including the construction of additional trails
- Boat use, including density, speed, type of boats, and access on the lake
- Several types of natural resource management, including invasive weeds, grazing, fire, control of water levels in the lake and fisheries management

The terminology used to assess the degree of impact on biological resources is defined below:

- **Beneficial Impact:** Impacts to biological resources that are detectable and significantly and positively alter historical or desired conditions. These impacts would contribute to the enhancement of vegetation, wildlife, fisheries and aquatic communities, or special-status species.
- **No Impact:** Impacts to biological resources that cannot be detected.
- **Minor Adverse Impact:** Impacts to biological resources that are detectable and are within or below regulatory standards or thresholds, and do not interfere with park goals or downstream biological resources.
- **Major Adverse Impact:** Impacts that are detectable and significantly and negatively alter historical baseline or desired conditions of biological resources in the Plan Area or downstream. These impacts would contribute to the deterioration of vegetation, wildlife, fisheries and aquatic communities, or special-status species.

Potential impacts to special-status species (those covered by the federal and/or state Endangered Species Acts) in this section have been evaluated using the terminology and the degree of impact described above. Potential impacts to special-status species were not assessed using federal or state Endangered Species Act terminology or methodology. Project-level actions discussed under each alternative will not be implemented until separate NEPA and/or CEQA compliance is completed. At that time, project-level (site-specific) impacts to special-status species will be evaluated, and consultation under the federal and/or state Endangered Species Acts will be initiated.

4.4.3 Impacts Common to All Alternatives

4.4.3.1 Camping and Recreation

The existing camping and recreation at the County Park, Sweetwater, Camp Whittier, and Live Oak Camp would be continued under all alternatives. Table 2-3 lists the camping and recreation uses in these areas. With population growth expected to increase by approximately 20 percent in Santa Barbara County over the next 20 years, it can be expected that visitor use of these areas will increase and, thus, impacts to biological resources will increase as well. Potential impacts include impacts to fisheries due to increased fishing and motorized vessel emissions causing impacts to water quality, impacts to vegetation, wildlife, and rare plants due to increased trampling, disturbance, trash and polluted runoff associated trail use and camping.

Under all alternatives, the Santa Barbara County Capital Improvement Program (Santa Barbara County 2009a) would be implemented, depending on funding. It includes park road improvements, replacement of water treatment plant and sewer treatment plant and restroom remodeling. In addition, the park entrance would have a new design and relocation plan, the entrance road to Live Oak Camp would be improved, and stretches of roads prone to flooding, especially Park road that leads to Mohawk campground, would be fixed. These activities would have impacts to vegetation and wildlife.

When specific projects are developed, a site-specific environmental study would be conducted and a more focused analysis of the proposed project's impacts to biological resources would occur. At that time, more clearly defined biological impacts may be identified. If major impacts to biological resources were to be identified, the proposed project would be modified to minimize biological impacts. Any new facilities would be designed or located in such a way as to avoid sensitive biological resources. Mitigation measures would also be developed to compensate for biological impacts. All state and federal environmental regulations would apply.

4.4.3.2 Natural Resource Management

Natural resource management activities that would continue under all alternatives include fire management, weed control, education of visitors and invasive species control.

Fire Management

Fire suppression has decreased the abundance of certain native plants, including some special-status plants that have evolved in California's fire-dependent ecosystems. Fire suppression favors climax vegetation communities such as woodlands and shrublands rather than grasslands, and overall the lack of fire decreases habitat diversity. In addition, fire suppression increases the risk of a disastrous wildfire. Prescribed burning is often used to reduce these negative impacts of fire suppression; however, prescribed burning creates a disturbance that could increase the cover of invasive exotic plants.

Under all alternatives, prescribed burns would be conducted annually to support grazing and reduce vegetative fuel for fires. A Vegetation Management Plan would be developed to address fire management and incorporate new information or methods to better manage the resources. Visitors would be educated to help reduce accidental fires. The County Park's 2005 analysis of fire flow and conceptually designed new fire lines would be implemented, and new additional

hydrants would be installed at the park. The feasibility of prescribed burn activities would continue to be evaluated and prescribed burns conducted, if possible. The County Park would work with USFS and CDF to establish an annual prescribed burn schedule. These actions would have beneficial impacts to vegetation and wildlife if implemented in a way that would minimize negative impacts such as spreading of noxious invasive plants.

Weed Control

Weed eradication efforts including mowing and weed whacking would continue under all alternatives along with pursuing the use of herbicides on invasive Italian thistle. Italian thistle is a noxious weed that has shown a tendency to spread from campground areas into natural areas. In recent years, the herbicide Roundup® has been used in the Plan Area for weed removal. The active ingredient is glyphosate (Monsanto 2002). The U.S. Environmental Protection Agency has estimated that annual use of glyphosate in the U.S. is between 103 and 113 million pounds (Kiely, Donaldson, and Grube 2004). Glyphosate-based pesticides have been studied extensively for their effects to human health and the environment. Although the USEPA considers glyphosate to not be harmful when used at the recommended doses (Federal Register 2009), exposure to glyphosate herbicides has been associated with eye irritation and inflammation, burning eyes, blurred vision, skin rashes, burning or itchy skin, nausea, sore throat, asthma and difficulty breathing, headache, lethargy, nose bleed, and dizziness (California Environmental Protection Agency 2004). In recent years, researchers have associated the so-called "inert ingredients" of Roundup and similar products, such as polyethoxylated tallowamine, with other potential effects including cell damage in humans, including umbilical cord cells (Gammon 2009).

Researchers have also associated glyphosate-based pesticides with other environmental effects, including genetic damage in fish, frogs, and insects; certain types of plant diseases; and reduced populations of birds and spiders from killing plants that serve as food and/or shelter (Cox 2004). Glyphosate-based pesticides, when applied improperly, can "drift" and affect desirable plants and crops. In a sampling of California waterbodies conducted as part of the U.S. Geological Survey's National Water Quality Assessment Program, glyphosate was found at detectable levels in 3 out of 51 stations tested (USGS 2010). None of the detections were in or along the Santa Ynez River, and the closest detection was approximately 200 miles away, in the San Joaquin River. Glyphosate has generally been found to not harm soil microorganisms at recommended rates in field studies and when applied to soil in laboratory bioassays, but high-rate applications have been found to stimulate microbial respiration and affect nutrient cycling processes (Ratcliff, Busse, and Shestak 2006).

The weed control program would focus on eradicating existing invasive plant species and preventing noxious weeds from spreading in the County Park, Live Oak Camp, and into natural areas. Weed whacking and mowing would be conducted prior to weeds seeding to prevent seeds from spreading. Herbicides would be used in manner so as to protect native plants and minimize impacts to the environment. Any herbicide used in the Plan Area would be applied in accordance with manufacturer instructions for the product and would include, but not be limited to, the following BMPs:

- Properly calibrate sprayers to avoid overapplication.
- Apply only the minimum amount necessary to control weeds.

- Use integrated weed management such as combination with mechanical removal methods.
- Strictly observe spray setback distances from surface waterbodies in accordance with product instructions. (If specific directions are not provided, avoid spraying herbicides within 50 feet from wells, 66 feet from outlets to streams or rivers, and 200 feet from lakes. Do not mix or load herbicides within 50 feet of a well.)

Continuing the weed control activities would have beneficial impacts to biological resources.

Education

Under all alternatives, efforts would increase to educate the public on how to reduce their impacts to the environment and follow park regulations. Educational displays would be set up around the park and other measures taken to increase visitors' awareness to reduce their impacts on water quality and other components of the natural resource environment. This effort would have beneficial impacts to the natural resources of the Plan Area.

Fisheries and Aquatic Resources

Both quagga and zebra mussels are dime-sized freshwater mussels that are prolific breeders. Both species pose an ecological risk by disrupting natural foodwebs. Their consumption of significant amounts of phytoplankton from the water is often followed a reduction in zooplankton, some crustaceans and fish (California Science Advisory Panel 2007). The decrease of phytoplankton increases water clarity, which often causes explosive growth of bottom algae as a result. An infestation of invasive mussels can shift the primary and secondary production from pelagic to benthic zones of lakes and large rivers (California Science Advisory Panel 2007). The result can be a shift in native species and a disruption of the ecological balance of entire bodies of water (CDFG 2008).

An invasive mussel infestation of Cachuma Lake would likely impact steelhead in the lower Santa Ynez River. The effects of this shift on downstream salmonid populations are primarily related to invertebrate food sources. Clearer water flowing from the reservoir would likely lead to a decrease in filter filter-feeding invertebrates and a subsequent increase in grazers downstream (due to an increase in algae). Within the reservoir and downstream of Bradbury Dam, pelagic planktonivore populations would likely be reduced. These fish are a major food source for pelagic piscivorous fish, including salmonids and centrarchids. This may cause a decrease in the ability of salmonids to feed on larger prey. Alternatively, this shift in fish populations may also lead to a decrease in food availability downstream of Cachuma Lake, potentially leading to an increase in predation of juvenile steelhead by larger predatory fish (i.e., bass and adult steelhead).

Neither quagga nor zebra mussels are currently known to inhabit Cachuma Lake; however, any accidental introduction resulting from recreational watercraft use at Cachuma Lake could affect fish and aquatic resources in the Plan Area and downstream of Bradbury Dam. As described in Section 4.1.3, invasive mussels could also be transported into the Plan Area by numerous sources upstream of Cachuma Lake, where no mussel inspection and quarantine program is in place.

An infestation of invasive mussels, regardless of the source, would be a major adverse impact. It is unlikely that the source of the infestation could be identified. Continued implementation of the vessel inspection and quarantine program at Cachuma Lake would reduce the potential for inadvertent transfer of invasive mussels via recreational watercraft that are currently allowed

under all alternatives. Mitigation WQ-6 also addresses control and eradication if an infestation should occur. The residual impact would be minor.

4.4.4 Impacts Specific to Alternative 1 (No Action)

Biological impacts associated with maintaining the habitat at the current level of management with the No Action Alternative (Alternative 1) are discussed below. Currently, all camping and day use is confined to the County Park with special events at Live Oak Camp. Some hiking trails are designated on the south shore and the north shore is restricted to equestrian use by permit on designated trails.

4.4.4.1 Vegetation

Camping and Recreation

Under the No Action Alternative, minor adverse impacts would occur to vegetation as described in Section 4.4.3.

Trail Use

The No Action Alternative does not include the construction of additional trails; however, trail use is expected to increase so minor adverse impacts would occur to vegetation as discussed in Section 4.4.3.

Boat Use

Under the No Action Alternative, boat use would have no impact on vegetation. Impacts of the No Action Alternative on aquatic resources, including littoral zone plant communities, are discussed below in Section 4.4.4.3.

Natural Resource Management

The No Action Alternative would have beneficial impacts to vegetation as discussed in Section 4.4.3.

Grazing Management

Grazing leases would continue. Beneficial and adverse impacts are similar to Alternative 2 and are discussed in Section 4.4.5.1.

4.4.4.2 Wildlife

Camping and Recreation

Under the No Action Alternative, camping and recreation would not be expanded; however, minor adverse impacts to wildlife associated with increased visitor use would occur as discussed in Section 4.4.3.

Trail Use

The No Action Alternative does not include the construction of additional trails. Trail use, as proposed by the No Action Alternative, would have minor adverse impacts on wildlife as described in Section 4.4.3.

Boat Use

Under the No Action Alternative, an increase in boat use is expected because demographic projections show up to a 20 percent population increase in Santa Barbara County in 2030. An increase in boat use may correlate with an increase in fishing. If fisheries decreased due to more fishing, other wildlife species that forage on fish such as the bald eagle and osprey would be impacted. Therefore, an increase in boat use, as a result of increased visitors as a function of population growth, would have minor adverse impacts to wildlife in the Plan Area.

Natural Resource Management

The No Action Alternative would not have a Trail System Management Plan, Fisheries Management Plan, Vegetation Management Plan, or Boating Management Plan while Alternatives 2 and 3 would have all of these plans. Fish provide a food source for wildlife and vegetation provides habitat, so with the Fisheries Management Plan in Alternatives 2 and 3, a potential exists for beneficial impacts to wildlife as result of proper management. Since fisheries may be impacted by an increase in boat use as discussed under boat use above, lack of a Fisheries Management Plan under the No Action Alternative would have minor adverse impacts to wildlife in the Plan Area.

4.4.4.3 Fisheries and Aquatic Communities

Camping and Recreation

Under the No Action Alternative, the only changes in camping would be upgrading existing facilities. Improving facilities could attract more visitors as well as an expected increase in population growth, which may result in increasing fishing, and since the No Action Alternative does not include a Fisheries Management Plan, could cause a decrease in the fisheries. Thus, the No Action Alternative would have minor adverse impacts to fisheries and aquatic communities.

Trail Use

The No Action Alternative does not include the construction of additional trails. Trail use, as proposed by the No Action Alternative, would have no impacts on fisheries and aquatic communities in the Plan Area.

Boat Use

The No Action Alternative does include some increases in boat use on the lake as discussed in Section 4.4.4.2. Boat use, as proposed by the No Action Alternative, would have minor adverse impacts on fisheries and aquatic communities in the Plan Area.

Natural Resource Management

The impacts of maintaining natural resource management at the current level under the No Action Alternative are discussed in Section 4.4.4.2. Similarly, the No Action Alternative would have minor adverse impacts on fisheries and aquatic communities in the Plan Area.

4.4.4.4 Special-Status Species

Camping and Recreation

Under the No Action Alternative, the only changes in camping would be upgrading existing facilities. As discussed in the previous section, a slight increase in visitors that may result in increasing fishing is expected. Fish is a food source for the bald eagle, a state endangered species that overwinters at the lake. One breeding pair has successfully fledged chicks in years past and is still believed to occupy a nest site located 1.35 miles north of the Plan Area. Since the No Action Alternative does not include a Fisheries Management Plan, the fisheries may not be properly managed with increased fishing pressure and could cause a decrease in the fisheries and, thus, impact the food source for bald eagles. Thus, the No Action Alternative could have minor adverse impacts to the bald eagle.

Trail Use

The No Action Alternative does not include the construction of additional trails. Trail use, as proposed by the No Action Alternative, would have no impacts on special-status species in the Plan Area.

Boat Use

The No Action Alternative does include some increases in boat use on the lake as discussed in Section 4.4.4.2. Boat use, as proposed by the No Action Alternative, would have minor adverse impacts on the bald eagle.

Natural Resource Management

The impacts of maintaining natural resource management at the current level under the No Action Alternative are discussed in Section 4.4.4.2. Since the No Action Alternative would have minor adverse impacts on fisheries, it would have minor adverse impacts to the bald eagle.

4.4.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Impacts to biological resources associated with Alternative 2 are discussed below. An increase in recreational activities associated with this alternative could include those activities listed in Table 2-3.

4.4.5.1 Vegetation

Camping and Recreation

Expansion of camping and recreational activities, as proposed by Alternative 2, would have minor adverse impacts to vegetation as a result of human trampling, disturbance of native vegetation for new facilities, and increased potential to spread weeds. These impacts would be similar to, but greater than, those impacts resulting from Alternative 1, but less than those resulting from Alternative 3 (see Section 4.4.6).

Trail Use

Alternative 2 would maintain current trails. In addition, a limited number of primitive trails would be developed on north shore east and west for use by hikers, horseback riders, and mountain bikers with a Trail System Management Plan. This development could have minor impacts to habitat and special-status species as overall use increases.

Boat Use

Under the Alternative 2, kayaking would be added to boating and fishing (all at 5 mph) in Cachuma Bay (in compliance with inspection, treatment, and quarantine protocols to prevent introduction of invasive mussels). This addition would result in similar impacts compared to Alternative 1. Impacts associated with Alternative 2 on aquatic plant communities are discussed below in Section 4.4.5.3.

Natural Resources Management

Alternative 2 includes measures to protect riparian areas that are not affected by annual lake level fluctuations, provide habitat enhancement and management activities at the east end of the lake, and would allow only scientific and educational uses in no public access/wildlife areas.

In addition, Alternatives 2 and 3 include the development of a Trail System Management Plan to avoid and minimize impacts to vegetation and wildlife associated with expansion of the trail system, and development of a Vegetation Management Plan to address issues of invasive weeds, grazing, and fire management. Addressing the above vegetation management issues within a single plan has the benefit of allowing an analysis of the relationships among invasive weeds, grazing and fire. Development of a single integrated Vegetation Management Plan will be more cost effective than developing three separate plans. The issues surrounding invasive weeds and grazing are described below.

