Appendix C

Biological Resources Appendix

ESA

Appendix C1
Biological Resource Evaluation

ESA

BIOLOGICAL RESOURCE EVALUATION OF THE LAKE PERRIS DAM REMEDIATION PROJECT

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APPENDICES

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LIST OF ABBREVIATIONS

BMPs	Best Management Practices
CDFG	California Department of Fish and Game
CDSM	cement-deep-soil mixing
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
cy	cubic yards
DWR	California Department of Water Resources
LPSRA	Lake Perris State Recreation Area
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
MSHCP	Multi-Species Habitat Conservation Plan
msl	mean sea level
MWD	The Metropolitan Water District of Southern California
OHWM	ordinary high water mark
RCA	Regional Conservation Authority
RWQCB	Regional Water Quality Control Board
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WTI	Wetland Training Institute

1.0 Introduction

Lake Perris is an earthfill embankment-constructed fresh-water reservoir that was completed in 1974. The embankment is approximately 11,600 feet long, with a maximum structural height of 128 feet. The fill material was originally obtained from sediments in what was to become the lake bed and from a quarry constructed within the Bernasconi Hills just east of the dam within the Lake Perris State Recreation Area (LPSRA). The normal maximum operating water level on the lake is 1,588 feet above mean sea level (msl), 108 feet above reservoir bottom (note: all elevations shown in this report are based on the National Geodetic Vertical Datum of 1929). The spillway crest is at 1,590 feet msl and the dam crest elevation is at 1,600 feet msl. The designed reservoir capacity is 127,000 acre-feet with a surface area of 2,292 acres.

Lake Perris is the final link in a series of reservoirs and canals comprising the California Water Project, which was conceived to provide an additional drinking water supply to Southern California residents. Perris Dam impounds Lake Perris which is entirely within the LPSRA, 15 miles south of the City of Riverside in Riverside County, California. The water storage and conveyance facilities are owned and operated by California Department of Water Resources (DWR), in cooperation with The Metropolitan Water District of Southern California (MWD). The LPSRA, which surrounds and encompasses Lake Perris, opened in 1973 and is operated as a part of the California Department of Parks and Recreation (State Parks). The LPSRA welcomes approximately 1.1 million visitors each year and receives intense recreational use including: water skiing, jet skiing, fishing, camping, hiking, rock climbing, horseback riding, hunting (in season), bicycling, and wildlife watching. In addition to recreation use, Lake Perris provides water uses, wildlife enhancement, emergency water storage, and incidental flood protection.

In 2005, DWR completed a foundation study of the Perris Dam. Results of the detailed liquefaction analysis of the Perris Dam foundation indicated that seismically-induced ground shaking could result in embankment deformations due to the liquefaction potential of sediments under the dam at several locations along the 2,300-foot-long segment along the southern span (left reach) of the dam. With the lake filled to its design capacity, a seismic event could result in overtopping of the dam during a strong ground shaking event. Based on the results of this stability analysis, DWR lowered the reservoir water surface elevation by 25 feet to 1,563 feet msl until a long-term remedial solution can be implemented. This reduction in surface elevation reduced the storage capacity of the lake approximately 40 percent from 126,841 acre-feet to 72,000 acre-feet.

As a result of the above study, in August 2005, DWR initiated the drawdown of Lake Perris from 1,588 feet msl to 1,563 feet msl. The drawdown was complete by November 2005. The water removed from the lake was delivered to MWD for delivery or storage in other facilities.

However, in an effort to maintain recreational activities on the lake, DWR ensured that the marina remained in the lowered lake and constructed a causeway from the shore across the exposed lakebed, providing full access to the marina facility. DWR imported 14,171 tons of sand to the Perris Beach area to enhance beach-going recreational uses near the location of the previous beaches. A thick riparian habitat existed along the eastern edge of Lake Perris prior to the drawdown. DWR installed a two-mile long drip-line irrigation system connected to State

Park water pumps to convey lake water to the existing riparian habitat along the eastern edge of the original lakeshore, in an effort to maintain that riparian community during the temporary drawdown of the lake level. As a result of the drawdown, newly exposed lake-bottom soils were exposed. Consequently, vegetation invaded the previously inundated area creating several plant communities that previously did not exist in that area.

DWR proposes the Lake Perris Dam Remediation Program (proposed project) to upgrade the Lake Perris Dam, replace the outlet tower, and extend the outlet conveyance extension to connect with the Perris Valley Storm Drain. The proposed project is one project with three elements. The project is being proposed to address seismic safety concerns and to bring the facilities up to current safety standards in order to ensure maximum public safety for those using the LPSRA and those living downstream of the lake.

In support of the proposed project, Psomas biologists conducted an analysis of biological resources potentially associated with the proposed project to establish the existing conditions of these resources. A literature review, agency consultation and field surveys were conducted to assess the presence or absence of endangered, threatened, or sensitive species and jurisdictional areas on the proposed project site and adjacent areas. Psomas biologists and subconsultant biologists visited the LPSRA a total of fifty-nine times from May 2007 to July of 2008 to conduct the following surveys:

- habitat assessment
- general vegetation surveys
- focused sensitive plant surveys
- general wildlife surveys
- focused wildlife surveys for the following species:
    - southwestern willow flycatcher (*Empidonax traillii extimus*)
    - least Bell's vireo (*Vireo bellii pusillus*)
    - coastal California gnatcatcher (*Polioptila californica californica*)
    - Stephens's kangaroo rat (*Dipodomys stephensi*)
    - Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)
- jurisdictional plant community determination

The purpose of this biological resources report is to address concerns expressed by DWR and other resource agencies that the proposed project has the potential to result in direct and/or indirect impacts to biological resources and jurisdictional waters. Specifically, this report assesses the potential presence of sensitive biological resources and jurisdictional waters, analyzes the potential impacts to those resources from proposed project implementation. This report provides a summary of the biological resources present including plant communities, the potential occurrence of listed and sensitive plant and wildlife species, the potential occurrence of jurisdictional waters and identifies and analyzes the potential biological significance of site construction and development in view of federal, state, and local laws and regulations. This report was prepared based upon results of a literature review, agency consultation, and field surveys.

1.1 Proposed Project Location

1.1.1 Lake Perris State Recreation Area (LPSRA)

Lake Perris is located within the LPSRA in the City of Perris, within the Inland Empire of Riverside County, California (Figure 1, *Regional Map*). LPSRA is located 11 miles south of the City of Riverside and approximately 65 miles east of Los Angeles. The LPSRA is located via Highway 60 or Interstate 215. The address of LPSRA is: 17801 Lake Perris Drive, Perris, CA 92571.

Lake Perris is situated in a valley at an elevation of 1,560 feet msl. It is ringed by hills and small mountains. The lake is 3 miles long and 2 miles across with about 10 miles of accessible shoreline. The lake is approximately 2,320 acres. It inundates 125,000 acre feet of water behind a 2 mile long, 128 foot tall, chevron-shaped earthfill dam.

Small, unnamed hills (sometimes referred to as Russell Mountains) and Moreno Valley is located to the north; the Badlands (mountains) and San Jacinto Valley is located to the northeast; Bernasconi Hills are located to the east and south; and Perris Valley is located to the southwest and west (Figure 2, *Vicinity Map*). The Perris Fairgrounds immediately adjacent to the LPSRA to the west supports a motor sports complex. The San Jacinto Valley and the San Jacinto Wildlife Area is located immediately east of the Bernasconi Hills and the LPSRA. The surrounding area around the LPSRA is composed of a mosaic of suburban, developed land and open space/natural areas (Figure 3, *LPSRA Site Overview*).

The LPSRA is graphically depicted on the United States Geological Survey (USGS) 7.5 Minute Perris and Sunnymead Topographic Quadrangle maps (Figure 4, *USGS Topographic Map*). Table 1-1, *Lake Perris State Recreation Area Location*, describes where the LPSRA is located on the USGS 7.5 Minute Topographic Map, and the Township, Range, and Sections in which it is located.

Table 1-1
Lake Perris State Recreation Area Location

USGS 7.5 Minute Topographic Quadrangle	Township	Range	Section(s)
Perris	3 S	3 W	25, 26, 33, 34, 35, 36
Perris	4 S	3 W	1, 2, 3, 4, 9, 10, 11, 12, 14, 15
Sunnymead	3 S	3 W	13, 14, 22, 21
Sunnymead	3 S	3 W	Fractional Sections 24, 25, 26
Sunnymead	3 S	3 W	Unsurveyed Land – San Jacinto Nuevo y Potrero just north of Fractional Sections 24, 25, 26
Sunnymead	3 S	2 W	18, 19, 30

Source: USGS 1967 Photorevised 1979 and USGS 1967 Photorevised 1980

Biological Resource Evaluation of the Lake Perris Dam Remediation Project

Legend

- County Boundary
- Lake Perris State Recreation Area (LPSRA)
- Interstates/Major Highways
- State Highways

N W E S

0 2.5 5 10 Miles

CA State Plane, Zone 6, NAD 83

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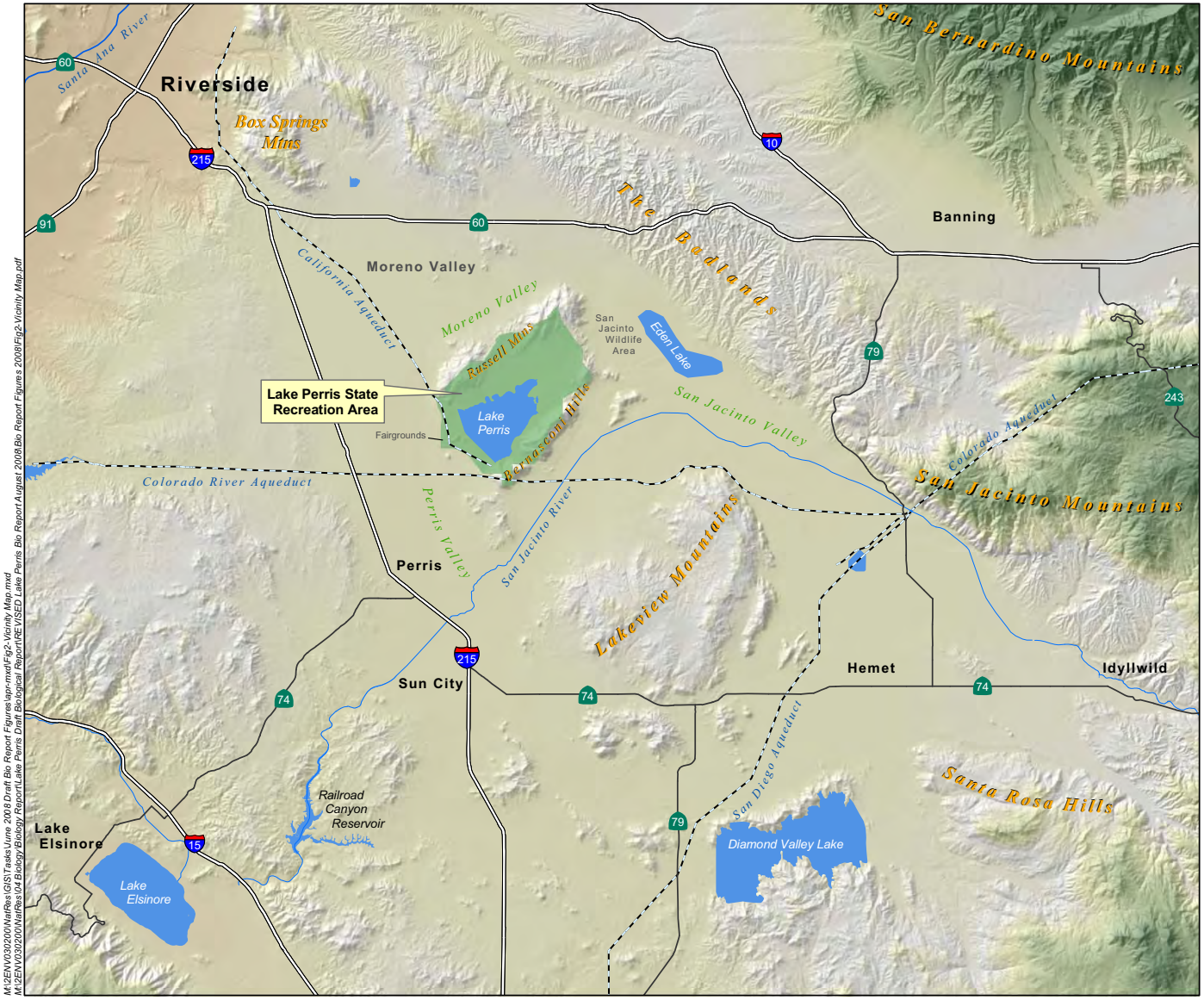
Regional Map

PSOMAS

Figure 1

Biological Resource Evaluation of the Lake Perris Dam Remediation Project



Legend

- Lake Perris State Recreation Area (LPSRA)
- Regional Lakes
- Aqueducts
- Interstate/Major Highways
- State Highway

N W E S

0 1.25 2.5 5 Miles

CA State Plane, Zone 6, NAD 83

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Vicinity Map

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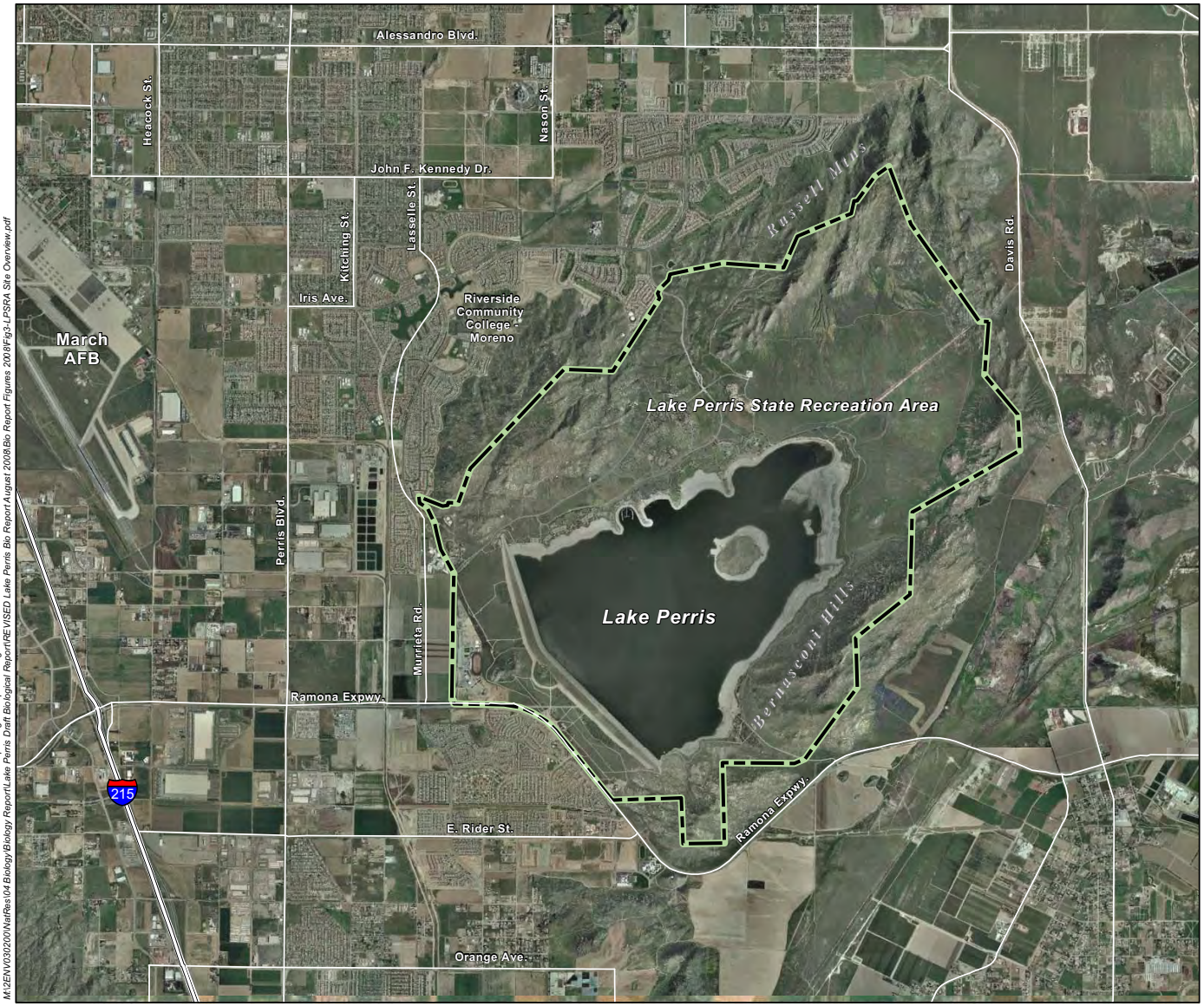
Figure 2



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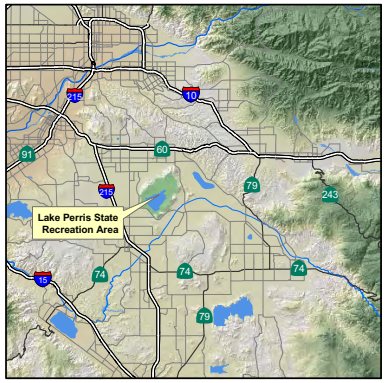
Biological Resource Evaluation of the Lake Perris Dam Remediation Project



Legend

Lake Perris State Recreation Area (LPSRA)

N
W E
S

0 0.5 1 2 Miles

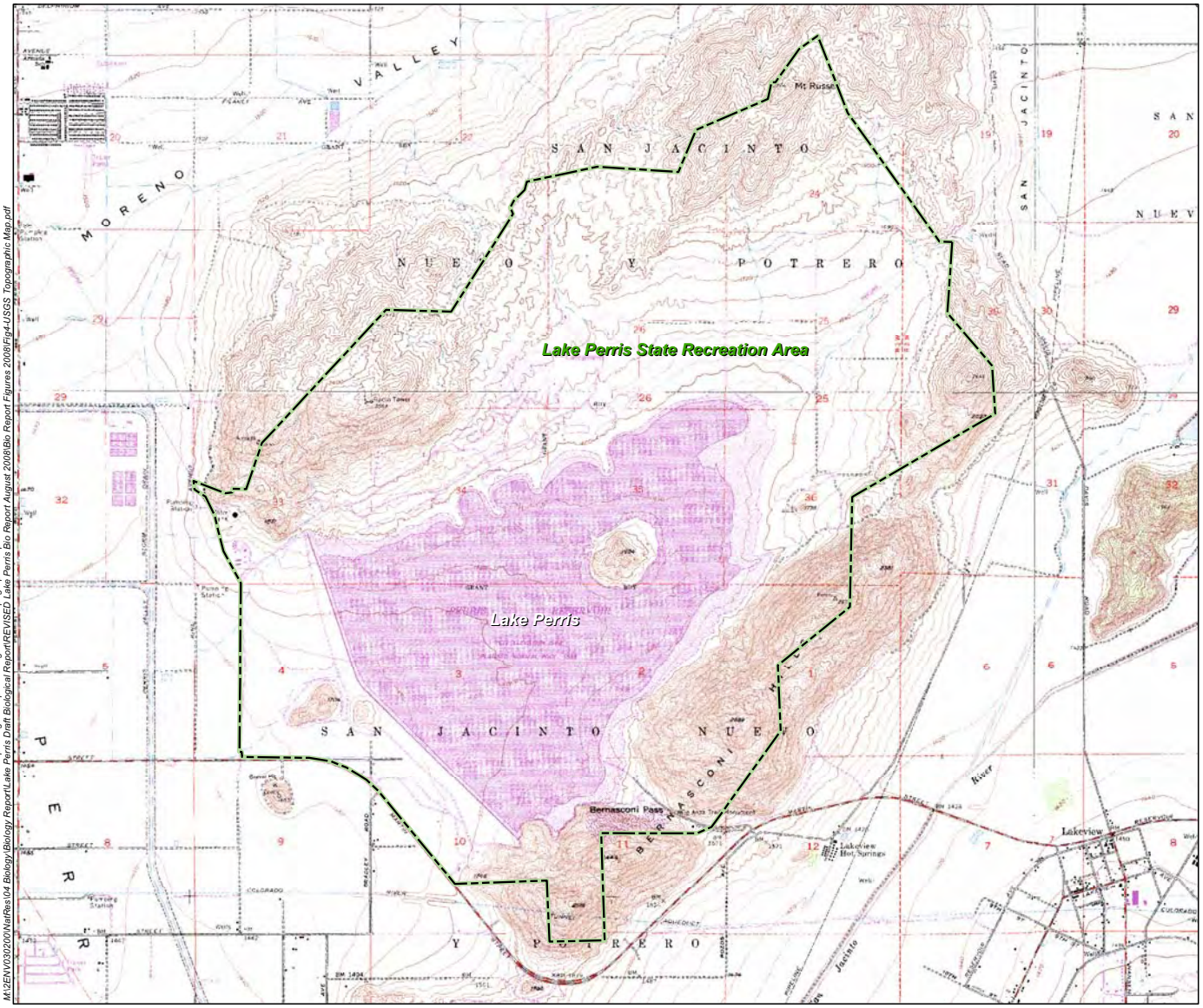
State Plane NAD 83 Zone 6

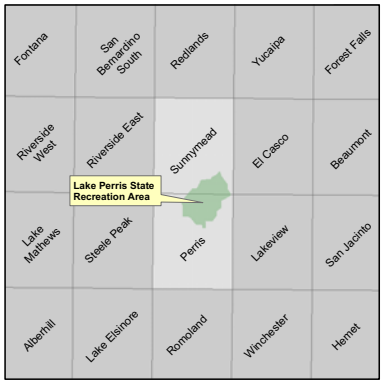
Date of Aerial Photo: February 2006

LPSRA Site Overview

PSOMAS

Figure 3





USGS 7.5 Minute Topographic Map Quadrangles

Legend

Lake Perris State Recreation Area (LPSRA)

N
W E
S

0 0.25 0.5 1 Miles

CA State Plane, Zone 6, NAD 83

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Source: USGS Topographic Quadrangles 7.5 minute; Perris and Sunnymead

USGS Topographic Map

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Figure 4

The LPSRA also falls within the boundaries of the area covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP is a comprehensive, multi-jurisdictional habitat conservation plan focusing on conservation of species and their associated habitats in western Riverside County. The MSHCP establishes a framework and mechanism for projects to comply with state and federal endangered species regulations.

1.1.2 Proposed Project Site Location

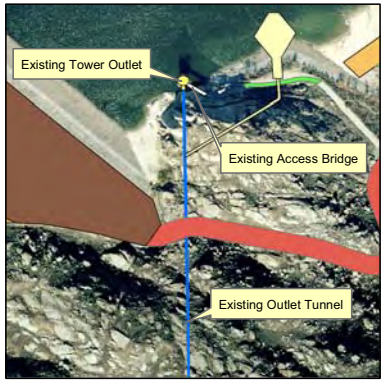
The proposed project site is located wholly within the LPSRA and consists of a soils excavation area, a haul road, rock quarry, construction staging area, emergency outlet extension site, and an earthen berm site (Figure 5, *Proposed Project Site*). The soils excavation area and most of the haul road are located on shoreline exposed by the drawdown. The haul road over the Bernasconi Hills, the construction staging area, the berm, and drain are located in upland habitats.

More specifically, the proposed project site is approximately 340 acres in size and consists of:

- The stability berm area on the southeastern reach of the dam, (the "left reach") and a 200-foot wide area below the reach.
- A 20-acre staging area.
- The borrow area in the lakebed at the east end of the lake.
- The rock quarry area in the original rock quarry south of the lake in the Bernasconi Hills.
- The haul road from the east side of the lake, along the lakebed on the south side of the lake, and over a low spot on the Bernasconi Hills near the dam's left abutment.
- The approximately two mile long emergency outlet channel from the existing outlet valve along the north edge of Ramona Expressway to the Perris Valley Storm Drain.

1.1.3 Biological Survey Area

At a meeting between the United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), State Parks, DWR, ESA, and Psomas, it was determined that the survey area for biological resources would include the all of the immediate habitats surrounding Lake Perris and especially the habitats surrounding the proposed project site. These areas included portions of the grassland and sage scrub habitats within the Bernasconi Hills adjacent to the proposed haul road; the riparian and marsh habitats adjacent to the proposed haul road and the soil excavation area; the habitats below the dam; and the habitats surrounding the proposed Perris drain extension. This area is referred to as the Biological Survey Area (Figure 6, *Biological Survey Area*), and includes area outside of the proposed project area. All the field surveys were conducted within this Biological Survey Area.



Existing Structures Enlargement

Legend

Existing Structures

- Existing Outlet Tower
- Existing Outlet Tunnel
- Existing Access Bridge

Proposed Project Components

- Dam Stabilization
- Primary Borrow
- Secondary Borrow
- Haul Road
- Access Road
- Existing Roads/Developed Areas
- Staging Area
- Proposed Outlet Entrance
- Proposed Outlet Tunnel
- Outlet Channel - Open
- Outlet Channel - Covered
- Quarry Excavation

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

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Proposed Project Site

PSOMAS

Figure 5

Legend

Biological Survey Area

N
W E
S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

Biological Survey Area

PSOMAS

Figure 6

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2.0 Proposed Project Description

As a result of the recent studies described in Section 1.0, DWR has determined that Perris Dam, its outlet tower, and emergency drain outlet require repair to address seismic safety concerns and to bring the facilities up to current safety standards. The repairs are required to ensure maximum public safety for those using the LPSRA and those living downstream of the lake. The Lake Perris Dam Remediation Program (proposed project) is being proposed to upgrade the Lake Perris Dam, replace the outlet tower, and extend the outlet conveyance extension to connect with the Perris Valley Storm Drain. The proposed project is one project with three elements. This section describes the three elements of the proposed project.

2.1 Description of Proposed Project Elements

2.1.1 Perris Dam Remediation

DWR proposes to seismically upgrade the dam by improving the foundation material with cement-deep-soil-mixing (CDSM) methods, excavating the toe of the dam to remove the liquefiable foundation material, replacing the foundation material with re-compacted engineered fill, and then constructing a stability berm on top of the replaced foundation. This remediation strategy would allow Lake Perris to return to its previous maximum operating pool elevation of 1,588 feet msl after construction.

Following deep soil mixing, the groundwater would be lowered by an array of pumping wells to facilitate the excavation and replacement of the uppermost liquefiable soils. Some of the dewatering wells would become permanent and replace the existing relief wells, thereby preventing seepage from ponding on the ground surface once the lake level is returned to its original elevation. The wells would maintain a stable groundwater elevation south of the dam. The water pumped from the wells during construction would discharge into a solid pipe leading out to the flow meter and on toward MWD's delivery system. After construction, gravity drainage from the extended drainage blanket and the new wells would also flow through the existing flow meter on toward MWD's system.

Approximately 700,000 cy of soil would be excavated from the shallow foundation at the toe of the dam. Drain rock would be placed in the bottom lifts of the excavation to extend the existing drainage blanket to the new toe of the stability berm. The excavated material would be stockpiled on site and recompacted as excavation backfill and as part of the stability berm. Approximately 800,000 tons of drain rock and 300,000 cy of soil would be backfilled into the excavation area.

A stability berm would be constructed atop the re-compacted foundation along the downstream toe of the dam. The berm would consist of approximately 1.75 million cy of soil and one million tons of rock. The soil for the stability berm would be excavated from within the lakebed at the east end of the lake, and the rock would be quarried from the original rock quarry east of Lake Perris in Bernasconi Hills. To convey the soil and rock to the downstream face of the dam, a haul road would be constructed from the east side of the lake, along the lakebed on the south side of the lake, and over a low spot on the Bernasconi Hills near the dam's left abutment. Soil and

rock hauled to the toe of the dam may be stockpiled near the construction area or applied directly to the construction activity as they are quarried and delivered.

The borrow area would be located entirely within the lakebed exposed by the temporary drawdown. Similarly, the haul road would be constructed entirely within the exposed lakebed from the borrow area to just north of the dam. The haul road would continue over a portion of the Bernasconi Hills to the downstream side of the dam. The haul road in this location will become a permanent, paved maintenance road at the end of construction. The borrow area and remaining portions of the haul road will be submerged when the lake is refilled.

2.1.2 Outlet Tower Replacement

DWR is proposing to construct a new outlet structure as a replacement facility, because the existing tower may fail during a major earthquake. The new outlet facility would be located approximately 400 feet from the existing tower. An area on the southern shore between the hill and the lake would be excavated and the new outlet tower constructed using dry construction methods and underwater blasting. Excavated material would be hauled to the dam remediation construction area and used in the stability berm. Blasting into hard rock would be required. A 600-foot long, 12.5-foot diameter tunnel would be constructed to connect the new outlet facility to the existing underground tunnel that connects to MWD's delivery system. A staging area would be needed near the construction area to stockpile construction material and equipment. Once the new outlet structure and the tunnel are constructed, a 300-foot long approach channel would be constructed to open the new outlet to the lake. A buoy line would be set in the lake approximately 300 feet from the shore limiting access to the vicinity of the facility. The old outlet tower would remain in place and would not be deconstructed.

2.1.3 Emergency Outlet Extension

DWR is proposing to either retrofit the existing valve or add a new valve to reduce emergency releases to a maximum 1,500 cfs. DWR would also construct a new emergency outlet extension that would completely contain and convey the maximum release from the dam to the Perris Valley Storm Drain.

The proposed outlet extension would be approximately two miles long and would redirect flow away from Ramona Expressway and the Perris Fairgrounds by connecting the outlet structure to the Perris Valley Storm Drain. The initial portion of the extension would consist of a 2,000-foot long, 20-foot wide concrete rectangular channel that would tie into the existing outlet structure. A 20-foot wide service road would run parallel to the channel. Overall, the affected width (channel and service road) would be 50 feet. After approximately 1,600 feet, the channel will transition from a concrete rectangular channel to an unlined trapezoidal channel with a bottom width of 100 feet and side slope (H:V) of 2:1. The trapezoidal channel would be approximately 8,800-feet long and would travel parallel to Ramona Expressway to the Perris Valley Channel. The total affected width along this section, channel and service road, would be 160 feet.

The alignment crosses the MWD's buried 10-foot diameter pipe. This section of channel would be lined with concrete to protect the MWD's pipeline. The concrete-lined area will also provide

an area where vehicles can cross the channel. The alignment crosses three roads which run perpendicular to Ramona Expressway: Fair Way, Lake Perris Drive, and Evans Road. Each road crossing would have reinforced concrete box culverts to allow vehicle traffic across the channel. A reinforced concrete box culvert would also be used to pass flow into the Perris Valley Channel. Rip-rap would be placed on the upstream and downstream slopes of the Perris Valley Channel to reduce localized scour.

2.2 Construction Scenario

The proposed project would require an approximately four-year total construction period to be completed in 2012. Table 2-1, *Construction Duration*, summarizes proposed construction activities for each element of the proposed project and provides an estimate of the duration for those activities. Listed activities for each project are generally sequential, with each of the elements potentially overlapping. As shown in Table 2-1, each of the three main facilities included in the proposed project would require approximately two years each to construct.

Table 2-1
Construction Duration

Construction Activity	Duration (Months)		
	Perris Dam Remediation	Outlet Tower Replacement	Emergency Outlet Extension
preliminary activities and site preparation	2	2	2
relocate utilities	-	-	6
excavation	4	3	2
blasting	7	1	-
CDSM treatment	15	-	-
structure improvements	6.5	3	5
embankment fill and additional improvements	8.5	-	-
construct outlet release extension	-	-	3
construct culverts	-	-	6
construct delivery tunnel	-	3	-
construct outlet tower	-	8	-
site restoration and demobilization	3	2	3
total construction duration per project	**22**	**18**	**22**

Table 2-2, *Construction Sequence and Equipment*, highlights a proposed construction sequence and the required equipment for each project. In general, construction activities would occur between 7:00 a.m. and 7:00 p.m., five days per week (Monday through Friday), although weekend and nighttime work may be required during some periods of construction activity. CDSM activities for the dam remediation element of the proposed project would require two CDSM rigs working a 10-hour shift per day.

Large haul truck trips to and from the site would be generally limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, although some haul truck trips to and from the site could occur on weekends. Deliveries from off site would include cement, concrete, reinforcing steel, fencing, other construction materials, and construction equipment.

Table 2-2
Construction Sequence and Equipment

Project Element	Proposed Construction Sequence	Required Equipment
Dam Remediation	• mobilize • delineate and fence equipment and work areas • grade buttress area below dam • grade new haul road • clear embankment, borrow , and stockpile/staging areas • blasting at quarry • excavate borrow area • excavate below dam • cement deep soil mixing • haul soil and rock to toe of dam • construct and compact stability berm	• excavators • scrapers • graders • loaders • bulldozers • CDSM rigs • vibrating rollers • Sheepfoot rollers • hydraulic backhoes • end-dumps and belly-dumps • dump trucks • large trucks (importing material cement to the site) • generators
Outlet Tower	• mobilize and clear staging area • excavate (blasting) • construct new outlet tower • tunnel to existing outlet tunnel • remove granite plug, joining new tower to lake	• bulldozers • graders • scrapers • water trucks • concrete trucks • excavator • dump trucks • personal vehicles • large trucks (importing material cement to the site) • generators
Emergency Outlet Extension	• mobilize • clear and grub project area • identify and remove or relocate existing buried utilities • excavate and grade canal • construct ramps over canal along Old Ramona Road • culverts at Fair Way, Lake Perris Drive and Evans Road • tie-in to Perris Valley storm drain	• bulldozers • graders • scrapers • Sheepfoot rollers • water trucks • concrete trucks • excavators • dump trucks • lumber truck • forklift • asphalt paver • tandem roller • Pneum roller • personal vehicles

3.0 Study Methods

Studies of the biological resources included a review of available literature, consultation with resource agencies and field surveys. Psomas contacted the local field offices of Regional Conservation Authority (RCA), CDFG, and USFWS to identify any agency concerns regarding the Biological Survey Area. This effort was followed by on-site field surveys.