Invasive Weeds

As part of Alternatives 2 and 3, Reclamation and the local managing partner would collaborate with organizations such as the County of Santa Barbara Agriculture Commission to address invasive weeds as part of the Vegetation Management Plan. Reclamation would collaborate with the local managing partner to acquire funding (e.g., from grazing leases or Natural Resources Conservation Service funds) for invasive weed control. The Plan Area contains well-developed riparian areas, which are important for wildlife. These existing riparian areas should receive additional protection from potential impacts caused by invasive weeds. Under Alternatives 2 and 3, efforts to manage invasive weeds would have beneficial impacts on vegetation, wildlife, and special-status species in the Plan Area.

Under the Vegetation Management Plan, native plant species would be incorporated into restoration and landscape plantings. Such plantings would be used for erosion control following facilities construction, for trail enhancement, and for ecosystem restoration projects. Special efforts would be made to install native vegetation in the less traveled areas in the County Park. The use of native vegetation under Alternatives 2 and 3 would have beneficial impacts on vegetation in the Plan Area.

Grazing Management

Under Alternative 2, grazing leases in the Plan Area would continue as with Alternative 1. The effect of grazing, or the lack of grazing, on native plants and special-status plants in the Plan Area is an important management issue. Of special concern are riparian areas, native grasslands, oak woodlands, and rare plants. Grazing can potentially improve habitat for native plants or can degrade habitat and damage plants depending on various factors, including season, duration, intensity, and number and type of livestock, and type of habitat grazed. Potential benefits of grazing include increasing native plant abundance and diversity by removing thatch and decreasing ruderal nonnative plants. Potential negative impacts of grazing include destruction of individual plants by damaging the plants or their reproductive capacity, increasing abundance of nonnative exotic plants such as Italian thistle, and decreasing native plant biodiversity.

Under Alternative 2, the Rangeland Assessment and Grazing Management Plan (Sage Associates 2003) would be updated to assess existing rangeland conditions and operational management standards and improvements. Implementation of the Rangeland Assessment and Grazing Management Plan would include collaboration with CDFG, and would include monitoring of grazing impacts.

The proposed Vegetation Management Plan would address the coordination of weed and fire management. The existing riparian areas and native grasslands should receive extra protection from grazing under the vegetation management plan.

Both plans would have a beneficial impact on vegetation and special-status species in the Plan Area.

4.4.5.2 Wildlife

Camping and Recreation

Expansion of camping and recreational activities, as proposed by Alternative 2, would have minor adverse impacts to wildlife. Expansion of camping and day use areas near riparian habitat could result in impacts to wildlife in these areas from recreation use and water quality impacts associated with polluted runoff from campgrounds and day use areas. Amphibian species may be highly susceptible to potential impacts in riparian areas due to their dependence on this resource. Picnic areas at the upper end of Cachuma Bay could impact the riparian habitat associated with Cachuma Creek and would cause disturbance to Clark's and western grebe breeding and bald eagle foraging habitat as well as potential southwestern pond turtle egg nests. In addition, an increase in concession stands could result in minor adverse impacts to wildlife. If trash or food products were to become accessible to wildlife, they could harm animals or create problematic encounters between park visitors and wildlife. These impacts would be similar to, but less than, impacts resulting from Alternative 3 (see Section 4.4.6).

Trail Use

Increased trail use, as proposed by Alternative 2, would have a minor adverse impact on wildlife. Potential impacts include increased human disturbance in wildlife areas including trampling, harassment, increased litter, loss of habitat, potential for poaching on the north shore, and degradation of habitat due to spreading of weeds.

Boat Use

Under Alternative 2, boat use would likely increase as described in Section 4.4.4.2. This increase would have minor adverse impacts to wildlife. The existing boat regulations would be maintained including year-round restrictive log booms in Santa Cruz Bay, at the east end, near the dam, and at the intake station. However, kayaking would be allowed past the log boom in Santa Cruz Bay and at the east end of the lake. Allowing kayakers access to the entire lake may also expose sensitive wildlife species to a new human presence. Sensitive species such as the bald eagle may react negatively to a new human presence where previous human access has been restricted.

When entering areas which were previously restricted to boats, kayakers may be restricted from small scale buffer zones in order prevent the disturbance of sensitive wildlife in the area. Buffer zones would be identified in the Boating Management Plan and marked by buoys on the lake. Behavior of sensitive wildlife receptors such as foraging bald eagles will be observed during trial periods by naturalists at the lake and re-evaluated after an analysis of disturbance is conducted.

Natural Resources Management

Natural resource management as described in Section 4.4.5.1 along with the Fisheries Management Plan described below would have beneficial impacts to wildlife in the Plan Area.

Fisheries Management Plan

Constant changes in the surface elevation of the reservoir do not allow development of a permanent littoral zone, thus cover habitat for centrarchid fish is limited. These fish species, which provide much of the prey base for large sport fish, depend upon resources within the littoral zone. Water level fluctuations also reduce spawning success of fish such as largemouth bass. To maintain healthy and productive populations of sport fishes, a Fisheries Management Plan would be developed and implemented under the action alternatives.

Under the action alternatives, fishing would be improved by creating better spawning grounds in the lake and by preparing a Fisheries Management Plan. Several issues would be addressed in this plan:

- Restoration and protection of a riparian buffer zone along tributaries such as Cachuma Creek, Santa Cruz Creek, and Horse Canyon Creek could benefit native fish species. Management of creek habitats could promote a greater diversity among native fish species in the Plan Area. Potential native species includes rainbow trout and prickly sculpin. Aggressive or persistent nonnative species such as green sunfish and carp should be controlled.
- Native species in creek habitats such as Cachuma Creek, Santa Cruz Creek, and Horse Canyone Creek should be monitored and managed. Native species include rainbow trout, armored three-spine stickleback, and prickly sculpin.

4.4.5.3 Fisheries and Aquatic Communities

Camping and Recreation

Increasing camping and recreation opportunities, as proposed by Alternative 2, along with an expected increase in visitors would likely cause an increase in fishing and possibly an increase in

pollution runoff from campgrounds and day use areas, which would have minor adverse impacts on fisheries and aquatic communities in the Plan Area.

Trail Use

Trail construction activities must adhere to all state and local requirements for erosion control and storm water pollution, therefore increased trail use, as proposed by Alternative 2, would not adversely impact fisheries and aquatic communities.

Boat Use

Under the Alternative 2, boat use would likely increase as described in Section 4.4.4.2, resulting in a minor adverse impact to fisheries and aquatic communities. However, a beneficial impact to fisheries and aquatic communities would result from restricting motor-powered boats from entering Cachuma Bay, which would reduce pollution and fishing in these areas. As a result, overall fisheries and aquatic communities would not be impacted.

Natural Resources Management

The natural resource management improvements associated with Alternative 2 as described in Sections 4.4.5.1 and 4.4.5.2 would have beneficial impacts to fisheries and aquatic communities in the Plan Area.

4.4.5.4 Special-Status Species

Camping and Recreation

Expansion of camping and recreational activities, as proposed by Alternative 2, would have minor adverse impacts to special-status species as a result of increased human presence in wildlife habitats, particularly increased human use such as picnicking at the upper end of Cachuma Bay, which is bald eagle foraging habitat. These impacts would be similar to, but less than, those impacts resulting from Alternative 3 (see Section 4.4.6).

Trail Use

Increased trail use, as proposed by Alternative 2, would have minor adverse impacts on special-status species. Several populations of rare plants in the Plan Area could be impacted by new trails. In addition, trails near areas where special-status species are known to occur and breed would cause negative impacts to these species, potentially resulting in unsuccessful breeding. The Trail System Management Plan would place trails in areas to avoid and minimize impacts to special-status species; however, minor adverse impacts to these species may occur due to increased human disturbance.

Boat Use

Under Alternative 2, boat use, as described in Section 4.4.5.2, would have minor adverse impacts to special-status species, particularly the bald eagle. However, a beneficial impact to special-status species including bald eagles and peregrine falcons would likely result from restricting motor-powered boats from entering Cachuma Bay and thus reducing disturbance to one of their foraging habitats. Thus, the overall impact of Alternative 2 to special-status species would be minor.

Natural Resources Management

The natural resource management improvements associated with Alternative 2 as described in Sections 4.4.5.1 and 4.4.5.2 would have beneficial impacts to special-status species in the Plan Area.

4.4.6 Impacts Specific to Alternative 3 (Expanded Recreation)

Impacts to biological resources associated with Alternative 3 are discussed below. An expansion of recreational activities associated with this alternative could include the activities listed in Table 2-3.

4.4.6.1 Vegetation

Camping and Recreation

Under Alternative 3, the expansion of camping and recreational facilities including new camps sites and day use areas, swimming, RC airplane strip corresponding increase in visitor use, and access would have major adverse impacts to vegetation. The visitors would be able to access several natural areas on the north shore and south shore via trails and boat. Access to these areas under the baseline condition is limited, so they are usually dominated by native vegetation, except where cattle have grazed intensively. Areas already disturbed by cattle have the least amount of native vegetation; however, some of these areas such as Santa Cruz Meadows contain the few remaining patches of native grassland, which is a sensitive habitat in the Plan Area. Grazing would be discontinued on the north shore to allow increased recreational use in this area. Removing cattle from the north shore would reduce impacts to native vegetation; however, unless a weed management program is implemented in the grazed areas, a substantial increase in weeds would occur.

Trail Use

Under Alternative 3, impacts of increased trails and trail use would be similar to, but greater than, Alternative 2. Increased impacts would result from development of full public access trails on the north shore similar to Alternative 2. Alternative 3 proposes to develop new trails on the north shore east and north shore west (six potential new trails identified) and a Trail System Management Plan to manage trail usage. The expansion of the trail system proposed by Alternative 3 would have minor adverse impacts on vegetation. Some possible impacts associated with expanding trails include:

- Native plant species could be removed during construction of new trails.
- Seeds of invasive weed species may spread due to trail use and disturbance from construction.
- Concern exists about the spread of serious pathogens, such as *Phytophthora ramorum*, a water mold that causes sudden oak death. Although sudden oak death is not known in the Plan Area, it is expected to become much more widespread in California and could spread to this area. Increased recreation use and expansion of trails has the potential to facilitate the spread of sudden oak death should this pathogen reach the Plan Area.

Boat Use

Under Alternative 3, boat use would have minor adverse impacts to riparian and wetland vegetation. With increased access to the east end where wetland and riparian vegetation is present, potential exists for boats to run over and damage this vegetation. Impacts of Alternative 3 on aquatic plant communities are discussed below in Section 4.4.6.3.

Grazing Management

Under Alternative 3, grazing on the north shore would be discontinued but would remain on the south shore. With no grazing on the north shore, the Vegetation Management Plan will need to address other weed management alternatives than grazing to prevent weeds from increasing in areas no longer grazed. Beneficial and adverse impacts and implementation of the Rangeland Assessment and Grazing Management Plan and the Vegetation Management Plan are discussed under Alternative 2.

Natural Resource Management

Under Alternative 3, riparian areas not affected by annual lake level fluctuations would be actively protected. Actively protecting riparian areas would minimize potential impacts to riparian vegetation associated with increased visitors due to increased recreational opportunities. Education offered to visitors would be increased by enhancing the nature center and expanding the interpretive boat program with additional natural, cultural and/or historic resource themes. An improvement in educating visitors about sensitive environmental issues and how to reduce their impacts could reduce impacts to vegetation associated with increased recreation in areas not presently disturbed. Natural resource management under Alternative 3 would have beneficial impacts to vegetation.

4.4.6.2 Wildlife

Camping and Recreation

Increased human activity on the lake associated with increased camping and recreational opportunities would increase disturbance to wildlife. Noise associated with an RC airplane strip would cause disturbance to wildlife in the nearby vicinity. Allowing kayaks through currently restricted areas during the nonbreeding season such as the east end and Santa Cruz Bay would cause disturbance to waterfowl. All of these activities combined under Alternative 3 would have major adverse impacts to wildlife.

Trail Use

Increased trail use, as proposed by Alternative 3, would have a major adverse impact on wildlife. The construction of additional trails may remove some wildlife habitat, and edge effects could result in small-scale degradation of habitat quality. Potential for poaching could increase with increases in visitor use. Increases in trail use can result in encounters between humans and wildlife, which can be detrimental to wildlife populations.

Boat Use

Boat use under Alternative 3, would have moderately increased activity as compared with the baseline because expanding recreational opportunities would likely increase boat use, the allowable boat densities would be increased. In addition, kayaking would be allowed during the

nonbreeding season past the log boom in Santa Cruz Bay while low impact boating (under 5 mph) and kayaking would be allowed past the log boom at the east end during the nonbreeding season. Alternative 3 would have greater impacts to wildlife than Alternatives 1 and 2 because greater disturbance would occur to fisheries, waterfowl, and foraging bald eagles. Alternative 3 would have major adverse impacts to wildlife.

Natural Resource Management

Along with the Vegetation Management Plan and Fisheries Management Plan as described in Sections 4.4.5.1 and 4.4.5.2, riparian areas would be protected and educational opportunities would increase as discussed in Section 4.4.6.1. Implementing these natural resource management measures under Alternative 3 would provide beneficial impacts to wildlife.

4.4.6.3 Fisheries and Aquatic Communities

Camping and Recreation

Under Alternative 3, visitor use is expected to increase with an increase in recreational opportunities and specifically more fishing opportunities with increased shore access and fishing docks in the Plan Area. The extent to which the increase in visitors will correspond with an increase in fishing activity is unknown, but increased fishing may result in a decrease in the fish population of the reservoir thereby disturbing aquatic communities. In addition, an increase in runoff from campgrounds and day use areas would likely impact water quality for fish and aquatic communities. Therefore, Alternative 3 would have minor adverse impacts to fisheries and aquatic communities.

Trail Use

Trail construction activities must adhere to all state and local requirements for erosion control and storm water pollution, therefore increased trail use, as proposed by Alternative 3, would not adversely impact fisheries and aquatic communities.

Boat Use

As compared with Alternative 1 (No Action), boat use under Alternative 3 would allow greater maximum boat densities and more fishing opportunities at the east end. With increased recreational opportunities, it is expected that boat use would increase and possibly increase the amount of fishing causing a decrease in the fishing population of the lake and associated aquatic communities.

Natural Resources Management

Along with the Vegetation Management Plan and Fisheries Management Plan as described in Sections 4.4.5.1 and 4.4.5.2, riparian areas would be protected and educational opportunities would increase as discussed in Section 4.4.6.1. Natural resource management under Alternative 3 would have beneficial impacts to fisheries and aquatic communities.

4.4.6.4 Special-Status Species

Camping and Recreation

Expansion of camping facilities and recreational opportunities would have major adverse impacts to special-status species:

- Bald eagles are uncommon nesters in the region of the Plan Area, but one pair has been known to breed approximately 1.35 miles north of the Plan Area since 1989 and has fledged one chick per year on average. Although recently delisted by the USFWS, the bald eagle remains listed as a state endangered species. Studies show that pedestrian activity may disturb nesting bald eagles if the activity occurs within a 0.6-mile radius of a nest site (Watson and Rodrick 2000). Additionally, declines in prey base could cause the bald eagle to abandon nesting areas. Either of these two disturbances would be a major adverse impact.
- American peregrine falcon is a state fully protected species that is likely to occur on the lake due to the abundance of prey. At Cachuma Lake this falcon likely feeds primarily on waterfowl. High levels of disturbance or a decline in prey base would impact the foraging opportunities for the species, but since other foraging opportunities exist in the region Alternative 3 is not considered to have an adverse impact upon the species.
- The following special-status species have been observed on rare occasion in the Plan Area:
  - Least Bell's vireo (Federally and State Endangered)
  - Southwestern willow flycatcher (Federally and State Endangered)
  - California spotted owl (California Species of Special Concern)

These species are not known to breed in the Plan Area, but a potential exists for them to breed in riparian woodland present in the Plan Area, except for the spotted owl, which would breed in oak woodland. Increased human disturbance associated with expanded recreational opportunities on the north shore and east end could cause minor adverse impacts to these species such as preventing them from potentially breeding in these areas.

Trail Use

Increased trail use, as proposed by Alternative 3, would have minor adverse impacts on special-status species. Additional trails near areas where special-status species occur could result in habitat degradation and human related disturbances to these species. Impacts would be similar to, but greater than, those associated with Alternative 2 (see Section 4.4.5.4).

Boat Use

Compared with Alternatives 1 and 2, boat use under Alternative 3 would have greater impacts to special-status species. Boat use would generally be more intense than the baseline conditions because limited low impact boating would be allowed at the east end during the nonbreeding season. The east end provides foraging habitat for the bald eagle and peregrine falcon. With increased boat use in these areas, it would likely result in increased fishing and less waterfowl, thus reducing foraging habitat and increasing human disturbance in the foraging habitats for these special-status species. Therefore, under Alternative 3, boat use would have minor adverse impacts to special-status species.

Natural Resources Management

Along with the Vegetation Management Plan and Fisheries Management Plan as described in Sections 4.4.5.1 and 4.4.5.2, riparian areas would be protected and educational opportunities would increase as discussed in Section 4.4.6.1. Natural resource management under Alternative 3 would have beneficial impacts to special-status species.

4.4.7 Impacts Summary

Alternative 1, Alternative 2, and Alternative 3 range from the least adverse impact to the greatest impact on biological resources. The impacts of Alternative 3 are greatest because this alternative includes a major increase in recreational uses and associated increase in visitor use. The three alternatives represent a range of recreation from No Action (Alternative 1) to Expanded Recreation (Alternative 3). Alternative 1 would impact natural resources the least because it provides for less boat use, fewer visitors, fewer trails, and less impact to the north shore.

As described above, the three alternatives include several minor and some possible major adverse impacts under Alternative 3 to biological resources. Using appropriate mitigation measures described below, these adverse impacts would be reduced to no residual impacts.

Impact BI-1

The expansion of camping and recreation opportunities, along with increased visitor use, would have minor adverse impacts to vegetation, wildlife, fisheries and aquatic communities, and special-status species under Alternative 2, and major adverse impacts to vegetation, wildlife, and special-status species under Alternative 3. Under Alternative 1, camping and recreation would not be expanded; however, a predicted increase would occur in visitor use resulting in minor adverse impacts to vegetation, wildlife, and special-status species. These impacts would be reduced through the beneficial impacts of increased education programs and natural resource management that will be implemented under all alternatives. Any additional impacts from Alternatives 2 and 3 would be reduced by applying the mitigation measures described below, resulting in no overall residual impacts.

Mitigation BI-1

The following are feasible mitigation measures that would be implemented to reduce impacts to vegetation, wildlife, and special-status species from the action alternatives.

(1) Under Alternatives 2 and 3, mitigation measures would be included in the Vegetation Management Plan if impacts are still present after avoidance measures are implemented. For example, surveys would be conducted prior to construction of new picnic or campsite areas to determine if rare plants or oak trees would be impacted. If rare plants or oak trees would be impacted, the site would be relocated to a location where rare plants and oak trees are not present. If avoidance and minimization of impacts to a rare plant, oak tree, or native habitat is not possible, the following are some examples of mitigation measures that could be implemented to reduce the impacts.

- If native habitat were damaged or destroyed during installation, the same type and amount of habitat destroyed will be restored in a suitable location.

- If native grassland were destroyed, a suitable mitigation site is the native grassland south of the park entrance. This existing grassland would be enhanced through weed management and planting and/or seeding of native plants.
- Implement intensive weed control and habitat restoration in areas where grazing is removed on the north shore.
- Map and eradicate invasive species around existing campgrounds.
- Include options in the Vegetation Management plan that would help control establishment of invasive species when high water recedes around the lake shore.
- Replace oak trees at a ratio that assures a 2:1 target replacement. The County of Santa Barbara Deciduous Oak Tree Protection and Regeneration Ordinance (adopted by the Santa Barbara County Board of Supervisors as Ordinance No.4490 on April 15, 2003) includes a higher replacement ratio (10:1 for evergreen and 15:1 for deciduous trees), although it does not apply to oak removal by the Federal Government on leased or federally owned property. Higher replacement ratios can be considered as appropriate during environmental analysis for specific projects implemented under the RMP.

(2) Implement additional patrols in new camping and day use areas to ensure that visitors comply with park regulations under all alternatives. Also increase signage and public education to reduce potential for poaching.

(3) Concession stands will be operated so that trash and food products are inaccessible to animals at all times under all alternatives.

(4) Mitigation for impacts to grebe breeding habitat or bald eagle foraging habitat include:

- Placement of barriers to only allow boats in the upper end of Cachuma Bay during the nonbreeding season under Alternatives 2 and 3.
- Monitor bald eagle perches to determine if increased human activity is impacting their activities under all alternatives. If impacts are noticeable, measures will be taken to reduce human activities in the vicinity of the bald eagle perch sites. Studies show that a buffer of a 0.25-mile radius around a bald eagle nest should be free of human activities and sometimes up to 0.5-mile radius depending on topography (Watson and Rodrick 2000). A known nest location lies approximately 1.35 miles outside of the Plan Area on private property; therefore, avoidance measures will not be necessary since the distance from any potential recreational disturbance is over twice the recommended distance from the nesting site.

(5) Under Alternatives 2 and 3, expansion of facilities, including camping, recreation, and parking, would include site-specific environmental studies to assess biological impacts and determine mitigation measures that will reduce these impacts. More detailed surveys should be conducted to determine the presence or absence and breeding of special-status species with potential to occur in the Plan Area during the environmental review process for new facilities.

Impact BI-2

Under Alternative 3, the RC airplane strip could impact breeding raptors and foraging bald eagles. Impacts could be major.

Mitigation BI-2

To reduce impacts to nesting raptors and bald eagles, the landing strip would be located on the south shore, away from bald eagle perches and the prime raptor nesting habitat. RC airplanes should be limited to use only during the nonbreeding season (September 1 through February 1), which would also reduce conflicts with campers near the RC airplane strip, since most of the camping occurs during the summer. An annual use compatibility monitoring report would be required to address whether additional mitigation may be needed to prevent impacts to foraging and perching activities and bird watching opportunities. Residual impacts would be minor.

Impact BI-3

The increased use and expansion of the trail system proposed by Alternatives 2 and 3 would have minor adverse impacts on vegetation, wildlife, and special-status species. In addition, under the No Action Alternative, minor adverse impacts would occur to vegetation, wildlife, and special-status species due to increased trail use associated with increased visitors. The potential impacts associated with increased trails and trail use include the following:

- Native plant species could be removed during construction of new trails.
- Seeds of invasive weed species may spread due to trail use and disturbance from construction.
- Increased recreation use and expansion of trails has the potential to facilitate the spread of pathogens such as sudden oak death should this pathogen reach the Plan Area.
- Trail construction could result in small-scale removal of wildlife and special-status species habitat and increased edge effects that would degrade habitat quality.

The implementation of the following mitigation measures for Alternatives 2 and 3 would result in no residual impact to native vegetation, wildlife, or special-status species due to trail construction or trail use.

Mitigation BI-3

Under Alternatives 2 and 3, a Trail System Management Plan will be developed to manage trail usage. The trail management plan will provide measures to avoid and minimize impacts to native plant species by trail construction, address noxious weed control, and assess the potential for plant pathogens to become introduced to the Plan Area. The Trail System Management Plan would also include potential mitigation measures if impacts cannot be avoided. Some of the mitigation measures would include:

- The known populations of rare and uncommon plants that occur near trails should be monitored to ensure their protection. If rare plants occur near trail edges and are subject to trampling, fencing and educational signs should be installed to prevent people from entering these areas.
- If weeds along trails increase noticeably, the weed control should be expanded to reduce weeds from spreading into natural areas.
- Apply Mitigation Measure SG-2 in Section 4.3.7 to reduce erosion impacts.

Impact BI-4

Increased boat use on the main body of the lake would have minor adverse impacts to vegetation, fisheries, and special-status species. For Alternative 3, major impacts would occur to wildlife (particularly waterfowl) due to kayaking and motorized boating at the east end and kayaking in Santa Cruz Bay. Alternative 2 would also allow kayaking in Santa Cruz Bay. By applying the mitigation below, minor residual impacts would remain.

Mitigation BI-4

(1) Under Alternatives 2 and 3, where avoidance and minimization measures to reduce impacts to fisheries and aquatic communities as included in the Fisheries Management Plan could not reduce impacts, Mitigation Measure BI-5 would be implemented.

(2) Mitigation to reduce impacts to waterfowl and fisheries associated with kayaking and boats in currently restricted areas would be to limit the number of boats allowed into restricted areas by issuing a limited amount of day passes to enter log boom areas. In restricted areas where major impacts could occur, boats would not be allowed and the number of kayaks would be limited. In addition, when entering areas that were previously restricted to boats, kayakers may be restricted from small scale buffer zones in order prevent the disturbance of sensitive wildlife in the area. The effectiveness of buffer zones and behavior of sensitive wildlife receptors such as foraging bald eagles will be observed during trial periods by naturalists at the lake and re-evaluated after an analysis of disturbance is conducted.

(3) Mitigation for minor impacts to riparian and wetland vegetation at the east end would be to shift the log boom east (depending on the lake level and the location of large amounts of emergent vegetation) and prevent boats from entering the new boom location.

Impact BI-5

Under Alternatives 2 and 3, an increase in fishing would have minor adverse impact to fisheries and aquatic communities and special-status species. A Fisheries Management Plan would be implemented to manage the fisheries in a manner to avoid and minimize impacts associated with increased visitor use and fishing opportunities. Where adverse impacts cannot be avoided, mitigation measures will be included in the plan to mitigate for impacts. If Mitigation BI-5 were implemented, no residual impact would occur to fisheries and aquatic communities and special-status species.

Mitigation BI-5

As mitigation to reduce impacts to fisheries, the trout and warm water fisheries population would be monitored under the Fisheries Management Plan and if declines were noticeable, actions to increase the fisheries would be implemented such as increasing the existing trout-stocking program.

Impact BI-6

Under Alternatives 2 and 3 impacts would occur to water quality and thus impacts to fisheries and aquatic communities due to an increase in sedimentation runoff associated with an increase

in camping, day use, and trail use. By applying the Mitigation BI-6, no residual impact would remain.

Mitigation BI-6

Mitigation to reduce impacts to fisheries and aquatic communities due to increased runoff would be to avoid expanding campgrounds and trails near the lakeshore and riparian habitats. In addition, Mitigation Measures SG-1 and SG-2 in Section 4.3.7 and Mitigation Measures WQ-3 and WQ-4 in Section 4.1.7 would reduce impacts to water quality associated with construction of new camp/day use sites and trails, and trail use.

Impact BI-7

Under all alternatives, impacts to fish, other aquatic species, and aquatic habitat from invasive mussels could occur if recreational watercraft entering the lake transport quagga or zebra mussels or their larva into the waters of Cachuma Lake. With Alternative 3, the risk could increase because boat densities would be higher. An infestation of Cachuma Lake would be a major adverse impact. Implementing Mitigation WQ-6 in Section 4.1.7 would reduce the potential impact to minor.

Mitigation BI-7

See Mitigation WQ-6 in Section 4.1.7.

Cumulative Impacts BI-8

General. Biological resources in the Plan Area and adjacent vicinity will be affected by ongoing and future development activities in the vicinity, such as continued recreation and facilities expansion outside the Plan Area, increased agricultural development such as vineyards in northern Santa Barbara County, and some residential development. Cumulative impacts to vegetation would include continued decreases in native plant species, and increases in invasive weeds. Cumulative impacts to wildlife and special-status species would result from continued removal of habitat and increased habitat fragmentation.

Although Alternatives 2 and 3 would increase recreational use and impacts to biological resources, they include a framework in which to better manage these resources, so cumulative impacts could be managed. However, under Alternative 1, the existing framework to manage biological resources would not be sufficient to properly manage the resources with increase pressure on biological resources from population growth and development in the area. Therefore, minor cumulative impacts would be associated with Alternative 1, but not with Alternatives 2 and 3.

Oak Trees. In addition, a lake level surcharge project will be implemented during the planning period for the Cachuma RMP that will impact oak trees due to an increase in lake level, resulting in a potential impact to about 452 oaks with a 3-foot recharge. The proposed development of recreational facilities and trails at Cachuma Lake with Alternatives 2 and 3 result in the loss of a much smaller number of oak trees. The additional loss of oak trees associated with the Cachuma RMP project would be a minor adverse impact, when combined with the loss of oaks with the

surcharge project. Therefore, to reduce these cumulative impacts to no residual impact, Mitigation BI-8 would be implemented.

Genetic Mixing of Southern California DPS Steelhead. Implementation of the RMP would not contribute to cumulative impacts to Southern California DPS steelhead from mixing of genetics between hatchery trout and wild steelhead. Based on the results of recent genetic studies of steelhead/rainbow trout within the Santa Ynez River system and other nearby river systems, it does not appear that hatchery trout have influenced wild population structure or genetics (Nielsen 1998; Nielson et al. 2003; Greenwald and Campton 2005; Girman and Garza 2006; Garza and Clemento 2007). This is most likely a result of the high percentage of hatchery fish caught within the reservoir, as well as low reproductive success of hatchery fish in comparison to wild trout (Chilcote et al. 1986). Hatchery trout are different enough in life history and physiology that they do not successfully reproduce with naturally spawning fish, and a signal of reproduction of hatchery fish in the Santa Ynez River appears to be largely or totally absent (Garza and Clemento 2007). While hatchery trout may have some influence on the genetic structure of the Santa Ynez steelhead, it is not likely to be significant.

Invasive Mussels. Cumulative impacts associated with a potential infestation of invasive mussels are discussed in Section 4.1.7.

Summary. The RMP would have no residual long-term impacts on biological resources in the region. Although the RMP would provide for increased recreational opportunities, the impacts of increased recreation would be offset by increased management of natural resources and implementation of mitigation measures.

Mitigation BI-8

Oak trees removed for the development of recreational facilities and trails under Alternatives 2 and 3 will be replaced at a ratio that assures a 2:1 target replacement. Suitable locations for oak tree replacement have been identified under the oak tree replacement project for the surcharge project.

As stated in Section 2.5.5, any stocking program implemented under the RMP will comply with the requirements set forth in the Recovery Plan Outline for Southern California DPS steelhead (NMFS 2007) and the Recovery Plan that is currently in development (when it is issued). Additionally, the local managing partner will work with CDFG to determine the appropriate stocking program for Cachuma Lake. Within one year of adoption of the Cachuma RMP, the local managing partner will develop a Fisheries Management Plan that will comply with NMFS Recovery Plan provisions for Southern California DPS steelhead and CDFG's stocking program. This may mean that only sterile triploid trout are planted within Cachuma Lake, which is currently not the case.

4.5 CULTURAL RESOURCES

4.5.1 Introduction

Management actions that meet the definition of a federal undertaking would be subject to review under Section 106 of the NHPA. New facilities, routine maintenance of existing facilities, permitted land-use activities (e.g., livestock grazing), and recreational pursuits all have the

potential of causing impacts to archaeological resources. Within the following section, the potential impacts to cultural resources from each of these possible sources are presented.

Potential cultural resource impacts would be related to:

- Ground-disturbing activities associated with new facilities/utilities installation or improvements
- Increased lake margin erosion at archaeological sites caused by increased boat wakes
- Increased visitor use (associated with new trail construction), which could result in the increase of unauthorized collection of artifacts, or vandalism to cultural resource sites
- Livestock grazing activities and fuel management activities

Because the RMP is a programmatic document, the cultural resource mitigation measures provided herein are necessarily generic in their application, because specific actions at specific locations that would have a potentially adverse effect on a specific cultural resource have not been identified.

Three classes of resources could be affected by the actions carried out under the RMP. These include:

- Built environment resources (buildings, structures and other above ground built features)
- Archaeological sites (prehistoric, historic, or mixed component)
- Traditional Cultural Properties (traditional use areas such as plant gathering areas that still retain significance for living populations)

The kinds of activities that could affect the resource classes described above include:

- Ground-disturbing activity caused by construction, maintenance, or wake-induced erosion.
- Vandalism and/or looting of archaeological or built environmental resources as a result of increased visitor use and/or improved visitor access.
- Willful or unintentional disturbance to a Traditional Cultural Property through direct physical disturbance, installation of facilities or infrastructure in an inappropriate area, or visitor use of an area leading to vandalism or looting.

4.5.2 Impact Thresholds

The purpose of assessing cultural resources within a study area is to determine the potential for impacts by the proposed project on the region's cultural resources. For the purpose of evaluating impacts, a four-tiered classification system has been developed (which is similar to other resource categories) to assess the impacts on cultural resources. The four impact categories are:

- **Beneficial Impact:** This impact category would occur when a planning element could result in enhanced visitor awareness regarding the fragile and irreplaceable nature of cultural resources. A beneficial impact would also occur when opportunities for public interpretation of cultural resource sites are implemented.
- **No Impact:** This impact category would occur if any proposed activity would result in no change over existing cultural resources conditions.

- **Minor Adverse Impact:** This impact category applies if impacts occur to a cultural resource that does not qualify as a historic property.
- **Major Adverse Impact:** This impact category would occur if a proposed undertaking results in a Finding of Adverse Effect to a Historic Property.