The purpose of the field surveys were to describe and map vegetation communities, determine the presence of sensitive plant communities, assess wildlife use of the area, determine whether special status plant and wildlife species occur or could potentially occur within or adjacent to the proposed project area, and determine the extent of United States Army Corps of Engineers (USACOE) and CDFG jurisdictional waters and associated vegetation communities. During the field surveys, biologists searched for potentially occurring listed and sensitive plant and wildlife species, as well as habitat with the potential to support those species.

3.1 Agency Consultation

The USFWS and CDFG were consulted at the beginning of the project. Primary consultation concerning the contents and scope of this report took place at a meeting on May 23, 2007 at the Lake Perris State Recreation Area. Meeting participants included representatives from DWR, USFWS, CDFG, State Parks, ESA, and Psomas. The USFWS and CDFG expressed concerns regarding impacts to the southwestern willow flycatcher, least Bell's vireo, coastal California gnatcatcher, Los Angeles little pocket mouse, fisheries, and bats. CDFG also expressed concerns that wildlife and plant surveys required to satisfy the requirements of California Environmental Quality Act (CEQA) be performed. Both CDFG and the USFWS stated that the existing conditions for the proposed project be the lake level prior to drawdown and that this condition would also apply to any jurisdictional permitting from CDFG.

A second meeting between DWR, ESA, and CDFG took place on August 17, 2007 in Sacramento. At that meeting CDFG provided its guidance on the mitigation they and the USFWS would require from DWR. Additional coordination was performed by e-mail and telephone between Psomas and the resource agencies.

Consultation between ESA and the USACOE determined that Lake Perris is subject to jurisdiction of the USACOE pursuant to the federal Clean Water Act, section 404 because Lake Perris is a traditionally navigable water, following the Rapanos decision.

3.2 Literature Review

3.2.1 Soils

The Soil Survey of Western Riverside Area, California (USDA 1971) was review to determine the soil types associated with the LPSRA and the Biological Survey Area.

3.2.2 Plant Communities

Prior to field surveys, the California Natural Diversity Database (CNDDB) (CDFG 2008a, 2007a), a database that inventories status and locations of sensitive plant communities, rare plants, wildlife, and habitats in California, was used to identify the sensitive plant communities that may exist in the Biological Survey Area. Psomas conducted a query for the USGS 7.5 Minute Topographic Map Perris Quadrangle and the eight quadrangles surrounding the Perris Quadrangle. The CNDDB identified four sensitive plant communities having the potential to occur within the vicinity of the Biological Survey Area, including:

- southern coast live oak riparian forest (Element Code 61310)
- southern cottonwood-willow riparian forest (Element Code 61330)
- southern riparian scrub (Element Code 63000)
- southern sycamore alder riparian woodland (Element Code 62400)

Generally, classifications of habitat types or vegetation communities were based on *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986).

3.2.3 Special Status Species Identification

Prior to the field surveys, available literature regarding listed endangered, threatened, candidate, and other sensitive plant and wildlife species was reviewed to identify special status plant and wildlife species having the potential to occur within the Biological Survey Area. Literature reviewed and consulted included the following listed below.

- CNDDB search for the USGS 7.5 Minute Topographic Map Perris Quadrangle and the eight quadrangles surrounding the Perris Quadrangle (CDFG 2008a, 2007a):
    - Elsinore Quadrangle
    - Romoland Quadrangle
    - Winchester Quadrangle
    - Lakeview Quadrangle
    - El Casco Quadrangle
    - Sunnymead Quadrangle
    - Riverside East Quadrangle
    - Steele Peak Quadrangle
- The USFWS list of Endangered and Threatened Species for Riverside County (USFWS 2008b, 2007b).
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2008, 2007). Quadrangle search for:
    - Perris
    - Sunnymead
- The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (RCIP 2003).

An inventory of listed endangered, threatened, candidate, and other sensitive plant and wildlife species was derived from the literature review and agency consultation. This, in addition to the query of the CNDDB for reported locations of listed and sensitive plant and wildlife species and sensitive natural communities, identified the known locations of rare, threatened, and endangered species and significant natural communities in the region and assisted in identifying the potential for on-site occurrence of such species. The life history and survey requirements for listed, candidate and sensitive plant and wildlife species were identified through the literature review.

3.2.4 Endangered, Threatened, or Candidate Species

3.2.4.1 Endangered, Threatened, Candidate or State Rare Plant Species

As a result of the literature review and agency consultation, 18 plant species listed as endangered, threatened, candidate or state rare pursuant to the federal or state Endangered Species Acts were identified as having the potential to occur within the region of the Biological Survey Area. These listed, candidate and state rare plant species are listed below.

- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- dwarf burr ambrosia (San Diego ambrosia) (*Ambrosia pumila*)
- Parish's daisy (Parish's fleabane) (*Erigeron parishii*)
- Nevin's barberry (*Berberis nevinii*)
- marsh sandwort (*Arenaria paludicola*)
- San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*)
- Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*)
- triple-ribbed milk-vetch (*Astragalus tricarinatus*)
- Brand's star phacelia (Brand's phacelia) (*Phacelia stellaris*)
- Hidden Lake bluecurls (*Trichostema austromontanum* ssp. *compactum*)
- Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*)
- Moran's navarretia (spreading navarretia) (*Navarretia fossalis*)
- slender-horned spineflower (*Dodecahema leptoceras*)
- Vail Lake ceanothus (*Ceanothus ophiochilus*)
- salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*)
- Munz' onion (*Allium munzii*)
- thread-leaved brodiaea (threadleaf clusterlily) (*Brodiaea filifolia*)
- California Orcutt grass (*Orcuttia californica*)

3.2.4.2 Endangered, Threatened or Candidate Wildlife Species

As a result of the literature review and agency consultation, 30 wildlife species listed as endangered, threatened or candidate pursuant to the federal or state Endangered Species Acts were identified as having the potential to occur within the region of the Biological Survey Area. These listed and candidate wildlife species are listed below.

- vernal pool fairy shrimp (*Branchinecta lynchi*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)

- quino checkerspot butterfly (*Euphydryas editha quino*)
- bonytail (*Gila elegans*)
- Colorado pikeminnow (Colorado squawfish) (*Ptychocheilus lucius*)
- Santa Ana sucker (*Catostomus santaanae*)
- razorback sucker (humpback sucker) (*Xyrauchen texanus*)
- desert pupfish (*Cyprinodon macularius*)
- California tiger salamander (*Ambystoma californiense*)
- desert slender salamander (*Batrachoseps major aridus*)
- arroyo toad (*Bufo californicus*)
- California red-legged frog (*Rana aurora draytonii*)
- Sierra Madre yellow-legged frog (mountain yellow-legged frog) (*Rana muscosa*)
- desert tortoise (*Gopherus agassizii*)
- Coachella Valley fringe-toed lizard (*Uma inornata*)
- southern rubber boa (rubber boa) (*Charina umbratica*)
- California brown pelican (*Pelecanus occidentalis californicus*)
- bald eagle (*Haliaeetus leucocephalus*)
- American peregrine falcon (*Falco peregrinus anatum*)
- Yuma clapper rail (*Rallus longirostris yumanensis*)
- California least tern (*Sternula antillarum browni*)
- western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
- southwestern willow flycatcher (*Empidonax traillii extimus*)
- least Bell's vireo (*Vireo bellii pusillus*)
- coastal California gnatcatcher (*Polioptila californica californica*)
- Palm Springs round-tailed ground squirrel (*Spermophilus tereticaudus chlorus*)
- San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
- Stephens's kangaroo rat (*Dipodomys stephensi*)
- Peninsular bighorn sheep (Distinct Population Segment) (*Ovis canadensis nelsoni* DPS)

3.2.5 Sensitive and Locally Important Species

3.2.5.1 Sensitive and Locally Important Plant Species

Twenty-two sensitive and locally important plant species were identified by the literature review and agency consultation as having the potential to occur within the region of the Biological Survey Area. These sensitive and locally important plant species are listed below.

- San Bernardino aster (*Symphyotrichum defoliatum*)
- smooth tarplant (*Centromadia pungens* ssp. *laevis*)
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)
- chaparral ragwort (rayless ragwort) (*Senecio aphanactis*)
- Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*)
- Payson's jewel-flower (Payson's wild cabbage) (*Caulanthus simulans*)
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)
- South Coast saltscale (*Atriplex pacifica*)

- Parish's brittlescale (Parish's saltbush) (*Atriplex parishii*)
- Davidson's saltscale (Davidson's saltbush, bractscale) (*Atriplex serenana* var. *davidsonii*)
- many-stemmed dudleya (*Dudleya multicaulis*)
- round-leaved filaree (large-leaf filaree) (*California macrophylla*)
- mud nama (mud fiddeleaf) (*Nama stenocarpum*)
- salt spring checkerbloom (mountain sidalcea) (*Sidalcea neomexicana*)
- chaparral sand-verbena (*Abronia villosa* var. *aurita*)
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)
- long-spined spineflower (knotweed spineflower) (*Chorizanthe polygonoides* var. *longispina*)
- little mousetail (*Myosurus minimus* ssp. *apus*)
- Parish's desert-thorn (*Lycium parishii*)
- Plummer's mariposa lily (*Calochortus plummerae*)
- intermediate mariposa lily (Weed's mariposa lily) (*Calochortus weedii* var. *intermedius*)
- vernal barley (*Hordeum intercedens*)

3.2.5.2 Sensitive and Locally Important Wildlife Species

Forty-eight sensitive and locally important wildlife species were identified by the literature review and agency consultation as having the potential to occur within the region of the Biological Survey Area. These sensitive and locally important wildlife species are listed below.

- western spadefoot (*Spea hammondii*)
- southwestern pond turtle (southern Pacific pond turtle) (*Actinemys marmorata pallida*)
- San Diego banded gecko (*Coleonyx variegatus abbotti*)
- coast (San Diego) horned lizard (*Phrynosoma coronatum* (*blainvillii* population))
- orange-throated whiptail (*Aspidoscelis hyperythra*)
- coastal whiptail (coastal western whiptail) (*Aspidoscelis tigris stejnegeri*)
- silvery legless lizard (*Anniella pulchra pulchra*)
- coastal rosy boa (*Charina trivirgata roseofusca*)
- San Bernardino ring-necked snake (*Diadophis punctatus modestus*)
- northern red-diamond rattlesnake (*Crotalus ruber ruber*)
- double-crested cormorant (*Phalacrocorax auritus*)
- white-faced ibis (*Plegadis chihi*)
- osprey (*Pandion haliaetus*)
- white-tailed kite (*Elanus leucurus*)
- northern harrier (*Circus cyaneus*)
- sharp-shinned hawk (*Accipiter striatus*)
- Cooper's hawk (*Accipiter cooperii*)
- ferruginous hawk (*Buteo regalis*)
- golden eagle (*Aquila chrysaetos*)
- mountain plover (*Charadrius montanus*)
- burrowing owl (*Athene cunicularia*)
- long-eared owl (*Asio otus*)
- loggerhead shrike (*Lanius ludovicianus*)

- California horned lark (*Eremophila alpestris actia*)
- purple martin (*Progne subis*)
- San Diego cactus wren (coastal cactus wren) (*Campylorhynchus brunneicapillus sandiegensis*)
- yellow warbler (*Dendroica petechia brewsteri*)
- yellow-breasted chat (*Icteria virens*)
- southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
- Bell's sage sparrow (*Amphispiza belli belli*)
- tricolored blackbird (*Agelaius tricolor*)
- Lawrence's goldfinch (*Carduelis lawrencei*)
- Dulzura pocket mouse (*Chaetodipus californicus femoralis*)
- northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)
- Bryant's woodrat (*Neotoma bryanti intermedia*) (formally known as San Diego desert woodrat [*Neotoma bryanti intermedia*])
- southern grasshopper mouse (*Onychomys torridus ramona*)
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
- California leaf-nosed bat (*Macrotus californicus*)
- western mastiff bat (western bonneted bat) (*Eumops perotis californicus*)
- pocketed free-tailed bat (*Nyctinomops femorosaccus*)
- western red bat (*Lasiurus blossevillii*)
- western yellow bat (*Lasiurus xanthinus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- spotted bat (*Euderma maculatum*)
- pallid bat (*Antrozous pallidus*)
- mountain lion (*Puma concolor*)
- American badger (*Taxidea taxus*)

3.2.6 Critical Habitat

The USFWS' online service for information regarding Threatened and Endangered Species final Critical Habitat designation within California was reviewed to determine if the Biological Survey Area is within any species' designated Critical Habitat (USFWS 2008a, 2007a).

3.2.7 Jurisdictional Waters

The USGS 7.5 Minute Topographic Map Perris and Sunnymead Quadrangles and aerial photographs were reviewed to determine the potential presence or absence of blue-line streams, wetland areas, their location within watersheds associated with the proposed project site, and other features that might contribute to federal or state jurisdictional authority located within watersheds associated with the Biological Survey Area.

In addition, the following published and grey literature was reviewed and consulted:

- 1996 National List of Vascular Plant Species that occur in Wetlands (USFWS 1996).
- *2006 U.S. Army Corps of Engineers Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*.
- *Field Guide for Wetland Delineation* (1987 USACOE Manual) prepared by the Wetland Training Institute (WTI 1999).
- *A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994).

However, during the meeting on May 23, 2007, CDFG and USFWS stated that the jurisdictional line for waters of the state and U.S. for the purposes of analysis for this proposed project would be the pre-drawdown regulated level at 1,588 feet msl. Therefore, Psomas used the USGS topographic map as the primary method to determine the extent of jurisdiction for the USACOE and CDFG. The other literature and guidelines described below were used to determine the extent of jurisdictional wetlands or associated riparian plant communities that would be subject to the jurisdiction of either CDFG or the USACOE or both.

3.2.7.1 U.S. Army Corps of Engineers Jurisdiction

Section 404 of the federal Clean Water Act applies to "Waters of the United States." Presently, "Waters of the United States" are defined to include waterways, streams, and wetlands that have a connection to navigable waters, and tributaries to these waters. In non-tidal waters, the limits of jurisdiction under the category of "Waters" are "ordinary high water marks" (OHWM) that are identified through field observation of features such as shelving and debris deposits. Where wetlands occur above high water marks, they are considered "adjacent wetlands", and are included within USACOE jurisdiction, as long as such features are connected hydrologically to navigable waters or their tributaries.

As a result of the recent Rapanos decisions the USACOE now has jurisdiction over traditional navigable waters, wetlands adjacent to traditional navigable waters, non-navigable tributaries of traditional navigable waters that are relatively permanent where tributaries typically flow year-round, and wetlands that directly abut such tributaries.

3.2.7.2 California Department of Fish and Game Jurisdiction

Section 1600, et. seq., of the California Fish and Game Code are applied to lakes and streams. CDFG has interpreted jurisdictional boundaries to be limited to the tops of stream banks (i.e., the limit of stream influence) and/or the limit of the canopy of riparian vegetation that is hydrologically connected to the stream, whichever is greatest. Isolated wetlands not associated with a stream or body of water are not protected under Sections 1600 et seq. of the Fish and Game Code, although other sections of the Code pertaining to rare species, game, and other categories can apply if these resources are present.

3.2.7.3 Wetlands/Jurisdictional Riparian Communities

The USACOE's technical guidelines for defining wetlands are provided in their *2006 U.S. Army Corps of Engineers Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Supplemental Manual)*. The 1987 Wetlands Delineation Manual was used as a secondary resource for the proposed project. Wetlands are a subset of the "Waters

of the United States" that may be subject to regulation under Section 404. One key feature of the definition of wetlands is that, under normal circumstances, they support a "prevalence of vegetation typically adapted to life in saturated soil conditions." The USACOE defines a wetland as a site that is "inundated or saturated…at a frequency and duration sufficient to support…vegetation typically adapted for life in saturated soil conditions…" Soil saturation deprives plant roots of oxygen, limiting the types of plants that can grow. Absence of oxygen leads to "reducing" chemical conditions and to the development of unique soil types, called hydric soils. The USACOE's technical guidelines outlined in the 1987 Manual (pages 13-14) define three criteria for delineating a feature as a "wetland:" hydrology, soils, and vegetation. Under the procedures and criteria in the 1987 Manual, a feature must normally satisfy all three criteria to be classified as a wetland. The Supplemental Manual was also used to help identify and delineate wetlands and jurisdictional areas.

Typically, CDGG uses only one of the three above criteria to determine the presence of a jurisdictional wetland adjacent to waters of the State.

3.3 Field Survey Methods

Psomas biologists and subconsultant biologists visited the Biological Survey Area a total of fifty-nine times from May 2007 to July of 2008 to conduct the following surveys:

- habitat assessment
- general vegetation surveys
- focused sensitive plant surveys
- general wildlife surveys
- focused wildlife surveys for the following species:
    - southwestern willow flycatcher
    - least Bell's vireo
    - coastal California gnatcatcher
    - Stephens's kangaroo rat
    - Los Angeles pocket mouse
- jurisdictional plant community determination

The dates of these surveys can be found in Table 3-1, *Biological Resource Survey Dates and Types*.

Table 3-1
Biological Resource Survey Dates and Types

Survey Date	Survey Type
2007 Surveys	
May 9, 2007	HA, GVS, GWS, JD
May 30, 2007	HA, GVS, GWS, JD
May 31, 2007	SWFL, LBV
June 5, 2007	HA, GVS, GWS, JD
June 7, 2007	SWFL, LBV
June 12, 2007	HA, GVS, GWS, JD
June 14, 2007	HA, GVS, GWS, LBV
June 21, 2007	SWFL, LBV
June 26, 2007	HA, GVS, GWS, JD
June 27, 2007	LBV
June 28, 2007	SWFL
July 5, 2007	LBV, CAGN
July 11, 2007	SWFL
July12, 2007	LBV, CAGN
July 18, 2007	LBV, CAGN
July 26, 2007	LBV, CAGN
August 1, 2007	HA, GWS, CAGN
August 17, 2007	CAGN
August 26, 2007	HA, GVS, GWS, JD
September 2, 2007	HA, GVS, GWS, JD
September 10, 2007	CAGN
September 20, 2007	HA, GVS, GWS
September 24, 2007	LAPM
September 25, 2007	LAPM
September 26, 2007	LAPM
September 27, 2007	LAPM
September 28, 2007	CAGN, LAPM
September 29, 2007	LAPM
October 11, 2007	CAGN
October 24, 2007	CAGN
November 8, 2007	CAGN
2008 Surveys	
April 17, 2008	LBV, CAGN
April 18, 2008	LBV
April 24, 2008	CAGN
April 29, 2008	LBV, FSPS
May 2, 2008	LBV, CAGN

Survey Date	Survey Type
May 10, 2008	CAGN
May 12, 2008	LBV
May 16, 2008	LBV, CAGN
May 23, 2008	CAGN
May 30, 2008	LBV
May 31, 2008	SWFL
June 2, 2008	LBV, FSPS
June 9, 2008	LBV, SWFL
June 13, 2008	LBV
June 15, 2008	SKR
June 16, 2008	SKR
June 17, 2008	SKR
June 18, 2008	SKR
June 19, 2008	SKR
June 20, 2008	SKR
June 23, 2008	LBV, SWFL
June 24, 2008	LBV
July 2, 2008	SWFL
July 3, 2008	LBV
July 8, 2008	LBV
July 11, 2008	SWFL
July 14, 2008	LBV
July 18, 2008	LBV
Legend	
HA: habitat assessment	**LBV:** focused least Bell's vireo survey
GVS: general vegetation survey	**CAGN:** focused coastal California gnatcatcher survey
GWS: general wildlife survey	**LAPM:** focused Los Angeles pocket mouse survey
FSPS: focused sensitive plant survey	**SKR:** focused Stephens's kangaroo rat survey
SWFL: focused southwestern willow flycatcher survey	**JD:** jurisdictional plant community determination

3.3.1 Habitat Assessment

During the field surveys, Psomas biologists walked and/or drove the entire Biological Survey Area to assess the habitat present. The biologists paid special attention to those habitat areas that appeared to provide suitable habitat for the species listed in Section 3.2.4 and Section 3.2.5 and sensitive plant communities. Focus was placed on locating sensitive biological resources including listed and sensitive plant and wildlife species listed in Section 3.2.4 and Section 3.2.5 and their habitats, assessing the quality of habitat present on site for potentially occurring sensitive biological resources, and assessing potential impacts from proposed project activities.

Habitat assessment field surveys were conducted by Psomas biologists (Dr. Brad Blood, Ms. Jennifer Campbell-Young, Ms. Cathleen Weigand, Mr. Gregg Miller, Ms. Amanda Weinberg,

Mr. Duane Haselfeld, and Ms. Alicia Williams). The habitat assessment surveys were conducted on the following dates:

- May 9, 2007
- May 30, 2007
- June 5, 2007
- June 12, 2007
- June 14, 2007
- June 26, 2007
- August 1, 2007
- August 26, 2007
- September 2, 2007
- September 20, 2007

The plant communities in the Biological Survey Area were identified and mapped in the field directly on ortho-corrected GIS aerial photos. Aerial photographs were used to assist in the delineation of plant community boundaries. Biologists also searched for sensitive plant communities to determine whether they occur within the Biological Survey Area. Following field mapping, plant communities were digitized and entered into a GIS database. Photographs were taken by field biologists to document existing conditions within the Biological Survey Area.

3.3.2 General Vegetation Surveys

Psomas biologists walked and/or drove the entire Biological Survey Area to assess the vegetation present. During the field surveys, focus was placed on locating sensitive biological resources including listed, candidate, state rare and sensitive plant species listed in Section 3.2.4 and Section 3.2.5 and their habitats and assessing the quality of habitat present on site for potentially occurring sensitive biological resources. The purpose of the field surveys was not to extensively search for every plant species occurring within the study area, but to ascertain general conditions and identify habitat areas that could be suitable for listed, candidate, state rare or sensitive plant species. During the field surveys, the potential for plant species listed in Section 3.2.4 and Section 3.2.5 to occur was assessed as low, moderate, or high.

General vegetation field surveys were conducted by Psomas biologists (Dr. Brad Blood, Ms. Jennifer Campbell-Young, Ms. Cathleen Weigand, and Ms. Amanda Weinberg). The general vegetation surveys were conducted on the following dates:

- May 9, 2007
- May 30, 2007
- June 5, 2007
- June 12, 2007
- June 14, 2007
- June 26, 2007
- August 26, 2007

- September 2, 2007
- September 20, 2007

The biologists paid special attention to those habitat areas that appeared to provide suitable habitat for the species listed in Section 3.2.4 and Section 3.2.5. All plant species encountered during the field surveys were identified and recorded in field notes. All common plant species were readily identified by visual characteristic and morphology in the field. Unusual and less familiar plants were later identified using taxonomical guides. Taxonomic nomenclature used in this study follows the California Native Plant Society (CNPS) nomenclature and *The Jepson Manual* (Hickman 1993). Plant field guides and photographs were used to assist with identification of plant species during surveys.

3.3.2.1 General Vegetation Field Survey Limitations

Conducting the field surveys in the late spring, summer and fall decreased the detection of winter and early spring blooming plant species. There were a number of plants in bloom, but there were also a number of plants not yet in bloom and a number of plants that had already bloomed and gone to seed. Therefore, a number of plant species could not be identified, and some annuals had not yet appeared, or the blooming period was missed. An effort was made to determine presence or absence of potentially suitable habitat for those plants that could not be identified at that time.

3.3.3 2008 Focused Sensitive Plant Surveys

Psomas biologist conducted focused sensitive plant surveys around the areas of impact immediately around the dam. Psomas biologists walked the entire survey area to assess the vegetation present. During the field surveys, focus was placed on locating sensitive plant resources and their habitats and assessing the quality of habitat present on site for potentially occurring sensitive plant resources. The purpose of the focused sensitive plant surveys was to search for the listed, candidate, state rare and sensitive plant species listed in Section 3.2.4 and Section 3.2.5.

Focused sensitive plant surveys were conducted by Psomas biologists (Ms. Cathleen Weigand and Ms. Amanda Weinberg). The focused sensitive plant surveys were conducted on the following dates:

- April 29, 2008
- June 2, 2008

The biologists paid special attention to those habitat areas within the survey area that appeared to provide suitable habitat for the species listed in Section 3.2.4 and Section 3.2.5. All plant species encountered during the field surveys were identified and recorded in field notes. All common plant species were readily identified by visual characteristic and morphology in the field. Unusual and less familiar plants were later identified using taxonomical guides. Taxonomic nomenclature used in this study follows the CNPS nomenclature and *The Jepson Manual* (Hickman 1993). Plant field guides and photographs were used to assist with identification of plant species during surveys.

3.3.3.1 Focused Sensitive Plant Survey Limitations

Conducting the field surveys in the late spring decreased the detection of early spring, summer, fall and winter spring blooming plant species. Due to the early summer, dry conditions at Lake Perris during the time of the surveys, there were a number of plants that had already bloomed and gone to seed. Therefore, a number of plant species could not be identified, and some annuals had not yet appeared, or the blooming period was missed.

3.3.4 General Wildlife Surveys

Psomas biologists walked and/or drove the entire Biological Survey Area to assess the wildlife present. During the wildlife field surveys, focus was placed on locating sensitive biological resources including listed and sensitive wildlife species listed in Section 3.2.4 and Section 3.2.5 and their habitats and assessing the quality of habitat present on site for potentially occurring sensitive biological resources. The purpose of the field surveys was not to extensively search for every wildlife species occurring within the Biological Survey Area, but to ascertain general conditions and identify habitat areas that could be suitable for listed, candidate or sensitive wildlife species. During the field surveys, the potential for wildlife species listed in Section 3.2.4 and Section 3.2.5 to occur was assessed as low, moderate, or high.

General wildlife field surveys were conducted by Psomas biologists (Dr. Brad Blood, Mr. Gregg Miller, and Ms. Amanda Weinberg). The general wildlife surveys were conducted on the following dates:

- May 9, 2007
- May 30, 2007
- June 5, 2007
- June 12, 2007
- June 14, 2007
- June 26, 2007
- August 1, 2007
- August 26, 2007
- September 2, 2007
- September 20, 2007

The methods used to detect and identify wildlife included: sight, scat, animal tracks, burrows, nests, and vocalizations. Binoculars were used to aid in the identification of observed wildlife. Wildlife field guides and photographs were used to assist with identification of wildlife species during the field surveys. All wildlife species encountered during the field surveys were identified and recorded in field notes. Incidental wildlife observations were also made during the focused wildlife surveys that are described below in the following sections.

The rock quarry at LPSRA was surveyed during early morning hours August 1, 2007 and evening hours of September 2, 2007 by Psomas biologist Gregg Miller to assess bat use of the quarry. The surveys were conducted by observing bat activity and searching the quarry for potential bat roost sites such as deep protected crevices and hollows.

3.3.4.1 General Wildlife Field Survey Limitations

Conducting the field surveys in the late spring, summer and fall decreased the detection potential for some wildlife species. Therefore, an effort was made to determine presence or absence of potentially suitable habitat for those wildlife species that could not be identified at that time.

The field surveys were conducted during the daytime to maximize the detection of most wildlife. Birds represent the largest component of the fauna, and because most birds are active in the daytime, diurnal surveys maximize the number of observations of this portion of the fauna. In contrast, daytime surveys usually result in few observations of mammals, many of which may only be active at night. In addition, many species of reptiles and amphibians are secretive in their habits and are difficult to observe. Many wildlife species are secretive and nocturnal, such as some reptiles, amphibians and small mammals.

During the field surveys, many species of wildlife that could potentially utilize the proposed project site may not have been present because they occur only on a seasonal basis. Many species are nocturnal, move about a territory, or may have become dormant for the season. A single day survey cannot be used to conclusively determine presence or absence of a species; therefore assessments of presence/absence were made based on the presence suitable habitat to support the species, diagnostic signs (burrows, scat, tracks, vocalizations and nests), known records or occurrence within the area, known distributional and elevational range, and habitat utilization from the relevant literature.

3.3.5 2007 and 2008 Focused Southwestern Willow Flycatcher Surveys

Surveys for the southwestern willow flycatcher were conducted following protocol approved by the USFWS (Sogge et al. 1997), and updated by the California/Nevada Operations Office (USFWS 2000). The surveys were conducted by wildlife biologist Mr. John Konecny, and authorized by USFWS section 10(a) permit number TE837308-4, and a CDFG Memorandum of Understanding (MOU). Mr. Konecny is familiar with southwestern willow flycatcher songs, calls, scolds, and plumage characteristics of adult and juvenile flycatchers. The purpose of these surveys was to determine the presence/absence of southwestern willow flycatchers within the Biological Survey Area.

Pursuant to USFWS approved protocol, five focused southwestern willow flycatcher surveys were conducted between May 31 and July 11, 2007 and five focused southwestern willow flycatcher surveys were conducted between May 31 and July 11, 2008. Conducting surveys in May and early June allowed the biologist to look for flycatchers when they are most vocal. Conducting surveys in late June and July allowed the biologist verify if flycatchers are nesting. Surveys were conducted on the following dates of 2007 and 2008:

2007 Focused Southwestern Willow Flycatcher Surveys

- May 31, 2007
- June 7, 2007

- June 21, 2007
- June 28, 2007
- July 11, 2007

2008 Focused Southwestern Willow Flycatcher Surveys

- May 31, 2008
- June 9, 2008
- June 23, 2008
- July 2, 2008
- July 11, 2008

Surveys for the southwestern willow flycatcher were usually begun at or just before sunrise and lasted approximately three hours. Surveys were conducted during weather conducive to observing southwestern willow flycatcher. Surveys were not conducted during inclement weather. Surveys were conducted in two areas in the Biological Survey Area: within the southern willow woodland and scrub along the eastern lakeshore and the southern willow woodland and scrub immediately west and below the dam (Figure 7, *Focused Biological Survey Site Locations*).

The surveys were conducted by walking slowly within and/or along the riparian habitat and stopping at approximately 50 foot (15 meters) intervals, listening and watching for flycatchers. If flycatchers were not detected passively, a digital vocalization of the species ("fitz-bew") was played with a MP3/iPod player and amplified speakers for approximately 15 seconds. A response was listened for in the next two-minute interval. The digital vocalization was used to elicit a vocal response from flycatchers, and to subsequently observe behaviors that indicate nesting (e.g. establishing and defending territories, soliciting mates, acquiring/carrying nest material, etc.). Locations of flycatcher observations were taken with a hand held GPS unit. If flycatchers were not detected, this procedure was repeated again before proceeding to the next station. Detailed notes and all avian species encountered during the field surveys were identified and recorded in field notes.

Legend

- Biological Survey Area
- 2007 & 2008 Least Bell's Vireo and Southwestern Willow Flycatcher Survey Areas
- 2007 & 2008 Coastal California Gnatcatcher Survey Area
- 2007 Los Angeles Pocket Mouse Survey Area
- 2008 Stephens' Kangaroo Rat Survey Area (Transects)

N W E S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

Focused Biological Survey Site Locations

PSOMAS

Figure 7

M:\2ENV030200\NatRes\GIS\Tasks\June 2008 Draft Bio Report Figures\apr-mxd\Fig7-FocusedBiologicalSurvey.mxd
M:\2ENV030200\NatRes\04 Biology\Biology Report\Lake Perris Draft Biological Report\REVISED Lake Perris Bio Report August 2008\Bio Report Figures 2008\Fig7-FocusedBiological Survey.pdf

3.3.6 2007 and 2008 Focused Least Bell's Vireo Surveys

The 2007 focused least Bell's vireo surveys were performed by Psomas Senior Biologist (Mr. Gregg Miller) and Psomas' subconsultant biologist (Mr. John Konecny). The least Bell's vireo surveys were conducted following a modification of the federal Least Bell's Vireo Survey Guidelines (USFWS 2001). The modification was recommended by USFWS (Ms. Doreen Statdlander). The purpose of these surveys was to determine the presence/absence of least Bell's vireos within the Biological Survey Area.

In 2007, nine focused least Bell's vireo surveys were conducted between May 31 and July 26, 2007. This time period encompasses the period during which most vireo nesting activity occurs. The June 7, 2007 survey was conducted by Mr. Konecny. All others were conducted by Mr. Miller. Mr. Miller and Mr. Konecny are familiar with least Bell's vireo songs, calls, scolds, and plumage characteristics of adult and juvenile vireos. Surveys were conducted on the following dates in 2007:

- May 31, 2007
- June 7, 2007
- June 14, 2007
- June 21, 2007
- June 27, 2007
- July 5, 2007
- July 12, 2007
- July 18, 2007
- July 26, 2007

The 2008 focused least Bell's vireo surveys were performed by Psomas Senior Biologist (Mr. Gregg Miller). The least Bell's vireo surveys were conducted following the federal Least Bell's Vireo Survey Guidelines (USFWS 2001). The purpose of these surveys was to determine the presence/absence of least Bell's vireos within the Biological Survey Area.