In the event a significant cultural resource (historic property), as defined by the NRHP criteria, is identified that may be affected by future projects, the potential for impacts (effects) will be taken into consideration, and measures to avoid the resource will be considered. In the event the resource cannot be avoided, it will be subject to mitigation measures such as data recovery, further study, enhanced recordation, interpretation, physical protection, or some combination of these measures to reduce impacts to a less than significant level (i.e., to reduce an adverse effect to no adverse effect.

4.5.3 Impacts Common to All Alternatives

Within the RMP elements for all three alternatives, identified actions or improvements are common to all alternatives. Any specific improvement that would result in ground-disturbing activity or increased visitor use would be subject to a project-specific environmental review that would include an assessment of potential impacts to cultural resources. When specific projects are developed, a site-specific environmental analysis would be conducted and a more focused analysis of the proposed project's impacts to cultural resources would occur. At that time, more clearly defined cultural resource impacts may be identified. If significant cultural resource impacts were to be identified, the proposed project would be modified or mitigation measures, as described under NEPA, would be implemented to reduce these impacts.

The following actions/activities would occur under all of the alternatives, and could adversely impact cultural resources:

- **Facilities and Services:** The existing facilities and services, such as primitive camping, hiking and day-use sites at Live Oak Camp and the County Park, currently impact known archaeological sites. The proposed improvements at these locations could impact both known and unknown cultural resources in the Plan Area by increasing the number of visitors to these locations. Potential expansion or improvements to the existing facilities (via ground disturbance) could also potentially impact cultural resources.
- **Boating:** The current pattern for boat usage on Cachuma Lake has shown a slight downward trend over the last 5 years. However, the populations of Santa Barbara and Los Angeles counties are projected to increase by approximately 20 percent between the years 2000 and 2030. It is assumed that increased populations may result in similar increases in boat usage. The potential increase in boat usage would potentially increase the amount of wake-induced erosion, which could expose previously unknown archaeological sites, or further erode currently exposed sites.

4.5.4 Impacts Specific to Alternative 1 (No Action)

Potential impacts to cultural resources under this alternative include:

Facilities and Services

Currently, recreational uses are restricted to Live Oak Camp, Camp Whittier, and the County Park. These facilities would continue to operate at current standards under this alternative. It is possible that historic or prehistoric cultural resources could be affected by visitor access to archaeological sites that could be subject to looting and/or vandalism.

Equestrian Trails

No trail improvements or additions are identified under this alternative. The continued use of these trails could result in impacts to known and/or previously unknown cultural resources that could be subject to looting and/or vandalism.

Grazing/Land Management

The current grazing program within the Plan Area would continue under this alternative. Proposed fuel management activities have the potential to impact archaeological sites due to erosion. Livestock activities and possible increased visitor access could subject these sites to looting and/or vandalism.

4.5.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Potential impacts to cultural resources under this alternative include:

Facilities and Services – North Shore

Levels of trail use on the north shore will be increased to more users and primitive trails would be developed under this alternative. Increased visitor access to cultural resource sites (via these trails and facilities) could subject these sites to looting and/or vandalism. Primitive trail use by guide or permit would limit potential impacts.

Facilities and Services – Live Oak Camp

This alternative would allow limited day use and limited camping facilities at Live Camp Oak. Day use facilities would include individual and group picnic areas. Overnight camping would be allowed, including primitive camping, and RV camping. Ground disturbing activities associated with this alternative could disturb previously unidentified archaeological sites. Increased visitor access to cultural resource sites (via these facilities) could subject these sites to looting and/or vandalism.

Facilities and Services – County Park

Potential actions under this alternative include increasing the number of yurts and providing full service "executive" RV campsites. Camping and day use facilities could be expanded to

accommodate more visitors, and the internal layout of the park would be improved. Ground disturbing activities associated with this alternative could disturb previously unidentified archaeological sites. Increased visitor access to cultural resource sites (via these facilities) could subject these sites to looting and/or vandalism.

Trails (Hiking, Equestrian, and Biking)

Access to trails along the northern shore would be available all year, though partially restricted during the winter under this alternative. Equestrian use, hiking and biking from Live Oak Camp would be restricted to daylight hours and would require a permit. These activities could provide increased visitor access to cultural resource sites that could be subject to looting and/or vandalism.

Kayaking

Kayaking would be allowed under this alternative on the Main Lake, Cachuma Bay and on Santa Cruz Bay. Kayakers would have access to the entire lake, subject to the normal boating restrictions regarding boomed areas and the prohibition of landing along the shoreline. Increased visitor access to the entire lake shoreline via kayaks, could expose cultural resource sites in normally inaccessible locations, to looting and/or vandalism.

Grazing/Land Management

The current grazing program along the northern side of Cachuma Lake would continue under this alternative. Proposed fuel management activities have the potential to impact archaeological sites do to erosion. Livestock activities and possible increased visitor access could subject these sites to looting and/or vandalism.

4.5.6 Impacts Specific to Alternative 3 (Expanded Recreation)

Potential impacts to cultural resources under this alternative include impacts that are common to the other alternatives as well as the following:

Facilities and Services – North Shore

This alternative would allow year-round day use and primitive camping the northern side of the Plan Area (and at Santa Ynez Point). The specific locations, layout and development plans have not been developed, but would be dictated by demand. Increased visitor access to cultural resource sites (via these facilities) could subject these sites to looting and/or vandalism.

Facilities and Services – Live Oak Camp

Full park facilities would be allowed at Live Oak Camp under this alternative, including campsites, yurts, cabins, picnic areas, a café, a store, and educational or recreational buildings. Ground disturbing activities associated with this alternative could disturb previously unidentified archaeological sites. Increased visitor access to cultural resource sites (via these facilities) could subject these sites to looting and/or vandalism.

Facilities and Services – County Park

Day use and camping facilities would be expanded to accommodate more visitors under this alternative. Proposed facilities include the construction of a water slide/park, and day use "opportunities," i.e., miniature golf, game arcades, basketball, baseball, football and soccer playing areas, and RC airplane activity. The existing Nature Center would be modernized and enhanced to educate the public. Ground disturbing activities associated with this alternative could disturb previously unidentified archaeological sites. Increased visitor access to cultural resource sites (via these facilities) could subject these sites to looting and/or vandalism.

Trails (Hiking, Equestrian, and Biking)

Proposed development of trails on the north shore could provide increased visitor access to cultural resource sites that could be subject to looting and/or vandalism.

Kayaking

As with Alternative 2, kayaking would be allowed under this alternative. Kayakers would have access to the entire lake including the east end, subject to the normal boating restrictions regarding the prohibition of landing along the shoreline. Increased visitor access to the entire lake shoreline via kayaks, could expose cultural resource sites in normally inaccessible locations, to looting and/or vandalism.

Grazing

The current grazing program along the northern side of Cachuma Lake would not continue under this alternative. Grazing activities would continue along the southern side of Cachuma Lake. Proposed fuel management activities have the potential to impact archaeological sites do to erosion. Livestock activities and possible increased visitor access could subject these sites to looting and/or vandalism.

4.5.7 Impacts Summary

In general, many agencies have resorted to developing education programs that include the production of pamphlets and/or interpretive exhibits aimed at educating the public on the prehistory and history of the vicinity and the importance of protecting cultural resources. Most pamphlets and interpretive exhibits or signage also warn against illegal removal of artifacts. Santa Barbara County Parks Department should consider adopting a similar strategy, producing an educational pamphlet and/or interpretive exhibits and signage placed in high visitor use areas, in particular the Cachuma Lake County Park/Nature Center vicinity.

A summary of the mitigation measures for cultural resources within the Plan Area are identified below and are keyed to the impacts discussed above. The summary of the impacts to cultural resources within the Plan Area is provided below:

Impact CU-1

Both prehistoric and historic cultural resources are known to exist throughout the Plan Area; known sites are located within Live Oak Camp and the County Park. Construction of proposed facilities at these locations will require ground-disturbing activities during the course of development. As a result, cultural resources could be disturbed.

- **Alternative 1:** Under this alternative, recreational uses would be restricted to Live Oak Camp and the County Park and would continue to operate at current standards. No new construction with related ground-disturbing activities is proposed. Therefore, the No Action Alternative would have no impact.
- **Alternative 2:** Under this alternative, recreational uses would increase along the southern shoreline, specifically at Live Oak Camp and the County Park. Additional day use facilities would be expanded or created and would involve ground disturbance during the course of construction. This development would be a major adverse impact if significant cultural resources (historic properties) would be affected.
- **Alternative 3:** This alternative proposed a greater number of facility improvements along the southern shoreline. The construction of numerous new facilities, which include a café and store at Live Oak Camp, RC airplane airstrip, and a new water slide/park at the County Park, will require ground disturbance activities during the course of construction. Due to the higher number of proposed projects under this alternative, along with higher volume of ground disturbance, a higher likelihood exists for major adverse impacts if significant cultural resources (historic properties) would be affected with this alternative than with Alternative 2.

Mitigation CU-1

- **Alternative 2:** Prior to any specific proposed undertaking with potential ground disturbance activities, qualified personnel will conduct a cultural resources inventory for the areas of potential effects. This effort should be in conjunction with consultation with members of the local Native American community and consultation with other interested member of the public as appropriate. This inventory will identify the cultural resources that will be impacted by the proposed project(s). The cultural resources will then be evaluated for their eligibility for the NRHP. If the affected resource is not significant (does not qualify as a historic property), then no mitigation would be required and the impact would be considered minor. If the affected resource qualifies as a historic property and the impacts can be mitigated (treated) through the Section 106 process, there would be no residual impact. If the resource cannot be mitigated through the Section 106 process, Reclamation may still be able to conclude the Section 106 Process as described in 36 CFR Part 800.7 (*Failure to resolve adverse effects*) of the Section 106 implementing regulations. Reclamation may also elect to reconsider the action to the affected resource, seek measures to resolve adverse impacts outside the Section 106 process, or implement the project upon conclusion of the Section 106 process.
- **Alternative 3:** Prior to any specific proposed undertaking with potential ground disturbance activities, qualified personnel will conduct a cultural resources inventory for the areas of potential effects. This effort should be in conjunction with consultation with members of the local Native American community and consultation with other interested member of the

public as appropriate. This inventory will identify the cultural resources that will be impacted by the proposed project(s). Due to the higher volume of proposed projects with Alternative 3, the probability of encountering cultural resources is higher. The cultural resources will then be evaluated for their eligibility for the NRHP. If the affected resource is not significant (does not qualify as a historic property), then no mitigation would be required and the impact would be considered minor. If the affected resource qualifies as a historic property and the impacts can be mitigated (treated) through the Section 106 process, there would be no residual impact. If the resource cannot be mitigated through the Section 106 process, Reclamation may still be able to conclude the Section 106 Process as described in 36 CFR Part 800.7 (*Failure to resolve adverse effects*) of the Section 106 implementing regulations. Reclamation may also elect to reconsider the action to the affected resource, seek measures to resolve adverse impacts outside the Section 106 process, or implement the project upon conclusion of the Section 106 process.

Impact CU-2

Archaeological sites are scattered along the margins of Cachuma Lake, with the highest density of sites occurring along the southern shoreline. Upon formal evaluation some of these sites could be found to qualify as historic properties (eligible for listing on the National Register of Historic Places). Lake levels have slowly risen since the 1950s, when many of these resources were originally recorded. Many of these sites have already been impacted by prior wave erosion and flooding. As part of the baseline for this RMP, it is assumed that with the Surcharge project, lake levels would continue to rise above levels originally recorded prior to the Surcharge project.

- **Alternative 1:** Boating is assumed to increase under this alternative, but management will not change, therefore the wake erosion to banks would be a minor adverse impact.
- **Alternative 2:** Overall, boating activity would slightly increase under this alternative; however, speed limits would be strictly managed. Human-powered watercraft (i.e., kayaks and canoes) would be introduced to the main lake and Santa Cruz Bay (in compliance with inspection, treatment, and quarantine protocols to prevent introduction of invasive mussels). Minor adverse impacts similar to Alternative 1 would occur. No mitigation is proposed.
- **Alternative 3:** Under this alternative, boating activity may increase slightly over Alternatives 1 and 2, but impacts due to wake erosion are still considered minor adverse impacts. No mitigation is proposed.

Impact CU-3

Currently, public access to the shoreline of Cachuma Lake is fairly limited. Various trails (hiking, equestrian and biking) are located throughout the Plan Area. Certain elements of the RMP will increase visitor activity along these trails and other portions of the lake, therefore potentially exposing archaeological sites to higher volumes of visitor activity.

- **Alternative 1:** No improvements or additions are identified under this alternative. Though the continued and potential increase in the use of these trails could impact archaeological sites, this alternative is a no impact alternative.

- **Alternative 2:** Under this alternative, access to trails along the northern shore would be available all year (with guides or permits). Hiking, horseback riding, and biking would be allowed (with a permit) on primitive trails during daylight hours at Live Oak Camp. Low-impact, limited group day use at the Santa Ynez Peninsula would be allowed with a guide. Due to the potential increase in visitor activity (as compared to Alternative 1), this alternative would have the potential to result in disturbance to archaeological resources. If the affected resource is not significant (does not qualify as a historic property), then no mitigation would be required and the impact would be considered minor. If the affected resource qualifies as a historic property and the impacts can be mitigated (treated) through the Section 106 process, there would be no residual impact. If the resource cannot be mitigated through the Section 106 process, Reclamation may still be able to conclude the Section 106 Process as described in 36 CFR Part 800.7 (*Failure to resolve adverse effects*) of the Section 106 implementing regulations. Reclamation may also elect to reconsider the action to the affected resource, seek measures to resolve adverse impacts outside the Section 106 process, or implement the project upon conclusion of the Section 106 process.
- **Alternative 3:** Proposed improvements under this alternative are more intense than those outlined in Alternative 2. Full-day use and camping (at Santa Ynez Peninsula and Live Oak Camp), with full public access for hiking and biking on primitive and/or well-developed trails (at Santa Ynez Peninsula, portions of the north shore and Horse Canyon) will be allowed. Primitive camping will be allowed at Horse Canyon, and on selected areas on the north shore. With the higher volume of proposed projects, along with higher probability for visitor activity, the likelihood for major adverse impacts is higher with this alternative than with Alternative 2. If the affected resource is not significant (does not qualify as a historic property), then no mitigation would be required and the impact would be considered minor. If the affected resource qualifies as a historic property and the impacts can be mitigated (treated) through the Section 106 process, there would be no residual impact. If the resource cannot be mitigated through the Section 106 process, Reclamation may still be able to conclude the Section 106 Process as described in 36 CFR Part 800.7 (*Failure to resolve adverse effects*) of the Section 106 implementing regulations. Reclamation may also elect to reconsider the action to the affected resource, seek measures to resolve adverse impacts outside the Section 106 process, or implement the project upon conclusion of the Section 106 process.

Mitigation CU-3

- **Alternative 2:** Due to the potential increase in visitor activity, surveys to identify sensitive areas for cultural resources should be conducted. To avoid impacts to any identified sensitive resources, mitigation would include a combination of monitoring by patrol staff, public outreach, and/or rerouting of sensitive trail segments. Residual impacts would be minor. With implementation of these measures, residual minor impacts would likely result in a finding of no adverse effect.
- **Alternative 3:** It is important to note that due to the higher volume of proposed projects with Alternative 3, the probability of visitors encountering cultural resources is higher. Overall, more intensive work (i.e., surveys, rerouting, monitoring by patrol staff, public outreach) would be required of this alternative. Residual impacts would be minor. With implementation

of these measures, residual minor impacts would likely result in a finding of no adverse effect.

Impact CU-4

Four livestock grazing lease areas occur within the Plan Area, and at least 18 previously identified archaeological sites fall within the lease areas. Very little land within these leases has been surveyed for cultural resources, so it is probable that other sites also occur within these lease areas. Along with grazing, fuel management and prescribed burns are proposed components of the alternatives.

- **Alternative 1:** Under this alternative, the current grazing program and fuel management program would continue. Though use through livestock grazing and a fuel management program is continued, this alternative would have a minor adverse impact.
- **Alternative 2:** As with Alternative 1, the current grazing program and fuel management program would continue. This alternative would have a minor adverse impact.
- **Alternative 3:** Under this alternative, the current grazing and fuel management programs would not continue on the north shore. With the removal of livestock from these regions, the impacts would diminish. Therefore, this impact is beneficial. No mitigation is proposed.

Mitigation CU-4

- **Alternative 2:** Grazing areas adjacent to the Plan Area should be monitored, as appropriate, for early detection and evaluation if required, of previously unknown cultural resources. These preventative measures should occur seasonally, in grazing areas adjacent to, or within, areas that are frequented by visitors. Residual impacts would be minor. With implementation of these measures, residual minor impacts would likely result in a finding of no adverse effect.

4.6 HAZARDOUS MATERIALS

4.6.1 Introduction

Three factors could result in exposure to hazardous materials:

- Release of gasoline at the marina and/or at the gas station located at the store
- Known hazardous materials sites
- Release of treatment chemicals from the water treatment plant

4.6.2 Impact Thresholds

- **Beneficial Impact**: Impacts that are detectable and significantly and positively alter historical or desired hazardous conditions.
- **No Impact**: Exposure to hazardous materials cannot be detected.

- **Minor Adverse Impact:** Impacts are detectable and are within or below regulatory standards or thresholds for exposure to hazardous materials, and do not interfere with park goals.
- **Major Adverse Impact:** Exposure to hazardous materials is detectable and significantly and negatively alter historical baseline or desired conditions. These impacts would contribute to the deterioration of safe conditions in the Study Area, the public's enjoyment of park resources, or would interfere with park goals for exposure to hazardous materials.

4.6.3 Impacts Common to All Alternatives

Release of Gasoline at the Marina

Release of gasoline at the marina could have adverse impacts in the Plan Area under all three alternatives. The accidental release of gasoline at the marina could expose boaters, fish, and wildlife to hazardous materials found in gasoline. The marina has an installed containment system to capture any accidental releases. Therefore, the impact from an accidental release would be reduced to a level of no impact.

Known Hazardous Sites

No hazardous materials sites are known within the Cachuma project area; therefore, no effect from known hazardous sites would occur under all three alternatives.

Release of Treatment Chemicals from Water Treatment Plant

Hypochlorite is used at the Plan Area's water treatment plant. The plant's storage and use of hypochlorite is regulated under California Department of Public Health and California Occupational Safety & Health Administration guidelines, which includes but is not limited to having a risk management plan, a contingency plan, alarms, and proper notification processes. Access to areas near the treatment plant is restricted. No additional impacts would occur from different uses and changes under the alternatives. No impacts are expected.

4.6.4 Impacts Summary

The No Action and action alternatives would have no impact from hazardous materials, and therefore, no mitigation measures are proposed.

Cumulative Impacts

No cumulative impacts to hazardous materials would occur.

4.7 VISUAL RESOURCES

4.7.1 Introduction

Impacts to visual resources in the Plan Area could occur due to changes in viewsheds caused by increased boat use on the lake, development activities in the north shore area, and along the perimeter of the main body of the lake.

4.7.2 Impact Thresholds

- **Beneficial Impact:** This impact category would occur if the visual quality or the visual character of an existing viewshed were improved by a specific RMP element or group of elements. In addition, the creation of a new viewshed would result in a beneficial impact.
- **No Impact:** This impact category would occur if a specific element or group of elements does not result in a change in the quality or visual character of a viewshed.
- **Minor Adverse Impact:** This impact category would occur if a specific element or group of elements results in a decrease in the visual quality or visual character of a viewshed. This impact would be minimal or temporary, but detectable.
- **Major Adverse Impact:** This impact category would occur if a specific element or group of elements results in a permanent, highly noticeable, and substantial decrease in the visual quality or visual character of a viewshed.

4.7.3 Impacts Common to All Alternatives

All three alternatives allow various levels of recreational development or maintenance activities along the south shore of Cachuma Lake, where viewsheds and other visual resources are of a lesser quality compared to the north shore. The type and intensity of development allowed under each alternative for the south shore, although different (day use vs. camping) would generally have the same impact on visual resources. Development along the south shore is generally back dropped or within oak woodlands, which further minimizes the visual impact of the campgrounds and other facilities, creating no impact to a minor adverse impact when designed to fit with its surroundings. Any development on the south shore designed to fit with the existing setting and use materials that blend with the natural setting of the lake would have no impact on visual resources.

If prescribed burn activities were to occur, they could temporarily alter the viewsheds throughout the Plan Area by introducing large amounts of smoke into the area. Smoke caused by this activity could dramatically reduce the visual resources of the Plan Area and would have an adverse impact on visual resources. Due to the temporary and infrequent occurrences of prescribed burning activities, this impact would be a minor adverse impact, as defined above.

4.7.4 Impacts Specific to Alternative 1 (No Action)

Because Alternative 1 would not propose new development on the north shore, no impact to visual resources would occur on the north shore or on the lake.

4.7.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Alternative 2 would have no impact to visual resources on the north shore. Alternative 2 allows for limited, permit, or guide-required public access to the north shore, which includes low impact day use, equestrian, hiking, and biking on primitive trails on north shore west and east. These uses would not involve the construction of structures that could disrupt the north shore viewshed. Only primitive trails would be developed as well for Alternative 2. Primitive trails would not involve any type of construction, slope protection, nor cut or fill that would make the trails noticeably visible from the lake, south shore, or SR 154. Any development on the north shore would be designed to fit with the existing setting and use materials that blend with the natural setting of the lake to maintain no impact on visual resources.

Alternative 2 would allow for kayak use within Cachuma Bay and Santa Cruz Bay, therefore opening new areas for viewing from manpowered boats. This impact would be beneficial compared to existing conditions and the No Action Alternative.

4.7.6 Impacts Specific to Alternative 3 (Expanded Recreation)

Alternative 3 would have minor to major adverse impacts to visual resources on the north shore. Alternative 3 allows for more intensive access and use on the north shore compared to the other alternatives, which includes full public access and camping at north shore west and east, and Horse Canyon, and shore access and dock fishing, developed trails, and tent camping at primitive sites with bathrooms. These uses could involve the construction of structures that would impact the north shore viewshed. Developed trails could involve construction of wider trails for greater public access. The construction of these trails could involve brush clearing, slope protection and cut or fill that would make the trails noticeably visible from the lake, south shore, or SR 154. Greater public access to could lead to impacts to the natural vegetation from visitors creating access points to the shore, clearing vegetation for campfires, going off trail, and other misuse. Furthermore, the uses allowed under Alternative 3 would require construction of restrooms and other facilities that may be visible within the viewshed. Any development on the north shore would need to be designed to fit with the existing setting and use materials that blend with the natural setting of the lake to reduce the impact to a minor adverse impact on visual resources.

Alternative 3 would allow for motorized boats at the east end. Compared to existing conditions and to the No Action Alternative, this allowance would introduce minor impacts to the east end where no boats are now allowed.

4.7.7 Impacts Summary

Impact VR-1

Both action alternatives would allow for the construction of structures that could diminish the natural visual resources of the south shore and result in minor adverse impacts to visual resources.

Mitigation VR-1

All development on the south shore will be designed to fit in with the existing setting and use materials that blend with the natural setting of the lake to minimize visual impacts to the greatest extent possible. This effort would include, but not be limited to:

- Avoiding the cutting down of oak trees to the maximum extent possible
- Using natural materials or materials that match the natural setting
- Designing facilities to work with the terrain and foliage of the area
- Minimizing grading of slopes to the maximum extent possible.
- Revegetating all cut and fill slopes with native plants

Mitigation would reduce the impacts to a no impact level.

Impact VR-2

Smoke that could result from potential prescribed burn activities under all the alternatives would be temporary and infrequent, resulting in a minor adverse impact to visual resources. No mitigation is proposed.

Impact VR-3

Under Alternative 1, the maximum density of boats on the entire lake would stay at the current density and have no impact on visual resources. The noticeable change in the boat density on the main lake and east end of the lake from the action alternatives would result in a minor adverse impact to visual resources. Both action alternatives would allow the same increase in boat density at these lake locations. No mitigation is proposed.

Impact VR-4

Alternative 1 would not allow development on the north shore. Alternative 2 would allow for primitive trails that could diminish the visual resources of the north shore and result in minor adverse impacts to visual resources. Alternative 3 would allow for the construction of trails and structures that could diminish the visual resources of the north shore and result in major adverse impacts to visual resources.

Mitigation VR-4

All development on the north shore will be designed to fit in with the existing setting and use materials that blend with the natural setting of the lake to minimize visual impacts to the greatest extent possible. This effort would include, but not be limited to:

- Avoiding the cutting down of oak trees to the maximum extent possible
- Using natural materials or materials that match the natural setting
- Designing facilities to work with the terrain and foliage of the area
- Minimizing grading of slopes to the maximum extent possible

- Revegetating all cut and fill slopes with native plants
- Using native material to the maximum extent possible to stabilize trails

With implementation of these measures, Alternative 2 would have no residual impacts, and Alternative 3 would have minor adverse residual impacts.

Impact VR-5, Cumulative Impacts

The Cachuma project would result in the surcharging of the lake 1.8 or 3.0 feet, depending on the alternative selected, resulting in a potential loss to about 452 oaks with a 3-foot recharge. The proposed development of recreational facilities at Cachuma Lake with Alternatives 2 and 3 result in the loss of a much smaller number of oak trees. The additional loss of oak trees associated with the Cachuma RMP project would be a minor adverse impact, when combined with the loss of oaks with either recharge alternative.

Mitigation VR-5

Oak trees removed for the development of recreational facilities will be replaced at a 2:1 replacement ratio.

4.8 LAND USE

4.8.1 Introduction

Potential land use impacts would be related to:

- Land use conflicts between prescribed burning activities and other Plan Area land uses
- Conflicts between grazing practices and other Plan Area land uses
- Conflicts between different user groups on the trail system

4.8.2 Impact Thresholds

- **Beneficial Impact:** This impact category would occur when a planning element could result in the elimination, reduction, or resolution of a conflict between existing land uses.
- **No Impact:** This impact category would occur if planning elements would result in no change over the existing condition.
- **Minor Adverse Impact:** This impact category would occur if an activity would result in deterioration in the intended use of the Plan Area or when an activity would result in a conflict between intended land uses.
- **Major Adverse Impact:** This impact category would occur if an activity would result in a dramatic deterioration of the intended use of the Plan Area or when a planning element would result in a severe conflict between intended land uses. This type of impacts would often be long term and substantial.

4.8.3 Impacts Common to All Alternatives

Many of the RMP elements for the action alternatives have been designed to reduce land use conflicts and to clearly designate specific land uses in appropriate locations of the Plan Area. Except for the few planning elements described below, at a programmatic level, most of the planning elements that are common for all of the alternatives would have no impacts to land use. When specific projects are developed, a site-specific environmental analysis would be conducted and a more focused analysis of the proposed project's impacts to land use would occur. At that time, more clearly defined land use impacts may be identified. If substantial land use impacts were to be identified, the proposed project would be modified, if possible, to reduce these impacts.

Under all of the alternatives, prescribed burn activities may be allowed for vegetation management in the Plan Area. Prescribed burns would only occur when specific fuel moisture and climatic conditions have been achieved and when permission from the SBCAPCD and CDF has been provided. Due to these limitations, prescribed burns would likely not occur annually in the Plan Area. Prescribed burns typically occur in the fall and the spring, though the necessary climatic and fuel conditions are less common in the spring. Burning activities generally occur over a couple of days and mop-up and monitoring activities occur during the following week or two.

For prescribed burns to occur safely, parts of the Plan Area would need to be closed to visitors during the days of the burning activities. The precise areas that would be closed would be dependent on the location of the prescribed burn. The closure of parts of the Plan Area could result in limiting public access to areas where access is generally permitted. These closures could create a land use conflict with other intended functions of the Plan Area. Depending on the location, all Plan Area users (boaters, campers, trail users, hunters, ranchers, etc.) could be affected by area closures in the Plan Area. In addition, depending on prevailing winds, smoke and ash could affect areas of the Plan Area where public access would be permitted during the burning activities, making visitor use of these areas less desirable.

As described in Chapter 3, visitor use of the Plan Area is relatively low during the fall and relatively high during the spring. The land use conflicts between prescribed burning activities and access for Plan Area users would be minimized if the burns occurred in the fall. Prescribed burns that would occur in the spring have the potential to affect more Plan Area users and result in a larger land use conflict. Regardless of the season that a prescribed burn would occur, the land use impact would be minimal and temporary because area closures would only occur for a few days. Due to the temporary nature of the land use impact and the infrequency that this impact may occur, this impact would be a minor adverse impact.

The nearest Indian Trust Asset is approximately 6 miles southwest of the Plan Area. Implementation of the RMP will not affect Indian Trust Assets (Rivera 2010).

4.8.4 Impacts Specific to Alternative 1 (No Action)

Under Alternative 1, no land use impacts would be anticipated between grazing practices and other Plan Area land uses. Similarly to the existing conditions, grazing and equestrian use would be concurrently permitted in several of the north shore areas. At Santa Ynez Peninsula, north shore east, and Horse Canyon, grazing would be permitted under lease agreements and

equestrian use would be allowed under specific permits on the existing trail system. Because these two activities concurrently occur under existing conditions at these locations without land use conflicts, continuing these activities would not result in an impact to land use.

This alternative would result in some increase in the user demand. With hiking, cycling, and equestrian use permitted on the same trails, the increase in demand could result in a land use conflict between these two user groups. Currently, no conflict has been identified between these two groups. Therefore, the potential conflict between these user groups in the future would likely be minimal. This potential trail use conflict would result in a minor adverse impact to land use.

4.8.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Limited, low-impact day use activities would be allowed on north shore east and north shore west in the same areas where grazing is allowed. The activities could include hiking, biking, and equestrian uses on primitive trails with a permit. Recreation access would be restricted during cattle shipping operations, and no recreational uses would be allowed at the existing corral facilities on the North Shore near Live Oak Camp.

Primitive camping and equestrian use of existing trails with a permit or guide could take place concurrently with grazing at Horse Canyon. On the Santa Ynez Peninsula, where grazing also takes place, low-impact, limited group day use would be allowed with a guide, and access would be coordinated with the grazing leaseholder.

The potential exists for grazing activities and these low-impact day use activities to come into conflict. However, low-impact recreation activities occur concurrently with grazing activities in other parks in the region, and land use conflicts have been minimal and minor. By requiring a permit, observing any applicable restrictions, and supervision of grazing practices through the grazing lease agreements, the resulting land use impact would be minimal. These activities would result in a minor adverse impact.

4.8.6 Impacts Specific to Alternative 3

This alternative would result in the use of trails in the Santa Ynez Peninsula, north shore east, and north shore west areas by hikers, bikers, and equestrians. Conflicts could occur among hikers, bikers, and equestrians because they are utilizing the same trails in some areas. This potential conflict would be minimized with a Trail System Management Plan. Minor adverse impacts to land use are expected from the use of the same trail system by hikers, bikers, and equestrians.

4.8.7 Impacts Summary

As described above, none of the three alternatives would result in large or substantial land use impacts. Many of the RMP elements for all three alternatives have been designed to reduce land use conflicts and to clearly designate specific land uses in appropriate areas of the Plan Area.

Impact LU-1

Under all alternatives, land use impacts from potential prescribed burning activities would be temporary and infrequent, resulting in a minor adverse impact to land use. No mitigation is proposed.

Impact LU-2

The allowance of low-impact, limited day use activities in areas where grazing would also be permitted could result in conflicts between user groups, resulting in a minor adverse impact to land use. The Trail System Management Plan proposed for Alternatives 2 and 3 will minimize these minor adverse impacts to no impact levels.

Impact LU-3

The use of the trail system by multiple users under all alternatives would result in a minor adverse land use impact. Under Alternative 2 and Alternative 3, the proposed Trail System Management Plan would reduce this impact to no impact.

4.9 RECREATION

4.9.1 Introduction

Cachuma Lake is widely known for its natural, scenic qualities. It is also one of Southern California's favorite bass and trout fishing lakes. No body contact sports such as swimming or water-skiing are currently allowed. The County Park also has designated hiking and biking trails and the larger Plan Area (Reclamation land surrounding the lake) has a large group event area called Live Oak Camp. The north side of the lake consists of open space that is leased for grazing and permitted equestrian use. It is not open to general public access.

Under each of the alternatives described in Section 2, opportunities for visitors to engage in any or all of the existing and potential recreational activities depends on: 1) the availability of appropriate facilities and resources, 2) the quality of these resources and settings, and 3) the density of recreational use and potential impacts imposed on natural resources and the setting. Recreation goals and preferences will vary and may even conflict among users, and managers will have to make decisions that guide recreational uses.

This section includes recommendations for management actions such as the use of a permitting system and guided activities to control the number and types of uses in different portions of the Plan Area, but these recommendations are intended as broad guidelines, and may be altered based on actual usage. For example, management actions may be altered during holiday and high use summer weekends when recreational use is high. Management actions will influence visitor perceptions of the quality of the recreation experience.