In 2008, sixteen focused least Bell's vireo surveys were conducted between April 17 and July 18, 2008. This time period encompasses the period during which most vireo nesting activity occurs. In order to cover all the areas that needed to be surveyed in the time allotted for surveying for least Bell's vireos, it took sixteen days to complete all 8 surveys. Surveys were conducted on the following dates:

- April 17, 2008
- April 18, 2008
- April 29, 2008
- May 2, 2008
- May 12, 2008
- May 16, 2008
- May 30, 2008
- June 2, 2008

- June 9, 2008
- June 13, 2008
- June 23, 2008
- June 24, 2008
- July 3, 2008
- July 8, 2008
- July 14, 2008
- July 18, 2008

Surveys for the least Bell's vireo were usually begun near sunrise and lasted approximately three hours. Surveys were conducted during weather conducive to observing least Bell's vireo. Surveys were not conducted during inclement weather. Surveys were conducted in two areas in the Biological Survey Area: within the southern willow woodland and scrub along the eastern lakeshore and the southern willow woodland and scrub immediately west and below the dam (Figure 7).

The surveys were conducted by walking slowly within and/or along the riparian habitat and stopping at approximately 50 foot (15 meters) intervals, listening and watching for vireos. Vocalization tapes were not used during the surveys. Locations of vireo observations were taken with a hand held GPS unit.

The methods used to detect and identify least Bell's vireo included sight and vocalizations. Binoculars, wildlife field guides and photographs were used to assist with identification of wildlife species during the field surveys. Detailed notes and all wildlife species encountered during the field surveys were identified and recorded in field notes.

3.3.7 2007 and 2008 Focused Coastal California Gnatcatcher Surveys

Prior to conducting the coastal California gnatcatcher focused surveys in 2007 and 2008, Psomas searched the most recent version of the CNDDB output for the Perris Quadrangle (CDFG 2008a, 2007a), the Western Riverside County MSHCP (RCIP 2003) and MSHCP monitoring reports to determine if and to what extent the coastal California gnatcatcher occurs on and adjacent to the LPSRA. A 10-day pre-survey notification was sent to the USFWS Carlsbad Field Office (Ms. Sandy Marquez) on June 20, 2007 and on April 1, 2008. The purpose of these surveys was to determine the presence/absence of coastal California gnatcatchers within in areas that could potentially be impacted by the proposed project.

The 2007 and 2008 focused coastal California gnatcatcher surveys were performed by Psomas Senior Biologist, Mr. Gregg Miller (permit # TE834488-5). The 2007 coastal California gnatcatcher surveys were conducted pursuant to federal survey guidelines (USFWS 1997) for non-breeding season surveys. The 2008 coastal California gnatcatcher surveys were conducted pursuant to federal survey guidelines (USFWS 1997) for breeding season surveys. Mr. Miller is familiar with coastal California gnatcatcher songs, calls, scolds, and plumage characteristics of adult and juvenile gnatcatchers.

In 2007, a total of nine protocol non-breeding season surveys were conducted at least two weeks apart from July 5 to November 8, 2007. Two additional opportunistic surveys were conducted on July 12 and July 26, 2007. Surveys were conducted on the following dates:

- July 5, 2007
- July 12, 2007
- July 18, 2007
- July 26, 2007
- August 1, 2007
- August 17, 2007
- September 10, 2007
- September 28, 2007
- October 11, 2007
- October 24, 2007
- November 8, 2007

In 2008, a total of six protocol breeding season surveys were conducted at least one week apart from April 17 to May 23, 2008. Surveys were conducted on the following dates:

- April 17, 2008
- April 24, 2008
- May 2, 2008
- May 10, 2008
- May 16, 2008
- May 23, 2008

Surveys for the coastal California gnatcatcher were begun near sunrise and lasted approximately two hours. Surveys were conducted during weather conducive to observing coastal California gnatcatchers. Surveys were not conducted during inclement weather. Surveys were conducted within areas that contained suitable coastal sage scrub habitat in the Biological Survey Area that may be impacted by the proposed project (Figure 7).

The surveys were conducted by walking slowly within and/or along the coastal sage scrub habitat and stopping periodically, listening and watching for gnatcatchers. If gnatcatchers were not detected passively, a vocalization of the species was played. A response was listened for in the next two-minute interval. The vocalization was used to elicit a vocal response from gnatcatchers, and to subsequently observe behaviors. If gnatcatchers were observed, their locations were taken with a hand held GPS unit.

The methods used to detect and identify coastal California gnatcatcher included sight and vocalizations. Binoculars, wildlife field guides and photographs were used to assist with identification of wildlife species during the field surveys. Detailed notes and all wildlife species encountered during the field surveys were identified and recorded in field notes.

3.3.8 2008 Focused Stephens's Kangaroo Rat Surveys

The habitat assessment and live-trapping surveys were performed by Dr. Phil Brylski (permit # TE14855-0), assisted by Mr. Steven Montgomery (permit # TE745541-8) and Psomas Senior Biologist Mr. Gregg miller (permit # TE834488-5). The Stephens's kangaroo rat surveys were conducted following protocols in federal Stephens's kangaroo rat permit conditions. The purposes of the Stephens's kangaroo rat surveys were to determine the presence or absence of Stephens's kangaroo rat in potential habitat in the proposed project site and in adjacent areas where Stephens's kangaroo rat had been previously observed, and to obtain information on the occurrence of other small mammal species.

Prior to the field surveys, available literature regarding Stephens's kangaroo rat and other sensitive mammal species was reviewed to determine if and to what extent Stephens's kangaroo rat occur on or adjacent to the proposed project site. The most recent version of the CNDDB (CDFG 2008a) was queried for the Perris Quadrangle. In addition, the Western Riverside MSHCP (RCIP 2003) and MSHCP monitoring reports (RCA 2007a, 2007b, 2006) were reviewed.

Before trapping took place, a reconnaissance-level habitat assessment was conducted by foot and vehicle of the proposed project site to assess the presence or absence of suitable habitat for Stephens's kangaroo rat, Los Angeles pocket mouse, and other sensitive mammal species within the project impact boundaries. The field team assessed and evaluated the condition of the plant communities on-site to assess the probability of their ability to support Stephens's kangaroo rat, Los Angeles pocket mouse, and other sensitive mammalian species. Site characteristics including soils, topography, the condition of the plant communities, and evidence of human use were assessed. Observations of sign of Stephens's kangaroo rat, Los Angeles pocket mouse and other sensitive mammalian species included scat, trails, tracks, dust baths, and burrows.

Following the habitat assessment, areas with suitable habitat and site conditions were chosen to conduct live-trapping surveys for Stephens's kangaroo rat (Figure 7). These survey areas included:

- The area that would be directly impacted by dam remediation, road building and improvements, and outlet flood protection activities.

- Areas adjoining and near to habitats that would be directly impacted by project activities. These areas were south of the dam and several areas north and east of the lake. The areas surveyed included two areas where Stephens's kangaroo rat had been live-captured under a previous monitoring effort (RCA 2007a).

The areas surveyed for Stephens's kangaroo rat and Los Angeles pocket mouse are within Township 3S, Range 3W, Section 36, and Township 4S, Range 3W, Sections 2, 4, 5 and 10.

The current USFWS permit conditions require five nights of trapping, conducted when Stephens's kangaroo rat are known to be active aboveground (at night and preferably during a new moon phase). The conditions also prohibit trapping when the nightly low temperature is

predicted to be 50°F or less. Trapping was conducted during suitable weather conditions on the following nights:

- June 15, 2008
- June 16, 2008
- June 17, 2008
- June 18, 2008
- June 19, 2008
- June 20, 2008

Within each survey area transects were placed predominantly along edges of dirt roads as loose soil conditions were conducive to rodent burrowing as indicated by sign. Transects were also placed in sparsely vegetated locations. Eleven traplines of 10 to 30 traps were set with traps approximately 10 meters apart. Traplines were placed within the proposed project site's most suitable habitat areas, and also outside the proposed project site in areas where MSHCP monitoring had previously captured Stephens's kangaroo rat. Individual traps were located near small mammal sign and/or suitable soils and vegetation for Stephens's kangaroo rat to maximize the probability of capture.

Traps were baited with birdseed placed at the back of the traps. The traps were left in place, opened at dusk each night, checked once during the night, and checked and closed at dawn the following morning. Traps were left closed during the day. Prior to closure all traps were examined to be sure no animals had become lodged under the treadle. All animals captured were identified to species, and released at the point of capture. Animals were not individually marked. The sex of each captured Stephens's kangaroo rat was recorded and its age was estimated based on pelage characteristics. Locations of any sensitive mammal species captures were taken with a hand held GPS unit.

3.3.9 2007 Focused Los Angeles Pocket Mouse Surveys

The purpose of the focused Los Angeles pocket mouse field surveys was to determine whether the Los Angeles pocket mouse occurs or could potentially occur on the proposed project site. Field surveys were conducted by a permitted wildlife biologist (Ms. Karen Kirtland, USFWS Permit TE068072-02), assisted by Psomas biologists (Ms. Alicia Williams and Dr. Brad Blood). Before trapping took place, the biologists conducted a preliminary driving and walkover survey of the Biological Survey Area to determine suitable areas for trapping the Los Angeles pocket mouse on September 24, 2007. During the reconnaissance surveys, the various plant communities and condition of the habitats onsite were noted. Based on this survey, four trapping locations were determined to be needed (Figure 7).

Trapping surveys were conducted following standard protocols for small mammals. The protocol specifies five consecutive nights of trapping conducted when the animals are active above ground at night and preferably during a new moon phase. The trap lines were placed in suitable habitat along the lake shore within the area of likely impact from project activities (NRA, Inc. 2008). The trap locations were placed in areas containing the most likely soils and vegetation for small mammals. All traplines were located below the high water mark of the

former shoreline of the lake. Traps lines utilized 30 to 40 - 12-inch Sherman folding live traps, set in lines or grids, with traps approximately five meters apart depending on the vegetation and substrate. Surveys were conducted on the following dates:

- September 24, 2007
- September 25, 2007
- September 26, 2007
- September 27, 2007
- September 28, 2007
- September 29, 2007

Surveys usually began at, or just before sunrise (5:15 am – 7:00 am) lasting approximately four hours, and at dusk, taking approximately three hours to re-set and bait all the traps. The traps were baited and set at dusk and inspected and closed at dawn. In the evening each trap was set and baited with a mixture of birdseed, placed at the back of the traps. At dawn, every trap was checked for animals, and then closed until re-setting the traps again in the evening. Upon trapping, each species name was recorded, along with the date and time, and the area in which it was found. All animals were identified and released at the point of capture. Photographs were taken to document the existing condition of the habitat and the species sampled.

3.3.10 Jurisdictional Waters and Associated Plant Communities

Because the resource agencies set the jurisdictional limit at the 1,588 feet mark, Psomas biologists surveyed to identify the furthest edge of associated jurisdictional wetlands and riparian communities, using the outer-most vegetation's drip line to determine the extent of jurisdiction for CDFG and USACOE. The surveyors also searched for the presence of wetland hydrology, wetland soils, and hydrophytic vegetation. Soil pits were determined not to be necessary due to the observed presence of hydrology and hydrophytic vegetation.

4.0 Results

Psomas biologists and subconsultant biologists visited the Biological Survey Area a total of fifty-nine times from May 2007 to July of 2008 to conduct the following surveys: habitat assessment; general vegetation surveys; focused sensitive plant surveys; general wildlife surveys; focused southwestern willow flycatcher surveys; focused least Bell's vireo surveys; focused coastal California gnatcatcher surveys; focused Stephens's kangaroo rat surveys; focused Los Angeles pocket mouse surveys; and jurisdictional plant community determination. Biological field surveys were conducted for the purpose of collecting data on habitat communities, identifying listed and sensitive plant and wildlife species, and providing a base line data for the determination of potential project impacts.

4.1 Field Surveys

Field surveys for the habitat assessment, general vegetation, focused sensitive plant surveys, general wildlife and jurisdictional plant communities of the Biological Survey Area were conducted as described in Table 4-1, *Habitat Assessment, General Vegetation, Focused Sensitive Plant, General Wildlife, and Jurisdictional Plant Community Determination Field Survey Information*.

Table 4-1
Habitat Assessment, General Vegetation, Focused Sensitive Plant, General Wildlife, and Jurisdictional Plant Community Determination Field Survey Information

Survey Date	Survey Time	Approximate Temperature	Cloud Cover
May 9, 2007	8:00 am – 4:00 pm	70°F	clear
May 30, 2007	8:00 am – 4:00 pm	80°F	clear
June 5, 2007	8:00 am – 4:00 pm	66°F - 90°F	clear
June 12, 2007	8:00 am – 4:00 pm	80°F	clear
June 14, 2007	8:30 am – 3:00 pm	80°F	clear
June 26, 2007	7:30 am – 3:00 pm	80°F	clear
August 1, 2007	6:05 am – 7:30 am	68°F	high overcast
August 26, 2007	4:00 pm – 9:00 pm	80°F	high overcast
September 2, 2007	3:00 pm – 7:00 pm	60°F	clear
September 20, 2007	8:00 am – 4: 00 pm	70°F	clear
April 29, 2008	7:00 am – 1:00 pm	68°F - 88°F	clear
June 2, 2008	7:30 am – 11:00 pm	71°F - 78°F	clear

The 2007 focused field surveys for the southwestern willow flycatcher were conducted as described in Table 4-2, *2007 Focused Southwestern Willow Flycatcher Field Survey Information*.

Table 4-2
2007 Focused Southwestern Willow Flycatcher Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
May 31, 2007	6:05 am – 9:35 am	58°F - 78°F	3 - 5 mph	overcast
June 7, 2007	5:50 am – 9:10 am	57°F - 84°F	3 - 5 mph	overcast
June 21, 2007	7:00 am – 10:10 am	59°F - 82°F	1 - 3 mph	slight overcast
June 28, 2007	5:15 am – 8:05 am	60°F - 72°F	1 - 3 mph	clear
July 11, 2007	5:20 am – 8:10 am	67°F - 71°F	4 - 7 mph	slight overcast

The 2008 focused field surveys for the southwestern willow flycatcher were conducted as described in Table 4-3, *2008 Focused Southwestern Willow Flycatcher Field Survey Information*.

Table 4-3
2008 Focused Southwestern Willow Flycatcher Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
May 31, 2008	6:00 am – 9:25 am	49°F - 66°F	1 - 7 mph	overcast
June 9, 2008	5:55 am – 9:20 am	52°F - 85°F	1 – 5 mph	slightly overcast
June 23, 2008	5:40 am – 9:00 am	62°F - 86°F	3 – 5 mph	clear
July 2, 2008	5:25 am – 8:35 am	58°F - 87°F	1 – 5 mph	clear
July 11, 2008	5:20 am – 8:30 am	67°F - 78°F	5 - 7mph	clear

The 2007 focused field surveys for the least Bell's vireo were conducted as described in Table 4-4, *2007 Focused Least Bell's Vireo Field Survey Information*.

Table 4-4
2007 Focused Least Bell's Vireo Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
May 31, 2007	7:00 am – 8:30 am	58°F - 78°F	3 – 5 mph	overcast
June 7, 2007	5:50 am – 9:10 am	57°F - 84°F	3 – 5 mph	overcast
June 14, 2007	6:30 am – 10:45 am	65°F	0 mph	clear
June 21, 2007	6:00 am – 9: 50 am	60°F	0 mph	clear

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
June 27, 2007	5:45 am – 11:00 am	60°F	0 mph	clear
July 5, 2007	7:30 am – 10:45 am	70°F	0 mph	clear
July 12, 2007	6:00 am – 10:45 am	60°F	0 mph	clear
July 18, 2007	6:30 am – 11:15 am	68°F	0 mph	clear
July 26, 2007	6:15 am – 11:15 am	70°F	0 mph	clear

The 2008 focused field surveys for the least Bell's vireo were conducted as described in Table 4-5, *2008 Focused Least Bell's Vireo Field Survey Information*.

Table 4-5
2008 Focused Least Bell's Vireo Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
April 17, 2008	7:00 am – 9:00 am	65°F	5-10 mph	clear
April 18, 2008	7:00 am – 9:10 am	55°F	0 mph	clear
April 29, 2008	6:30 am – 10:30 am	56°F	0 mph	clear
May 2, 2008	9:30 am – 10:30 am	60°F	0 mph	clear
May 12, 2008	6:30 am – 9:45 am	52°F	0 -12 mph	overcast
May 16, 2008	9:15 am – 10:00 am	82°F	0 -18 mph	clear
May 30, 2008	6:30 am – 10:00 am	55°F	0 mph	clear
June 2, 2008	10:00 am – 11:30 am	70°F	0 - 5 mph	clear
June 9, 2008	6:15 am – 9:40 am	58°F	0 mph	clear
June 13, 2008	8:00 am – 9:30 am	68°F	0 mph	clear
June 23, 2008	7:00 am – 8:15 am	68°F	0 mph	clear
June 24, 2008	6:45 am – 10:10 am	65°F	0 mph	clear
July 3, 2008	6:30 am – 9:00 am	69°F	0 mph	clear
July 8, 2008	6:15 am – 9:45 am	68°F	0 mph	clear
July 14, 2008	6:40 am – 8:30 am	67°F	0 mph	partly cloudy
July 18, 2008	7:15 am – 10:00 am	68°F	0 mph	partly cloudy

The 2007 focused field surveys for the coastal California gnatcatcher were conducted as described in Table 4-6, *2007 Focused Coastal California Gnatcatcher Field Survey Information*.

Table 4-6
2007 Focused Coastal California Gnatcatcher Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
July 5, 2007	6:15 am – 7:15 am	68°F	0 mph	clear
July 12, 2007	7:00 am – 8:00 am	70°F	0 mph	clear
July 18, 2007	7:40 am – 8:45 am	75°F	0 mph	clear
July 26, 2007	7:10 am – 8:30 am	70°F	0 mph	clear
August 1, 2007	6:05 am – 7:30 am	68°F	0 – 5 mph	high overcast
August 17, 2007	6:10 am – 8:00 am	70°F	0 mph	clear
September 10, 2007	7:10 am – 8:30 am	70°F	0 – 5 mph	clear
September 28, 2007	8:15 am -10:30 am	63°F	0 – 5 mph	overcast
October 11, 2007	7:15 am – 9:15 am	51°F	0 – 3 mph	high overcast
October 24, 2007	7:45 am – 9:55 am	78°F	5 – 10 mph	clear
November 8, 2007	7:00 am – 9:40 am	55°F	0 – 4 mph	overcast, light fog

The 2008 focused field surveys for the coastal California gnatcatcher were conducted as described in Table 4-7, *2008 Focused Coastal California Gnatcatcher Field Survey Information*.

Table 4-7
2008 Focused Coastal California Gnatcatcher Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
April 17, 2008	9:15 am – 10:55 am	70°F	0 mph	clear
April 24, 2008	7:15 am – 9:40 am	49°F	0 mph	overcast
May 2, 2008	7:00 am – 8:45 am	55°F	0 mph	clear
May 10, 2008	6:30 am – 8:45 am	55°F	0 mph	overcast
May 16, 2008	6:45 am – 9:00 am	65°F	0 mph	clear
May 23, 2008	6:30 am – 8:20 am	50°F	0 mph	overcast

The 2008 focused field surveys for Stephens's kangaroo rat were conducted as described in Table 4-8, *2008 Focused Stephens's Kangaroo Rat Field Survey Information*. Weather conditions were conducive to capture Stephens's kangaroo rat, with generally warm temperatures and no precipitation.

Table 4-8
2008 Focused Stephens's Kangaroo Rat Field Survey Information

Survey Date	Morning Temperature	Night Temperature	Cloud Cover
June 15, 2008	66°F	55°F	clear
June 16, 2008	67°F	58°F	clear
June 17, 2008	68°F	59°F	clear
June 18, 2008	66°F	55°F	clear
June 19, 2008	67°F	56°F	clear
June 20, 2008	70°F	60°F	clear

The 2007 focused field surveys for the Los Angeles pocket mouse were conducted as described in Table 4-9, *2007 Focused Los Angeles Pocket Mouse Field Survey Information*.

Table 4-9
2007 Focused Los Angeles Pocket Mouse Field Survey Information

Survey Date	Survey Time	Temperature	Wind	Cloud Cover
September 24, 2007	8:00 am – 6:00 pm	50°F - 80°F	0 mph	clear
September 25, 2007	8:00 am – 6:00 pm	50°F - 80°F	0 mph	clear
September 26, 2007	8:00 am – 6:00 pm	40°F - 80°F	0 mph	clear
September 27, 2007	8:00 am – 6:00 pm	40°F - 80°F	0 mph	clear
September 28, 2007	8:00 am – 6:00 pm	55°F - 80°F	8 - 10 mph	overcast
September 29, 2007	8:00 am – 6:00 pm	50°F - 80°F	5 - 6 mph	mostly cloudy

4.2 Soils

Soils and soil types are important in determining which plant species, and hence which plant communities occur in any region. For example, an absence of alkaline soils means that plants adapted to alkaline conductions would not be likely to occur. According to the Soil Survey of Western Riverside Area, California (USDA 1971), the soils of the Bernasconi Hills and Russell Mountains consist of Cieneba-Rock Land-Fallbrook Association. The soils of this association are on granitic rock islands and on uplands. They are well drained and somewhat excessively drained, undulating to steep, very shallow to moderately deep soils that have a surface layer of sandy loam and fine sandy loam; on granitic rock.

The soils of the land between the Bernasconi Hills and Russell Mountains consist of Hanford-Tujunga-Greenfield Association. These soils formed in granitic alluvium washed from the uplands. Soils of this association are very deep, well-drained to excessively drained, nearly level to moderately steep soils that have a surface layer of sand to sandy loam, and occur on alluvial fans and flood plains.

Soils around the lakeshore of Lake Perris differ from those found on the ground surface between the Bernasconi Hills and the Russell Mountains. They are sandy soils from deeper below the ground surface, deposited on the surface as a result of dredging and excavation activities associated with the creation of the lake.

None of the soils associated with the Biological Survey area are alkaline. Alkaline soils are absent from the Biological Survey Area.

4.3 Plant Communities and Non-Vegetated Features

The Biological Survey Area and the proposed project site are located in the southwestern California subregion of the California floristic province (Hickman 1993). Lake Perris is situated in a valley and ringed by hills and small mountains. The Russell Mountains and Moreno Valley are located to the north; the Badlands (mountains) and San Jacinto Valley are located to the northeast; Bernasconi Hills are located to the east and south; and Perris Valley is located to the southwest and west. Lake Perris has hot, dry summers and cool, moist winters. Rainy weather is limited almost completely to the months between November and April. The area lies at a crossroads of weather influences. Coastal fog comes from the west, while strong, hot, dry Santa Ana winds come from the deserts to the east and northeast.

Habitats around the Biological Survey Area are greatly influenced by natural biotic and abiotic features and elements as well as human-related activities. Except near Lake Perris, much of the area is relatively dry. Coastal sage scrub is the predominant plant community on the slopes of the Russell Mountains and Bernasconi Hills; it is characterized by shrubby plants including brittlebush (*Encelia californica*), California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), and deerweed (*Lotus scoparius*). A sparse association of grasses, forbs and scattered sage scrub shrubs are found in the flatter areas near the toes of the surrounding mountain slopes. Riparian woodland and scrub habitats surround Lake Perris on the eastern shoreline.

This section describes the general plant communities and non-vegetated features determined to be present within the Biological Survey Area as a result of the literature review and field surveys. Generally, classifications of habitat types or vegetation communities were based on the *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986) with modifications to better represent existing conditions. Ten plant communities, 13 associated sub-communities, and four non-vegetated features were observed within the Biological Survey Area during the field surveys (Figure 8, *Plant Communities and Non-Vegetated Features*). For clarity, only the primary plant community designation is mapped on Figure 8. These plant communities, sub-communities and non-vegetated features with acreages mapped are described in Table 4-10, *Plant Communities and Non-Vegetated Features found within the Biological Survey Area*. Characteristics of each plant community and non-vegetated feature are described in detail below from Section 4.3.3 to Section 4.3.17.

Legend

- Biological Survey Area

Plant Communities & Non-Vegetated Features

- Southern Willow Woodland and Scrub/ Mule Fat Scrub/Heliotrope Scrub/Sandbar
- RSS Riversidean Sage Scrub
- SWS Southern Willow Woodland and Scrub
- MFS Mule Fat Scrub
- FWM Freshwater Marsh
- CBS Coyote Bush Scrub
- HS/S Heliotrope Scrub/Sandbar
- NNG Non-Native Grassland
- EW Eucalyptus Woodland
- R Ruderal
- AG Agriculture
- NVF Non-Vegetated Features

Plant Communities and Non-Vegetated Features	Total Acres
SWilwScrb/MlftScrb/HeliScrb/Sand	44
Riversidean Sage Scrub	595
Southern Willow Woodland and Scrub	78
Mule Fat Scrub	47
Freshwater Marsh	68
Coyote Bush Scrub	13
Heliotrope Scrub/Sandbar	134
Non-Native Grassland	347
Eucalyptus Woodland	28
Ruderal	10
Agriculture	9
Non-Vegetated Features	606
Total	**1,977**

N W E S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6
Date of Aerial Photo: February 2006

Plant Communities and Non-Vegetated Features

PSOMAS

Figure 8

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Table 4-10
Plant Communities and Non-Vegetated Feature found within the Biological Survey Area

Habitat Type	Acres Mapped Within the Biological Survey Area
Plant Communities and Sub-Communities	
Riversidean sage scrub	511.1
• disturbed Riversidean sage scrub	27.8
• burned Riversidean sage scrub	0.6
• California buckwheat dominate Riversidean sage scrub	14.2
• brittlebush dominate Riversidean sage scrub	7
• Riversidean sage scrub/urban	18.6
• disturbed Riversidean sage scrub/urban	15.4
southern willow woodland and scrub*	76.6
• southern willow scrub/mule fat scrub*	1.2
mule fat scrub*	38.8
• mule fat scrub/rip-rap*	0.8
• mule fat scrub/freshwater marsh*	7.4
freshwater marsh*	45.5
• disturbed freshwater marsh*	22.4
coyote bush scrub	12.6
heliotrope scrub/sandbar*	7.7
• heliotrope scrub/tamarisk/sandbar*	126.4
non-native grassland	329.1
• burned non-native grassland	17.4
eucalyptus woodland	0.8
• eucalyptus woodland/disturbed Riversidean sage scrub	26.7
ruderal	10
agriculture	8.9
southern willow woodland and scrub/mule fat scrub/heliotrope scrub/sandbar*	44.5
Non- Vegetated Features	
sand	88.2
rip-rap	18.9
urban areas	464.9
rock quarry	33.6
Legend	
* sensitive plant community	

4.3.1 Lake Perris Drawdown and Subsequent Habitats

In 2005, DWR completed a foundation study of the Perris Dam. Based on the results of the stability analysis, DWR lowered the reservoir water surface elevation by 25 feet. In August 2005, DWR initiated the drawdown of Lake Perris from 1,588 feet msl to 1,563 feet msl. The lake drawdown was complete by November 2005. This resulted in non-vegetated lake shore being made available for colonization by plants, and the subsequent establishment of plant communities that hitherto were not present, or were unable to expand.

Table 4-11, *Plant Communities and Non-Vegetated Features: Pre- and Post-Drawdown at Lake Perris;* presents Psomas' determination of a variety of the pre- and post-drawdown plant community structure.

Table 4-11
Plant Communities and Non-Vegetated Features:
Pre- and Post- Drawdown at Lake Perris

Habitat Type	Existed in Pre-Lake Perris Drawdown Conditions	Created by Lake Perris Drawdown
Plant Communities and Sub-Communities		
Riversidean sage scrub	X	
• disturbed Riversidean sage scrub	X	
• burned Riversidean sage scrub	X	
• California buckwheat dominate Riversidean sage scrub	X	
• brittlebush dominate Riversidean sage scrub	X	
• Riversidean sage scrub/urban	X	
• disturbed Riversidean sage scrub/urban	X	
southern willow woodland and scrub	X	X
• southern willow scrub/mule fat scrub	X	X
mule fat scrub	X	X
• mule fat scrub/rip-rap	X	X
• mule fat scrub/freshwater marsh	X	X
freshwater marsh	X	X
• disturbed freshwater marsh	X	X
coyote bush scrub	X	
heliotrope scrub/sandbar	X	X
• heliotrope scrub/tamarisk/sandbar	X	X
non-native grassland	X	
• burned non-native grassland	X	
eucalyptus woodland	X	
• eucalyptus woodland/disturbed Riversidean sage scrub	X	
ruderal	X	

Habitat Type	Existed in Pre-Lake Perris Drawdown Conditions	Created by Lake Perris Drawdown
agriculture	X	
mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar	X	X
Non- Vegetated Features		
open water/Lake Perris	X	
sand	X	X
rip-rap	X	X
urban areas	X	

4.3.2 Sensitive Plant Communities

Sensitive plant communities are those that are considered to support unique vegetation, sensitive plant species and/or wildlife species, are riparian associated, or function as corridors for wildlife movement. The CNDDB identified four sensitive plant communities having the potential to occur within the vicinity of the Biological Survey Area. These sensitive plant communities are listed below.

- southern coast live oak riparian forest (Element Code 61310)
- southern cottonwood-willow riparian forest (Element Code 61330)
- southern riparian scrub (Element Code 63000)
- southern sycamore alder riparian woodland (Element Code 62400)

4.3.2.1 Holland Designated Sensitive Plant Communities and Sub-Communities

Three plant communities and their sub-communities are associated with the Holland designated southern riparian scrub (Element Code 63000). These plant communities were observed within the Biological Survey Area during the field surveys and are sensitive. These sensitive plant communities are listed below.

- southern willow woodland and scrub
    - southern willow scrub/mule fat scrub
- mule fat scrub
    - mule fat scrub/rip-rap
    - mule fat scrub/freshwater marsh
- mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar

4.3.2.2 Wetland Associated Sensitive Plant Communities and Sub-Communities

In addition, five plant communities and their sub-communities are also considered sensitive plant communities because they are a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section

1600-1603 of the California Fish and Game Code; and/or the California Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act. These plant communities were observed within the Biological Survey Area during the field surveys and are sensitive. These sensitive plant communities are listed below.

- southern willow woodland and scrub
    - southern willow scrub/mule fat scrub
- mule fat scrub
    - mule fat scrub/rip-rap
    - mule fat scrub/freshwater marsh
- freshwater marsh
    - disturbed freshwater marsh
- heliotrope scrub/sandbar
    - heliotrope scrub/tamarisk scrub/sandbar
- mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar

4.3.3 Riversidean Sage Scrub

Approximately 594.5 acres of Riversidean sage scrub were mapped within the Biological Survey Area, of which 19.7 acres occur within the proposed project site. *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986) classifies this species assemblage as Riversidean sage scrub (Element Code 32700). Riversidean sage scrub is the dominant plant community observed on the slopes of the Russell Mountains and Bernasconi Hills surrounding Lake Perris, and is characterized by low shrubby plants. In the majority of areas in which this plant community was found, California buckwheat, brittlebush and California sagebrush were observed to be the dominant plant species. A sparse association of grasses, forbs and scattered sage scrub shrubs are found in the more level areas near the toes of the surrounding hills and mountain slopes.

Holland describes Riversidean sage scrub as the most xeric expression of coastal sage scrub south of Point Conception. Typical stands are fairly open and are generally dominated by brittlebush, California sagebrush, California buckwheat, and red brome (*Bromus madritensis* ssp. *rubens*), each attaining at least 20 percent cover. Riversidean sage scrub typically exist on xeric sites such as steep slopes, severely drained soils, or clay soils that release stored soil moisture only slowly. This plant community usually intergrades at slightly higher elevations with several southern California chaparrals.

Shrubs were less than three meters tall and the shrub canopy was continuous in most areas. The ground layer was open, but contained annual herbs and grasses throughout. Characteristic species of this plant community that were observed during the field surveys included: brittlebush, California sagebrush, California buckwheat, deerweed, coyote bush (*Baccharis pilularis*), black sage, annual bur ragweed (*Ambrosia acanthicarpa*), common California aster (*Corethrogyne filaginifolia*), bush monkeyflower (*Mimulus aurantiacus*), ripgut grass (*Bromus diandrus*), and red brome among others.

Six sub-communities of Riversidean sage scrub were mapped within the Biological Survey Area and are described in more detail below. These sub-communities include the following:

- disturbed Riversidean sage scrub
- burned Riversidean sage scrub
- brittlebush dominate Riversidean sage scrub
- California buckwheat dominate Riversidean sage scrub
- Riversidean sage scrub/urban
- disturbed Riversidean sage scrub/urban

4.3.3.1 Disturbed Riversidean Sage Scrub

Of the approximately 594.5 acres of Riversidean sage scrub found within the Biological Survey Area, approximately 27.8 acres of disturbed Riversidean sage scrub were mapped. This disturbed Riversidean sage scrub plant community is similar in composition to Riversidean sage scrub, but is characterized by larger areas of bare ground, invasion by non-native species, or mechanical disturbance. This plant community was observed in the flatter areas near the toes of the surrounding hills and mountain slopes. Non-native shrubs, herbs and grasses such as brome grasses, tocalote (*Centaurea melitensis*), tree tobacco (*Nicotiana glauca*), prickly sow thistle (*Sonchus asper*), and Russian thistle (*Salsola tragus*), among others were observed within the disturbed Riversidean sage scrub. This disturbed plant community was observed in small areas around Lake Perris mostly adjacent to roads and developed areas.

4.3.3.2 Burned Riversidean Sage Scrub

Of the approximately 594.5 acres of Riversidean sage scrub found within the Biological Survey Area, approximately 0.6 acre of burned Riversidean sage scrub was mapped. This burned Riversidean sage scrub is similar in composition to the disturbed Riversidean sage scrub, but was burned by the State Parks in order to restore habitat for the federally listed-endangered Stephens's kangaroo rat (*Dipodomys stephensi*) which is known to occur within the area. This community contains burned shrubs and large areas of bare ground. Riversidean sage scrub plant species are present in the burn areas; however due to the newly created open ground, non-native herbs, such as tocalote, and exotic grasses are beginning to dominate this plant community.

4.3.3.3 California Buckwheat Dominant Riversidean Sage Scrub

Of the approximately 594.5 acres of Riversidean sage scrub found within the Biological Survey Area, approximately 14.2 acres of California buckwheat dominant Riversidean sage scrub were mapped. This California buckwheat dominant Riversidean sage scrub plant community is similar in composition to Riversidean sage scrub, but it is dominated solely by California buckwheat. This plant community was observed in areas in the north, east, and southwest around Lake Perris.

4.3.3.4 Brittlebush Dominant Riversidean Sage Scrub

Of the approximately 594.5 acres of Riversidean sage scrub found within the Biological Survey Area, approximately seven acres of brittlebush Riversidean sage scrub were mapped. This brittlebush dominant Riversidean sage scrub plant community is similar in composition to Riversidean sage scrub, but it is dominated solely by brittlebush. This plant community was observed in the northwestern portion of Lake Perris.

4.3.3.5 Riversidean Sage Scrub/Urban

Of the approximately 594.5 acres of Riversidean sage scrub found within the Biological Survey Area, approximately 18.6 acres of Riversidean sage scrub/urban habitat were mapped. This Riversidean sage scrub/urban plant community is similar in composition to Riversidean sage scrub; however it contains landscape plant species and it is within and/or surrounded by urban development, picnic areas, parking lots, lake and recreation facilities. It was also found in planters within parking lots.

4.3.3.6 Disturbed Riversidean Sage Scrub/Urban

Of the approximately 594.5 acres of Riversidean sage scrub found within the Biological Survey Area, approximately 15.4 acres of disturbed Riversidean sage scrub/urban habitat were mapped. This disturbed Riversidean sage scrub/urban plant community is similar in composition to the Riversidean sage scrub/urban plant community; however the habitat is more open with larger areas of bare ground, and has been invaded by non-native species and/or has been mechanically disturbed.

4.3.4 Southern Willow Woodland and Scrub

Approximately 77.8 acres of southern willow woodland and scrub were mapped within the Biological Survey Area, of which 11 acres occur within the proposed project site. *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986) classifies this species assemblage as southern willow scrub (Element Code 63320). Southern willow woodland and scrub was found in large areas around Lake Perris, especially around the eastern shoreline and below the dam.

Holland describes southern willow scrub as a dense, broadleafed, winter-deciduous riparian thickets dominated by several willow (*Salix*) species, with scattered emergent California sycamores (*Platanus racemosa*) and Fremont cottonwoods (*Populus fremontii*). Most stands are too dense to allow much understory development. The site factors for this plant community are loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. Southern willow scrub was formerly extensive along the major rivers of coastal southern California, but now much reduced by urban expansion, flood control, and channel improvements.

In this southern willow woodland and scrub plant community, more than one willow species was an important shrub or tree in the canopy. Characteristic species of this plant community that were observed during the field surveys included: red willow (*Salix laevigata*), Goodding's black willow (*Salix gooddingii*), narrowleaf willow (*Salix exigua*), Fremont's cottonwood, and mule

fat (*Baccharis salicifolia*). Understory species included: wild tarragon (*Artemisia dracunculus*), curly dock (*Rumex crispus*), annual bursage, southwestern spiny rush (*Juncus acutus*), and bromes.

Within the willow woodland areas, a tall overstory mix of mature willows were present along with random Fremont cottonwoods, with a dense understory of sapling willows and other native shrubs such as mule fat and coyote bush. These willows created dense woodlands. The willow trees were usually less than 32 feet tall and the canopy was continuous. Shrubs were sparse under the tree canopy and the ground layer was covered with thick leaf litter. This woodland community existed before the lake drawdown was implemented in 2005. The mature southern willow woodland along the eastern portion of the lake is being irrigated to compensate for water loss due to the lake drawdown. The southern willow woodland and scrub areas located in front of the dam are a result of seepage from the dam.

Within the willow scrub areas, the willows were young and shrubby. The willow scrub areas were created by the lake drawdown implemented in 2005. Given more time, this plant community could become a woodland. These willow scrub areas were created and seeded from the mature surrounding southern willow woodland which existed prior to the 2005 lake drawdown. Stands of cattails (*Typha* sp.) and other riparian stream plants were found in the lowest, wettest soils, and where water was present. Most areas within the willow scrub were dense with vegetation; however in some areas, vegetation was open with clumps of shrubby willows and mule fat, separated by open sandy sandbar with scattered herbaceous riparian species. The southern willow woodland and scrub areas located, behind the dam, are a result of seepage from the dam.

Southern willow woodland and scrub is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act. This plant community is also considered sensitive by the CNDDB.

One sub-community of southern willow woodland and scrub, southern willow scrub/mule fat scrub, was mapped within the Biological Survey Area and is described in more detail below.

4.3.4.1 Southern Willow Scrub/Mule Fat Scrub

Of the approximately 77 acres of southern willow woodland and scrub found within the Biological Survey Area, approximately 1.2 acre of southern willow scrub/mule fat scrub was mapped. This southern willow scrub/mule fat scrub plant community is similar in composition to southern willow scrub; however it is equally dominated by willow species and mule fat. Portions of the southern willow scrub/mule fat scrub along the shoreline of Lake Perris are a result of the lake drawdown implemented in 2005.

Southern willow scrub/mule fat scrub is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and

Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act. This plant community is also considered sensitive by the CNDDB.

4.3.5 Mule Fat Scrub

Approximately 47 acres of mule fat scrub were mapped within the Biological Survey Area, of which 7.9 acres occur within the proposed project site. *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986) classifies this species assemblage as mule fat scrub (Element Code 63310). This mule fat scrub plant community is similar in composition to southern willow scrub; however mule fat is the sole or dominant shrub in the canopy. Other willow species and other trees and shrubs are also present.

Holland describes mule fat scrub as a depauperate, tall, herbaceous riparian scrub strongly dominated by mule fat. This early seral community is maintained by frequent flooding. Site factors for this plant community include intermittent stream channels with fairly coarse substrate and moderate depth to the water table. This plant community frequently occurs as a patchy understory in light gaps in forests and woodlands.

Within the Biological Survey Area shrubs were usually less than four meters tall and the canopy was usually continuous. The ground layer was sparse. Characteristic species of this plant community that were observed during the field surveys included: mule fat, Goodding's black willow, red willow, rushes (*Juncus* sp.), narrow-leaved cattail (*Typha angustifolia*), wild tarragon, and bush monkey flower. Other species present in the community include annual bursage, hoary nettle (*Urtica dioica*), and bromes.

Mule fat scrub was mapped in numerous areas in the Biological Survey Area. Portions of the mule fat scrub habitat mapped along the northwestern, north, northeastern, and southeastern lakeshore of Lake Perris are a result of the lake drawdown implemented in 2005. The mule fat scrub in front of the dam is a result of seepage from the dam.

Mule fat scrub is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act. This plant community is also considered sensitive by the CNDDB.

Two sub-communities of mule fat scrub, mule fat scrub/rip-rap and mule fat scrub/freshwater marsh, were mapped within the Biological Survey Area and are described in more detail below.

4.3.5.1 Mule Fat Scrub/Freshwater Marsh

Of the approximately 47 acres of mule fat scrub found within the Biological Survey Area, approximately 7.4 acres of mule fat scrub/freshwater marsh was mapped. This mule fat scrub/freshwater marsh plant community is similar in composition to mule fat scrub; however it is intermixed with freshwater marsh species such as narrow-leaved cattail, bulrush (*Scirpus* sp.), rushes, willows, and willow herb (*Epilobium ciliatum* ssp. *ciliatum*) along the newly exposed shore areas around Lake Perris. Portions of the mule fat scrub/freshwater marsh habitat mapped

along the north and northeastern lakeshore of Lake Perris are a result of the lake drawdown implemented in 2005.

Mule fat scrub/freshwater marsh is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act. This plant community is also considered sensitive by the CNDDB.

4.3.5.2 Mule Fat Scrub/Rip-Rap

Of the approximately 47 acres of mule fat scrub found within the Biological Survey Area, approximately 0.8 acre of mule fat scrub/rip-rap was mapped. This mule fat scrub/rip-rap plant community is similar in composition to mule fat scrub; however it is intermixed with rip-rap along the shore areas around Lake Perris. Portions of the mule fat scrub/rip-rap habitat along the shoreline of Lake Perris are a result of the lake drawdown implemented in 2005.

Mule fat scrub/rip-rap is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act. This plant community is also considered sensitive by the CNDDB.

4.3.6 Freshwater Marsh

Approximately 67.9 acres of freshwater marsh were mapped within the Biological Survey Area, of which 16.5 acres occur within the proposed project site. Narrow-leaved cattail is the dominant plant species found within this plant community. The cattail vegetation association observed closely fits the coastal and valley freshwater marsh (Element Code 52410) described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986). The freshwater marsh plant community is found along the shoreline of Lake Perris.

Holland describes coastal and valley freshwater marsh as dominated by perennial, emergent monocots such as cattail and bulrush, 4 – 5 meters tall. It often forms completely closed canopies. Site factors for this plant community include quiet sites (lacking significant current) permanently flooded by fresh water (rather than brackish, alkaline, or variable). Prolonged saturation permits accumulation of deep, peaty soils. This plant community is found occasionally along the coast and in coastal valleys near river mouths and around the margins of lakes and springs.

Within the Biological Survey Area the cattails were usually less than 5 meters tall and the canopy was continuous. Characteristic species of this plant community that were observed during the field surveys included: narrow-leaved cattail, bulrush, rushes, willows, Mediterranean tamarisk (*Tamarix ramosissima*), willow herb, alkali heliotrope (*Heliotropium curassavicum*), and poison hemlock (*Conium maculatum*).

A majority of the freshwater marsh habitat mapped along the shoreline of Lake Perris is a result of the lake drawdown implemented in 2005. The more mature areas of freshwater marsh in the northeastern portion of the Biological Survey Area and areas along the shallow water fringe were present prior to the drawdown; however at this time it is unclear as to how much of the habitat has been created due to the lake drawdown.

Freshwater marsh is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act.

One sub-community of freshwater marsh, disturbed freshwater marsh, was mapped within the Biological Survey Area and is described in more detail below.

4.3.6.1 Disturbed Freshwater Marsh

Of the approximately 67.9 acres of freshwater marsh found within the Biological Survey Area, approximately 22.4 acres of disturbed freshwater marsh was mapped. This disturbed freshwater marsh plant community is similar in composition to freshwater marsh; however it is more open with larger areas of bare ground (sand), and has been invaded by non-native species, namely Mediterranean tamarisk. Non-native shrubs, herbs and grasses such as bromes, prickly sow thistle, tree tobacco, and Russian thistle, among others were also observed within the disturbed freshwater marsh habitat. This disturbed plant community was observed and mapped in small areas around Lake Perris. Portions of the disturbed freshwater marsh habitat mapped along the lake shore of Lake Perris are a result of the lake drawdown implemented in 2005.

Disturbed freshwater marsh is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act.

4.3.7 Coyote Bush Scrub

Approximately 12.6 acres of coyote bush scrub were mapped within the Biological Survey Area, of which 0.7 acre occurs within the proposed project site. Within this plant community, coyote bush is the sole or dominant shrub in the canopy. The coyote bush vegetation association observed within the Biological Survey Area does not fit any classification described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986). Although Holland does not recognize coyote bush scrub habitat in their literature, this habitat type is persistent in California where coyote bush dominates the landscape. This plant association is part of the coastal scrub series with plant species common to those observed and mapped within the Riversidean sage scrub habitat.

Within the Biological Survey Area, coyote bush scrub was found below the dam. The canopy tends to be continuous to intermittent with sparse ground cover. Characteristic species of this plant community that were observed during the field surveys included: coyote bush, mule fat, wild tarragon, bush monkey flower, annual bursage, and bromes.

4.3.8 Heliotrope Scrub/Sandbar

Approximately 134 acres of heliotrope scrub/sandbar were mapped within the Biological Survey Area, of which 51.4 acres occur within the proposed project site. Alkali heliotrope was the dominant plant species found in the exposed sandbar areas surrounding the lake. The heliotrope vegetation association observed within the Biological Survey Area does not fit any classification described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986). Although Holland does not recognize heliotrope scrub/sandbar habitat in their literature, this habitat type is persistent in California where alkali heliotrope dominates sandbar and lake shore areas.

Heliotrope scrub/sandbar was mapped in numerous areas along the shoreline of Lake Perris. Portions of the heliotrope scrub/sandbar habitat mapped along the northwestern, north, northeastern, eastern, and southeastern lakeshore are a result of the lake drawdown implemented in 2005. Characteristic species of this plant community that were observed during the field surveys included: alkali heliotrope, Mediterranean tamarisk, mule fat, mugwort (*Artemisia douglasiana*), and bromes.

Heliotrope scrub/sandbar is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act.

One sub-community of heliotrope scrub/sandbar, heliotrope scrub/tamarisk scrub/sandbar, was mapped within the Biological Survey Area and is described in more detail below.

4.3.8.1 Heliotrope Scrub/Tamarisk Scrub/Sandbar

Of the approximately 134 acres of heliotrope scrub/sandbar found within the Biological Survey Area, approximately 126.4 acres of heliotrope scrub/tamarisk scrub/sandbar were mapped. This heliotrope scrub/tamarisk scrub/sandbar plant community is similar in composition to the heliotrope scrub/sandbar habitat; however it is dominated by Mediterranean tamarisk. This plant community was observed along the banks of Lake Perris; portions of the heliotrope scrub/tamarisk/sandbar habitat along the banks of Lake Perris are a result of the lake drawdown implemented in 2005. Characteristic species of this plant community that were observed during the field surveys included: alkali heliotrope, Mediterranean tamarisk, mule fat, mugwort, and bromes.

Heliotrope scrub/tamarisk scrub/sandbar is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act.

4.3.9 Mix of Southern Willow Woodland and Scrub, Mule Fat Scrub and Heliotrope Scrub/Sandbar

Approximately 44.5 acres of a mixed habitat combining elements of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar vegetation were mapped within the Biological Survey Area; 42 acres of this mixed habitat occur within the proposed project site.

The vegetation mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/tamarisk scrub/sandbar is considered a sensitive plant community because it is a wetland associated plant community within the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and/or the California RWQCB pursuant to Section 401 of the Clean Water Act.

4.3.10 Non-Native Grassland

Approximately 346.5 acres of non-native grassland were mapped within the Biological Survey Area, of which 49.3 acres occur within the proposed project site. *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986) classifies this species assemblage as non-native grassland (Element Code 42200). This non-native grassland was found in the flatter areas of the Biological Survey Area and near the toes of the surrounding mountain slopes.

Holland describes non-native grassland as a dense to sparse cover of exotic, annual grasses often associated with numerous species of native annual forbs (wildflowers), especially in years with plentiful rain. Seed germination occurs with the onset of the late fall rains. Growth, flowering, and seed-set occur from winter through spring. Typically, plants are dead through the dry summer and early fall, persisting as seeds. Soil conditions associated with this community include fine-textured, usually clay soils, moist or even water-logged during the winter rainy-season and very dry during the summer and early fall. In general, the species composition of this community varies among stands. Fall temperatures and precipitation are major factors that determine dominant species, along with light intensity limited by shading from plants and litter, and differences in microtopography. The result of this assemblage is that it is highly unique by locality.

The characteristic grass species which dominated the non-native grassland within the Biological Survey Area include: soft chess (*Bromus hordeaceus*), wild oats, red brome, ripgut grass, and foxtail barley (*Hordeum murinum*). Other exotic plant species found in this plant community include: tocalote, black mustard (*Brassica nigra*), sweet fennel (*Foeniculum vulgare*), and filaree (*Erodium* sp.) among others. Random native Riversidean sage scrub plants were also found in this plant community.

One sub-community of non-native grassland, burned non-native grassland, was mapped within the Biological Survey Area and is described in more detail below.

4.3.10.1 Burned Non-Native Grassland

Of the approximately 346.5 acres of non-native grassland found within the Biological Survey Area, there are approximately 17.4 acres of burned non-native grassland. This burned non-native grassland is similar in composition to the non-native grassland described above, however it was burned by State Parks in order to restore habitat for the federally listed-endangered Stephens's kangaroo rat that known to occur within the area. This community contains large areas of bare ground due to the burn with patches of non-native grasses and shrubs.

4.3.11 Eucalyptus Woodland

Approximately 27.5 acres of eucalyptus woodland were mapped within the Biological Survey Area, of which 0.2 acres occur within the proposed project site. Eucalyptus trees (*Eucalyptus* sp.) dominate this habitat. The eucalyptus woodland vegetation association observed within the Biological Survey Area does not fit any classification described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986). Although Holland does not classify eucalyptus woodland as a habitat type, this habitat type is persistent in California where eucalyptus trees are dominant.

Eucalyptus trees were the sole or dominant trees in the canopy in this association, with few other species present. Trees tended to have a continuous canopy. Riversidean sage scrub shrubs were infrequent and the ground layer was sparse.

One sub-community of eucalyptus woodland, eucalyptus woodland/disturbed Riversidean sage scrub was mapped within the Biological Survey Area and is described in more detail below.

4.3.11.1 Eucalyptus Woodland/Disturbed Riversidean Sage Scrub

Of the approximately 27.5 acres of eucalyptus woodland found within the Biological Survey Area, there are approximately 26.7 acres of eucalyptus woodland/disturbed Riversidean sage scrub. Eucalyptus woodland/disturbed Riversidean sage scrub is similar in composition to the eucalyptus woodland described above; however the eucalyptus canopy was open and not continuous. This plant community also had a high density of Riversidean sage scrub associated plant species and a denser ground cover of exotic herbs and grasses.

4.3.12 Ruderal

Approximately ten acres of ruderal vegetation were mapped within the Biological Survey Area, of which one acre occurs within the proposed project site. Ruderal refers to those open areas where vegetation has been affected by human activities resulting in a dominance of weedy annual dicot species. The ruderal vegetation association observed within the Biological Survey Area does not fit any classification described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986). Although Holland 1986 does not recognize this ruderal habitat in their literature, this habitat type is persistent in California where habitat has been affected by human activities resulting in a dominance of weedy annual, non-native dicot species. The characteristic ruderal plant species observed during the field surveys include: bromes, mustards (*Brassica* sp. and *Sisymbrium* sp.), filaree, and tocalote.

4.3.13 Agriculture

Approximately 8.9 acres of agriculture were mapped within the Biological Survey Area, none of which occur within the proposed project site. Agriculture describes field areas laying either fallow or being actively used for agriculture practices. Although the *Preliminary Descriptions of the Terrestrial Communities of California* (Holland 1986) does not recognize agriculture in their literature, this habitat type is persistent in California where habitat has been affected by human activities. Agriculture was found along the Ramona Expressway and the existing outlet tunnel.

4.3.14 Open Water/Lake Perris

Open water/Lake Perris describes Lake Perris. Lake Perris is a man-made, dammed lake with no inlet or outlet to natural water sources. The lake is used for recreation purposes and fishing year-round. Water flow is slow within the lake.

Open water/Lake Perris is under the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and the California RWQCB pursuant to Section 401 of the Clean Water Act.

4.3.15 Sand

Approximately 88.2 acres of sand were mapped within the Biological Survey Area. Sand describes the shoreline and beach areas around Lake Perris. The sand areas tended to either be depauperate of vegetation, or very sparsely vegetated with both native and non-native plant species. Plant species identified within theses areas included small mule fat and willow saplings, alkali heliotrope, scattered tamarisk, and bromes. Significant portions of the sand habitat mapped within the Biological Survey Area were exposed as a result of the lake drawdown implemented in 2005.

The sand areas within the Biological Survey Area are under the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG pursuant to Section 1600-1603 of the California Fish and Game Code; and the California RWQCB pursuant to Section 401 of the Clean Water Act.

4.3.16 Rip-Rap

Approximately 18.9 acres of rip-rap were mapped within the Biological Survey Area. Rip-rap describes the areas along the banks and shore of Lake Perris where un-grouted rip-rap has been placed for bank stabilization. Rip-rap is found within one of the mule fat scrub plant communities mentioned above. Sparse vegetation, between the rip-rap and boulders and along the lake edge includes mule fat and willow saplings, rushes, bromes, and alkali heliotrope, among others. Portions of the rip-rap mapped within the Biological Survey Area, mainly the lower areas along the shoreline of Lake Perris, were exposed as a result of the lake drawdown implemented in 2005.

The rip-rap areas within the Biological Survey Area are under the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act; the CDFG, pursuant to Section 1600-1603 of the California Fish and Game Code; and the California RWQCB pursuant to Section 401 of the Clean Water Act.

4.3.17 Urban Areas

Approximately 464.9 acres of urban areas were mapped within the Biological Survey Area. Urban areas describe land occupied by structures, paving and other impermeable surfaces, and/or areas where landscaping has been installed and is maintained. Within the Biological Survey Area, urban areas describes the associated lake recreation areas, camping facilities, picnic areas, boat docks, paved roads, unpaved road, trails, launch ramps, and surrounding residences. These urban areas also contained landscaped trees such as: eucalyptus, myoporum (*Myoporum laetum*), Peruvian pepper tree (*Schinus molle*), and pines (*Pinus* sp.). These trees were found around many recreation facilities and within the parking lots.

4.3.18 Rock Quarry

The rock quarry, which lies within the Biological Survey area, comprises 33.6 acres.

4.3.19 Plant Communities and Non-Vegetated Features found within the Proposed Project Site

Table 4-12, *Plant Communities and Non-Vegetated Features found within the Proposed Project Site* describes each proposed project site location and what plant community and/or non-vegetated feature is found there.

Table 4-12
Plant Communities and Non-Vegetated Features found within the Proposed Project Site

Habitat	Soils Excavation Area	Rock Quarry	Haul Road	Emergency Outlet Extension	Construction Staging Area	150' Wide Clearing of Vegetation	Stability Berm
Plant Communities and Sub-Communities							
Riversidean sage scrub (19.7 acres)		X	X	X	X	X	
southern willow woodland and scrub (11 acres)				X		X	
mule fat scrub (7.9 acres)	X				X		
freshwater marsh (16.5 acres)	X						
coyote bush scrub (0.7 acre)						X	

Habitat	Soils Excavation Area	Rock Quarry	Haul Road	Emergency Outlet Extension	Construction Staging Area	150' Wide Clearing of Vegetation	Stability Berm
Plant Communities and Sub-Communities							
heliotrope scrub/sandbar (51.4 acres)	X		X				
non-native grassland (49.3 acres)				X	X	X	
eucalyptus woodland (0.2 acres)							
ruderal (1 acre)			X				
agriculture (0 acres)				X			
mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar (42 acres)	X						
non-vegetated feature (140.4 acres)		X		X	X	X	X

4.4 Plants

As a result of the literature review and agency consultation, 18 plant species listed as endangered, threatened, candidate or state rare pursuant to the federal or state Endangered Species Acts were identified as having the potential to occur within the region of the proposed project site. Twenty-two sensitive and locally important plant species were identified by the literature review and agency consultation as having the potential to occur within the region of the proposed project site.

4.4.1 Listed, Candidate and Sensitive Plant Species Having the Potential to Occur Within the Biological Survey Area

Each of the plant species mentioned above and listed in Section 3.2.4.1 and Section 3.2.5.1 were assessed for their potential to occur within the Biological Survey Area based on each species' known distributional and elevational ranges. A species was determined to have no potential to occur within the Biological Survey Area if the Biological Survey Area was located outside the species' known distributional range, and/or the species' known elevational range. A number of plant species were determined to have no potential to occur within the Biological Survey Area and were therefore eliminated from further evaluation. A complete listing of these species evaluation can be found in Appendix A, *Plant and Wildlife Species Potential Occurrence Determination*.

Plant species determined to have the potential to occur within or adjacent to the Biological Survey Area are presented in Table 4-13, *Listed, Candidate and Sensitive Plant Species Having the Potential to Occur within the Biological Survey Area*. Table 4-13 also summarizes conclusions from analysis and field surveys regarding the potential occurrence of listed and sensitive plant species within the Biological Survey Area. The table provides the taxonomic and common names of each potentially occurring species, describes each species' status, describes each species' preferred habitat and general distribution, and analyzes the species' potential to occur within the Biological Survey Area.

During the field surveys, the potential for species listed in Table 4-13 to occur was assessed as low, moderate, or high based on the following criteria:

- *Low*: species with a low potential for occurrence are those for which the Biological Survey Area is on the boundary of the known distributional and/or the elevational range of the species, or those for which the Biological Survey Area is within the boundary of the known range of the species and for which suitable habitat in the Biological Survey Area is not known to be used by the species, or for which there are no known recorded occurrences of the species within or adjacent to the Biological Survey Area.

- *Moderate*: species with a moderate potential for occurrence are those for which suitable habitat is present at the Biological Survey Area, the Biological Survey Area is within the known distributional and elevational range of the species, and one or more surveys did not detect the species. No nearby occurrences of the species are known. Failure to detect the species is not definitive, and may be due to variable effects associated with migration, weather, fire, and/or time of day and year.

- *High*: species with a high potential for occurrence are those for which suitable habitat is present at the Biological Survey Area, the Biological Survey Area is within the known distributional and elevational range of the species, and the species has been observed in similar habitat in the region by a qualified biologist.

Table 4-13 summarizes results and conclusions from the field surveys and the literature review with regard to the potential for the occurrence of listed, candidate, state rare and sensitive plant species within areas potentially impacted by the proposed project.

A standard in the professional practice of botany is to conclude species absence in only a few limited instances:

- Where the species is detectable without flowers or fruits (e.g., perennial shrubs with distinctive vegetative features).
- Suitable habitat to support the species is clearly absent.
- Numerous surveys over many years have not detected the species.

In general and outside of these limited cases, even with field surveys, botanists assess probability of occurrence rather than make a definitive conclusion about species presence or absence. Failure to detect the presence of the species is not definitive, and may be due to variable effects

associated with fire, rainfall patterns, and/or season. For example, plant species with a moderate potential for occurrence are considered to be those for which suitable habitat is present to support the species, the Biological Survey Area is within the known distributional and elevational range of the species, and one or more surveys did not detect the presence of the species.

The timing of the field surveys was considered suitable for the identification of most, but not all plant species. Conducting the field surveys in the late spring, summer and fall decreased the detection of winter and early spring blooming plant species. There were a number of plants in bloom, but there were also a number of plants not yet in bloom and a number of plants that had already bloomed and gone to seed. Therefore, an effort was made to determine presence or absence of potentially suitable habitat for those plants that could not be identified at that time.

Table 4-13
Listed, Candidate, and Sensitive Plant Species
Having the Potential to Occur within the Biological Survey Area

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Listed Endangered, Threatened, Candidate and State Rare Plants						
Ambrosia pumila	dwarf burr ambrosia (San Diego ambrosia)	FE, CNPS:1B.1	San Diego ambrosia occurs in open habitats such as chaparral and coastal sage scrub in coarse substrates near drainages, and in upland areas on clay slopes or on the dry margins of vernal pools. This species occurs in a variety of associations that are dominated by sparse grasslands or marginal wetland habitats such as river terraces, pools, and alkali playas. In Riverside County, San Diego ambrosia is associated with open, gently-sloped grasslands and is generally associated with alkaline soils. Blooming period: Apr – Oct.	San Diego ambrosia is distributed from western Riverside County and western San Diego County, California south in widely scattered populations along the west coast of Baja California, Mexico. The majority of the California populations occur in San Diego County, where approximately 11 distinct populations have been reported along with two transplanted populations. San Diego ambrosia generally occurs at low elevations generally less than 1,600 feet in the Riverside populations and less than 600 feet in San Diego County.	Covered (b)	**No potential to occur.** The Biological Survey Area lacks suitable soils and substrates to support this species. This species is also not known to occur within the LPSRA or the immediate region.
Berberis nevinii	Nevin's barberry	FE, SE, CNPS:1B.1	Grows in alluvial scrub community on sandy and gravelly substrates along the margins of dry washes. In the chaparral community, it grows on steep, north-facing slopes with coarse soils and rocky slopes. It has also been found in cismontane woodlands, riparian scrub, and coastal sage scrub. Occurs in wetlands in another region, but occurs almost always under natural conditions in non wetlands in California. Blooming period: Mar – Apr.	Nevin's barberry is endemic to southwestern cismontane southern California. It occurs in restricted localized populations from the interior foothills of the San Gabriel Mountains of Los Angeles County and San Bernardino County southeast to near the foothills of the Agua Tibia Mountains of southwestern Riverside County. Scattered naturalized populations have been established outside this range in San Diego County. Elevational range: 970 – 2,700 feet MSL.	Covered (b, d)	**Low potential to occur.** Potentially suitable habitats and substrates are present within the Biological Survey Area. This species was not observed. Another species of barberry, Fremont's barberry (*Berbis fremontii*) was observed during the surveys. Nevin's barberry is not known to occur within the LPSRA or the immediate region.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Atriplex coronata var. *notatior*	San Jacinto Valley crownscale	FE, CNPS:1B.1	San Jacinto Valley crownscale occurs primarily in floodplains (seasonal wetlands) on moist, alkaline soils dominated by alkali chenopod scrub, alkali playas, vernal pools, and, to a lesser extent, alkali grasslands. Blooming period: Apr – Aug.	This species is restricted to the San Jacinto Valley, Perris Valley, Elsinore Valley and Menifee Valley of western Riverside County. The majority of known occurrences are in the vicinity of Hemet on white-clay soils along the San Jacinto River and Old Salt Creek tributary drainages. Elevational range: 455 – 1,640 feet MSL.	Covered (a, d)	**Low potential to occur.** The Biological Survey Area lacks suitable floodplains habitat and suitable alkaline soils to support this species.
Navarretia fossalis	Moran's navarretia (spreading navarretia)	FT, CNPS:1B.1	The primary habitat for this species is vernal pools and depressions and ditches in areas that once supported vernal pools in saline-alkaline soils. It can also be found in artificial roadside ditches. It has been found in alkaline or saline scrubs (chenopod scrub) and playas, shallow freshwater marshes and swamps. Occurs almost always under natural conditions in wetlands. Blooming period: Apr – Jun.	Fewer than 30 occurrences exist throughout its range in Los Angeles, Riverside and San Diego counties to Baja California, Mexico. Most populations occur in three locations: on Otay Mesa, southwestern San Diego County; along the San Jacinto River in western Riverside County; and near Hemet also in Riverside County. Elevational range: 98 – 4,265 feet MSL.	Covered (a, b)	**Low potential to occur.** The Biological Survey Area lacks appropriate vernal pools habitat and saline-alkaline soils to support this species.
Allium munzii	Munz' onion	FE, ST, CNPS:1B.1	Munz' onion is found on mesic exposures or seasonally moist microsites in grassy openings in coastal sage scrub, chaparral, juniper woodland, cismontane woodland, valley and foothill grasslands in clay soils. Blooming period: Mar – May.	Fewer than 15 occurrences of Munz' onion remain. All are located in western Riverside County. Found from Corona through Temescal Canyon and along the Elsinore Fault Zone to the southwestern foothills of the San Jacinto Mountains. Elevational range: 984 – 3,510 feet MSL.	Covered (b)	**Low potential to occur.** The Biological Survey Area does not contain suitable habitat and it lacks appropriate clay soils to support this species. However, this species is known to occur within the immediate region of the LPSRA.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Brodiaea filifolia	thread-leaved brodiaea (threadleaf clusterlily)	FT, SE, CNPS:1B.1	This species typically occurs on gentle hillsides, valleys, and floodplains in semi-alkaline mudflats, vernal pools, mesic southern needlegrass grassland, mixed native-nonnative grassland and alkali grassland plant communities in association with clay, loamy sand, or alkaline silty-clay soils. This plant grows on various substrates ranging from clay to fine sand. It occurs in open valley and foothill grasslands, at the edge of vernal pools, flood plains, playas and openings in chaparral, cismontane woodlands or coastal scrub. It is equally likely to occur in wetlands or non wetlands. Blooming period: Mar – Jun.	Thread-leaved brodiaea occurs in a few scattered localities within Los Angeles, Orange, western Riverside, and northwestern San Diego counties. Small populations of the species occur on Fish and Game's lands at the San Jacinto Wildlife Area in Riverside County and Carlsbad Highlands in San Diego County. A significant population occurs on The Nature Conservancy's Santa Rosa Plateau in western Riverside County and a small population occurs in Aliso-Wood Canyons Regional Park in Orange County. Elevational range: 82 – 2,821 feet MSL.	Covered (a, b, d)	**Moderate potential to occur.** The Biological Survey Area contains suitable grassland and coastal sage scrub habitats with suitable soils and substrates to support this plant. This species is also known to occur within the immediate region of the LPSRA.
Sensitive and Locally Important Plants						
Symphyotrichum defoliatum (=*Aster bernardinus*)	San Bernardino aster	CNPS:1B.2	Found in cismontane woodlands, coastal scrub, lower montane coniferous forests, meadows and seeps, marshes and swamps, and vernally mesic valley and foothill grasslands. Can be found near ditches, streams, springs or disturbed areas. Grows in seasonally moist fine alluvial soils. Blooming period: Jul – Nov.	Found in Kern, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties. Elevational range: 6 – 6,691 feet MSL.	X	**Moderate potential to occur**. The Biological Survey Area contains suitable coastal sage scrub habitat to support this species. This species is also known to occur within the immediate region of the LPSRA.
Centromadia pungens ssp. *laevis* (=*Hemizonia pungens* ssp. *laevis*)	smooth tarplant	CNPS:1B.1	Smooth tarplants occur in a variety of habitats including alkali scrub, alkali playas, riparian woodland, watercourses, and grasslands with alkaline affinities. Also found on disturbed places. Blooming period: Apr – Sept.	Found in Riverside, Orange, San Diego and San Bernardino counties. Western Riverside County accounts for over 60 percent of the reported populations: the San Jacinto Wildlife Area, Salt Creek, the City of Hemet and San Jacinto, and in the Murrieta/Temecula area.	Covered (a, b, d)	**Moderate potential to occur.** The Biological Survey Area lacks suitable alkaline habitat. However, this species is known to occur within the immediate region of the LPSRA.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
				Elevational range: 0 – 1,574 feet MSL.		
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	CNPS:1B.1	Coulter's goldfields are associated with low-lying alkali habitats along the coast and in inland valleys. The majority of the populations are associated with coastal salt marsh. Coulter's goldfields occur primarily in the alkali vernal plains community. These are floodplains dominated by alkali scrub, alkali playas, vernal pools, and, alkali grasslands. These habitats form mosaics that are largely dependent on salinity and micro-elevational differences. Blooming period: Feb – Jun.	Coulter's goldfields are distributed from coastal San Luis Obispo County south through coastal Santa Barbara County, Ventura County, Los Angeles to San Diego County and northwestern Baja California. Interior valley populations have been recorded from the Carrizo Plain of San Luis Obispo County south through Tehachapi (Kern County), Twenty Nine Palms (San Bernardino County), and cismontane western Riverside County, to the Ojos Negros Valley east of Ensenada, Mexico. Elevational range: 3 – 4,002 feet MSL.	Covered (a, b, d)	**Low potential to occur.** The Biological Survey Area lacks appropriate alkali habitats and soils to support this species. However, this species is known to occur within the immediate region of the LPSRA.
Senecio aphanactis	chaparral ragwort (rayless ragwort)	CNPS: 2.2	Chaparral, cismontane woodland, coastal scrub (sometimes alkaline) and drying alkaline flats. Blooming period: Jan – Apr.	Found in Alameda, Contra Costa, Fresno, Los Angeles, Merced, Monterey, Orange, Riverside, Santa Barbara, Santa Clara, San Diego, San Luis Obispo, Solano, and Ventura counties. Elevational range: 50 – 2,624 feet MSL.	X	**Moderate potential to occur.** The Biological Survey Area contains suitable coastal sage scrub habitat to support this species. This species is also known to occur within the immediate region of the LPSRA.
Trichocoronis wrightii var. *wrightii*	Wright's trichocoronis	CNPS: 2.1	Found in meadows and seeps, marshes and swamps, riparian forest and vernal pools/alkaline. Also found on mud flats of vernal lakes, drying river beds, and alkali meadows. In Riverside County, Wright's trichocoronis is found in the alkali vernal plains and associated with alkali playa, alkali annual grassland, and alkali vernal pool	Found in Riverside and Merced counties. Nearly extirpated in the Central Valley. This species is known only from four locations along the San Jacinto River from the vicinity of the Ramona Expressway and San Jacinto Wildlife Area and along the northern shore of Mystic Lake. Only two locations on either side of the	Covered (a, b)	**Low potential to occur.** The Biological Survey Area lacks suitable alkali habitats and soils to support this species.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			habitats. It is highly dependent on alkaline soils that are saturated for extended periods of time. Blooming period: May – Sept	Ramona Expressway have been seen in recent years. Elevational range: 16 – 1,426 feet MSL.		
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	CNPS:1B.2	Dry soils on chaparral and coastal sage scrub. Blooming period: Jan – Jul.	Found in Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties. Elevational range: 3 – 2,903 feet MSL.	X	**Low potential to occur.** The Biological Survey Area contains suitable coastal sage scrub habitat to support this species; however this species is not known to occur within the region of the LPSRA.
Dudleya multicaulis	many-stemmed dudleya	CNPS: 1B.2	Many-stemmed dudleya is often associated with clay soils in barrens, rocky places, and ridgelines as well as thinly vegetated openings in chaparral, valley and foothill grassland, and coastal sage scrub in heavy soils, often clay. Blooming period: Apr – Jul.	Many-stemmed dudleya is endemic to southwestern California from western Los Angeles County south through extreme southwestern San Bernardino, Orange, and western Riverside Counties south to extreme northern San Diego County. Elevational range: 50 – 2,591 feet MSL.	Covered (b)	**Low potential to occur.** The Biological Survey Area contains suitable coastal sage scrub and grassland habitat to support this species; however it does not support suitable clay soils. This species is not known to occur within the region of the LPSRA.
California macrophylla (=*Erodium macrophyllum*)	round-leaved filaree (large-leaf filaree)	CNPS:1B.1	This species is restricted to open cismontane woodland and valley and foothill grassland habitats on very friable clay soils. Blooming period: Mar – May.	In southern California, found in Kern, Los Angeles, Riverside, San Diego, and Ventura counties. Elevational range: 50 – 3,937 feet MSL.	Covered (d)	**Low potential to occur.** The Biological Survey Area generally lacks suitable habitats with friable clay soils to support this species. This species is known to occur within the region of the LPSRA.
Nama stenocarpum	mud nama (mud fiddeleaf)	CNPS: 2.2	Found along marshes, swamps, lake shores, river banks, stream banks and intermittently wet areas. Blooming period: Jan – Jul.	Found in Los Angeles, Orange, Riverside, Imperial and San Diego counties. Elevational range: 16 – 1,640 feet MSL.	Covered (a, b, d)	**Moderate potential to occur.** The Biological Survey Area contains marshes along the lake shore; However, these