This section presents the likely effects to recreation that would result from implementing each of the alternatives. For each alternative, impacts are characterized based on their intensity and context. The analysis of these impacts is provided to help decision-makers and the public understand the type and magnitude of the effects to recreation activities in the Plan Area.

4.9.2 Impact Thresholds

Since the primary recreational use at Cachuma Lake is boating and fishing, emphasis is placed on this type of recreational use. The discussion of impacts for boat usage is quantified to the extent possible based on comparison of estimated capacity of Cachuma Lake and estimated demand.

As described in Sections 2 and 3, WROS management zones were assigned to Cachuma Lake for each alternative, based on existing use and projections for types of use, management actions, and physical and social settings (see WROS Figures 2-2, 2-3, and 2-4). For recreational resources, the WROS classifications serve as a guide to understanding the type and location of the six types of recreation opportunities that make up the WROS spectrum: Urban (U), Suburban (SU), Rural Developed (RD), Rural Natural (RN), Semiprimitive (SP), and Primitive (P). The attributes that differentiate these WROS management zones have implications on the recreational opportunities and benefits that recreationists may experience.

In this section, impacts to boating are characterized based on a comparison of existing conditions and demand to the projected capacities and demand for proposed management zones. A breakdown of estimated boating capacities (acres per boat) for each WROS management zone is provided in Table 4.9-1. These estimated boating capacity coefficients are based on collaborative expert opinions, published literature, and professional judgment (Aukerman and Haas 2004).

Table 4.9-1
Boat Capacity on Cachuma Lake

WROS Category	WROS Acres/Boat	Current Condition		Alternative 1		Alternative 2		Alternative 3	
		Acres	No. Boats	Acres	No. Boats	Acres	No. Boats	Acres	No. Boats
Urban	5.5		0		0		0.0		0.0
Suburban - S2	10.0		0.0		0		0		0.0
Suburban - S3	15.0		0.0		0		0	2,467	165.0
Suburban - S4	20		0		0		0.0		0
Rural Developed - RD4	20	1,546	78	2,467	124	2,467	124.0	184	10
Rural Developed - RD5	35	196	6		0		0.0		0
Rural Developed - RD6	50		0	184	4		0.0		0
Rural Natural - RN6	50	677	14		0		0		0
Rural Natural - RN7	80	232	3		0		0		0
Rural Natural- RN8	110		0		0		0		0
Semiprimitive	295		0		0		0		0
Primitive	1,840		0		0		0		0
TOTAL		**2,651**	**101**	**2,651**	**128**	**2,467**	**124**	**2,651**	**175**

Note: Total boats per WROS category = WROS acres in category / Midpoint of WROS acres per boat

The current condition of the lake (see Figure 2-1) is a mix of RN and RD zones, where the bays exhibit a more natural setting and the main body of the lake allows more developed uses. The two bays are categorized as RN, at the mid level of the RN spectrum (RN7), which corresponds to 80 acres per boat. Whereas the main body of the lake exhibits all levels of the RD spectrum (RD4, RD5, and RD6), as well as the low end of the RN spectrum (RN6), which correspond to

20 acres per boat, 35 acres per boat, and 50 acres per boat, respectively (RD6 and RN6 share the same acres/boat average).

Both the No Action Alternative (Alternative 1) and the Enhanced Recreation Alternative (Alternative 2) boat capacities are based on the main body of the lake progressing to a more uniform, RD WROS category (RD4). This category corresponds to an average of 20 acres per boat. Alternative 3 is the alternative that exhibits increased recreational use on and around the lake, therefore progressing into the middle Suburban category (S3) with 15 acres per boat, which increases capacity on the lake for boats. These boat densities (and thus management zone capacities) will result from specific management actions that will be applied over the planning horizon. Evaluation of the different WROS classifications allows for alternative scenarios that are both reasonable and foreseeable for managing boating usage.

Existing and projected demand for boat usage is shown in Table 4.9-2. The percentage of boats active at any one time (BAOT) from total daily launches is estimated at 60 percent. Current County Park staff and the Marina management agreed upon this estimate. According to the manager of the Cachuma Lake Marina, the estimate for BAOT from marina slips is a maximum of 40 percent of the total marina slips (94 slips). Lastly, it is estimated that a maximum of 40 percent of the rental boats (approximately 87 boats, to date) would be active at any one time.

Table 4.9-2
Projected Demand for Boating

Existing Conditions									Estimated Increased Demand in 2030	
	Boat Launches[1]			Existing Marina[3]		Rental[4]		Total BAOT		Existing Launches, Marina and Rental
Percentile	Launches	Percent Active[2]	BAOT	Occupied Slips	Boats Active at Any One Time	Rented Boats	BAOT	Launch + Marina + Rental	Percent Increase[5]	BAOT (rounded to whole number)
10%	8	60	5	4	4	4	4	13	20	16
20%	13	60	8	8	8	8	8	24	20	29
30%	17	60	11	12	12	11	11	34	20	41
40%	20	60	12	16	16	14	14	42	20	51
50%	24	60	15	19	19	18	18	52	20	62
60%	27	60	17	23	23	22	22	62	20	74
70%	31	60	19	27	27	25	25	71	20	85
80%	36	60	22	31	31	28	28	81	20	97
90%	45	60	27	34	34	32	32	93	20	112
95%	54	60	33	36	36	34	34	103	20	124
98%	66	60	40	38	38	35	35	113	20	136
100%	96	60	58	38	38	35	35	131	20	157

[1] Demand based on annual weekend data from 2001 through 2004 (including holidays) - calculated at 80th and 90th percentiles
[2] Estimated 60 percent of boats would be active on the lake at one time during a 12-hour period, normalized.
[3] Estimated 40 percent of slips would be active on the lake at one time during a 12-hour period. Maximum BAOT (38 boats) is calculated as 40 percent of 94 slips.
[4] Estimated 40 percent of rental boats would be active on the lake at one time during a 12-hour period. Maximum BAOT (35 boats) is calculated as 40 percent of 87 rental boats.
[5] Growth estimated at 20 percent for launches based on population increases for Santa Barbara and Los Angeles Counties (Table 3.12-1).

In the following discussion of impacts, effects other than boat usage are also quantified where possible. In the absence of quantitative data, however, best professional judgment prevails. In many cases, impacts are characterized using ranges of potential impacts or in qualitative terms, as appropriate.

Terms referring to impact intensity, context, and duration are used in the analysis of effects on recreation. Unless otherwise stated, the standard definitions for these terms are as follows:

- **Beneficial Impact:** The impact of the action is positive.
- **No Impact:** The impact is at the lower level of detection; no measurable change would occur.
- **Minor Adverse Impact:** The impact is slightly adverse, but detectable; a small change would occur.
- **Major Adverse Impact:** The impact is adverse and severe; a highly noticeable, long-term, or permanent change would occur. It would indicate a marked decline in the quality or quantity of opportunities to participate in a recreation activity as a result of implementing an alternative. Therefore, to determine whether an impact is major, this discussion considers the effect of an alternative on recreational facilities, the setting and physical resources, and use density.

4.9.3 Impacts Common to All Alternatives

As discussed in Section 2.5.1, all RMP alternatives include specific infrastructure, facility, and operational improvements at the County Park and Live Oak Camp, as well as continued operation of Camp Whittier. The local managing partner will be responsible for implementing improvements as demand occurs and funding becomes available. Funding sources may include recreation fees, grants (federal, state, local, private), and federal government appropriations, if available. These improvements will provide better/more reliable public and recreational services, therefore resulting in beneficial impacts for recreation.

Under all alternatives, all applicable federal and state regulations would be followed, and appropriate actions to ensure compliance would be taken. No impacts will result from the continuation of existing activities.

The existing recreational facilities will be upgraded as necessary to comply with applicable laws and regulations, such as ADA. At a minimum, existing facilities including campgrounds, group camps, and the amphitheater that are currently in compliance with governing laws and regulations will continue to be maintained under all alternatives, and no adverse impacts to recreation would occur as a result. Seasonal events and activities would continue to be promoted. Special events at Live Oak Camp will continue to be managed via special permits. Seasonal concession stands would be provided under all alternatives, as well as the new Reclamation guidelines for concessionaires on federal land. Regular maintenance will preserve the quality of the facilities, which would have a beneficial impact for users. Safety measures would be enforced and emergency response plans would be in place under all alternatives.

For all future growth, Reclamation and the managing partner will coordinate with Santa Barbara County. Actions will be taken to the extent that they are necessary to comply with guiding plans

and policies. The objective of these actions would be to have no impact on the recreational experience for visitors; however, individual actions may impact user groups differently.

Visitors would be educated about the protection of natural and cultural resources, maps would be provided, and visitors would be instructed to stay on trails and keep away from sensitive areas. In addition to the accessibility and management of facilities, the availability of recreational facilities and educational information about the resources can enhance visitors' experiences, resulting in beneficial impacts for recreation.

Under all three alternatives (including the No Action Alternative), in addition to complying with guiding policies and regulations, Reclamation and the managing partner will take a proactive approach to integrating management policies. Managers will also continue to coordinate noxious weed control and continue yearly weed eradication efforts, as well as pursue the use of herbicides on invasive Italian thistle. Taking a holistic approach to managing resources will have a beneficial impact on recreationists.

Under all alternatives, existing recreational facilities would also be enhanced or upgraded to meet existing and projected needs, although specific actions will differ based on WROS goals and objectives. Entrance stations would be redesigned to meet growth as required. All of the day use facilities would be maintained or upgraded as necessary. Improvements would be accompanied by expansion of utilities, as necessary. These actions would have short-term construction effects that may restrict recreation activities; such impacts are characterized as minor due to their temporary nature. New facilities would be designed so that they do not diminish the visual character of the area. Under these alternatives, managers would also add more staff and equipment needed to maintain the facilities and resources of the Plan Area. Overall, improvements, upgrades, and enhancements will have beneficial impacts to recreationists.

In addition, managers would study and implement additional infrastructure improvements under all alternatives, such as improving the road at Live Oak Camp. Stretches of roads prone to flooding would also be fixed. Furthermore, additional parking spaces would be provided. Any expansion of or repairs to infrastructure and services will result in beneficial impacts for recreational users.

Waterskiing would not be permitted. Patrols would be increased throughout the lake during the peak season, and security patrols within the lake and at the dam overlook area would be provided as necessary. Safety-related enhancements will have beneficial impacts to recreation users.

Under all alternatives, in addition to providing updated visitor information maps and basic resource information, Reclamation and the managing partner would set up educational displays around the park to reach out to the public and emphasize important characteristics of the natural resource environment, including water quality. Such actions will help protect existing resources in the future, enabling park staff to take a more active role in educating visitors. Therefore, these actions would have beneficial impacts on recreation groups.

To control BAOT levels and speeds, particularly in the bays where RN settings may be desired under the various alternatives, managers will improve existing signage that designates speed limits and off-limit areas. BAOT restrictions and other restrictions on size and speed may also be waived during competitions such as bass tournaments.

4.9.4 Impacts Specific to Alternative 1 (No Action)

The No Action Alternative largely maintains the status quo, with new actions being limited to the infrastructure and operational improvements discussed in Section 2.5.1 and the compliance requirements under federal and state regulations. This alternative does not expand recreational opportunities at the lake or allow public access to any areas on or around the lake that is not currently allowed.

As such, actions under this alternative are limited to the following:

- Upgrade existing facilities necessary to be ADA-compliant.
- Implement the infrastructure and operational improvements specifically outlined in Section 2.5.1.
- Implement actions required to retain the current level of recreational opportunities through maintenance of trails, facilities, services (i.e., patrols, park staff), and existing restrictions.

The No Action Alternative is characterized by the continued provision of services and facilities, with current management practices in place. Both Santa Barbara and Los Angeles counties (where the main user groups for Cachuma Lake come from) are projected to have lower growth rates up to the year 2030 (approximately 20 percent) in comparison to the projected state of California growth rate (approximately 34 percent). With this projected population growth, growth in recreational demand for Cachuma Lake is somewhat unknown, although some growth is assumed.

As demand continues to increase over time, the WROS classifications in and around the lake will change, as demonstrated by the difference in WROS classifications on the Existing Conditions WROS Map versus the Alternative 1 WROS Map. Although Alternative 1 is the No Action Alternative, management still must consider the fact that demand and visitor use will somewhat increase over the years, and boat densities will increase in the absence of new controlling management actions.

Although boating demand could be met most of the time, under the No Action Alternative boat densities would reach capacity more often than currently (see Table 4.9-1). With slightly higher BAOT densities on the main body of the lake than under current conditions, some visitors' experiences would be compromised. In general, user groups favoring lower boat densities could be somewhat impacted by a lower quality experience. This impact would be a minor adverse impact.

Similarly, the number of trail users would increase (simply due to population increase), but no associated increase in trails or change in management would occur. With a higher concentration of trail users on existing trails, the potential for erosion and loss of a peaceful environment would increase. While recreation opportunities will exist for all recreation users most of the time, the quality of recreational experiences would decline when crowds exceed management zone densities. The frequency at which demand exceeds management zone densities may increase. This impact will be a major adverse impact.

Some actions, such as the upgrade of infrastructure and facilities to meet regulatory requirements and the specific implementing measures defined by this RMP in Section 2.5.1, will take place under the No Action Alternative that would be beneficial to recreational users.

4.9.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Under Alternative 2, the objective is to expand current recreational uses and public access at Cachuma Lake to attract more visitors and increase recreational opportunities, while protecting natural resources with new or modified land and recreation management practices. Improvements and additions to existing facilities would be made to accommodate the increasing visitor demands. Types of actions that would characterize this alternative include:

- Access to the North Shore would be available all year, but would be restricted in the winter months during and immediately after rain events to reduce damage to trails. Limited equestrian, hiking, and biking would be available on the North Shore. Permits issued by the local managing partner would regulate these uses.
- Maintain existing trails for use by hikers, horseback riding, and mountain biking, and provide overall management with a Trail System Management Plan.
- Develop new primitive trails on the north shore east and west for use with guide or by permit.
- Limited day use on Arrowhead Island and the Santa Ynez Peninsula with a permit or guide.
- Kayaking would be allowed on the lake under this alternative. Both open and close hull kayaks would be allowed. Kayakers would have access to specified areas including Santa Cruz Bay subject to certain restrictions, including those outlined in Section 2.7.2 and any conditions set forth in the Boating Management Plan, and the prohibition on landing along the shoreline.
- Total number of boats allowed in the lake at one time would range from 40 (minimum pool) to 120 (maximum pool). Exceptions to maximum boat numbers may be allowed for special events as included in the Boating Management Plan. Allowable boat speed would be 25 mph in RD zones and 40 mph in the main channel.
- Limited day use and camping facilities would be allowed at Live Oak Camp, with specific restrictions (see Section 2.7.2). Day use would include individual picnic and group picnic areas with barbecue pits. Overnight camping would be allowed, including both primitive camping and RV camping. These facilities would provide new recreational opportunities for the public in a more remote and picturesque area of the lake.

Just as with the No Action Alternative, the main body of Cachuma Lake would be classified as RD4. This classification means that most of the lake is within the WROS category that is very close to the Suburban inventory scale (S4), therefore accommodating a higher overall BAOT density than currently handled under existing conditions (see WROS Figure 2-3).

As described in Section 2 and outlined above, management actions would be aimed at providing facilities and services to maintain and improve the quality of visitor experiences, in accordance with the projected WROS classifications. A Boating Management Plan would be implemented, so boat speeds would be managed based on the character of the different areas of the lake. As with Alternative 1, boating would not be allowed at the east end of the lake, past the log boom at the "narrows," or past the log boom in Santa Cruz Bay (except as noted for kayaking, above). These management actions are designed to protect waterfowl, wildlife, and natural resources, as well as to ensure the safety of the visitors to the lake. Overall, enforcing such restrictions would have a beneficial impact to recreation groups.

Live Oak Camp would be opened to more public use that is not currently allowed under existing conditions. This alternative would allow the local and regional growing populations to have more local recreation and natural resource facilities available, which would be a beneficial impact on recreation.

Supporting infrastructure would also be improved under Alternative 2, as under all alternatives. Additional funding for seasonal and permanent staff would be sought to meet the demands of more recreation users. Ease of access and the addition of support staff would enhance the quality of visitor experiences. This impact would constitute a beneficial impact to recreation.