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
						soils are sandy and wekk drained. This species is not known to occur within the region of the LPSRA.
Sidalcea neomexicana	salt spring checkerbloom (mountain sidalcea)	CNPS: 2.2	Found in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, alkali playas, and brackish marshes. Blooming period: Mar – Jun.	Found in Kern, Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, and Ventura counties. Elevational range: 50 – 5,018 feet MSL.	X	**Low potential to occur.** The Biological Survey Area contains suitable coastal sage scrub habitat to support this species; however this species is not known to occur within the region of the LPSRA.
Abronia villosa var. *aurita*	chaparral sand-verbena	CNPS:1B.1	Found in sandy soils of chaparral, coastal scrub, and desert dunes. Blooming period: Jan – Sept.	Found in Riverside, San Bernardino and San Diego counties. Elevational range: 262 – 5,249 feet MSL.	X	**Moderate potential to occur.** The Biological Survey Area contains suitable coastal sage scrub habitat. This species is known to occur within the region of the LPSRA.
Chorizanthe polygonoides var. *longispina*	long-spined spineflower (knotweed spineflower)	CNPS:1B.2	Long-spined spineflower is associated primarily with heavy, often rocky, clay soils in valley and foothill grasslands, and openings in coastal sage scrub, and chaparral. Occasionally this species is associated with mountain meadows in sandy loam soil as at Cuyamaca State Park or in sandy or gravelly soils as on Kearney Mesa or Cutca Valley in San Diego County. Blooming period: Apr – Jul.	Populations found in Orange, western Riverside, San Diego and Santa Barbara counties. Elevational range: 100 – 4,760 feet MSL.	Covered	**Moderate potential to occur.** The Biological Survey Area contains suitable soils, valley and foothill grasslands and coastal sage scrub habitats to support this species. This species is also known to occur within the region of the LPSRA.
Myosurus minimus ssp. *apus*	little mousetail	CNPS: 3.1	In southern California, little mousetail occurs in association with vernal pools and within the alkali vernal pools and alkali annual grassland components of alkali	Found in Riverside, San Bernardino, San Diego, Alameda, Contra Costa, Colusa, Lake, Merced, Solano, Tulare, Baja California, and Oregon.	Covered (a, b, d)	**No potential to occur.** The Biological Survey Area lacks suitable vernal pools and associated alkali habitats and soils to

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			vernal plains. Little mousetail is found in areas that have semi-regular inundation. Blooming period: Mar – Jun.	Most southern California populations are relatively small. The two largest concentrations of little mousetail are on the Otay Mesa of San Diego County and at Salt Creek west of Hemet in Riverside County. Elevational range: 65 – 2,100 feet MSL.		support this species. This species is not known to occur at LPSRA.
Lycium parishii	Parish's desert-thorn	CNPS: 2.3	Found in coastal sage scrub and Sonoran desert scrub. Blooming period: Mar – Apr.	Found in Riverside, San Diego and Imperial counties. Elevational range: 1,000 – 3,280 feet MSL.	X	**Low potential to occur.** The Biological Survey Area lacks suitable desert habitat to support this species. Coastal sage scrub habitat is present; this species is not known to occur within the region of the LPSRA.
Calochortus plummerae	Plummer's mariposa lily	CNPS:1B.2	This plant prefers openings in chaparral, foothill woodland, coastal sage scrub, valley and foothill grasslands, cismontane woodland, lower montane coniferous forest and yellow pine forest. They are found on dry, rocky slopes and soils and brushy areas. Can be very common after fire. Blooming period: May – Jul.	Found in Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. Elevational range: 330 – 5,580 feet MSL.	Covered (e)	**Moderate potential to occur.** The Biological Survey Area supports suitable habitats and substrates to support this species. This species is known to occur within the region of the LPSRA.
Hordeum intercedens	vernal barley	CNPS: 3.2	Vernal barley is associated with mesic grasslands, vernal pools, and large saline flats or depressions. In Riverside County, vernal barley is associated with alkali flats and flood plains within the alkali vernal plains community. Within this community vernal barley is primarily associated	Vernal barley occurs in scattered locations bordering the Central Valley of central California. In southern California it has been reported from Santa Barbara, Ventura, Los Angeles, Orange, Riverside, and San Diego Counties. Elevational range: 16 – 3,280 feet	Covered (a)	**No potential to occur.** The Biological Survey Area lacks suitable alkaline habitats and soils to support this species. This species is known to occur within the region of the LPSRA.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			with alkali annual grasslands and vernal pools and to a lesser extent alkali scrub and alkali playa. Can also be found on coastal dunes, coastal scrub, and alkaline valley/foothill grasslands. Blooming period: Mar – Jun.	MSL.		

Legend

Federal Status

FE = federally endangered: any species, subspecies, or variety of plant or animal that is in danger of extinction throughout all or a significant portion of their range. Species become officially listed as endangered and receive explicit protection under the Federal Endangered Species Act (ESA) upon publication of final rule for listing in the Federal Register.

FT = federally threatened: any species, subspecies, or variety of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future. Once listed in the Federal Register, threatened species receive discretionary protection under the Endangered Species Act.

California State Status

SE = California state endangered: any species, subspecies, or variety of plant or animal that are in serious danger of becoming extinct throughout all, or a significant portion, of their range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

ST = California state threatened: any species, subspecies, or variety of plant or animal that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

California Native Plant Society Status

CNPS 1B = California Native Plant Society List 1B plants are native California species, subspecies or varieties that are rare, threatened, or endangered in California and throughout its range.

CNPS 2 = California Native Plant Society List 2 plants are native California species, subspecies or varieties that are rare, threatened or endangered in California, but more common outside of the state.

CNPS 3 = California Native Plant Society List 3 plants are native California species, subspecies or varieties that more information is needed to assign them to one list or another or to reject them.

California Native Plant Society Threat Codes

0.1 means it is seriously endangered in California.

0.2 means it is fairly endangered in California.

0.3 means it is not very endangered in California.

Western Riverside County MSHCP

Covered: No further surveys are required.

Covered (a): Surveys may be required for these species as part of wetlands mapping (Section 6.1.2 of MSHCP).

Covered (b): Surveys may be required for these species within Narrow Endemic Plant Species survey area (Section 6.1.3 of MSHCP)

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence

Covered (d): Surveys may be required for these species within Criteria Area as (Section 6.3.2 of MSHCP)
Covered (e): These Covered Species will be considered to be Covered Species Adequately Conserved when conservation requirements identified in species-specific conservation objectives have been met. Species specific conservation objectives for these species are presented in Section 9.0 of the MSHCP. Please refer to Table 9-3 of the MSHCP for specific conservation objectives that must be met for the 16 species prior to including them on the list of Covered Species Adequately Conserved.
X Not covered by the MSHCP, but identified by the CNDDB and other literature.

Sources for Table 4-13:

- California Natural Diversity Database (CDFG 2008a, 2007a).
- State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFG 2008e).
- Species Accounts from CDFG website (CDFG 2008b, 2007b).
- CNPS Inventory of Rare and Endangered Plants of California (CNPS 2008, 2007).
- Calflora website (Calflora 2008, 2007).
- *The Jepson Manual: Higher Plants of California* (Hickman 1993).
- *A Flora of Southern California* (Munz 1974).
- Understanding the Plants and Animals of Western Riverside County MSHCP) (Dudek and Associates 2003).

4.4.2 Plant Species Observed During the Field Surveys

Plant species observed during the field surveys are common in the surrounding areas. A complete list of plant species observed by Psomas within the Biological Survey Area during the field surveys is provided in Table 4-14, *Plant Species Observed during Field Surveys*.

Table 4-14
Plant Species Observed During Field Surveys

Scientific Name	Common Name
Gymnosperms	
Cupressaceae	**Cypress Family**
Cupressus sp.	cypress
Pinaceae	**Pine Family**
Pinus radiata	Monterey pine
Angiosperm Dicots	
Amaranthus	**Pigweed, Amaranth Family**
*Amaranthus albus**	tumble pigweed
Anacardiaceae	**Sumac or Cashew Family**
Rhus trilobata	skunkbrush (squawbush, basketbush)
*Schinus molle**	Peruvian pepper tree (California pepper tree)
Toxicodendron diversilobum	poison oak
Apiaceae	**Carrot Family**
*Conium maculatum**	poison hemlock
*Foeniculum vulgare**	fennel
Asteraceae	**Sunflower Family**
Acourtia microcephala	perezia (sacapellote)
Ambrosia acanthicarpa	annual bur ragweed (annual bur-sage)
Artemisia californica	California sagebrush
Artemisia douglasiana	mugwort
Artemisia dracunculus	wild tarragon (tarragon)
Artemisia tridentata	Great Basin sagebrush (big sagebrush)
Baccharis emoryi	Emory's baccharis
Baccharis pilularis	coyote bush
Baccharis salicifolia	mule fat
Bebbia juncea	sweetbush
Brickellia californica	California brickellbush
Brickellia desertorum	desert brickellbush
*Centaurea melitensis**	tocalote (Malta star thistle)
*Chamomilla suaveolens**	pineapple weed (rayless chamomile)
Cirsium occidentale var. *occidentale*	cobweb thistle
Conyza canadensis	horseweed (mare's tail)

Scientific Name	Common Name
Conyza coulteri	Coulter's horseweed
*Cotula coronopifolia**	brass-buttons
Encelia farinosa	brittlebush (incienso)
Ericameria palmeri	grassland goldenbush
Erigeron foliosus var. *foliosus*	fleabane aster
Eriophyllum confertiflorum var. *confertiflorum*	golden-yarrow
Filago californica	California filago (fluff weed)
*Filago gallica**	narrow-leaved filago
Gnaphalium bicolor	two-toned everlasting (bicolored cudweed)
Gnaphalium californicum	California everlasting (green everlasting)
Gnaphalium canescens ssp. *microcephalum*	felt-leaf everlasting (white everlasting)
Gutierrezia californica	California matchweed (snakeweed)
Helianthus annus	common sunflower
Deinandra paniculata	paniculate tarplant (slender tarweed)
Heterotheca grandiflora	telegraph weed
Isocoma menziesii	Menzies' goldenbush (white flowered goldenbush)
*Lactuca serriola**	prickly lettuce (wild lettuce)
Oncosiphon piluliferum (=Matricaria globifera)	stink-net
Pluchea sericea	arrow weed
*Senecio vulgaris**	common groundsel
*Sonchus oleraceus**	common sow-thistle
Stephanomeria virgata	virgate wreath-plant (twiggy wreath-plant)
Berberidaceae	**Barberry Family**
Berberis fremontii	Fremont's barberry
Boraginaceae	**Borage Family**
Amsinckia menziesii var. *intermedia*	common fiddleneck
Cryptantha microstachys	Tejon cryptantha
Heliotropium curassavicum	alkali heliotrope (wild heliotrope)
Brassicaceae	**Mustard Family**
Brassica geniculata (=*Hirschfeldia incana*)*	short-podded mustard (Mediterranean mustard)
*Brassica nigra**	black mustard
*Capsella bursa-pastoris**	shepherd's purse
*Sisymbrium orientale**	Oriental mustard (Oriental sisymbrium)
Thysanocarpus laciniatus	lacepod (fringepod)
Cactaceae	**Cactus Family**
Opuntia littoralis	coastal prickly pear
Opuntia prolifera	coast cholla
Capparaceae	**Caper Family**
Isomeris arborea (=*Cleome isomeris*)	bladderpod

Scientific Name	Common Name
Caprifoliaceae	**Honeysuckle Family**
*Lonicera japonica**	Japanese honeysuckle
Adoxaceae	**Elderberry Family**
Sambucus mexicana	blue elderberry (Mexican elderberry)
Chenopodiaceae	**Goosefoot Family**
Atriplex canescens	fourwing saltbush
*Chenopodium album**	white goosefoot (lamb's quarters)
*Salsola tragus**	Russian thistle (tumbleweed)
Suaeda nigra (= *S. mosquinii*)	bush seepweed (iodine weed)
Convolvulaceae	**Morning-Glory Family**
*Convolvulus arvensis**	bindweed
Crassulaceae	**Stonecrop Family**
Dudleya lanceolata	lance-leaved dudleya (lance-leaved live-forever)
Cucurbitaceae	**Gourd Family**
Cucurbita foetidissima	stinking gourd (wild gourd, coyote melon)
Marah macrocarpus	wild cucumber (manroot)
Cuscataceae	**Dodder Family**
Cuscuta californica	dodder (California witch's hair)
Euphorbiaceae	**Spurge Family**
Croton californicus	California croton
Croton setigerus (=*Eremocarpus setigerus*)	turkey mullein (doveweed)
Euphorbia albomarginata (=*Chamaesyce albomarginata*)	rattlesnake spurge (rattlesnake weed)
*Ricinus communis**	castor bean
Fabaceae	**Legume Family**
*Acacia longifolia**	Sydney golden wattle
Lotus agrophyllus	silverleaf lotus (silver lotus)
Lotus salsuginosus	coastal lotus (alkali lotus)
Lotus scoparius	deerweed (California broom)
Lupinus sp.	lupine
*Medicago polymorpha**	California bur clover (bur-clover)
*Melilotus albus**	white sweet clover
*Melilotus officinalis**	yellow sweet clover
*Parkinsonia aculeata**	Mexican palo verde
Fagaceae	**Oak Family**
Quercus agrifolia	coast live oak
Garryaceae	**Silk Tassel Family**
Garrya flavescens	pale silk tassel
Geraniaceae	**Geranium Family**
*Erodium cicutarium**	red-stemmed filaree

Scientific Name	Common Name
Grossulariaceae	**Gooseberry Family**
Ribes aureum	golden currant
Ribes indecorum	white-flowered currant (white chaparral currant)
Hydrophyllaceae	**Waterleaf Family**
Eucrypta chrysanthemifolia	common eucrypta
Phacelia cicutaria	caterpillar phacelia
Phacelia distans	common phacelia
Juglandaceae	**Walnut and Pecan Family**
Juglans californica	California black walnut
Lamiaceae	**Mint Family**
*Marrubium vulgare**	horehound
Salvia columbariae	chia
Salvia leucophylla	purple sage
Salvia mellifera	black sage
Lauraceae	**Laurel Family**
*Cinnamomum camphorum**	camphor tree
Malvaceae	**Mallow Family**
Malacothamnus fasciculatus	bush mallow (chaparral bush mallow)
Myoporaceae	**Myoporum Family**
*Myoporum laetum**	myoporum
Myrtaceae	**Myrtle Family**
*Eucalyptus globulus**	blue gum eucalyptus
Eucalyptus sp.*	eucalyptus
Nyctaginaceae	**Four O'Clock Family**
Mirabilis laevis	wishbone bush
Oleaceae	**Olive Family**
Fraxinus velutina	Arizona ash (velvet ash)
*Olea europaea**	common olive
Onagraceae	**Evening Primrose Family**
Epilobium ciliatum ssp. *ciliatum*	willow herb
Papaveraceae	**Poppy Family**
Eschscholzia californica	California poppy
Platanaceae	**Plane Tree, Sycamore Family**
*Platanus hybrida**	London planetree
Platanus racemosa	California sycamore (western sycamore)
Polygonaceae	**Buckwheat Family**
Eriogonum fasciculatum	California buckwheat
Eriogonum fasciculatum var. *polifolium*	California buckwheat
Eriogonum sp.	buckwheat
Polygonum lapathifolium	willow weed
*Rumex acetosella**	sheep sorrel

Scientific Name	Common Name
*Rumex crispus**	curly dock
Portulacaceae	**Purslane Family**
Calyptridium monandrum	common pussypaws
Ranunculaceae	**Buttercup Family**
Clematis lasiantha	pipestems (virgin's bower)
Rhamnaceae	**Buckthorn Family**
Ceanothus crassifolius	hoary-leaved ceanothus (thick-leaved ceanothus)
Rhamnus ilicifolia	holly-leaf redberry
Rosaceae	**Rose Family**
Heteromeles arbutifolia	toyon (Christmas-berry, California holly)
Prunus ilicifolia	hollyleaf cherry
Rubiaceae	**Madder Family**
Galium angustifolium	narrow-leaved bedstraw
Galium nuttallii	climbing bedstraw
Salicaceae	**Willow Family**
Populus fremontii	Fremont cottonwood
Salix exigua	narrow-leaved willow (sandbar willow)
Salix gooddingii	black willow (Goodding's black willow)
Salix laevigata	red willow
Scrophulariaceae	**Figwort Family**
Antirrhinum coulterianum	white snapdragon
Keckiella antirrhinoides	yellow bush penstemon (yellow keckiella)
Keckiella cordifolia	heart-leaved bush penstemon
Mimulus aurantiacus	bush monkey flower (sticky monkey flower)
Penstemon centranthifolius	scarlet bugler
Penstemon sp.	penstemon
Scrophularia californica	California figwort (bee plant)
*Veronica anagalis-aquatica**	great water speedwell
Solanaceae	**Nightshade Family**
Datura wrightii	sacred datura (false jimson weed)
*Nicotiana glauca**	tree tobacco
*Solanum nigrum**	black nightshade
Sterculiaceae	**Cacao Family**
Fremontodendron californicum	flannelbush
Tamaricaceae	**Tamarisk Family**
*Tamarix ramosissima**	Mediterranean tamarisk
Urticaceae	**Nettle Family**
Urtica dioica	hoary nettle (stinging nettle)
Angiosperm Monocots	
Arecaceae	**Palm Family**
*Phoenix canariensis**	Canary Island date palm

Scientific Name	Common Name
*Washingtonia filifera**	California fan palm
Cyperaceae	**Sedge Family**
Carex sp.	sedge
*Cyperus involucratus**	umbrella sedge
Scirpus sp.	bulrush
Juncaceae	**Rush Family**
Juncus acutus	spiny rush
Juncus sp.	rush
Liliaceae	**Lily Family**
Bloomeria crocea	golden stars
Agavaceae	**Agave Family**
Yucca whipplei	our lord's candle (chaparral yucca, Spanish bayonet)
Poaceae	**Grass Family**
*Agrostis stolonifera**	creeping bentgrass
*Avena barbata**	slender oat
*Avena fatua**	wild oat
*Bromus diandrus**	ripgut grass
*Bromus hordeaceus**	soft chess (soft brome)
Bromus madritensis ssp. *rubens**	red brome(foxtail chess)
*Bromus tectorum**	cheatgrass (downy brome)
*Cynodon dactylon**	Bermuda grass
Distichlis spicata	salt grass
*Hordeum murinum**	foxtail barely
*Lamarckia aurea**	goldentop
Poa secunda	perennial bluegrass (pine bluegrass)
*Polypogon monspeliensis**	rabbitfoot grass (annual beard grass)
*Schismus barbatus**	a'bu ma shi' (father of the earth)
*Vulpia myuros**	rattail fescue
Typhaceae	**Cattail Family**
Typha angustifolia	narrow-leaved cattail
Legend	
* exotic plant species	

4.4.3 Listed Endangered, Threatened, Candidate and State Rare Plant Species

No plant species listed as endangered, threatened, candidate, or state rare pursuant to the federal or state Endangered Species Act were observed within or adjacent to the Biological Survey Area during the field surveys. However, because of the time of year in which the surveys took place, a habitat assessment was performed for potentially suitable habitat conditions to support listed plant species, especially for annual species that appear above ground in a vegetative stage earlier

or later in the year. As a result of the field surveys and the literature review, it was concluded that one listed plant species has a moderate potential to occur within the Biological Survey Area (Table 4-9):

- thread-leaved brodiaea (threadleaf clusterlily)

4.4.4 Sensitive and Locally Important Plant Species

No plant species designated as sensitive or locally important were observed within or adjacent to the Biological Survey Area during the field surveys. However, because of the time of year in which the surveys took place, a habitat assessment was performed for potentially suitable habitat conditions to support sensitive plant species, especially for annual species that appear above ground in a vegetative stage earlier or later in the year. As a result of the field surveys and the literature review, it was concluded that seven sensitive plant species have a moderate potential to occur within the Biological Survey Area (Table 4-9). These sensitive and locally important plant species are listed below:

- San Bernardino aster
- smooth tarplant
- chaparral ragwort (rayless ragwort)
- mud nama (mud fiddeleaf)
- chaparral sand-verbena
- long-spined spineflower (knotweed spineflower)
- Plummer's mariposa lily

4.5 Wildlife

The plant communities within the Biological Survey Area and the surrounding landscape provide a variety of habitats that support a diverse array of terrestrial wildlife species. Floristic characteristics contribute to the complexity and diversity of the wildlife habitat in the Biological Survey Area and also help support a wildlife community representative of the region. More than 100 species of birds have been observed at Lake Perris. Many are migratory, and stop at the park briefly during their travels, while others make their permanent residence here. Many varieties of waterfowl, shorebirds, and waterbirds use the lake to forage. Many different species of birds, reptiles, and mammals use the open lake, lake shoreline, riparian habitats, coastal sage scrub habitats and the grassland habitats to forage, roost, and breed.

The vegetation communities form the basis of the wildlife habitats of the Biological Survey Area. These habitats provide the primary plant productivity upon which wildlife depends, along with nesting and denning sites, escape and movement cover, and protection from adverse weather. Some species are habitat specific for all their life history requirements, while many wildlife species that occur in the area move freely between plant communities to obtain all their life history needs.

In general, more complex natural communities, with more vegetation layers and more plant species, provide higher value wildlife habitat than less complex vegetation communities. More complex communities have more niches for wildlife and usually support more animal species than less complex communities. Although simple communities may support few wildlife species, they may provide habitat for great numbers of those few species.

4.5.1 Listed, Candidate and Sensitive Wildlife Species Having the Potential to Occur Within the Biological Survey Area

As a result of the literature review and agency consultation, 30 wildlife species listed as endangered, threatened or candidate pursuant to the federal or state Endangered Species Acts were identified as having the potential to occur within the region of the proposed project site. Forty-eight sensitive and locally important wildlife species were identified by the literature review and agency consultation as having the potential to occur within the region of the proposed project site.

Each of the wildlife species mentioned above and listed in Section 3.2.4.2 and Section 3.2.5.2 were assessed for their potential to occur within the Biological Survey Area based on each species' known distributional and elevational ranges. A species was determined to have no potential to occur within the Biological Survey Area if the Biological Survey Area was located outside the species' known distributional range, and/or the species' known elevational range. A number of wildlife species were determined to have no potential to occur within the Biological Survey Area and were therefore eliminated from further evaluation. A complete listing of these species can be found in Appendix A.

Wildlife species determined to have the potential to occur within or adjacent to the Biological Survey Area are presented in Table 4-15, *Listed, Candidate and Sensitive Wildlife Species Having the Potential to Occur within the Biological Survey Area*. Table 4-15 also summarizes conclusions from analysis and field surveys regarding the potential occurrence of listed and sensitive wildlife species within the Biological Survey Area. The table provides the taxonomic and common names of each potentially occurring species, describes each species' status, describes each species' preferred habitat and general distribution, and analyzes the species' potential to occur within the Biological Survey Area.

During the field surveys, the potential for species listed in Table 4-15 to occur was assessed as low, moderate, or high based on the following criteria:

- *Low*: species with a low potential for occurrence are those for which the Biological Survey Area is on the boundary of the known distributional and/or the elevational range of the species, or those for which the Biological Survey Area is within the boundary of the known range of the species and for which suitable habitat in the Biological Survey Area is not known to be used by the species, or for which there are no known recorded occurrences of the species within or adjacent to the Biological Survey Area.

- *Moderate*: species with a moderate potential for occurrence are those for which suitable habitat is present at the Biological Survey Area, the Biological Survey Area is within the

known distributional and elevational range of the species, and one or more surveys did not detect the species. No nearby occurrences of the species are known. Failure to detect the species is not definitive, and may be due to variable effects associated with migration, weather, fire, and/or time of day and year.

- *High*: species with a high potential for occurrence are those for which suitable habitat is present at the Biological Survey Area, the Biological Survey Area is within the known distributional and elevational range of the species, and the species has been observed in similar habitat in the region by a qualified biologist.

A standard in the professional practice of wildlife biology is to conclude species absence in only a few limited instances.

- Where the species known distributional range and historic range is over 25 miles from the Biological Survey Area, with generally unsuitable habitat in between.
- Suitable habitat to support the species is clearly absent.
- Numerous surveys over many years have not detected the species.

In general and outside of these limited cases, even with field surveys, wildlife biologists assess probability of occurrence rather than make definitive conclusions about species presence or absence. Failure to detect the species is not definitive, and may be due to variable effects associated with migration, weather, fire, and/or time of day and year. For example, wildlife species with a moderate potential for occurrence are considered to be those for which suitable habitat is present to support the species, the Biological Survey Area is within the known distributional and elevational range of the species, and one or more surveys did not detect the species.

In general, the time of year was favorable for conducting a wildlife survey. The field survey was conducted during the daytime to maximize the detection of most wildlife. Birds represent the largest component of the fauna, and because most birds are active in the daytime, diurnal surveys maximize the number of observations of this portion of the fauna. In contrast, daytime surveys usually result in few observations of mammals, many of which may only be active at night. In addition, many species of reptiles and amphibians are secretive in their habits and are difficult to observe. Many wildlife species are secretive and nocturnal, such as some reptiles, amphibians and small mammals.

During the field surveys, many species of wildlife that could potentially utilize the Biological Survey Area may not have been present because they occur only on a seasonal basis. Many species are nocturnal, move about a territory, or may have become dormant for the season. A single day survey cannot be used to conclusively determine presence or absence of a species; therefore assessments of presence/absence were made based on the presence suitable habitat to support the species, diagnostic signs (burrows, scat, tracks, vocalizations and nests), known records or occurrence within the area, known distributional and elevational range, and habitat utilization from the relevant literature.