Along with the beneficial impacts associated with the proposed management actions under Alternative 2, some adverse impacts would also result. Although boating demand could be met most of the time, under Alternative 2, boat densities could reach capacity (120 BAOT) more often than currently. However, the difference in the BAOT of Alternative 2, in comparison with existing conditions is only approximately 20 boats (see Table 4.9-1). With slightly higher BAOT densities on the main body of the lake, some visitors' experiences could be minimally compromised. Fishing boats may have more limited opportunities to catch fish with slightly greater crowds, and kayaks may have safety issues with more motorboats on the lake. In general, user groups favoring lower boat densities could be somewhat impacted by a lower quality experience. This impact would be a minor adverse impact.

In general, adverse impacts under Alternative 2 would be very similar to those under the No Action Alternative. Both alternatives are characterized by slightly higher BAOT densities than under current conditions. While this density means more visitors would have an opportunity to experience the resources of Cachuma Lake, some recreational opportunities such as hiking, bird watching, and lake cruises, which all value serene conditions and little to no noise, may be slightly impacted. However, Alternative 2 aims to enhance opportunities for a wider range of users and therefore, several of the actions under this alternative have overall beneficial impacts, despite the possible minor adverse impacts that may occur occasionally to some user groups.

4.9.6 Impacts Specific to Alternative 3 (Expanded Recreation)

The objective of Alternative 3 is to expand recreational uses and public access to attract more visitors and increase recreational opportunities, while protecting natural resources with new or modified land and recreation management practices. This alternative is included to demonstrate a scenario in which recreational uses at Cachuma Lake are substantially expanded while meeting the RMP goals related to protection of natural resources to the extent feasible. Under Alternative 3, about 90 percent of the lake surface area would be managed as Suburban, and 10 percent as RD. Elements of this alternative include:

- Year-round day use and primitive camping on the North Shore and at Santa Ynez Point. The day use activities would include hiking, equestrian use, bike riding, fishing from piers, and picnicking. Only primitive camping would be allowed.
- New full use public trails would be developed on the north shore and managed to minimize user conflict and increase trail opportunities.
- Motor vehicles would not be permitted on the North Shore. No developed sewer, water, or electrical service would be provided on the North Shore or at Santa Ynez Point. Access improvements to the recreation area would be provided.

- Rest stops for equestrians and other recreationists would be implemented, including outhouses, water troughs, and improved picnic tables at appropriate vistas.
- Full park facilities would be allowed at Live Oak Camp, including camp sites, cabins and/or yurts, picnic areas, cafe, store, and educational or recreational buildings.
- Full-day use on Arrowhead Island, including public access for hiking/biking on primitive and/or well developed trails, picnicking, bird watching, group events, shoreline access, and shoreline and dock fishing.
- Kayakers would have access to the entire lake, including the east end of the lake and Santa Cruz Bay, where the log booms currently exist, with seasonal restrictions for access during bird breeding season.
- Guided, overnight boat-in campsites in Santa Cruz Bay and Horse Canyon.
- Boat-in picnic area and a 1- to 2-mile walking loop trail at the north end of Cachuma Bay.
- A swim beach and swimming area would be designated to a specific area where local managing partner staff could closely monitor and maintain the activity under this alternative.
- Windsurfing with wetsuits (to minimize body contact).
- Day use and camping facilities would be expanded on the mesa east of Mohawk and Jackrabbit Flats to accommodate more visitors.
- RC airplanes would be allowed and a landing strip would be built east of Mohawk campground.
- Improve internal layout of recreational facilities in the County Park to enhance recreational experiences and improve operations, and increase the variety and improve the quality of recreational opportunities at the County Park, such as a water slide/park or miniature golf.

As outlined above, Alternative 3 would provide a number of benefits to recreation users. Camping, hiking and biking resources for recreation users would be enhanced relative to existing conditions. In contrast with Alternative 2, this alternative would provide a more varied spectrum of visitor experiences. These additional opportunities would have an overall beneficial impact to recreation resources.

As in Alternative 2, managers will develop a Trail Management Plan under this alternative to regulate usage on the trail system. Opportunities for trail system widening or expansion will be evaluated under this alternative. New ADA-compliant trails will be considered.

For boaters, Alternative 3 would open the entire lake to kayakers. These improvements would be beneficial for human-powered boaters.

Alternative 3 would designate a small portion of the lake to swimmers and allow body contact with the water for the first time. Introducing body contact to the lake has an obvious impact on water quality (see Section 4.1.7 for impacts and mitigation for water quality). However, physical and chemical controls have been implemented at other drinking water reservoirs where body contact is allowed, which have been proven to be acceptable (see Section 3.9.1.2).

Safety is also a concern when mixing swimmers with boaters. The local managing partner would need to implement safety measures such as a seasonal lifeguard, access to the water, and

delineation of the designated swimming area. Although this new opportunity would be a beneficial impact for recreationists, it could be a major adverse impact to the recreational management.

Alternative 3 would allow the use of RC airplanes at the lake as well as a paved landing strip. RC airplane Float/Fly events are currently allowed with prior arrangements with the local managing partner, but a permanent RC airplane site has not been established due to the potential noise pollution and disturbance of bird habitat that the activity may pose. Due to the fact that the potential drawbacks of this activity include noise and possibly wildlife disturbance, a landing strip would have to be located in a discrete area, where the planes would be less likely to impact wildlife or park visitors who enjoy the silence of the area. For RC airplane enthusiasts, this alternative offers a new opportunity at Cachuma Lake that would be a very beneficial impact to these specific users. However, user conflict is unavoidable when several differing activities are brought together, and this new use could, therefore, have a minor adverse impact on those recreationists who may have their silence interrupted.

As in the case of the other alternatives, guidelines would be in place to manage boating densities under Alternative 3. This alternative would include a capacity constraint of 15 acres per boat in the main body of the lake. This amount represents a higher boat density than the RD WROS classifications of Alternatives 1 and 2 (20 acres per boat), and thus would accommodate more demand than Alternatives 1 and 2. With the WROS Suburban management classification, this alternative can accommodate approximately 150 to 165 BAOT, which is slightly higher than the anticipated increased demand by the year 2030 (see Table 4.9-2).

The two bays will be managed as RD zones under Alternative 3. Cachuma Bay would be managed at the upper level of the RD classification (RD4, 20 acres per boat), due to its proximity to the intensive uses at the County Park and due to the fact no log boom would restrict access into the bay. Santa Cruz Bay would be managed at the less intensive-use level of the RD classification (RD6, 50 acres per boat), due to the more remote location of this bay on the lake and the log boom, which restricts access to fishing boats.

To control boating densities, managers would have to either turn people away at the gate when the maximum boating capacity has been reached, or institute a reservation and/or permit system that controls the boat densities along the lake. Maintaining these Suburban and RD densities would have beneficial impacts for the boaters at Cachuma Lake, who tend to value the peace and serenity that the natural environment offers.

Under Alternative 3, supporting infrastructure and services would be enhanced for recreational users, such as an increase in boat/trailer parking areas. Access to and within the recreational area would be improved and new facilities within the park area, such as miniature golf, could be provided, depending on management preference and visitor demand. Bicycle access would be provided on the north shore. These facilities and services would serve the needs of the anticipated increase in visitor population, providing long-term benefits for recreational users.

Although many beneficial impacts are associated with the management actions proposed under Alternative 3, adverse impacts would also result to some user groups. Shared trails among hikers, horseback riders, and bicyclists can present potential conflicts, particularly during holiday or summer weekends when crowds are larger. Having a Trail System Management Plan would mitigate the impacts of shared use, but minor adverse impacts would remain; these impacts would become more evident during times of peak recreational use.

Some minor construction impacts would also result from the proposed infrastructure and access. Dust can be minimized through the use of BMPs, including controlling the timing of construction activities. Construction impacts are temporary in nature, and would not have long-term impacts on recreation users.

4.9.7 Impacts Summary

As described above, the three alternatives would result in a range of beneficial and adverse impacts to recreational resources. For each management action, effects may be different for different user groups. Impacts are evaluated based on recreational opportunities that exist to meet projected demand and based on the quality of visitor experiences. Recreational opportunities are determined by the physical infrastructure available to support recreational activities, access to recreational resources, and the services provided in the Plan Area. Over time, the opportunities relative to increasing demand will decline without proportionate increases in recreational resources. Quality of visitor experiences may differ based on the user group in question. However, impacts to recreational experiences are determined by the quality of the available resources and settings provided in the Plan Area and the density of recreational use.

Under Alternative 3, management actions would have the objective of maximizing opportunities for visitors. Facilities would be added and expanded for various recreation user groups. Specifically, day use and camping would be allowed on the north shore, Santa Ynez Point and Arrowhead Island, kayakers would be allowed on the lake, swimmers would be allowed in the lake (at a designated location), RC airplanes and a landing strip would be allowed, and new camping facilities and new trails open to new user groups will be added under this alternative. Additional parking and a reorganized park area will also be provided. A Trail System Management Plan would also be established. To ensure the safety of the growing population of recreational users using the recreation facilities, some restrictions will be enforced on the lake. Boat size and speeds will be regulated based on the WROS management zones.

Prescribed burns under all alternatives would result in temporary, short-term impacts to visitors utilizing camping, boating, etc, which may be most noticeable with Alternative 3.

With increases in recreational demand and the number of available opportunities for various recreational activities, adverse effects to some users will result. Boating densities will increase compared with existing conditions. Therefore, some boat users seeking tranquil settings may be disappointed with the quality of their experiences. Kayakers may find the lake dominated by motorized boats. Overall, opportunities for recreational use will increase under Alternative 3 for all user groups, and demand can be satisfied most of the time, with the possible exception of peak demand days. But, the quality of the experiences for some boat users and other recreationists will decline as the demand for limited resource use rises.

Alternative 2 provides opportunities for more varied recreational experiences than current conditions – ranging from RN to RD. Accordingly, new recreational facilities and services would be provided as under Alternative 3, but they would be more limited than under Alternative 3 to balance the quality of recreational experiences with opportunities for various user groups. For example, on the north shore Alternative 2 would allow low-impact, limited day use in certain areas, introducing hikers and bikers to existing trails and areas that are currently used only for equestrians and grazing. Whereas, with Alternative 3, trail development for hiking and biking, and some primitive camping opportunities on the north shore, would be expanded. Therefore,

although both increase the number of available recreational opportunities from existing conditions, the degree and quality of users' experiences differ.

Under the No Action Alternative (Alternative 1), management would basically maintain the "status quo" without many changes. However, the infrastructure and operational improvements discussed in Section 2.5.1 would be implemented, as under all alternatives, and the increase in demand/visitor use would be accommodated at a minimal level.

In summary, the No Action Alternative does not open up recreational opportunities that the resources of the area offer and that many user groups would like to have, as voiced at the public meetings for this RMP. Alternative 3 provides more infrastructure and service support to accommodate the projected demand, but the density of boat usage and users allowed in natural areas could compromise the quality of experience for many recreationists. Recreationists seeking tranquil and serene settings would have limited opportunities under this alternative. Alternative 2 provides fewer recreational opportunities than Alternative 3, but still satisfies approximately over 95 percent of the predicted increase in boating demand (see Table 4.9-2). Mitigation measures discussed below help offset some adverse impacts, and this alternative provides a balance between opportunity and quality of experience for most user groups, including boaters. Therefore, Alternative 2 provides the best balance between opportunity and quality of experience for a wide spectrum of recreation user groups.

The adverse impacts summarized below are based on the relative opportunity afforded to recreation users and the quality of the recreational experiences. With appropriate mitigation measures, most of the adverse impacts can be reduced.

Impact R-1

Expansion of camping and recreation facilities under the action alternatives would have temporary construction-related minor impacts that could affect recreational users in the vicinity of the construction activities.

Mitigation R-1

Construction-related impacts such as fugitive dust and visitor circulation can be controlled as discussed in Sections 4.1 and 4.3. Residual impacts would be minor.

Impact R-2

To maintain the quality and character of the proposed WROS management zones for each of the alternatives, managers will have to control the BAOT levels on the lake. This impact is considered minor.

Mitigation R-2

If Alternative 2 is implemented, under maximum projected demand, staff would have to either turn visitors away at the gate or use a permit / reservation system to control the number of visitors on the lake. Although scenarios when capacity cannot satisfy visitor demand would likely occur, the increase in demand is not anticipated to be much beyond the capacity that the alternatives allow (see Table 4.9-2). Management will likely only tolerate a limited number of

days when capacity is exceeded. During holidays and other peak recreation use weekends, managers could relax or waive permit requirements and WROS management zones. These management goals will be developed within the Boating Management Plan. Residual impacts would be minor or no impact if anticipated demand does not occur.

Impact R-3

Potential conflicts would occur between users on trails that are shared among different user groups including hikers, mountain bikers, and horseback riders. This impact is considered to be a potentially major adverse impact.

Mitigation R-3

A Trail System Management Plan would be developed under Alternatives 2 and 3. The plan would include provisions for management of trails. An education program would also be implemented to solve trail conflicts. Trail rules can be established for different users. It would be the management's and visitors' collective responsibility to find and uphold solutions that allow multiple use trails to work. Cyclists must be safe and conscientious riders and should follow some general rules that respect hikers and horses and their riders. Equestrians must also be safe and conscientious riders; they should only ride horses that are well trained and capable to withstand sharing multiple use public trails. Therefore, residual impacts would be minor. However, no Trail System Management Plan is proposed for the No Action Alternative; therefore, impacts could be major under this alternative as future demand grows.

Impact R-4

The action alternatives would introduce new recreation activities including biking, hiking, and new trails, camping, and water based activities such as kayaking. This impact is considered beneficial. No mitigation is proposed.

Impact R-5

Under Alternative 3, the noise pollution inherent in RC airplanes could adversely impact other recreationists who specifically use the area for peace and serenity. This impact is considered major.

Mitigation R-5

The RC airplane landing strip and designated use area would be located at a site that is not only safe for the airplanes, but also away from campsites and serene areas popular to birdwatchers and other visitors. Hours and days of use could be restricted. Residual impacts would be minor.

Impact R-6

Prescribed burns under all alternatives would have minor adverse air quality and visibility impacts on recreationists.

Mitigation R-6

Reclamation and the managing partner could develop and implement notification procedures announcing prescribed burns or schedule them to avoid heavy use periods. Residual impacts would be minor.

Impact R-7

Alternative 3 could have major adverse impacts to recreational user safety from mixing swimmers with boaters and other recreational users.

Mitigation R-7

Implement safety measures such as seasonal lifeguards and delineation of a swimming area. Residual impacts would be minor.

Cumulative Impacts

The geographic boundary of the study area for recreational cumulative impacts is roughly 9,250 acres, which includes Cachuma Lake and the lands surrounding the lake. In addition to Cachuma Lake, three lakes that have recreation opportunities are located south of Cachuma Lake within 120 miles: Lake Casitas, Lake Piru, and Lake Castaic. Within 200 miles to the north of Cachuma Lake lie four lakes with recreation opportunities: Santa Margarita Lake, Lake Lopez, Lake Nacimiento, and Lake San Antonio.

All of these lakes, with the exceptions of Santa Margarita Lake and Lake Casitas, offer more intensive water recreation opportunities than Cachuma Lake current offers, such as swimming, kayaking, sailing, and/or water-skiing. These other lakes also offer more hiking and biking opportunities as well as equestrian outlets (see Section 3.9.1.2). Lake Casitas is the closest lake to Cachuma Lake (50 miles southeast), which is a very similar lake, in that it does not allow body contact with the water, and hiking and biking trails are limited. Therefore, recreationists in the area around Cachuma Lake are somewhat deprived of hiking and biking opportunities around a lake, as well as water-based recreation (other than fishing), unless they travel over 100 miles. Therefore, slightly increasing recreation at Cachuma Lake would not adversely impact other lakes in the region.

4.10 VISITOR ACCESS AND CIRCULATION

4.10.1 Introduction

Potential impacts would be related to:

- Construction and maintenance activities
- Relocation of the park entrance.

4.10.2 Impact Thresholds

- **Beneficial Impact:** This impact category would occur when visitor access to and circulation within the Plan Area is improved. An activity would not be considered to have a beneficial impact if it merely addresses an existing problem.
- **No Impact:** This impact category would occur if planning elements would result in no changes over the existing conditions.
- **Minor Adverse Impact:** This impact category would occur if an RMP element would lead to a decrease in visitor access or circulation within the Plan Area. This impact would be minimal or temporary, but detectable.
- **Major Adverse Impact:** This impact category would occur if an RMP element would result in a considerable decrease in visitor access or circulation within the Plan Area. This type of impact would often be long term, highly noticeable, and substantial.