Table 4-15
Listed, Candidate, and Sensitive Wildlife Species
Having the Potential to Occur within the Biological Survey Area

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Listed Endangered, Threatened, and Candidate Wildlife						
Amphibians						
Bufo californicus	arroyo toad	FE, SSC	A toad of sandy riverbanks, streams, washes, and arroyos. Breeds in and near streams. It frequents riparian areas grown to mule fat, willows, cottonwoods, and/or sycamores or coast live oaks in valley-foothill and desert riparian as well as a variety of more arid habitats including desert wash, palm oasis, and Joshua tree, mixed chaparral and sagebrush. It requires shallow (3 -10 inches deep), exposed streamside, quiet water stretches, or overflow pools with silt-free sandy or gravelly bottoms especially favored for breeding. Nearby sandy terraces, dampened in places by capillary action, and with some scattered vegetation providing surface sheltering and burrowing sites and foraging areas.	The arroyo toad is found in the coastal plain, coastal slopes and coastal mountain streams of southern California west of the desert in southern Monterey County (San Antonio River) southward through the Transverse and Peninsular ranges to the Rio Santo Domingo (Baja California, Mexico). They also occupy a few drainages on the desert slopes of the San Gabriel and San Bernardino ranges. Desert populations found along lower Whitewater River in Riverside County and Mojave River in San Bernardino County. Its known elevational range extended from near sea level to 4,600 feet msl in California.	Covered (a, c)	**No potential to occur.** The Biological Survey Area does not contain suitable breeding water and substrate habitats to support this species. It is a toad of sandy riverbanks, streams, washes, and arroyos. Human disturbance and exotic species make presence unlikely. This species is not known to occur within the LPSRA, however it is known from the immediate region.
Birds						
Haliaeetus leucocephalus	bald eagle	SE, Fully Protected (nesting and wintering)	Range-wide, bald eagles occur primarily in or near seacoasts, rivers, wetlands swamps, and large lakes. Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches and nesting sites	Bald eagles breeds mostly in low mountain areas up to 7,000 feet msl in the northern third of the state. Most breeding territories are in northern California, but the eagles also nest in scattered locations in the central and	Covered (a)	**Known to occur seasonally at LPSRA.** The Biological Survey Area provides potential foraging and roosting habitat for this species during winter migration.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			to support them. Perching sites need to be composed of large trees or snags with heavy limbs or broken tops. It roosts communally in winter in dense, sheltered, remote conifer stands. The State's breeding habitats are mainly in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers.	southern Sierra Nevada mountains and foothills, in several locations from the central coast range to inland southern California, and on Santa Catalina Island. They winter throughout California, except in the highest mountains and the driest southern deserts; however it is found along parts of the Colorado River.		Bald eagles are known to use the LPSRA during the winter. The bald eagle is primarily a winter migrant within western Riverside County. Bald eagles have attempted to breed at LPSRA, but were unsuccessful.
Falco peregrinus anatum	American peregrine falcon (nesting)	SE, Fully Protected	Peregrines are found in a large variety of open habitats, including tundra, marshes, seacoasts, savannahs and high mountains. The species breeds mostly in woodland, forest, wetlands, cities, agricultural areas and coastal habitats. Open ledges, caves, and potholes on high, vertical cliffs, generally 100 to 300 feet in height that overlook rivers, lakes, or the ocean provide peregrines with suitable nesting sites.	The range includes most of California, except in deserts, during migrations and in winter. During the breeding season, the birds are most often sighted along the coastline of the entire state, in the Sierra Nevada, and in other mountains of northern California. In winter, found inland throughout the Central Valley, and occasionally on the Channel Islands. Migrants occur along the coast and in the western Sierra Nevada in spring and fall.	Covered (a)	**Present.** Observed during the field surveys by Psomas and known to occur seasonally at LPSRA. The peregrine falcon is primarily a rare spring and fall transient and a casual visitant during other seasons of the year. There are no breeding records documented for the species in the BSA.
Empidonax traillii extimus	southwestern willow flycatcher (nesting)	FE, SE	Southwestern willow flycatchers arrive in southern California in April and adults depart from the breeding territory in mid-August to early September. They utilize riparian woodlands along streams and rivers with mature, dense stands of willows and cottonwoods. Riparian habitat provides both breeding and foraging habitat for the species. They nest from zero to 13 feet above ground in thickets of trees.	It occurs from near sea level to over 8,500 feet msl, but is primarily found in lower elevation riparian habitat in southern California. Breeds in California from the Mexican border north to the Owens Valley, the South Fork Kern River, and Santa Ynez River in Santa Barbara County.	Covered (a)	**Absent.** This species was not observed during the 2007 and 2008 focused SWFL surveys. However, this species has been observed within the LPSRA. The Biological Survey Area contains suitable breeding and foraging riparian woodland habitat to support this species.
Vireo bellii	least Bell's	FE,	Least Bell's vireos primarily occupy	A spring and summer resident of	Covered (a)	**Present.** Observed

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
pusillus	vireo (nesting)	SE	riverine riparian habitats that typically feature dense cover within 1-2 m of the ground and a dense, stratified canopy. Typically it is associated with southern willow scrub, cottonwood-willow forest, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, arroyo willow riparian forest, or mesquite in desert localities. It uses habitat which is limited to the immediate vicinity of water courses. 2,000 feet elevation in the interior.	southern California. The subspecies is currently restricted to southern California south of the Tehachapi Mountains, along the coast and the western edge of the Mojave Desert to northwestern Baja California below 2,000 feet in elevation. Breeding pairs have been observed in the counties of Monterey, San Benito, Inyo, Santa Barbara, San Bernardino, Ventura, Los Angeles, Orange, Riverside, and San Diego.		during the 2007 and 2008 focused LBV field surveys by Psomas and known to occur seasonally at LPSRA. During the focused LBV surveys, this species was observed below the dam and near the proposed project area in the riparian band on the east shore of the lake.
Polioptila californica californica	coastal California gnatcatcher	FT, SSC	A non-migratory, permanent resident of coastal sage scrub habitat, which is a broad category of vegetation. They also use adjacent chaparral, grassland and riparian habitats for foraging.	They are restricted to coastal slopes of southern California from Ventura and western San Bernardino counties south to northern Baja below 1,500 feet msl. May still occur along lower, coastal slopes of San Gabriel and San Bernardino Mountains in Los Angeles and San Bernardino counties, but status is uncertain. Their breeding period is from February to August.	Covered	**Known to occur at LPSRA.** CAGN was not observed during the focused CAGN surveys conducted by Psomas (2007). However, this species has been observed within the LPSRA. Suitable foraging and breeding coastal sage scrub habitat is present within the Biological Survey Area.
Mammals						
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE, SSC	The San Bernardino kangaroo rat typically is found in early to intermediate stage alluvial fan sage scrub along river and stream terraces, and flood plains. Sandy loam substrates allow for the digging of simple, shallow burrows. They require open, sparse shrub vegetation and they actively avoid	The San Bernardino kangaroo rat occurs in scattered, isolated patches of alluvial sage scrub habitat throughout San Bernardino and Riverside counties. The remaining three locations (Santa Ana River, Lytle Creek Wash and Cajon Creek Wash, and San Jacinto River) contain the largest	Covered (c)	**Low potential to occur.** The Biological Survey Area does not contain suitable habitats to support this species.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			rocky substrates and areas with dense vegetation.	extant concentrations of San Bernardino kangaroo rats.		
Dipodomys stephensi	Stephens's kangaroo rat	FE, ST	The Stephens's kangaroo rat is found in open annual and perennial grasslands or sparse shrublands such as coastal sage scrub with cover of less than 50%. They avoid areas with dense grass cover. They require friable soils and avoid rocky soils and they use flatter slopes.	Stephens's kangaroo rat is restricted to the San Jacinto Valley and adjacent areas in western Riverside County and northern-central San Diego County. It is found at elevations ranging from approximately 180 feet msl on Camp Pendleton in San Diego County to 4,100 feet in the Anza Valley.	Covered	**Present.** The Biological Survey Area below the dam contains suitable grassland and coastal sage scrub habitat with suitable soils to support this species. This species is known to occur within the LPSRA.
Sensitive and Locally Important Wildlife						
Amphibians						
Spea hammondii	western spadefoot	SSC	A vernal pool associated species that uses upland areas such as coastal sage scrub, and grasslands habitats for aestivation. They require rain pools/vernal pools in which to reproduce and that persist with more than three weeks for metamorphosis. Pools must lack fish, bullfrogs, and crayfish.	It is a California near endemic ranging from Shasta County southward into Baja California restricted to west of the Sierran-desert range axis. The western spadefoot ranges throughout the Central Valley and adjacent foothills. In the Coast Ranges it is found from Point Conception, Santa Barbara County, south to the Mexican border. Elevations of occurrence extend from near sea level to 4,471 feet in the southern Sierra foothills.	Covered (a)	**Low potential to occur.** The Biological Survey Area does not support vernal pools or other ponding areas that the spadefoot needs in order to reproduce. This species is not known to occur within the LPSRA, but found within the immediate region.
Reptiles						
Actinemys marmorata pallida (=*Emys marmorata pallida*)	southwestern pond turtle	SSC	Inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons. Pools are the preferred habitat within streams. Abundant	Currently, it ranges south of San Francisco Bay to northern Baja California, Mexico.	Covered (a)	**No potential to occur.** Human disturbance and exotic species make presence unlikely. This species is not known to occur within the LPSRA or the immediate region.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			logs, rocks, submerged vegetation, mud, undercut banks, and ledges are necessary habitat components for cover as well as a water depth greater than 2 m.			
Coleonyx variegatus abbotti	San Diego banded gecko	ND	This species is found in granite or rocky outcrops in coastal scrub and chaparral habitats within coastal and cismontane southern California.	In California, this gecko is found in the interior southern coastal region, generally west of the Peninsular Ranges and South of the Transverse Ranges, and north up the coast to Ventura County. It ranges beyond California south into Baja California.	Covered	**Moderate potential to occur.** The Biological Survey Area supports suitable coastal sage scrub with rock outcrops to support this species. This species is not known to occur within the LPSRA; however they are known from immediate region of Moreno Valley and San Jacinto.
Phrynosoma coronatum (*blainvillii* population)	coast (San Diego) horned lizard	SSC	Found in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. In inland areas, this species is restricted to areas with pockets of open microhabitat with loose, fine soils with a high sand fraction; and abundance of native ants.	It ranges from the Transverse Ranges southward to the Mexican border west of the deserts. The known elevation range of this species is from 32 – 6,990 feet msl.	Covered	**Known to occur at LPSRA.** The Biological Survey Area supports habitat to support this species. This species is known to occur within the LPSRA and all over western Riverside County.
Aspidoscelis hyperythra (=*Cnemido-phorus hyperythrus*)	orange-throated whiptail	SSC	This subspecies is found within semi-arid brushy areas typically with loose soil and rocks, including washes, stream sides, rocky hillsides, and coastal chaparral. Habitat types include low elevational chaparral, non-native grassland, coastal sage scrub, juniper woodland and oak woodland. Associations include	Belding's orange-throated whiptail is uncommon to fairly common over much of its range in Orange, Riverside, and San Diego counties. Also occurs in southwestern San Bernardino County near Colton. They extend from near sea level to 3,412 feet msl (northeast of Aguanga, Riverside County).	Covered	**Known to occur at LPSRA.** The Biological Survey Area contains suitable habitats. This species is known to occur within the LPSRA and throughout western Riverside County.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			alluvial fan scrub and riparian areas.			
Aspidoscelis tigris stejnegeri (=*Cnemido-phorus tigris stejnegeri*)	coastal whiptail (coastal western whiptail)	ND	The coastal western whiptail is found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage such as deserts, chaparral and semiarid. Also found in woodland and riparian areas. The western whiptail can be found in open, often rocky areas with little vegetation or sunny microhabitats within shrub or grassland associations. The ground may be firm soil, sandy, or rocky.	This subspecies is found in coastal Southern California, mostly west of the Peninsular Ranges and south of the Transverse Ranges, and north into Ventura County. Ranges south into Baja California.	Covered	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable soils and open, rocky areas with little vegetation or sunny microhabitats within shrub or grassland associations to support this species. This species is known to occur within the LPSRA and all over western Riverside County.
Anniella pulchra pulchra	silvery legless lizard	SSC	This species is common in several habitats. It is found primarily in areas with sandy or loose organic soil or where there is plenty of leaf litter. Usually associated with friable soils with some moisture content and some vegetative cover. They are often found under surface objects.	This California endemic ranges throughout California. It generally occurs west of the desert.	X	**Moderate potential to occur.** The Biological Survey Area contains habitat with leaf litter However this species is not known to occur within the LPSRA, but it is known to occur within the immediate region.
Charina trivirgata roseofusca	coastal rosy boa	ND	The coastal rosy boa inhabits arid and semi-arid shrublands, canyons, and other rocky areas. Appears to be common in riparian areas, but does not require permanent water. It is absent from grasslands. It appears to prefer moderate to dense vegetative cover with rocks. They have been found under rocks, in boulder piles, and along rock outcrops and	The coastal rosy boa occurs in southwestern California to the coastal slopes of the San Gabriel and San Bernardino mountains, and across the Peninsular Ranges into the desert in San Diego County. They only occur west of the desert below approximately 3,937 feet msl in elevation.	X	**Known to occur within the LPSRA.** The Biological Survey Area contains suitable rocky scrub and riparian habitats to support this species. This species is known to occur within the LPSRA and throughout western Riverside County.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			vertical canyon walls.			
Crotalus ruber ruber	northern red-diamond rattlesnake	SSC	It is most commonly associated with heavy brush with large rocks or boulders. They need rodent burrows, cracks in rocks or surface cover objects.	The known range of northern red-diamond rattlesnake extends from Morongo Valley in San Bernardino County southward on both coastal and desert sides of the Peninsular Ranges to Baja California, Mexico. Its known elevational range extends from near sea level to about 5,000 feet msl.	Covered	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable coastal sage scrub and rock habitats to support this species. This species is known to occur within the LPSRA and throughout western Riverside County.
Birds						
Pelacanus erythrorhynchos	American white pelican (nesting colony)	SSC	This species nest sat large freshwater and salt water lakes, usually on small islands or remote dikes. The nest-site must be flat or gently sloping, lacking shrubs or other obstructions that would impede taking flight, free of human disturbance, and usually with loose earth suitable for nest-mounds.	In California, they nest only at large lakes in the Klamath Basin. They are common spring and fall migrants at the Salton Sea, the Colorado River, Morro Bay, and San Diego Bay. Migrant flocks pass overhead almost any month, but mainly in spring and fall throughout the state, especially in southern California.	X	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable foraging lake habitat to support this species during the migration season. This species is known to occur within the LPSRA, but do not nest.
Phalacrocorax auritus	double-crested cormorant (rookery site)	WL	They require lakes, rivers, reservoirs, estuaries, or ocean for foraging. They require undisturbed nest-sites beside the water, on islands or the mainland. Double-crested cormorants nest in tall trees (live or dead), wide rock ledges on cliffs, or rugged slopes near (or in) the aquatic environments. The suitable nest-site must be within 5 -10 miles of a dependable food supply.	A yearlong resident along the entire coast of California and on inland lakes. During August to May, it is fairly common to locally very common along the coast and in estuaries and salt ponds. Rookeries are extremely scarce away from the Salton Sea, the Colorado River, and the Channel Islands.	Covered (a)	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable foraging lake habitat to support this species. This species is known to occur within the LPSRA. They are not known to breed at the LPSRA.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Plegadis chihi	white-faced ibis (rookery site)	WL	Migrant and wintering white-faced ibis may be found foraging in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries.	The white-faced ibis is an uncommon summer resident in sections of southern California. This species no longer breeds regularly anywhere in California except at a few local spots in Riverside County, the Salton Sea, the Central Valley and northeastern California.	Covered (a)	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable foraging lakeshore mudflat habitat to support this species. This species is known to occur within the LPSRA.
Pandion haliaetus	osprey (nesting)	WL	Strictly restricted to ocean shores, bays, freshwater lakes, rivers, large streams, reservoirs, and large waters supporting fish with surrounding or nearby forest habitats.	A common winter species in southern California. Within California, breeding populations reside in the Cascade and Sierra Mountain ranges and along the coast south to Marin County. An uncommon breeder along southern Colorado River. Wintering habitat is found along the California coast south of San Francisco.	Covered (a)	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable lake habitat. As a transient species and potential nesting bird, the osprey has been recorded at LPSRA.
Elanus leucurus	white-tailed kite (nesting)	Fully Protected	The white-tailed kite inhabits low elevation, open grasslands, savannah-like habitats, agricultural areas, wetlands, oak woodlands and riparian areas adjacent to open areas. Open grasslands, meadows, or marshes are used for foraging close to isolated, dense-topped trees for nesting and perching. Substantial groves of dense, broad-leafed deciduous trees are used for cover, nesting and roosting.	In California, the white-tailed kite is a common to uncommon, year-long resident in coastal and valley lowlands. It is found in virtually all lowlands of California west of the Sierra Nevada range and the southeast deserts. It is common in the Central Valley and along the entire California coast.	Covered (a)	**Known to occur at LPSRA.** The Biological Survey Area contains suitable foraging grassland habitat and suitable nesting riparian habitat to support this species. This species is known to occur within the LPSRA as a year long resident.
Circus cyaneus	northern harrier	SSC	Frequents open fresh and saltwater wetlands, grasslands, pastures, upland prairies, dry	In California, it occurs from annual grassland up to lodgepole pine and alpine meadow habitats, as high as	Covered (breeding)	**Present.** Observed during the field surveys by Psomas.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
	(nesting)		uplands, croplands, shrub-steppe, meadows, desert sinks. It uses tall grasses and forbs in wetlands, for cover and it roosts on ground. It is mostly found in flat, open areas of tall, dense grasses, moist or dry shrubs, in the vicinity of marshes, rivers, ponds, or grassy valleys for nesting, cover, and feeding.	10,000 feet msl. It breeds from sea level to 5,700 feet msl in the Central Valley and Sierra Nevada.		The Biological Survey Area contains suitable foraging and nesting grassland habitat to support this species. This species is known to occur within the LPSRA
Accipiter striatus	sharp-shinned hawk (nesting)	WL	Habitats include riparian deciduous, ponderosa pine, black oak, mixed conifer, and Jeffrey pine. The species uses dense near open areas. It roosts in intermediate to high-canopy forest. For nesting they occur in dense tree stands which are cool, moist, well shaded and usually near water. For hunting habitat, they often use openings at the edges of woodlands.	It is a fairly common migrant and winter resident throughout California, except in areas with deep snow.	Covered	**Known to occur at LPSRA.** The Biological Survey Area contains suitable breeding and foraging riparian habitat. This species is known to occur within the LPSRA. It is a common migrant and wintering species within western Riverside County.
Accipiter cooperii	Cooper's hawk (nesting)	WL	The Cooper's hawk breeds primarily in riparian areas and oak woodlands. It frequents landscapes where wooded areas occur in patches and groves. Dense stands with moderate crown-depths are usually used for nesting. They hunt in broken woodland and habitat edges. Within the range in California, it most frequently uses dense stands of live oak, riparian deciduous or other forest habitats near water. They are also found and can breed in suburban and urban settings.	A breeding resident throughout most of the wooded portion of the state. In southern California, the species is present year-round.	Covered (a)	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable breeding and foraging riparian habitat to support this species. This species is known to occur within the LPSRA.
Buteo regalis	ferruginous hawk	WL	Within southern California, ferruginous hawks typically winter	In the winter, ferruginous hawks can be found throughout California,	Covered	**Known to occur seasonally at LPSRA.**

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
	(wintering)		in open fields, grasslands, and agricultural areas. It roosts in open areas, usually in a lone tree or utility pole.	with the exception of the extreme northeastern and northwestern regions. However, they are most common in the southern region of the state. It is migratory; it generally arrives in California in September and departs by mid-April. There are no breeding records from California.		The Biological Survey Area contains suitable foraging and roosting habitat to support this species. It does not breed in southern California.
Aquila chrysaetos	golden eagle (nesting and wintering)	Fully Protected	Golden eagles occur locally in open country, especially in rolling foothills and mountainous regions. Within southern California, the species favors grasslands, brushlands, deserts, oak savannas, open coniferous forests, and montane valleys. Nesting is primarily restricted to rugged, mountainous country.	Within California the distribution, abundance, and seasonality of the golden eagle is described as: uncommon permanent resident and migrant throughout California, except center of Central Valley. It ranges from sea level up to 11,500 feet msl.	Covered	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable foraging open country grassland habitat to support this species. This species is known to occur within the LPSRA, but it is not known to breed there.
Charadrius montanus	mountain plover (wintering)	SSC	Within southern California, the largest numbers of birds occur in short grasslands and agricultural areas in the interior, such as freshly plowed fields, newly sprouting grain fields, and sometimes sod farms. The birds spend about 75 percent of their time on plowed fields, but prefer heavily grazed annual grasslands or burned fields. They prefer short vegetation, bare ground, flat topography, and areas with burrowing rodents.	It does not nest in California. It occurs within the state only during the wintering season. Currently, mountain plovers winter in flocks in the Sacramento and San Joaquin Valleys, in central and south-coastal California, east locally to the southwestern deserts and south to central Mexico.	Covered	**Known to occur seasonally within the LPSRA.** The Biological Survey Area contains suitable foraging short grass habitats and flat topography to support this species.
Athene cunicularia	burrowing owl (burrow sites	SSC	They require large open expanses of sparsely vegetated areas on gently rolling or level terrain with an	It is a year-long resident formerly common throughout the state. In California, burrowing owls are	Covered (c)	**Known to occur at LPSRA.** The Biological Survey Area contains

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
	and some wintering sites)		abundance of active small mammal burrows, most notably the California ground squirrel. As a critical habitat feature need, they require the use of rodent or other burrows for roosting and nesting cover. They may also use pipes, culverts, and nest boxes where burrows are scarce.	restricted to the central valley to San Diego.		suitable habitat and level terrain.
Asio otus	long-eared owl (nesting)	SSC	Breeding habitat generally consists of groves of oaks or riparian woodlands with a closed canopy. Hunting habitat consists of oak and sycamore woodlands. Appears to be more associated with forest edge habitat than open or forest habitat. During breeding, the species uses the hardwood deciduous forests and during the winter season.	Uncommon yearlong resident throughout the state except the Central Valley and southern California deserts where it is an uncommon winter visitor. It apparently makes only local movements in California, although some migration may occur. These may be seasonal movement westward from the Sierra Nevada foothills in fall.	X	**Known to occur seasonally at LPSRA.** The Biological Survey Area contains suitable habitats to support this species. The species has not been reported recently to occur in western Riverside County.
Lanius ludovicianus	loggerhead shrike (nesting)	SSC	The loggerhead shrike prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. It is known to forage over open ground within areas of short vegetation. Individuals like to perch on posts, utility lines and often use the edges of denser habitats.	A common resident and winter visitor in lowlands and foothills throughout California.	Covered	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains habitat to support this species. It occurs as a yearlong resident, in western Riverside County.
Eremophila alpestris actia	California horned lark	WL	A year-long resident within the state and within a variety of open habitats. Within southern California, California horned larks breed primarily in open fields, (short) grasslands, and rangelands. Grasses, shrubs, forbs, rocks, litter, clods of soil, and other surface irregularities provide	The species breeds and resides in the coastal region of California from Sonoma County southeast to the Mexican border.	Covered	**Known to occur at LPSRA.** The Biological Survey Area supports suitable habitat with sparse vegetation. This species is known to occur within the LPSRA. It occurs as a yearlong resident in western

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			cover.			Riverside County.
Progne subis	purple martin (nesting)	SSC	Purple martins inhabit open forests, woodlands, and riparian areas with snags in the breeding season. The birds typically breed in tall sycamores, and other large trees. They are secondary cavity nesters and typically nest in old woodpecker holes usually near a body of water. It forages and nests in riparian areas, forest, and woodlands. Purple martins may be found virtually anywhere in aerial habitat during migration	It is an uncommon to rare, local summer resident in a variety of wooded, low-elevation habitats throughout the state. In the south, it is now only a rare and local breeder on the coast and in interior mountain ranges.	Covered (a)	**Low potential to occur.** The Biological Survey Area contains suitable nesting riparian habitat and foraging grassland habitat to support this species. This species is not known to occur within the LPSRA, but is known to occur in the immediate region.
Campylo-rhynchus brunneicapillus sandiegensis	San Diego cactus wren (coastal cactus wren)	SSC (San Diego and Orange counties)	An obligate, non-migratory resident of the coastal sage scrub plant community. It frequents desert succulent shrub, Joshua tree, and desert wash habitats and other arid terrain with thickets, patches, or tracts of larger, branching cacti, stiff-twigged, thorny shrubs, and small trees. It is closely associated with three species of cacti and occurs almost exclusively in thickets of cholla and prickly pear dominated stands of coastal sage scrub.	The current range of the San Diego cactus wren occurs in cismontane southern California from southern Ventura County, east through coastal Los Angeles County to southwestern San Bernardino County, and south through Orange County, western Riverside County to coastal San Diego County, California and extreme northwestern Baja California, Mexico. Found below 1,500 feet msl in elevation.	Covered	**Known to occur at LPSRA.** The Biological Survey Area does not contain suitable cactus and desert habitat. However this bird is known to exist in the Bernasconi Hills.
Dendroica petechia brewsteri	yellow warbler (nesting)	SSC	Yellow warblers in southern California breed and forage in lowland and foothill riparian woodlands dominated by cottonwoods, sycamores, aspens, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland.	It usually arrives in California in April, and mostly is gone by October. Small numbers regularly overwinter in southern California lowlands. Breeding distribution includes several southern California mountain ranges and throughout most of San Diego County. Winters in Imperial and Colorado River valleys.	Covered (a)	**Known to occur seasonally at LPSRA.** The Biological Survey Area contains suitable nesting and foraging riparian habitat to support this species. This species is known to occur within the LPSRA.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Icteria virens	yellow-breasted chat (nesting)	SSC	In southern California they are found in tall, dense, relatively wide riparian woodlands and thickets of willows with well-developed understories. Nesting areas are associated with streams, swampy ground, and the borders of small ponds. Breeding habitat must be dense to provide shade and concealment.	In southern California, breeds locally on the coast and very locally inland. In migration, may be found in lower elevations of mountains in riparian habitat. It usually arrives in April and departs by late September for the wintering grounds in Mexico and Guatemala.	Covered (a)	**Moderate potential to occur.** The Biological Survey Area contains suitable nesting and foraging riparian habitat. This species is not known to breed within the LPSRA.
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	WL	This species uses grass-covered hillsides, coastal sage scrub, and chaparral and often occur near the edges of the denser scrub and chaparral associations. Optimal habitat consists of sparse, low brush or grass, hilly slopes preferably interspersed with boulders and outcrops. The species may occur on steep grassy slopes without shrubs if rock outcrops are present.	The current range and distribution of this subspecies is extremely restricted to a narrow belt of semiarid coastal sage scrub and sparse chaparral from Santa Barbara south to the northwestern corner of Baja California.	Covered	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable coastal sage scrub and rocky habitat. This species is known to occur within the LPSRA and throughout western Riverside County.
Amphispiza belli belli	Bell's sage sparrow (nesting)	WL	Bell's sage sparrow is a breeder in dry chaparral and coastal sage scrub along the coastal lowlands, inland valleys, and in the lower foothills of local mountains. In transmontane California, it occupies sagebrush, alkali desert scrub, desert scrub, and similar habitats. In cismontane California, it frequents chaparral dominated by chamise, and coastal scrub dominated by sage.	In summer, it is uncommon to common east of the Cascade Range and Sierra Nevada, in foothills bounding the Central Valley, and in the Transverse, Peninsular, and coastal ranges from Trinity County south to the Mexican border. It occurs only locally at montane elevations, mostly in southern California.	Covered	**Known to occur at LPSRA.** The Biological Survey Area contains suitable coastal sage scrub habitat. This species is known to occur throughout western Riverside County.
Agelaius tricolor	tricolored blackbird (nesting	SSC	The tricolored blackbird breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets	Mostly a resident in California. It is common locally throughout the Central Valley and in coastal districts from Sonoma County	Covered (colony)(a)	**Known to occur at LPSRA.** The Biological Survey Area contains suitable nesting marsh

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
	colony)		of willow, blackberry, wild rose, tall herbs and forages in grassland and cropland habitats. Colonies require nearby water, a suitable nesting substrate, and open-range foraging habitat of natural grassland, woodland, or agricultural cropland.	south. It breeds locally west of the Cascade Range, Sierra Nevada, south to extreme southwest San Bernardino County, western Riverside County and western and southern San Diego County.		habitat and suitable foraging grassland habitat. This species is known to breed within the LPSRA. This species is a year long resident in western Riverside County.
Mammals						
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	SSC	It inhabits coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities. It generally exhibits a strong microhabitat affinity for moderately gravelly and rocky substrates. In western Riverside County, the San Diego pocket mouse also commonly is found in disturbed grassland and open sage scrub vegetation with sandy-loam to loam soils.	The northwestern San Diego pocket mouse occurs mainly in arid coastal and desert border areas in western San Diego County, in Riverside County southwest of Palm Springs, in San Bernardino County. Elevational range from sea level to 6,000 feet.	Covered	**Present.** Captured during the Los Angeles pocket mouse trapping surveys and the focused Stephens's kangaroo rat surveys. The Biological Survey Area contains suitable grassland and coastal sage scrub habitat. This species is known to occur within the LPSRA.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	SSC	This species probably inhabits open ground of fine, sandy soils and may utilize these soil types for burrowing. It may be restricted to lower elevation grassland and coastal sage scrub. It probably prefers sparsely vegetated habitats.	The geographic range of Los Angeles Pocket mice is restricted to lower elevation grasslands and coastal sage associations in the Los Angeles Basin, from approximately Burbank and San Fernando (Los Angles County) on the northwest to San Bernardino (San Bernardino County) on the northeast, and Cabazon, Hemet, and Aguanga (Riverside County) on the east and southeast.	Covered (c)	**Present.** Captured during the focused Stephens's kangaroo rat surveys. This species was not captured during the focused LAPM surveys. The Biological Survey Area contains suitable grassland and coastal sage scrub habitat outside of the proposed project area. This species is known to occur within the LPSRA.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Neotoma bryanti intermedia	Bryant's woodrat	SSC	Bryant's woodrat is found in a variety of shrub habitats primarily associated with rock outcroppings, boulders, sage scrub, cactus, or other areas of dense undergrowth. Bryant's woodrats commonly inhabit Joshua tree woodlands, pinyon-juniper woodlands, mixed chaparral, coastal sage scrub, and coastal desert habitats seaward of the coastal mountain ranges. Bryant's woodrat is often associated with coastal sage scrub communities, rocky outcroppings and boulder-covered hillsides in chaparral or oak woodlands, and if present large cactus patches, like the prickly pear cactus.	The subspecies of Bryant's woodrat occurs from Alameda County east of the San Francisco Bay in Central California south along both inner and outer Coast Ranges, the western foothill of southern Sierra Nevada, Transverse, and Peninsular Ranges, as well as coastal southern California into northwester Baja California, at least as far as El Rosario.	Covered	**Present.** Captured during the focused Stephens's kangaroo rat surveys. The Biological Survey Area contains suitable coastal sage scrub habitat and rock outcrops. This species is known to occur within the LPSRA and throughout western Riverside County.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	SSC	The black-tailed jackrabbit is a habitat generalist occurring in open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub. Jackrabbits typically are not found in high grass or dense brush.	San Diego black-tailed jackrabbit occurs only on the coastal side of the southern California mountains. This subspecies has been recorded from northern Baja California through San Diego, Orange, Los Angeles, Riverside, San Bernardino and Ventura Counties.	Covered	**Present.** Observed during the field surveys by Psomas. The Biological Survey Area contains suitable sparse habitat. This species is known to occur within the LPSRA and throughout western Riverside County.
Macrotus californicus	California leaf-nosed bat	SSC	In California, they occupy the low-lying desert areas of southern California. Habitats occupied include desert riparian, desert wash, desert scrub, desert succulent shrub, alkali desert scrub, and palm oasis. Needs rocky, rugged terrain with mines or caves for roosting. Day roosts usually are in deep mine tunnels or caves, occasionally in buildings or	The California leaf-nosed bat is found from Riverside, Imperial, San Diego, and San Bernardino counties south to the Mexican border. Former populations have disappeared from coastal basins, from Los Angeles to San Diego. Desert populations have declined, but this species is only common along the Colorado River. California records are below 2,000	X	**No potential to occur.** The Biological Survey Area does not contain suitable desert habitats to support this species. This species is not known to occur within the LPSRA or within the immediate region.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			bridges. The roost must provide shelter from heat and aridity. Night roosts may be in buildings, mines, bridges, rock shelters, or other sites with overhead protection. These bats often are found in large groups.	feet.		
Eumops perotis californicus	western mastiff bat	SSC	Western mastiff bats are found in a variety of habitats, such as semi-arid to arid habitats but is geomorphically restricted, occurring primarily where there are significant rock features offering suitable roosting habitat. A cliff dwelling species, found under exfoliating rock slabs and rock crevices along cliffs. Western mastiff bats can also be found in similar crevices in large boulders and buildings. When roosting in rock crevices they require a sizable drop from their roost in order to achieve flight. Western mastiff bats prefer deep crevices that are at least 15 or 20 feet above the ground.	In California, they have been recorded from Butte County southward through the southern California coastal basins and the western portions of the southeastern desert region.	X	**Low potential to occur.** The Biological Survey Area contains suitable foraging habitats, but it does not contain suitable roosting rock habitats. This species is not known to occur within the LPSRA, but it is known from the immediate region.
Nyctinomops femorosaccus	pocketed free-tailed bat	SSC	Habitats used include pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis. Pocketed Free-tailed bats are characteristically associated with rocky, desert areas with relatively high cliffs. They generally use crevices in rocks and caves as day-roosts, although they sometimes are found in man-made structures.	The pocketed free-tailed bat is found in Riverside, San Diego, and Imperial counties. This species is rare in California, but is more common in Mexico. May occur in Orange County.	X	**Low potential to occur.** The Biological Survey Area does not contain suitable foraging or roosting desert habitats to support this species. This species is not known to occur within the LPSRA, but it has been observed within the immediate region.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
Lasiurus blossevillii	western red bat	SSC	Prefers edges or habitat mosaics that have trees for roosting and open areas for foraging. Any mix of grassland, shrubs, forests, riparian areas and cropland are suitable. This bat is primarily solitary. It roosts in the foliage of trees. The space beneath the roost must be free of obstacles to allow the bats to drop into flight.	The red bat is locally common in some areas of California, from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts. The winter range includes western lowlands and coastal regions south of San Francisco Bay. There is migration between summer and winter ranges.	X	**Low potential to occur.** The Biological Survey Area does contain suitable foraging and roosting riparian habitat. However, this species is not known to occur within the LPSRA.
Lasiurus xanthinus	western yellow bat	ND	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. This species occurs year-round in California. Roosts in trees. Has been captured roosting under palm trees. Roosts and feeds in, and near, palm oases and riparian habitats. Forages over water and among trees.	The southwestern yellow bat is uncommon in California, known only in Los Angeles and San Bernardino counties south to the Mexican border. This species has been recorded below 2,000 feet msl.	X	**Low potential to occur.** The Biological Survey Area does contain suitable habitat. However, this species is not known to occur within the LPSRA, but it is known from the immediate region.
Corynorhinus townsendii	Townsend's big-eared bat	SSC	Townsend's big-eared bats live in a variety of communities, including coastal conifer and broad-leaf forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Edge is preferred for foraging. Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. May use separate sites for night and day. Maternity roosts are warm. Habitat for Townsend's big-eared bats must include appropriate roosting, maternity, and hibernacula sites free from disturbances by humans.	Townsend's big-eared bat is found throughout California, but the details of its distribution are not well known. This species may be found at any season throughout its range.	X	**Low potential to occur.** The Biological Survey Area does contain suitable foraging habitat, but not suitable roosting habitat. This species is not known to occur within the LPSRA.
Euderma maculatum	spotted bat	SSC	Little is known about the habitat requirements of this solitary	The spotted bat is mostly found in foothills, mountains and desert	X	**Low potential to occur.** The Biological

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			species. It appears to occupy a variety of habitats from dry deserts and grasslands through mixed conifer forests. They forage in a wide variety of habitats and feed over water and along washes, fields, marshes, and openings in coniferous forests. They roost mostly in rock crevices, and occasionally in caves and buildings. Cliffs provide optimal roosting habitat.	regions of southern California. Elevational range extends from below sea level in California to above 10,000 feet msl in New Mexico.		Survey Area contains suitable foraging and roosting habitats. However this species is not known to occur within the LPSRA or within the immediate region of the LPSRA.
Antrozous pallidus	pallid bat	SSC	Uses a wide variety of habitats including deserts, grasslands, shrublands, woodlands, and forests form sea level up through mixed conifer forests. They are most common in deserts, preferring areas of open, dry habitats, with rocky areas for roosting and water nearby. Night roosts may be in more open sites, such as porches and open buildings	The pallid bat is a locally common species of low elevations in California. It occurs throughout California except for the high Sierra Nevada. Local data suggest that this species may be most common at elevations below 6,000 feet msl on both coastal and desert sides.	X	**Low potential to occur.** The Biological Survey Area contains suitable foraging and roosting habitats to support this species; however this species is not known to occur within the LPSRA or within the immediate region of the LPSRA.
Puma concolor	mountain lion	Fully Protected	Mountain lions use many habitats, including desert scrub, chaparral, swamps, and forests. They avoid agricultural areas, flat shrubless desert, and other habitats that lack topographic or vegetative cover. It feeds primarily on mule deer and tends to be found where deer can be obtained. Mountain lions use rocky areas, cliffs, and ledges that provide cover within open woodlands and chaparral, as well as riparian areas that provide protective habitat connections for movement between fragmented	Mountain lions are a widespread, uncommon permanent resident, ranging from sea level to alpine meadows. They are found in nearly all habitats in California that support mule deer populations, except xeric regions of the Mojave and Colorado deserts that do not support mule deer populations and they are excluded from croplands in the Central Valley.	Covered	**Known to occur at LPSRA.** The Biological Survey Area contains suitable habitats to support this species. The LPSRA supports mule deer populations to support the mountain lion.

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence
			core habitat.			
Taxidea taxus	American badger	SSC	Badgers occur from alpine meadows to elevations as low as Death Valley. In California, badgers occupy a diversity of habitats. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground. Badgers are generally associated with dry, open, treeless regions, prairies, parklands, and cold desert areas. They seem to occur primarily in areas of low to moderate slope.	In California, badgers ranged throughout the state except for the humid coastal forests of northwestern California. No current data exist on the status of badger populations in California. The badger's altitudinal range extends from below sea level in Death Valley to over 12,000 feet msl.	X	**Known to occur at LPSRA.** The Biological Survey Area contains suitable open grassland habitats and ground squirrel populations to support this species.

Legend

Federal Status

FE = federally endangered: any species, subspecies, or variety of plant or animal that is in danger of extinction throughout all or a significant portion of their range. Species become officially listed as endangered and receive explicit protection under the Federal Endangered Species Act (ESA) upon publication of final rule for listing in the Federal Register.

FT = federally threatened: any species, subspecies, or variety of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future. Once listed in the Federal Register, threatened species receive discretionary protection under the Endangered Species Act.

California State Status

SE = California state endangered: any species, subspecies, or variety of plant or animal that are in serious danger of becoming extinct throughout all, or a significant portion, of their range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

ST = California state threatened: any species, subspecies, or variety of plant or animal that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

SSC = species of special concern status applies to animals not listed under the federal Endangered Species Act or the California Endangered Species Act, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist. The CDFG has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long term viability. Not all "Species of Special Concern" have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing as a "Threatened" or "Endangered" species under the State and/or Federal Endangered Species Acts.

fully protected: animal species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. Fish and Game Code.

WL = CDFG watch list. This list includes taxa that are not on the current special concern list that (1) formerly were on the prioritized 1978 or unprioritized 1992 special

Scientific Name	Common Name	Status	General Habitat Description	General Distribution	Western Riverside County MSHCP	Potential For Occurrence

concern lists and are not currently listed as state threatened and endangered, (2) have been removed (delisted) from either the state or federal threatened and endangered lists (and remain on neither), or (3) are currently designated as "fully protected" in California.

Other
ND = no designation

Western Riverside County MSHCP
Covered: No further surveys are required.
Covered (a): Surveys may be required for these species as part of wetlands mapping (Section 6.1.2 of MSHCP).
Covered (c): Surveys may be required for this species within locations shown on survey maps (Section 6.3.2 of MSHCP)
X Not covered by the MSHCP, but identified by the CNDDB and other literature.

Sources for Table 4-15:

- California Natural Diversity Database (CDFG 2008a, 2007a).
- Special Animals List (CDFG 2008c).
- State and Federally Listed Endangered and Threatened Animals of California (CDFG 2008d).
- Species Accounts from CDFG website (CDFG 2008b, 2007b).
- *A Field Guide to Western Reptiles and Amphibians*, 3rd ed. (Stebbins 2003).
- California Reptiles and Amphibians (CaliforniaHerps.com website 2008, 2007).
- *Field Guide to the Birds of North America*, 4th Ed. (National Geographic Society 2002).
- *Reference Atlas to the Birds of North America* (National Geographic Society 2003).
- *Complete Birds of North America* (National Geographic Society 2006).
- *Lives of North American Birds* (Kaufman 1996).
- *The Sibley Field Guide to Birds of Western North America* (Sibley 2003).
- *Hawks of North America* (Clark, W. and B. Wheeler 2001).
- *Mammals of California* (Eder 2005).
- *Mammals of North America* (Kays et. al. 2002).
- *The Smithsonian Book of North American Mammals* (Wilson, D. and S. Ruff 1999).
- *California Mammals* (Jameson, E., and H Peeters 1988).
- *Life on the Edge: A Guide to California's Endangered Natural Resources. Wildlife* (Thelander 1994).
- Understanding the Plants and Animals of Western Riverside County MSHCP) (Dudek and Associates 2003).

4.5.2 *Wildlife Species Observed During the Field Surveys*

The wildlife species observed and detected during the field surveys are common in the surrounding areas. A complete list of wildlife species observed by Psomas within the Biological Survey Area during the field surveys is provided in Table 4-16, *Wildlife Species Observed during the Field Surveys*.

Table 4-16
Wildlife Species Observed During the Field Surveys

Scientific Name	Common Name
Amphibians	
Bufo boreas (Anaxyrus boreas)	western toad
Pseudacris regilla	Pacific treefrog
Reptiles	
Trachemys scripta elegans	red-eared slider
Sceloporus orcutti	granite spiny lizard
Sceloporus occidentalis	western fence lizard
Uta stansburiana	common side-blotched lizard
Aspidoscelis tigris stejnegeri	coastal whiptail (coastal western whiptail)
Masticophis flagellum piceus	red racer (red coachwhip)
Masticophis lateralis	striped racer (California whipsnake)
Lampropeltis getula	common kingsnake
Crotalus ruber ruber	northern red-diamond rattlesnake *
Crotalus oreganus	western rattlesnake
Birds	
Anas americana	American wigeon
Anas platyrhynchos	mallard
Oxyura jamaicensis	ruddy duck
Phasianus colchicus	ring-necked pheasant
Callipepla californica	California quail
Podilymbus podiceps	pied-billed grebe
Aechmophorus occidentalis	western grebe
Pelecanus erythrorhynchos	American white pelican *
Phalacrocorax auritus	double-crested cormorant
Ardea herodias	great blue heron
Ardea alba	great egret
Egretta thula	snowy egret
Nycticorax nycticorax	black-crowned night-heron

Scientific Name	Common Name
Plegadis chihi	white-faced ibis
Cathartes aura	turkey vulture
Pandion haliaetus	osprey
Circus cyaneus	northern harrier *
Accipiter cooperii	Cooper's hawk
Buteo lineatus	red-shouldered hawk
Buteo jamaicensis	red-tailed hawk
Falco sparverius	American kestrel
Falco peregrinus anatum	American peregrine falcon (SE, FP)
Fulica americana	American coot
Charadrius vociferus	killdeer
Himantopus mexicanus	black-necked stilt
Recurvirostra americana	American avocet
Limnodromus sp.	dowitcher
Larus occidentalis	western gull
Hydroprogne caspia	Caspian tern
Sterna forsteri	Forster's tern
Columba livia	rock pigeon
Zenaida macroura	mourning dove
Geococcyx californianus	greater roadrunner
Bubo virginianus	great horned owl
Aeronautes saxatalis	white-throated swift
Calypte anna	Anna's hummingbird
Megaceryle alcyon	belted kingfisher
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	downy woodpecker
Colaptes auratus	northern flicker
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Myiarchus cinerascens	ash-throated flycatcher
Tyrannus vociferans	Cassin's kingbird
Tyrannus verticalis	western kingbird
Lanius ludovicianus	loggerhead shrike *
Vireo bellii pusillus	least Bells' vireo (FE, SE)
Aphelocoma californica	western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Tachycineta thalassina	violet-green swallow
Stelgidopteryx serripennis	northern rough-winged swallow
Petrochelidon pyrrhonota	cliff swallow
Hirundo rustica	barn swallow

Scientific Name	Common Name
Psaltriparus minimus	bushtit
Salpinctes obsoletus	rock wren
Catherpes mexicanus	canyon wren
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
Polioptila caerulea	blue-gray gnatcatcher
Chamaea fasciata	wrentit
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
Sturnus vulgaris	European starling
Phainopepla nitens	phainopepla
Dendroica coronata	yellow-rumped warbler
Dendroica occidentalis	hermit warbler
Geothlypis trichas	common yellowthroat
Wilsonia pusilla	Wilson's warbler
Piranga ludoviciana	western tanager
Pipilo maculatus	spotted towhee
Pipilo crissalis	California towhee
Aimophila ruficeps canescens	southern California rufous-crowned sparrow
Melospiza melodia	song sparrow
Zonotrichia leucophrys	white-crowned sparrow
Junco hyemalis	dark-eyed junco
Pheucticus melanocephalus	black-headed grosbeak
Passerina caerulea	blue grosbeak
Agelaius phoeniceus	red-winged blackbird
Sturnella neglecta	western meadowlark
Xanthocephalus xanthocephalus	yellow-headed blackbird *
Molothrus ater	brown-headed cowbird
Icterus bullockii	Bullock's oriole
Carpodacus mexicanus	house finch
Carduelis psaltria	lesser goldfinch
Carduelis lawrencei	Lawrence's goldfinch
Carduelis tristis	American goldfinch
Passer domesticus	house sparrow
Mammals	
Spermophilus beecheyi	California ground squirrel
Dipodomys simulans	San Diego kangaroo rat (Dulzura kangaroo rat)
Dipodomys stephensi	Stephens's kangaroo rat (FE, ST)
Chaetodipus fallax fallax	northwestern San Diego pocket mouse *
Perognathus longimembris brevinasus	Los Angeles pocket mouse *

Scientific Name	Common Name
Thomomys bottae	Botta's pocket gopher
Neotoma bryanti intermedia	Bryant's woodrat *
Peromyscus boylii	brush mouse
Peromyscus maniculatus	deer mouse (North American deermouse)
Lepus californicus bennettii	San Diego black-tailed jackrabbit *
Sylvilagus audubonii	Audubon's cottontail (desert cottontail)
Pipistrellus hesperus	western pipistrelle
Canis latrans	coyote
Mephitis mephitis	striped skunk
Procyon lotor	northern raccoon
Odocoileus hemionus	mule deer (black-tailed deer)
Legend	
FE: federally endangered **FP:** federally protected **SE:** state endangered **ST:** state threatened ***** species of special concern	

4.5.3 Listed Endangered, Threatened and Candidate Wildlife Species

Three wildlife species listed as endangered pursuant to the federal and state Endangered Species Acts, were observed within the Biological Survey Area during the field surveys by Psomas. These species are listed below:

- American peregrine falcon (non-breeding migrant)
- least Bell's vireo (breeding migrant)
- Stephens's kangaroo rat (resident)

No other wildlife species listed as endangered, threatened or candidate pursuant to the federal or state Endangered Species Acts were observed within the Biological Survey Area during the field surveys. While none of these listed endangered, threatened, or candidate wildlife species were observed during the field surveys, potentially suitable habitat is also present for some of the listed endangered, threatened, or candidate wildlife species in Table 4-11.

During the field surveys, many species of wildlife that could potentially utilize the Biological Survey Area may not have been present because they occur only on a seasonal basis. Many species are nocturnal, move about a territory, or may have become dormant for the season. There are a number of other listed wildlife species that were not observed during the field surveys, but are known to occur within the LPSRA, and therefore; potentially within the Biological Survey Area. These listed wildlife species could be residents or migrants and are listed below:

- bald eagle (non-breeding migrant)
- southwestern willow flycatcher (breeding migrant)
- coastal California gnatcatcher (breeding resident)

Appendix B, *Lake Perris Wildlife Species Accounts*, has detailed species accounts for those listed wildlife species that were observed within the Biological Survey Area by Psomas during the field surveys. Appendix B also has detailed species accounts for those listed wildlife species that are known to occur within the LPSRA.

4.5.4 Southwestern Willow Flycatcher

Surveys for the southwestern willow flycatcher were conducted following protocol approved by the USFWS. Psomas subconsulting biologist, Mr. John Konecny (10(a) permit number TE837308-4, and a CDFG MOU), conducted the surveys. Five focused southwestern willow flycatcher surveys were conducted between May 31 and July 11 of 2007 and 2008 in two areas in the Biological Survey Area: within the southern willow woodland and scrub along the eastern lakeshore and the southern willow woodland and scrub immediately west and below the dam. Conducting surveys in May and early June allowed the biologist to look for flycatchers when they are most vocal. Conducting surveys in late June and July allowed the biologists verify if flycatchers are nesting. See Appendix C, *2007 and 2008 Results of a Focused Survey for the Southwestern Willow Flycatcher at the Lake Perris State Recreational Area, Riverside County, California*.

4.5.4.1 Results of the 2007 Focused Southwestern Willow Flycatcher Surveys

No southwestern willow flycatchers were detected within the Biological Survey Area or within the LPSRA during the 2007 focused southwestern willow flycatcher surveys or any other surveys conducted in 2007. However, this species has been observed within the LPSRA in the past. The Biological Survey Area contains suitable breeding and foraging riparian woodland habitat to support this species. A minimum of one least Bell's vireo was detected in the east end of the survey area during these surveys. No other federal or state listed endangered or threatened wildlife species were detected during these surveys.

Suitable breeding riparian willow habitat for the flycatcher is present within the Biological Survey Area, and it is encouraging that least Bell's vireos are present. Because of the xeric conditions, it may be that 2007 was not a climatically favorable year for the species. Brown-headed cowbirds (*Molothrus ater*), documented nest parasites of the flycatcher, were detected in the Biological Survey Area as well. With environmentally sensitive management of the willow riparian habitat in the LPSRA, which may need to include brown-headed cowbird trapping; and habitat recovery and enhancement, it is possible that southwester willow flycatchers will someday colonize this area.

4.5.4.2 Results of the 2008 Focused Southwestern Willow Flycatcher Surveys

No southwestern willow flycatchers were detected within the Biological Survey Area or within the LPSRA during the 2008 focused southwestern willow flycatcher surveys or any other surveys conducted in 2008. However, a minimum of four least Bell's vireo territories were detected in the survey area. Three of these territories were located in the eastern section of the survey area, and one was located in the southern willow woodland below the dam. No other federal or state listed endangered or threatened species were detected.

The habitat requirements of the flycatcher are not as well understood as those of the vireo. Suitable willow habitat for the flycatcher is present within the area, and it is encouraging that Bell's vireos are present. Because of the xeric conditions, it may be that 2008 was not a climatically favorable year for the species. Brown-headed cowbirds, documented nest parasites of the flycatcher were detected in the area as well. With environmentally sensitive management of the willow riparian habitat in the LPSRA, which may need to include habitat recovery and enhancement, it is possible that flycatchers will someday colonize this area. It is recommended that brown-headed cowbird trapping be continued.

4.5.4.3 Occurrence within Western Riverside County

According to the MSHCP database, the southwestern willow flycatcher is sparsely located from the Prado Basin southeast to the Vail Lake region. It may also be located within Temescal Creek, Bautista Creek, Diamond Valley Reservoir area, and Vail Lake. Geographic locations include: Lake Perris, Hemet Lake, Lake Elsinore, Santa Rosa Plateau East, Vail Lake, Bautista Creek, Santa Ana River, Temecula Creek, Temescal Wash, Lake Mathews, Lake Skinner, Murrieta Creek, and Prado Park.

4.5.5 Least Bell's Vireo

The 2007 focused least Bell's vireo surveys were conducted following a modification of the federal Least Bell's Vireo Survey Guidelines (USFWS 2001). The modification was recommended by USFWS. In 2007, nine focused least Bell's vireo surveys were conducted between May 31 and July 26, 2007. Surveys were conducted in two areas in the Biological Survey Area: within the southern willow woodland and scrub along the eastern lakeshore and the southern willow woodland and scrub immediately west and below the dam.

The 2008 focused least Bell's vireo surveys were conducted following the federal Least Bell's Vireo Survey Guidelines (USFWS 2001). In 2008 sixteen focused least Bell's vireo surveys were conducted between April 17 and July 18, 2008. Surveys were conducted in two areas in the Biological Survey Area: within the southern willow woodland and scrub along the eastern lakeshore and the southern willow woodland and scrub immediately west and below the dam. The purpose of these surveys was to determine the presence/absence of least Bell's vireos within the Biological Survey Area.

4.5.5.1 Results of the 2007 Focused Least Bell's Vireo Surveys

Least Bell's vireos were detected within the Biological Survey Area a total of six times during the 2007 least Bell's vireo focused surveys. One least Bell's vireo was detected during the focused southwestern willow flycatcher surveys. Singing males were detected; however nests were not located. Although no nests were located and no fledglings were observed or detected, least Bell's vireo is believed to breed in Biological Survey Area due to the repeated observations of singing males during the breeding season. No banded individuals were observed during surveys. Based on the locations of the least Bell's vireo detections, there are a minimum of three least Bell's vireo territories in 2007: two in the southern willow woodland and scrub along the eastern lakeshore and one in the southern willow woodland and scrub immediately west of and below the dam (Figure 9, *2007 and 2008 Least Bell's Vireo Observations*).

4.5.5.2 Results of the 2008 Focused Least Bell's Vireo Surveys

Least Bell's vireos were detected within the Biological Survey Area a total of twelve times during the 2008 least Bell's vireo focused surveys. Singing males were detected; however nests were not located. Although no nests were located and no fledglings were observed or detected, least Bell's vireo is believed to breed in Biological Survey Area due to the repeated observations of singing males during the breeding season. No banded individuals were observed during surveys. Based on the locations of the least Bell's vireo detections, there are a minimum of four LBV territories in 2008: two in the southern willow scrub along the eastern lakeshore and two in the southern willow scrub immediately west of and below the dam (Figure 9).

4.5.5.3 Occurrence within Western Riverside County

According to the MSHCP database, the least Bell's vireo population in the Prado Basin (approximately 25 miles west of the Biological Survey Area) and contiguous (upstream and downstream) reaches of the Santa Ana River is the second largest population of this endangered species. Other observations of the species in the area and environs have occurred along Chino Creek, Temescal Wash, San Timoteo Creek, Alberhill Creek, Tucalota Creek, Murrieta and Temecula Creeks, along Wilson Creek, March Air Force Base, and in the vicinity of De Luz. Additional localities include the Santa Margarita River and Potrero Creek.

The key population areas include the Prado Basin as identified above. Other geographic locations that may serve as localized, yet important, populations of least Bell's vireo include: LPSRA, Alberhill, Lake Elsinore, Lake Mathews, March Air Reserve Base, Murrieta, Murrieta Hot Springs, Reche Canyon, Santa Rosa Plateau East, Vail Lake, Woodcrest, Bautista Creek, Cajalco Creek, Dawson Canyon, Murrieta Creek, Potrero, San Jacinto River, San Timoteo Creek, Santa Ana River, Santa Margarita River, Temecula Creek, Temescal Wash, Tucalota Creek, Wilson Creek, Lake Mathews Reserve, Lake Skinner Reserve, Santa Margarita Ecological Reserve, and Santa Ana River Regional Park.

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Biological Resource Evaluation of the Lake Perris Dam Remediation Project

Legend

- Biological Survey Area
- 2007 Least Bell's Vireo Observation Locations
- 2008 Least Bell's Vireo Observation Locations

N
W E
S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

2007 and 2008 Least Bell's Vireo Observations

PSOMAS

Figure 9

4.5.6 Coastal California Gnatcatcher

The 2007 coastal California gnatcatcher surveys were conducted pursuant to federal survey guidelines for non-breeding season surveys. The 2008 coastal California gnatcatcher surveys were conducted pursuant to federal survey guidelines for breeding season surveys. A total of nine protocol non-breeding season surveys were conducted at least two weeks apart from July 5 to November 8, 2007. Two additional opportunistic surveys were conducted on July 12 and July 26, 2007. In 2008, a total of six protocol breeding season surveys were conducted at least one week apart from April 17 to May 23, 2008. Surveys were conducted within areas that contained suitable coastal sage scrub habitat in the Biological Survey Area that may be impacted by the proposed project.

4.5.6.1 Results of the 2007 Focused Coastal California Gnatcatcher Surveys

No coastal California gnatcatchers were detected during the 2007 focused coastal California gnatcatcher surveys; however suitable Riversidean coastal sage scrub occurs throughout the Biological Survey Area and the LPSRA to potentially support this species. Coastal California gnatcatchers are also known to exist on the other side of the Bernasconi Hills.

4.5.6.2 Results of the 2008 Focused Coastal California Gnatcatcher Surveys

No coastal California gnatcatchers were detected during the 2008 focused coastal California gnatcatcher surveys; however suitable Riversidean coastal sage scrub occurs throughout the Biological Survey Area and the LPSRA to potentially support this species. Coastal California gnatcatchers are also known to exist on the other side of the Bernasconi Hills.

4.5.6.3 Occurrence within Western Riverside County

According to the MSHCP database, the coastal California gnatcatcher is found throughout western Riverside County in coastal sage scrub habitat. It is known to occur within the Bernasconi Hills located within the LPSRA.

4.5.7 Stephens's Kangaroo Rat

The habitat assessment and live-trapping surveys were performed by Dr. Phil Brylski (permit # TE14855-0), assisted by Mr. Steven Montgomery (permit # TE745541-8) and Psomas Senior Biologist Mr. Gregg Miller (permit # TE834488-5). The Stephens's kangaroo rat surveys were conducted following protocols in federal Stephens's kangaroo rat permit conditions. The purposes of the Stephens's kangaroo rat surveys were to determine the presence or absence of Stephens's kangaroo rat in potential habitat in the proposed project site and in adjacent areas where Stephens's kangaroo rat had been previously observed, and to obtain information on the occurrence of other small mammal species. Trapping was conducted during suitable weather conditions from June 15 to June 20, 2008. The complete reporting of 2008 Stephens's kangaroo rat surveys is included in Appendix D, *2008 Stephens's Kangaroo Rat Survey for the Lake Perris Dam Remediation Project.*

4.5.7.1 Results of the 2008 Focused Stephens's Kangaroo Rat Surveys

Eight species of small mammal were captured during the focused Stephens's kangaroo rat surveys. Of the eight species captured, one species is listed and three species are sensitive. These species include:

Listed Species

- Stephens's kangaroo rat

Sensitive Species

- northwestern San Diego pocket mouse
- Los Angeles pocket mouse
- Bryant's woodrat (*Neotoma bryanti intermedia*, formerly San Diego desert woodrat [*Neotoma lepida imtermedia*], see Patton, Huckaby, and Alvarez-Castaneda, 2008)

No Status Species

- deer mouse (*Peromyscus maniculatis*)
- Dulzura kangaroo rat (*Dipodomys simulans*)
- California ground squirrel (*Spermophilus beecheyi*)
- Audubon's cottontail (*Sylvilagus audubonii*)

The survey trapping results are shown in Table 4-17, *Small Mammal Capture Summary*.

Table 4-17
Small Mammal Capture Summary

Trap-line	SKR	DKR	LAPM	CHFA	PEMA	NEBI	SPBE	SYAU
1	0	0	10	16	1	0	0	2
2	0	0	10	12	2	0	0	0
3	0	0	18	2	5	0	0	0
4	0	4	21	12	2	0	0	0
5	0	0	24	3	8	1	0	0
6	0	4	10	8	1	0	0	0
7	2	0	0	2	0	0	0	0
8	3	0	0	0	0	0	0	0
9	1	0	0	0	0	0	0	0
10	0	0	1	3	1	0	0	0
11	0	0	0	1	4	0	1	0
Totals	**6**	**8**	**94**	**59**	**24**	**1**	**1**	**2**

Legend	
SKR	Stephens's kangaroo rat (*Dipodomys stephensi*)
DKR	Dulzura kangaroo rat (*Dipodomys simulans*)
LAPM	Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)
CHFA	northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)
PEMA	deer mouse (*Peromyscus maniculatis*)
NEBI	Bryant's woodrat (*Neotoma bryanti intermedia*)
SPBE	California ground squirrel (*Spermophilus beecheyi*)
SYAU	Audubon cottontail (*Sylvilagus audubonii*)

Stephens's kangaroo rat were captured a total of six times during the focused trapping surveys. Although captured individuals were not marked, all Stephens's kangaroo rat captures occurred during the first night of the trapping period and thus represent six individuals. Stephens's kangaroo rat was captured at Trapline 7, Trapline 8, and Trapline 9 on the first night of trapping these locations, and the traps at these locations were closed after the captures on the first day. Stephens's kangaroo rat capture information is shown in Table 4-18, *Stephen's Kangaroo Rat Capture Information*.

Table 4-18
Stephens's Kangaroo Rat Capture Information

Capture Number	Date	Trapline	Age	Sex
SKR 1	June 16	T7	adult	male
SKR 2	June 16	T7	adult	male
SKR 3	June 16	T8	adult	female
SKR 4	June 16	T8	adult	female
SKR 5	June 16	T8	adult	male
SKR 6	June 16	T9	adult	male

These sites where Stephens's kangaroo rat were captured are outside of the direct impact zone of the proposed project, and were trapped in part to determine whether Stephens's kangaroo rat were still present on or around the grid locations where they had been previously found. The capture locations are shown on Figure 10, *Stephens's Kangaroo Rat Captures*. The three areas where Stephens's kangaroo rat were captured: Trapline 7, Trapline 8, and Trapline 9, are areas of sparse non-native grassland where the dominant plant species is filaree (*Erodium* sp.), parts of which have exposed soil. One of these sites (Trapline 9) was located on the grid of a previous trapping effort that yielded Stephens's kangaroo rat captures, in the northeastern part of the study area (RCA 2007a). The other two (Trapline 7 and Trapline 8) are located in the western part of the study area in the vicinity of another grid where the previous survey yielded Stephens's kangaroo rat captures.

Los Angeles pocket mouse were captured a total of 94 times, and the capture locations are shown on Figure 11, *Sensitive Mammal Captures*. Los Angeles pocket mouse was captured both inside and outside the proposed project boundaries. Los Angeles pocket mouse is designated by CDFG as a species of special concern

The northwestern San Diego pocket mouse was captured a total of 59 times are shown on Figure 11. This species is designated by CDFG as a species of special concern.

Bryant's woodrat was captured only one time during the trapping nights is shown on Figure 11. This species is designated by CDFG as a species of special concern.

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Legend

- 2008 Stephens's Kangaroo Rat Captures

N
W E
S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

Stephens's Kangaroo Rat Captures

PSOMAS

Figure 10

Legend

- Northwestern San Diego Pocket Mouse
- Bryant's Woodrat
- Los Angeles Pocket Mouse

N W E S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

Sensitive Mammal Captures

PSOMAS

Figure 11

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4.5.7.2 Occurrence within Western Riverside County

The Stephens's kangaroo rat occurs in patchy distributions in western Riverside County, ranging from the Corona/Norco Hills just west of Highway 91, to the Badlands in the north. According to the MSHCP database, the largest and key populations of the Stephens's kangaroo rats are known and are centered within the larger core reserves in western Riverside County: San Jacinto Wildlife Area-Lake Perris Reserve, Lake Skinner-Domenigoni Valley Reserve, Lake Mathews-Estelle Mountain Reserve, Motte-Rimrock Reserve, Sycamore Canyon-March Air Reserve Base Reserve, Steele Peak, Kabian Park, Anza/Cahuilla valleys, Potrero/Badlands area, and patches scattered throughout Wilson Creek, Sage, and Aguanga areas.

In 1996, the estimated acreage of occupied habitat in Riverside County was approximately 34,450 acres. Main populations occur in the larger core reserves for the kangaroo rat; Lake Mathews-Estelle Mountain core reserve (approximately 4,264 occupied acres), Lake Skinner-Domenigoni Valley core reserve (approximately 1,988 occupied acres), and San Jacinto-Lake Perris core reserve (approximately 3,640 occupied acres). Smaller populations occur in the other core reserves; Sycamore Canyon-March Air Reserve Base core reserve (approximately 1,300 occupied acres), Steele Peak core reserve (approximately 860 occupied acres), and Motte-Rimrock core reserve (approximately 335 occupied acres). Approximately 12,400 acres of occupied Stephens's kangaroo rat habitat are contained in these six core reserves. Other areas supporting substantial occupied habitat include the Anza/Cahuilla valleys (1,000+ acres) and Potrero (approximately 1,332 acres). It is estimated that another 3,400 acres of occupied habitat occur in the western County outside of the Stephens's kangaroo rat HCP area.

4.5.8 Sensitive and Locally Important Wildlife Species

Sixteen sensitive wildlife species were observed within the Biological Survey Area during the field surveys by Psomas. These sensitive and locally important wildlife species could be residents or migrants and are listed below:

- coastal whiptail (coastal western whiptail) (resident)
- northern red-diamond rattlesnake (resident)
- American white pelican (non-breeding migrant)
- double-crested cormorant (non-breeding resident)
- white-faced ibis (non-breeding migrant)
- osprey (potential breeding resident)
- northern harrier (breeding resident)
- Cooper's hawk (breeding resident)
- golden eagle (non-breeding resident)
- loggerhead shrike (breeding resident)
- southern California rufous-crowned sparrow (breeding resident)
- yellow-headed blackbird (breeding migrant)
- northwestern San Diego pocket mouse (resident)
- Los Angeles pocket mouse (resident) (resident)
- Bryant's woodrat (resident)

- San Diego black-tailed jackrabbit (resident)

During the field surveys, many species of wildlife that could potentially utilize the Biological Survey Area may not have been present because they occur only on a seasonal basis. Many species are nocturnal, move about a territory, or may have become dormant for the season. There are a number of other sensitive wildlife species that were not observed during the field surveys, but are known to occur within the LPSRA. These species have been observed within the LPSRA by other biologists in the region and by LPSRA staff. These sensitive and locally important wildlife species could be residents or migrants and are listed below:

- coast (San Diego) horned lizard (resident)
- orange-throated whiptail (resident)
- coastal rosy boa (resident)
- white-tailed kite (breeding resident)
- sharp-shinned hawk (breeding resident)
- ferruginous hawk (non-breeding migrant)
- mountain plover (non-breeding migrant)
- burrowing owl (breeding resident)
- long-eared owl (non-breeding migrant)
- California horned lark (breeding resident)
- San Diego cactus wren (coastal cactus wren) (breeding resident)
- yellow warbler (breeding migrant)
- Bell's sage sparrow (breeding resident)
- tricolored blackbird (non-breeding resident)
- mountain lion (resident)
- American badger (resident)

Appendix B has detailed species accounts for those sensitive and locally important wildlife species that were observed within the Biological Survey Area by Psomas during the field surveys. Appendix B also has detailed species accounts for those sensitive and locally important wildlife species that are known to occur within the LPSRA.