4.10.3 Impacts Common to All Alternatives

Within the Plan Area, no physical constraints exist that would hinder improvements to, maintenance of, or development of new elements of the circulation system or the facilities that provide visitor access under the proposed activities for each alternative. Expansion and maintenance to the visitor access facilities and circulation system would be able to occur as necessary. For all alternatives, no long-term impacts to visitor access or circulation would be expected.

Construction and maintenance activities (including prescribed burning) would likely occur at various Park and Reclamation facilities within the Plan Area under all alternatives. These activities could result in temporary closures at visitor access facilities or the circulation system. For instance, a parking lot may be temporarily closed because it is being regraded or resurfaced, which would temporarily affect visitor access to the area; a lane of a roadway could be temporarily closed for maintenance to the roadway, which could cause delays along the roadway; a trail could be temporarily closed for trail maintenance, which would affect access to the trail; or a facility, such as a restroom, could be closed for maintenance, which could affect visitor access. As stated, these activities would be temporary and would thus have a minimal effect to visitor access and circulation. These actions would result in a minor adverse impact to visitor access and circulation.

Under all alternatives, the park entrance would be upgraded. This activity would improve circulation and visitor access into this popular and busy section of the Plan Area. This activity would also result in an improvement in public safety over the existing condition. This activity would result in a beneficial impact to visitor access and circulation.

4.10.4 Impacts Specific to Alternative 1 (No Action)

No specific impacts are expected to occur to visitor access and circulation as a result of Alternative 1.

4.10.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

No specific impacts are expected to occur to visitor access and circulation as a result of Alternative 2.

4.10.6 Impacts Specific to Alternative 3 (Expanded Recreation)

No specific impacts are expected to occur to visitor access and circulation as a result of Alternative 3.

4.10.7 Impacts Summary

Impact TR-1

Construction and maintenance activities under all alternatives at various park and Reclamation facilities would result in minor temporary adverse impacts to visitor access and circulation. No mitigation is proposed.

4.11 UTILITIES

4.11.1 Introduction

The increase in recreational usage at the lake could result in impacts to utilities.

4.11.2 Impact Thresholds

- **Beneficial Impact:** Impacts that are detectable and significantly and positively alter historical or desired conditions of the utilities.
- **No Impact:** Impacts to utilities cannot be detected.
- **Minor Adverse Impact:** Impacts to utilities are detectable but do not interfere with park goals.
- **Major Adverse Impact:** Impacts to utilities are detectable and negatively alter historical baseline or desired conditions. These impacts would contribute to the deterioration of safe conditions in the Study Area, the public's enjoyment of park resources, or would interfere with park goals for providing services.

4.11.3 Impacts Common to All Alternatives

Maintenance and safety upgrades to utilities will be required under all alternatives. These upgrades would include wear items on specific utilities, replacement of broken or damaged equipment, and replacing older equipment that is determined unsafe.

4.11.4 Impacts Specific to Alternative 1 (No Action)

The impacts specific to Alternative 1 are discussed under Impacts Common to All Alternatives.

4.11.5 Impacts Specific to Alternative 2 (Enhanced Recreation)

Alternative 2 would allow for an increase in facilities for the public more than Alternative 1. Additional facilities at Live Oak Camp will require additional or upgraded utilities, or the extension of utilities to these areas. This upgrading would have a potentially minor adverse impact on utilities.

4.11.6 Impacts Specific to Alternative 3 (Expanded Recreation)

Alternative 3 would allow the greatest increase in facilities for the public. Alternative 3 allows full-day use on Arrowhead Island; establishment of guided overnight boat-in campsites in Santa Cruz Bay and Johnson Canyon; full-day and camping uses, range of camp sites with bathrooms, store, marina, paved roads, pool, and other facilities east of Mohawk; full public access camping with bathrooms and water at Santa Ynez Peninsula; full range of campsites with bathrooms, marina, paved roads, pool, and other facilities at Live Oak Camp; public access and limited facilities on the north shore, and tent camping with bathrooms and water at Horse Canyon. These facilities will require additional utilities or the extension of utilities to these areas. Mohawk and Live Oak Camp may require sewer or septic systems depending on the density of campsites. This upgrading would have a potentially major adverse impact on utilities.

4.11.7 Impacts Summary

Impact U-1

The No Action Alternative would have no impact on utilities. Alternative 2 would have a potentially minor adverse impact on utilities. Alternative 3 would have a potentially major adverse impact on utilities.

Mitigation U-1

A Capital Improvement Plan would be developed for the required utility improvements, extensions, and upgrades needed for development of the approved uses for Alternative 2 or 3. Any new large and permanent facilities specific to an alternative will be designed based on a maximum surcharge lake level of 753 feet with a safety buffer of 7 feet above this elevation. Residual impacts would be minor.

Cumulative Impacts

No cumulatively significant impacts are related to utilities.

4.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.12.1 Introduction

This section evaluates the potential for socioeconomic and environmental justice impacts from implementation of the RMP.

4.12.2 Impact Thresholds

- **Beneficial Impact:** This impact category would occur when a planning element could result in the elimination, reduction, or resolution of a socioeconomic conflict.
- **No Impact:** This impact category would occur if planning elements would result in no change over the existing condition.
- **Minor Adverse Impact:** This impact category would occur if an activity would result in minor changes to the potential impacts listed below under Major Adverse Impact.
- **Major Adverse Impact:** This impact category would occur if a management action would:

  – Induce growth or concentrations of population that exceed regional population projections;

  – Induce substantial growth in an area either directly or indirectly (e.g., through management actions in the RMP);

  – Substantially increase demand for housing, schools, or public facilities;

  – Displace existing housing;

  – Disrupt or divide the physical arrangement of an established community; or

  – Cause adverse environmental justice effects as a result of disproportionate impacts to minority or low-income populations.

4.12.3 Impacts Common to All Alternatives

The Cachuma Lake Recreation Area is one of several parks in the region that provide water-based recreation to Santa Barbara County and surrounding areas of Southern California (Section 3.9.1.2.). Although variations in visitor use might occur depending on the alternative, the RMP does not include planning elements that would induce growth or increase population in excess of local and regional projections. Nor would implementation of any of the alternatives increase the likelihood that the area around Cachuma Lake would experience more growth than other water-based recreation areas. None of the alternatives would result in substantial demand for new housing, schools, or public facilities, or significantly affect local employment.

4.12.4 Impacts Specific to Alternative 1

Impacts are the same as those discussed in Section 4.12.3.

4.12.5 Impacts Specific to Alternative 2

Although visitor use could increase somewhat under Alternative 2, regional and local socioeconomic impacts such as population concentrations or growth inducement are not expected, as discussed in Section 4.12.3.

4.12.6 Impacts Specific to Alternative 3

Visitor use could increase over that for Alternative 2, but regional and local impacts would remain unlikely (no impact).

4.12.7 Environmental Justice – All Alternatives

Many visitors to the Plan Area come from Los Angeles County. As described in Section 3.12.2, Los Angeles County has a higher nonwhite and Hispanic population, lower median household income, and higher percentage of the population living in poverty than either Santa Barbara County or the State as a whole. No forecast or income information is available for two Census tracts that encompass Cachuma Lake, but 2000 data indicate that these areas had lower nonwhite and Hispanic populations than Santa Barbara and Los Angeles counties and the State.

None of the RMP alternatives would disproportionately affect minority or low-income communities, separate those populations from community facilities, or affect minority businesses.

4.13 SUMMARY OF IMPACTS OF EACH ALTERNATIVE

Table 4.13-1
Impacts Summary

Impacts to Resources	Alternative 1	Alternative 2		Alternative 3	
	Impact Magnitude	Impact Magnitude	Impact After Mit.	Impact Magnitude	Impact After Mit.
WATER RESOURCES					
WQ-1: Pollutants due to motorized vehicle emissions	Minor	Minor	Minor	Minor	Minor
WQ-2: Erosion and turbidity due to construction/ maintenance of facilities, roads, and trails.	Minor	Minor	Minor	Minor	Minor
WQ-3: Pollutants from new portable restrooms/vault toilets not pumped/cleaned properly	Minor	Minor	Minor	Minor	Minor
WQ-4: Erosion and toxins due to cattle, horse, and human access to the lake from the north shore	Minor	Minor	Minor	Minor	Minor
WQ-5: Pathogens due to swim beach area/body contact	N/A	N/A	N/A	Major	Minor
WQ-6: Inadvertent introduction of invasive mussels from recreational watercraft use	Major	Major	Minor	Major	Minor
AIR QUALITY					
AQ-1: Dust from site maintenance and facilities construction with ground disturbing activities	Minor	Minor	No Impact	Minor	No Impact
AQ-2: Combustion emissions from accidental or prescribed fires	Minor	Minor	Minor	Minor	Minor
SOILS AND GEOLOGY					
SG-1: Ground disturbing construction and maintenance activities	Minor	Minor	Minor	Major	Minor
SG-2: Erosion, compaction and disturbance due to trail use and construction	Minor	Minor	No Impact	Major	Minor
SG-3: Compaction and erosion due to cattle grazing	Minor	Minor	No Impact	Minor	No Impact
SG-4: Erosion due to fires	Major	Major	Minor	Major	Minor
BIOLOGY					
BI-1: Expansion of recreation and more visitors would impact vegetation, wildlife, fisheries, aquatic communities, and special-status species.	Minor	Minor	No Impact	Major	No Impact
BI-2: Noise/harassment to breeding raptors and bald eagles due to RC airplanes and landing strip	N/A	N/A	N/A	Major	Minor

Table 4.13-1
Impacts Summary

Impacts to Resources	Alternative 1	Alternative 2		Alternative 3	
	Impact Magnitude	Impact Magnitude	Impact After Mit.	Impact Magnitude	Impact After Mit.
BI-3: Expansion/construction of trails and increase in visitation would impact vegetation, wildlife, and special-status species. Specifically, native plant species could be removed, seeds of invasive weeds may spread, pathogens may spread among plants or animals, and trail construction could remove and/or degrade the habitat of small-scale wildlife and special-status species.	Minor	Minor	No Impact	Minor	No Impact
BI-4: Increased boat use would impact vegetation, fisheries, and special-status species.	Minor	Minor	Minor	Major	Minor
BI-5: Increase in fishing would impact fisheries and aquatic communities	Minor	Minor	No Impact	Minor	No Impact
BI-6: Increase in sedimentation runoff associated with increased camping, day use, and trail use would impact fisheries and aquatic communities.	Minor	Minor	No Impact	Minor	No Impact
BI-7: Potential for infestation of Lake by invasive mussels	Major	Major	Minor	Major	Minor
BI-8: Cumulative impacts to vegetation and wildlife will occur from ongoing population increases, agricultural, and residential development due to habitat removal and fragmentation. Furthermore, the Cachuma surcharge project will increase lake levels, impacting oak trees.	Minor	Minor	No Impact	Minor	No Impact
CULTURAL RESOURCES					
CU-1: Construction of proposed facilities (i.e., ground disturbing activities) at Live Oak Camp and the County Park, where known cultural resources exist	No impact	Major	Minor	Major	Minor
CU-2: Wake erosion due to increased boating and increased access to cultural resources via kayaks	Minor	Minor	Minor	Minor	Minor
CU-3: Increased visitor activity due to new trails and camp sites will expose archaeological sites	No impact	Major	Minor	Major	Minor
CU-4: Impacts to known archaeological sites and unsurveyed areas due to grazing and fuel management (i.e., prescribed burns)	Minor	Minor	Minor	Beneficial	Beneficial
HAZARDOUS MATERIALS					
Not applicable	No Impact	No Impact	No Impact	No Impact	No Impact
VISUAL RESOURCES					
VR-1: Construction of structures diminish the natural visual resources	Minor	Minor	No Impact	Minor	No Impact

Table 4.13-1
Impacts Summary

Impacts to Resources	Alternative 1	Alternative 2		Alternative 3	
	Impact Magnitude	Impact Magnitude	Impact After Mit.	Impact Magnitude	Impact After Mit.
VR-2: Smoke from prescribed burns	Minor	Minor	Minor	Minor	Minor
VR-3: Increase in boat densities (BAOT)	No Impact	Minor	Minor	Minor	Minor
VR-4: Development on the north shore	N/A	Minor	No Impact	Major	Minor
VR-5: Cumulative Impacts of surcharging and the result of losing oak trees	Minor	Minor	Minor	Minor	Minor
LAND USE					
LU-1: Prescribed burning	Minor	Minor	Minor	Minor	Minor
LU-2: Conflicts between user groups on the north shore	N/A	Minor	No Impact	Minor	No Impact
LU-3: Increased use of the trail system by multiple users	Minor	Minor	No Impact	Minor	No Impact
RECREATION					
R-1: Temporary construction activities at camping and recreation facilities	Minor	Minor	Minor	Minor	Minor
R-2: Management of BAOT levels to preserve WROS management zones	Minor	Minor	Minor/No Impact	Minor	Minor/No Impact
R-3: Conflicts on trails	Major	Major	Minor	Major	Minor
R-4: Addition of new recreation activities	No Impact	Beneficial	N/A	Beneficial	N/A
R-5: Noise from RC airplanes	N/A	N/A	N/A	Major	Minor
R-6: Air quality and visibility impacts from prescribed burns	Minor	Minor	Minor	Minor	Minor
R-7: Safety issues from mixing swimmers with boaters and other recreational users	N/A	N/A	N/A	Major	Minor
VISITOR ACCESS AND CIRCULATION					
TR-1: Construction and maintenance activities	Minor	Minor	Minor	Minor	Minor
UTILITIES					
U-1: Demand on utilities/Water Supply	No Impact	Minor	Minor	Major	Minor

4.14 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 1502.16 of NEPA requires this RMP to consider significant irreversible environmental changes that could result from the RMP should it be implemented. An impact would be determined to be a significant and irreversible change in the environment if implementation of the RMP would:

- Involve a large commitment of nonrenewable resources,
- Commit future generations to similar uses,
- Involve uses in which irreversible damage could result from any potential environmental accidents associated with the RMP, or

- Result in an unjustified consumption of resources.

Implementation of the proposed RMP would not involve any irreversible commitments of resources, use of resources that could cause irreversible damage, or an unjustified consumption of resources.

4.15 NEPA ENVIRONMENTALLY PREFERABLE ALTERNATIVE

NEPA as well as Reclamation's NEPA Handbook (Reclamation 2000, Section 8.6.5) requires that "the alternative or alternatives which were considered to be environmentally preferable" be identified. Environmentally preferable is defined as "the alternative that will promote the national environmental policy as expressed in Section 101 of the National Environmental Policy Act, meaning the alternative that causes the least damage to the biological and physical environment. In addition, it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources" (CEQ 1981). Although Council on Environmental Quality regulations requires the identification of the environmentally preferred alternative, the regulations do not require that the alternative be adopted.

NEPA Section 101 states that:

> … it is the continuing responsibility of the Federal Government to (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative 1, the No Action Alternative, would continue the management actions identified in Sections 2.5 and 2.6. No other development would take place. No phaseout of nonconformant engines would be imposed, potentially resulting in adverse effects to water quality, fisheries, and aquatic communities. The No Action Alternative would not have a Trail System Management Plan, Fisheries Management Plan, or Boating Management Plan, and the Rangeland Assessment and Grazing Management Plan (Sage Associates 2003) would not be updated. The lack of these plans could result in impacts including trail use conflicts; increased fishing pressure, which could adversely affect species that rely on fish as a food source; and boating conflicts, both among boaters and in areas where boating could disturb wildlife and other natural resources. The No Action Alternative would not ensure future protection of water, biological, and recreational resources because of its lack of management plans and other plan policies.

Alternative 2 is the Environmentally Preferred Alternative because it places more emphasis on resource protection than Alternative 1 and limits the expansion of recreation opportunities compared to Alternative 3. Under Alternative 2, a Trail System Management Plan, Fisheries Management Plan, and Boating Management Plan would be developed, and the Rangeland Assessment and Grazing Management Plan (Sage Associates 2003) would be updated, avoiding the impacts listed above for Alternative 1. By disallowing body contact with the lake, imposing a

2-year phaseout of nonconformant engines, and not increasing the motorized boat density over the Alternative 1 level, Alternative 2 would provide greater water quality protection than Alternative 3. Alternative 2 also provides a greater degree of natural resource protection in some areas where Alternative 3 proposes much greater access or development than under existing conditions, such as boat-in camping at Santa Cruz Bay, motorized boating beyond the log boom, resort development at Live Oak Camp, and an RC plane facility east of Mohawk. Fewer recreational facilities would be added with Alternative 2 than with Alternative 3. In summary, Alternative 2 would minimize potential effects to water quality, vegetation, special-status species, visual resources, and land use compared with Alternative 3, and it would include specific management plans to protect natural and cultural resources of the area.

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