As a result of the wildlife field surveys and literature review, it was concluded that three sensitive wildlife species have a moderate potential to occur within Biological Survey Area, either as residents or migrants (Table 4-11). These sensitive wildlife species are listed below:

- San Diego banded gecko (resident)
- purple martin (breeding migrant)
- yellow-breasted chat (breeding migrant)

4.5.9 Los Angeles Pocket Mouse

The purpose of the focused field surveys was to determine whether the Los Angeles pocket mouse occurs or could potentially occur on the proposed project site. Trapping surveys were conducted following standard protocols for small mammals. The protocol calls for five

consecutive nights of trapping conducted when the animals are active aboveground at night and preferably during a new moon phase. Five consecutive nights of trapping were conducted between September 25 and September 29, 2007. Psomas subconsulting biologist, Ms. Karen Kirtland, conducted the surveys, with assistance from Psomas biologists (Dr. Brad Blood and Ms. Alicia Williams). See Appendix E, *2007 Presence/Absence Trapping Studies, Sensitive Small Mammal Species, Lake Perris Improvement Project, Perris, California*.

4.5.9.1 Results of the 2007 Focused Los Angeles Pocket Mouse Surveys

No Los Angles pocket mouse or other listed mammals were captured or observed during trapping surveys. The San Diego kangaroo rat (Dulzura kangaroo rat), brush mouse (*Peromyscus boylii*), deer mouse and the northwestern San Diego pocket mouse were the only mammal species captured during the surveys (Table 4-19, *2007 Focused Los Angeles Pocket Mouse Survey Trapping Results*). One California towhee (*Pipilo crissalis*) was captured during the trapping and one San Diego black-tailed jackrabbit was observed visually during the surveys. The northwestern San Diego pocket mouse and the San Diego black-tailed jackrabbit are a species of special concern.

Table 4-19
2007 Focused Los Angeles Pocket Mouse Survey Trapping Results

Number of Trap Nights	Deer Mouse *(Peromyscus maniculatus)*	Brush Mouse *(Peromyscus boylii)*	San Diego Kangaroo rat (Dulzura Kangaroo Rat) *(Dipodomys simulans)*	Northwestern San Diego Pocket Mouse *(Chaetodipus fallax fallax)*	California Towhee *(Pipilo crissali)*
240	4	2	5	0	0
200	15	17	4	0	1
200	7	1	5	0	0
200	3	6	0	1	0
840*	**29***	**26***	**14***	**1***	**1***

*No animals were marked for identification; therefore, the total number of captures may include recaptures of previously trapped animals.

The proposed project site occurs within the Stephens's kangaroo rat fee area, and is known from the area, however, this species was not targeted during this trapping survey, and no Stephens's kangaroo rat were captured during the 2007 trapping surveys.

4.5.10 Bats

The quarry area was surveyed using visual observation by Psomas and ESA for potential bat use. Between four and ten bats were observed flying in the vicinity of the quarry by ESA. Exact identification is not possible, but because of the early hours of observation the bats were most likely western pipistrelle (*Pipistrellus hesperus*), which is an early emerging bat species.

The quarry has eight levels each approximately 15 to 20 feet high for an estimated height of 120 to 160 feet. The quarry is approximately 1/8 mile across. The vertical faces between levels are largely solid rock faces. The rock faces are a mixture of: 1) smooth, vertical and 2) rough, sloping surfaces. There are also scattered piles of rock rubble left from the quarry operations. The smooth, vertical faces are solid rock essentially without cracks or fissures. These faces offer no large roost sites for bats. The rough, sloping faces have a few natural cracks and fissures. Climbing predators such as raccoons, weasels and snakes could reach most locations on the rough sloping surfaces. There are very few natural cracks or fissures in the rock faces. There are numerous cracks from the quarry operation which are superficial and not deep.

No bat guano or rock staining from bats was found at the quarry during the field survey. No areas of whitewash or old bird nests were found, suggesting that predators can reach most areas of the quarry.

4.6 Critical Habitat

The Biological Survey Area is not located within designated critical habitat for any endangered or threatened species.

4.7 Jurisdictional Determination

This section describes those plant communities and other areas that were identified as subject to the regulatory authority of the USACOE as Waters of the U.S. pursuant to Section 404 of the federal Clean Water Act, and those plant communities and other areas that were identified as subject to the regulatory authority of the CDFG as Waters of State pursuant to Section 1600 et. seq. of the state Fish and Game Code. The plant communities, sub-communities and non-vegetated features determined to fall within the boundaries of jurisdictional areas include:

- southern willow woodland and scrub
- southern willow scrub/mule fat scrub
- mule fat scrub
- mule fat scrub/rip-rap
- mule fat scrub/freshwater marsh
- freshwater marsh
- disturbed freshwater marsh
- heliotrope scrub/sandbar
- heliotrope scrub/tamarisk scrub/sandbar
- open water/Lake Perris
- sand
- rip-rap

Table 4-20, *Approximate Acreages of Jurisdictional Areas Present within the Biological Survey Area* lists the approximate acreage of jurisdictional areas that were mapped within the Biological Survey Area.

Table 4-20
Approximate Acreages of Jurisdictional Areas Present within the Biological Survey Area

Plant Communities and Non-Vegetated Features	Acres of USACOE and CDFG Jurisdiction (Approximate)
southern willow woodland and scrub	77
mule fat scrub	45
freshwater marsh	68
heliotrope scrub/sandbar	134
mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar	44
coyote bush scrub	0.03
eucalyptus woodland	0.001
non-native grassland	0.07
ruderal	10
non-vegetated features	153
Total Jurisdictional Acres	**531**

4.7.1 U.S. Army Corps of Engineers Jurisdiction

Lake Perris is a Water of the U.S., which is subject to jurisdiction by the USACOE pursuant to Section 404 of the federal Clean Water Act because it is a traditionally navigable water body. As a result of the jurisdictional delineation it was determined that approximately 531 acres of plant communities and non-vegetated features within the Biological Survey Area are subject to USACOE jurisdiction, because they are hydrologically connected to the lake waters. The communities below the dam face are considered connected hydrologically because they are supported by the seepage from the lake. The areas of USACOE jurisdiction are graphically depicted in Figure 12, *USACOE and CDFG Jurisdictional Vegetation*.

4.7.2 California Department of Fish and Game Jurisdiction

Lake Perris and its associated riparian habitats and non-vegetated features are subject the jurisdiction of the CDFG pursuant to Section 1600 et. seq. The 531 acres of plant communities and non-vegetated features mentioned above have been determined to be hydrologically connected to Lake Perris and therefore subject to the jurisdiction of the CDFG. The areas of CDFG jurisdiction are graphically depicted in Figure 12.

Biological Resource Evaluation of the Lake Perris Dam Remediation Project

Legend

- Biological Survey Area
- USACOE and CDFG Jurisdiction

Plant Communities and Non-Vegetated Features

- Southern Willow Woodland and Scrub/ Mule Fat Scrub/Heliotrope Scrub/Sandbar
- SWS Southern Willow Woodland and Scrub
- MFS Mule Fat Scrub
- FWM Freshwater Marsh
- CBS Coyote Bush Scrub
- HS/S Heliotrope Scrub/Sandbar
- NNG Non-Native Grassland
- R Ruderal
- NVF Non-Vegetated Features

Plant Communities and Non-Vegetated Features	Total Acres
SWilwScrb/MlftScrb/HeliScrb/Sand	44
Southern Willow Woodland and Scrub	77
Mule Fat Scrub	45
Freshwater Marsh	68
Coyote Bush Scrub	0.03
Heliotrope Scrub/Sandbar	134
Non-Native Grassland	0.07
Ruderal	10
Non-Vegetated Features	153
Total	531

N W E S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

USACOE and CDFG Jurisdictional Vegetation

PSOMAS

Figure 12

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5.0 Conclusions

This section discusses the conclusions drawn from the literature review and field surveys, and assesses the potential for impacts to sensitive biological resources within and immediately adjacent to the proposed project area. Each subsection presents a discussion of potential direct and indirect impacts related to implementation of the proposed project. Direct impacts are those which affect a resource immediately, such as the removal of vegetation and habitat resulting from proposed project activities. Indirect impacts include those that result from the proposed project, but are not immediate effects, such as erosion created by the removal of vegetation.

In assessing direct and indirect impacts to biological resources which may occur as a result of implementation of the proposed project, Psomas biologists took into consideration results of the literature review and the 31 separate field surveys, all of which are documented in the sections above. The analysis of impacts was then undertaken against the backdrop of three conditions unique to this proposed project:

1. Many of the biological resources considered will be impacted by the return of the lake to its ordinary high water mark, effectively eliminating pioneering opportunities created by the 2005 drawdown. Pursuant to instructions from the USFWS and the CDFG, returning the lake to its pre-drawdown level is not to be considered an impact, because the existing condition is the state of the lake prior to the 2005 drawdown. Therefore, any impacts to pioneer habitats that may have taken advantage of lakebed exposed due to the 2005 drawdown are not considered.

2. The entire LPSRA (and therefore the Biological Survey Area within the LPSRA and, by extension, the proposed project site) is an impact of sorts, a result of human activity (i.e., construction of the dam and the eventual creation of Lake Perris, a water storage reservoir). From the standpoint of biological diversity and habitat quality, the creation of Lake Perris has been a net benefit, providing opportunities for multiple plant and animal species to develop and thrive that would not otherwise have existed.

3. In spite of the net benefit of the habitat opportunities created by Lake Perris, the impacts associated with the proposed project must still be mitigated for because the regulations that protect the resources that now exist at Lake Perris require it.

5.1 Potential Impacts to Plant Communities

The proposed project has the potential to directly impact plant communities from proposed construction activities. These impacts are graphically displayed in Figure 13, *Impacts to Plant Communities and Non-Vegetated Features*. Table 5-1, *Approximate Acreages of Potential Direct Impacts to Plant Communities and Non-Vegetated Features*, lists the approximate total acreages of plant communities that may be directly impacted by the proposed construction activities. It also lists the approximate acreage of the indirect impacts to southern willow woodland and scrub. Impacts to these plant communities would also result in impacts to those wildlife species that utilize those communities for all or a portion of their life cycle.

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Biological Resource Evaluation of the Lake Perris Dam Remediation Project

Legend

- Biological Survey Area
- Proposed Project Footprint

Plant Communities & Non-Vegetated Features

- Southern Willow Woodland and Scrub/ Mule Fat Scrub/Heliotrope Scrub/Sandbar
- RSS Riversidean Sage Scrub
- SWS Southern Willow Woodland and Scrub
- MFS Mule Fat Scrub
- FWM Freshwater Marsh
- CBS Coyote Bush Scrub
- HS/S Heliotrope Scrub/Sandbar
- NNG Non-Native Grassland
- EW Eucalyptus Woodland
- R Ruderal
- NVF Non-Vegetated Features

Plant Communities and Non-Vegetated Features	Impacted Acres
SWilw Scrb/MlftScrb/HeliScrb/Sand	42.0
Riversidean Sage Scrub	19.7
Southern Willow Woodland and Scrub	11.0
Mule Fat Scrub	7.9
Freshwater Marsh	16.5
Coyote Brush Scrub	0.7
Heliotrope Scrub/Sandbar	51.4
Non-Native Grassland	49.3
Eucalyptus Woodland	0.2
Ruderal	1.0
Non-Vegetated Features	140.4
Total	**340.1**

N W E S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6
Date of Aerial Photo: February 2006

Impacts to Plant Communities and Non-Vegetated Features

PSOMAS

Figure 13

Table 5-1
Approximate Acreages of Potential Direct Impacts to Plant Communities and Non-Vegetated Features

Plant Community and Non-Vegetated Feature	Approximate Acreage of Potential Direct Impacts
Riversidean sage scrub	19.7
southern willow woodland and scrub	11
mule fat scrub	7.9
freshwater marsh	16.5
coyote bush scrub	0.7
heliotrope scrub/sandbar	51.4
non-native grassland	49.3
eucalyptus woodland	0.2
ruderal	1
agriculture	0
mix of southern willow woodland and scrub, mule fat scrub/heliotrope scrub/sandbar	42
non-vegetated features	140.4
Total Acres	**340.1**

5.1.1 Riversidean Sage Scrub

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. It is estimated that approximately 19.7 acres of Riversidean sage scrub would be directly impacted by construction of the haul road for the proposed project. These impacts would be permanent, as the road is intended to be maintained for use during operation of the proposed project. Possible indirect impacts to this habitat would occur from increased erosion or run-off entering the site from construction activities; construction-related traffic; and maintenance-related traffic on the road.

5.1.2 Southern Willow Woodland and Scrub

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. It is estimated that approximately 11 acres of southern willow woodland and scrub would be directly impacted by construction activities. It is estimated that approximately 48 acres of southern willow woodland and scrub would be indirectly impacted by construction activities. Possible indirect impacts to this habitat would occur from increased erosion or run-off entering the site from construction activities; and construction and maintenance-related traffic.

Southern willow woodland and scrub is found at two separate locations within the proposed project area. One stand of 19 acres is located below the toe of the dam, and the other is located along the eastern edge of the lake. The southern willow woodland and scrub located below the toe of dam consists of approximately 19 acres. It is estimated that approximately 11 acres of southern willow woodland and scrub located below the toe of the dam would be directly

impacted by proposed project activities. These acres would be permanently lost because the placement of the reinforcement berm and associated maintenance road.

Approximately 48 acres of southern willow woodland and scrub along the lake's eastern shore have been indirectly impacted by the 2005 drawdown of the lake in anticipation of project implementation. Although drip irrigation was installed, may trees and branches have died back or have expressed signs of water stress, such as browning and wilting. It is assumed that this is a temporary indirect impact and that this area will recover naturally once the project has been completed and the water level returns to its pre-drawdown elevation. Field observations indicate that the current size of this southern willow woodland and scrub area is approximately the same as it was prior to lake lowering.

Impacts to this plant community have the potential to impact those wildlife species that depend on this habitat. For example, least Bell's vireo, a state and federally listed species, may utilize southern willow woodland and scrub for foraging and nesting activities.

Because the southern willow woodland and scrub is subject to the jurisdiction of USACOE and CDFG, impacts to this community will need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

5.1.3 Mule Fat Scrub

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. It is estimated that approximately 7.9 acres of mule fat scrub habitat would be directly impacted as a result of implementation of the proposed project. Direct impacts to this habitat would occur from the construction and use of the proposed haul road. Possible indirect impacts to this habitat would occur from increased erosion or run-off entering the site from construction activities; and construction and maintenance-related traffic.

Impacts to this plant community have the potential to impact those wildlife species that depend on this habitat. For example, least Bell's vireo, a state and federally listed species, may utilize mule fat scrub for foraging and nesting activities.

Because mule fat scrub is subject to the jurisdiction of USACOE and CDFG, impacts to this community will need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

5.1.3.1 Southern Willow Woodland and Scrub/Mule Fat Scrub/Heliotrope Scrub/Sandbar

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. It is estimated that approximately 42 acres of southern willow woodland and scrub/mule fat scrub/heliotrope scrub/sandbar habitat would be directly impacted as a result of implementation of the proposed project. Direct impacts to this habitat would occur from the construction and use of the proposed borrow area and haul road, and inundation of the site following completion of construction activities when the lake level is returned to its regulated

high water mark. Possible indirect impacts to this habitat would occur from increased erosion or run-off entering the site from construction activities; and construction and maintenance-related traffic.

Because southern willow woodland and scrub/mule fat scrub/heliotrope scrub/sandbar habitat is subject to the jurisdiction of USACOE and CDFG, impacts to this community need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

5.1.4 Freshwater Marsh

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. It is estimated that approximately 16.5 acres of freshwater marsh habitat would be directly impacted as a result of implementation of the proposed project. Direct impacts to this habitat would occur from the construction and use of the proposed borrow area and haul road, and inundation of the site following completion of construction activities when the lake level is returned to its regulated high water mark. Possible indirect impacts to this habitat would occur from increased erosion or run-off entering the site from construction activities; and construction and maintenance-related traffic.

Because freshwater marsh is subject to the jurisdiction of USACOE and CDFG, impacts to this community need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

5.1.5 Heliotrope Scrub/Sandbar

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. It is estimated that approximately 51.4 acres of heliotrope scrub/sandbar habitat would potentially be directly impacted as a result of implementation of the proposed project. Possible indirect impacts to this habitat would occur from increased erosion or run-off entering the site from construction activities; and construction and maintenance-related traffic. In addition this habitat type will be inundated following proposed project activities and the lake is refilled to its regulated high water mark.

Because heliotrope scrub/sandbar is subject to the jurisdiction of USACOE and CDFG, impacts to this community will need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

5.1.6 Non Native Grassland

Direct impacts to this habitat would occur from the removal of the habitat from the site during project activities. Approximately 49.3 acres of non native grassland would be directly impacted by construction of the stability berm; construction lay down area and construction of the Lake Perris Drain for the proposed project. These impacts would be permanent, as the road is intended to be maintained for future use. Possible indirect impacts to this habitat would occur from

increased erosion or run-off entering the site from construction activities; and construction and maintenance-related traffic.

5.1.7 Other Plant Communities

Other plant communities would also be directly impacted by proposed project activities including 0.7 acre of coyote bush scrub, 0.2 acre of eucalyptus woodland, 1 acre of ruderal land, and 140.4 acres of unvegetated features.

5.1.8 Open Water/Lake Perris

Direct impacts to the open water/Lake Perris occurred from in the drawdown in preparation of the proposed project. In addition, the excavating of lake bed materials for the proposed dam levee will create deep water habitat where shallow water habitat existed previously. These impacts are considered potentially significant with reference to loss of spawning habitat for fish. Effects to fisheries are addressed by ESA in the Environmental Impact Report prepared in support of the proposed project.

Indirect impacts from dust and erosion might occur; therefore these potential indirect impacts will need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

5.2 Potential Impacts to Listed Endangered, Threatened, Candidate and State Rare Plants

No plants listed endangered, threatened, candidate or state rare pursuant to the federal or state Endangered Species Acts were observed during the field surveys and are known to occur within the proposed project site; therefore no impacts to listed endangered, threatened, candidate or state rare plant species are anticipated as a result of implementation of the proposed project.

5.3 Potential Impacts to Sensitive and Locally Important Plant Species

No sensitive or locally important plants were observed during the field surveys and are known to occur within the proposed project site; therefore no impacts to sensitive plants are anticipated as a result of implementation of the proposed project.

5.4 Potential Impacts to Listed Endangered, Threatened and Candidate Wildlife

Three wildlife species listed as endangered pursuant to the federal and state Endangered Species Acts, were observed within the Biological Survey Area during the field surveys by Psomas. These species are listed below:

- American peregrine falcon (non-breeding migrant)
- least Bell's vireo (breeding migrant)
- Stephens's kangaroo rat (resident)

Three additional listed wildlife species were not observed during the field surveys, but are known to occur within the LPSRA, and therefore; potentially within the Biological Survey Area. These listed wildlife species could be residents or migrants and are listed below:

- bald eagle (non-breeding migrant)
- southwestern willow flycatcher (breeding migrant)
- coastal California gnatcatcher (breeding resident)

5.4.1 Bald Eagle

This species was not observed or detected during the field surveys; however this species is known to occur at the LPSRA, especially during the winter. The Biological Survey Area provides potential foraging and roosting habitat for this species during winter migration. The bald eagle is primarily a migrant and wintering species within western Riverside County. Bald eagles have attempted to breed at the LPSRA, but were unsuccessful. There is a low potential for bald eagles to nest on the proposed project site due to the lack of suitable nesting habitat such as large conifers trees. Since the bald eagle was not observed on the proposed project site during the field surveys and they are not known to nest at the proposed project site, it is safe to say the bald eagle will not be impacted from the proposed project.

5.4.2 American Peregrine Falcon

American peregrine falcons were observed by Psomas during the field surveys and they are known to occur within the LPSRA because it has suitable foraging grounds with concentrated populations of waterfowl and shorebirds. Two American peregrine falcons were observed flying together over Lake Perris. The falcons were diving and tumbling in the air with one another while chattering loudly. One falcon perched on a fence above the dam on the Bernasconi Hills before flying off. It is safe to say the American peregrine falcon will not be impacted from the proposed project because the American peregrine falcon is primarily a rare spring and fall transient and a casual visitant during other seasons of the year. There are no breeding records documented for the species and it currently is not likely to breed in the area and at the LPSRA due to lack of suitable breeding habitat.

5.4.3 Southwestern Willow Flycatcher

No southwestern willow flycatchers were detected within the Biological Survey Area or within the LPSRA during the 2007 and 2008 focused southwestern willow flycatcher surveys or any other surveys. This species was determined to be absent from the proposed project site. Therefore, no impacts to southwestern willow flycatcher are expected from construction and operation of the proposed project. However, this species has been observed within the LPSRA

in the past by other biologists. The Biological Survey Area contains suitable breeding and foraging riparian woodland habitat to support this species.

5.4.4 Least Bell's Vireo

Least Bell's vireos were detected within the Biological Survey Area a total of six times during the 2007 least Bell's vireo focused surveys. One least Bell's vireo was detected during the focused southwestern willow flycatcher surveys. Singing males were detected; however nests were not located. Although no nests were located and no fledglings were observed or detected, least Bell's vireo is believed to breed in Biological Survey Area due to the repeated observations of singing males during the breeding season. No banded individuals were observed during surveys. Based on the locations of the least Bell's vireo detections, there are a minimum of three least Bell's vireo territories in 2007: two in the southern willow woodland and scrub along the eastern lakeshore and one in the southern willow woodland and scrub immediately west of and below the dam

Least Bell's vireos were detected within the Biological Survey Area a total of twelve times during the 2008 least Bell's vireo focused surveys. Singing males were detected; however nests were not located. Although no nests were located and no fledglings were observed or detected, least Bell's vireo is believed to breed in Biological Survey Area due to the repeated observations of singing males during the breeding season. No banded individuals were observed during surveys. Based on the locations of the least Bell's vireo detections, there are a minimum of four LBV territories in 2008: two in the southern willow scrub along the eastern lakeshore and two in the southern willow scrub immediately west of and below the dam.

Indirect impacts to 51 acres of southern willow woodland and scrub at the eastern shoreline of the lake which resulted from the 2005 drawdown and subsequent lowering of the ground water available to the plants can be considered temporary. Impacts resulting from the drawdown are temporary and did not prevent nesting by two pairs of least Bell's vireo which were observed during 2007 focused surveys. It is anticipated that once Lake Perris is returned to its pre-drawdown level, impacts to the southern willow woodland and scrub at the eastern shore of the lake will be ameliorated and the habitat will return to its pre-drawdown condition.

Construction of the proposed project will result in a direct loss of approximately 10 acres of southern willow woodland and scrub; approximately 8 acres mule fat scrub; and 40 acres of southern willow woodland and scrub/mule fat scrub/heliotrope scrub/sandbar habitat for least Bell's vireo, which constitutes a direct and significant impact.

Indirect impacts to listed least Bell's vireos could occur from increased noise, lighting, and dust during construction, which could adversely affect the breeding behavior of these birds.

Because Lake Perris is within the Western Riverside County MSHCP Area, mitigation for these impacts to habitat for least Bell's vireo will need to be negotiated by DWR with the appropriate resource agencies: USFWS, CDFG, and the RCA. Psomas also recommends that because project implementation will occur so close to the nesting habitat, monitoring of the area by

biologists be included in the protection measures for wildlife established for construction of the proposed project.

5.4.5 Coastal California Gnatcatcher

No coastal California gnatcatchers were detected during the 2007 and 2008 focused coastal California gnatcatcher surveys. Based on results of the directed surveys, no impacts to coastal California gnatcatcher are anticipated in association with construction of the proposed project. Suitable Riversidean coastal sage scrub occurs throughout the Biological Survey Area, but well outside the boundaries of the proposed project site. Suitable Riversidean coastal sage scrub also occurs throughout the LPSRA to potentially support this species.

With the removal of 23 acres of Riversidean sage scrub it was determined that there may be the potential for direct impacts to foraging and nesting habitat for the coastal California gnatcatcher. However, since there are ample available foraging areas and nesting areas adjacent to the proposed project site, any impacts are considered less-than-significant.

5.4.6 Stephens's Kangaroo Rat

Below the dam, the project would result in the loss of approximately 43 acres of non-native grassland. The area directly impacted by the project is not considered suitable habitat for the Stephens's kangaroo rat due to the relatively high density of vegetation. This area is currently occupied by Los Angeles pocket mouse and is not currently occupied by Stephens's kangaroo rat. However, this area is within the Lake Perris Stephens's Kangaroo Rat Core Reserve established by the Stephens's Kangaroo Rat Habitat Conservation Plan and covered by the MSHCP. Because impacts will occur within the core area and/or land owned by CDFG, additional mitigation may be required.

Two small mammal species that are California Species of Special Concern also occur within the impact zone below the dam: the Los Angeles pocket mouse and northwestern San Diego pocket mouse. The Los Angeles pocket mouse was also found in one of the areas surveyed in the northeastern part of the project area, along the existing access trail.

The project would occur within the Lake Perris Stephens's Kangaroo Rat Core Reserve established under the Stephens's Kangaroo Rat Habitat Conservation Plan, and is covered by the Riverside County MSHCP. Even though there would appear to be no direct impacts to Stephens's kangaroo rat by the project, mitigations to enhance Stephens's kangaroo rat habitat within the Reserve may be required by the agencies. Stephens's kangaroo rat habitat enhancement measures could include:

- Reduce vegetation density with controlled burns.
- Reduce vegetation density grazing by cattle or sheep or goats.
- Plant Riversidean sage scrub plant species.
- Remove non-native exotic plant species.
- Till/rip hard packed soil to allow burrowing.

Measures that improve habitat for Stephens's kangaroo rat could also improve habitat quality for Los Angeles pocket mouse to some extent. However, the distribution of Los Angeles pocket mouse on the project site is probably determined more by the presence of sandy or friable soils.

5.5 Potential Impacts to Sensitive and Locally Important Wildlife

Sixteen sensitive wildlife species were observed within the Biological Survey Area during the field surveys by Psomas. These sensitive and locally important wildlife species could be residents or migrants and are listed below:

- coastal whiptail (coastal western whiptail) (resident)
- northern red-diamond rattlesnake (resident)
- American white pelican (non-breeding migrant)
- double-crested cormorant (non-breeding resident)
- white-faced ibis (non-breeding migrant)
- osprey (potential breeding resident)
- northern harrier (breeding resident)
- Cooper's hawk (breeding resident)
- golden eagle (non-breeding resident)
- loggerhead shrike (breeding resident)
- southern California rufous-crowned sparrow (breeding resident)
- yellow-headed blackbird (breeding migrant)
- northwestern San Diego pocket mouse (resident)
- Los Angeles pocket mouse (resident) (resident)
- Bryant's woodrat (resident)
- San Diego black-tailed jackrabbit (resident)

During the field surveys, many species of wildlife that could potentially utilize the Biological Survey Area may not have been present because they occur only on a seasonal basis. Many species are nocturnal, move about a territory, or may have become dormant for the season. There are a number of other sensitive wildlife species that were not observed during the field surveys, but are known to occur within the LPSRA. These species have been observed within the LPSRA by other biologists in the region and by LPSRA staff. These sensitive and locally important wildlife species could be residents or migrants and are listed below:

- coast (San Diego) horned lizard (resident)
- orange-throated whiptail (resident)
- coastal rosy boa (resident)
- white-tailed kite (breeding resident)
- sharp-shinned hawk (breeding resident)
- ferruginous hawk (non-breeding migrant)
- mountain plover (non-breeding migrant)
- burrowing owl (breeding resident)

- long-eared owl (non-breeding migrant)
- California horned lark (breeding resident)
- San Diego cactus wren (coastal cactus wren) (breeding resident)
- yellow warbler (breeding migrant)
- Bell's sage sparrow (breeding resident)
- tricolored blackbird (non-breeding resident)
- mountain lion (resident)
- American badger (resident)

As a result of the wildlife field surveys and literature review, it was concluded that three sensitive wildlife species have a moderate potential to occur within Biological Survey Area, either as residents or migrants. These sensitive wildlife species are listed below:

- San Diego banded gecko (resident)
- purple martin (breeding migrant)
- yellow-breasted chat (breeding migrant)

With the removal of several habitats due to construction activities, it was determined that there may be the potential for direct impacts to foraging and breeding habitat for some sensitive bird species and other sensitive wildlife species. However, since there are ample available foraging areas and breeding areas adjacent to the proposed project site, any impacts are considered less-than-significant.

Indirect impacts to sensitive wildlife could occur from increased noise, lighting, and dust during construction, which could adversely affect the breeding behavior of some sensitive birds and other sensitive wildlife species.

Psomas recommends pre-construction surveys for presence of sensitive species along the construction right-of-way, and within construction impact areas. To further protect sensitive species the surveying biologist should stake and flag the limits of construction and monitor construction activity to reduce impacts to sensitive species that may be located next to the construction area. Further measures could include silt fencing to act as a barrier and daily pre-activity surveys to remove wildlife from the construction area.

5.5.1 Nesting Birds, Raptors, and Roosting Bats

The proposed project site contains habitat that provide nesting habitat for a number of bird species. This includes habitats that have been temporarily created due to project related lake lowering. Some of the potential nesting habitat will be directly impacted by implementation of the proposed project. Indirect impacts to breeding birds could occur from increased noise, lighting, and dust during construction, which could adversely affect the breeding behavior of some birds.

Because these trees and habitats will be impacted as the result of proposed project activities during the nesting season, DWR shall have a breeding bird survey conducted by a qualified biologist to identify any potential nesting activities, or nesting birds prior to construction

activities. Project related disturbance of active nests, either direct or indirect, if identified, will require concurrence with CDFG and a permit (or concurrence) from the Migratory Bird Treaty Act (MBTA) division of USFWS. These impacts would be considered significant, but can be reduced to a level that is less-than-significant with incorporation of the following mitigation measure.

Psomas recommends that a biologist perform pre-construction nesting bird and raptor surveys. The locations of each nest found to be present should be marked using a hand-held GPS unit, and an area of at least 100 feet surrounding each nest should be flagged. A qualified wildlife biologist should be present during construction to act as a monitor to ensure the minimization and/or avoidance of impacts to nesting birds and raptors.

Impacts to the quarry area would be limited to the bottom of the quarry where no roosting habitat for bats occurs. Although bats were observed flying near the proposed project site in the vicinity of the quarry, the species could not be determined, nor could the location of any roosting site. Because of the condition of the quarry, it is unlikely to provide suitable roosting habitat for bats. Therefore no direct impact to bats or their roosting habitat is anticipated. Indirect impacts to foraging bats from proposed project activities are not anticipated.

5.5.2 Los Angeles Pocket Mouse

The Los Angles pocket mouse is one of the covered species under the MSHCP; therefore; impacts to 43 acres of occupied Los Angles pocket mouse habitat can be mitigate according to the guidelines in the MSHCP. Impacts can be mitigated by replacement of impacted Los Angles pocket mouse habitat at a minimum ratio of 1:1 (replaced: impacted) and will meet the requirements of the MSHCP.

The proposed project is within the MSHCP area and in the Lake Perris State Recreation Area (LPSRA). The LPSRA is a Public/Quasi-Public Lands and is part of the MSHCP Conservation Area which is to be managed under the MSHCP for open space value and/or in a manner that contributes to the conservation of the Los Angles pocket mouse and other covered species. Under the MSHCP, impacts to Los Angles pocket mouse habitat in Public/Quasi-Public Lands must be replaced at a minimum ratio of 1:1 (replaced: impacted). The replacement land must be acquired or otherwise permanently protected and must be biologically equivalent or superior to the land that will be affected. An equivalency analysis describing the equivalent conservation must be prepared and must be approved by the USFWS and CDFG.

The equivalency analysis must address the following:

- Effects on habitats.
- Effects on covered species.
- Effects on MSHCP Core Areas, Linkages and Constrained Linkages.
- Effects on MSHCP Conservation Area configuration and management (such as increases or decreases in edge).

- Effects on ecotones (defined as areas of adjoining Vegetation Communities, generally characterized by greater biological diversity) and other conditions affecting species diversity (such as invasion by exotics).

The equivalency analysis must compare the effects and benefits of the proposed project including specific mitigation and compensation for lost conservation values, with the conditions prior to development. The analysis must consider specific project design features, including project siting and design guidelines and BMPs in the MSHCP and supporting documents.

5.6 Potential Impacts to Jurisdictional Areas

The proposed project would directly impact jurisdictional areas from grading and other construction related activities (Figure 14, *Impacts to USACOE and CDFG Jurisdictional Vegetation*). The potential impacts to areas of jurisdiction for the USACOE and CDFG is the same for this project because the extent of jurisdiction is equal.

Approximately 139 acres of area subject to the jurisdiction of the USACOE and CDFG would be directly impacted due to construction of the haul road and the soils excavation area. Table 5-2, *Impacts to USACOE and CDFG Jurisdictional Vegetation*, describes the acres of impact to plant communities associated with jurisdiction of the USACOE and CDFG that would occur through implementation of the proposed project.

Table 5-2
Impacts to USACOE and CDFG Jurisdictional Vegetation

Plant Communities and Non-Vegetated Features	Approximate Acres of USACOE and CDFG Jurisdiction	Approximate Acres of Impacts
southern willow woodland and scrub	77	10
mule fat scrub	45	8
freshwater marsh	68	26
heliotrope scrub/sandbar	134	55
mix of southern willow woodland and scrub, mule fat scrub and heliotrope scrub/sandbar	44	40
coyote bush scrub	0.03	0.003
eucalyptus woodland	0.001	0
non-native grassland	0.07	0.02
ruderal	10	1
non-vegetated Features	153	0.2
Total Jurisdictional Acres	**531**	**139**

These riparian associated habitats are subject to the jurisdiction of USACOE and CDFG. Impacts to these plant communities will need to be addressed in the USACOE 404 permit process and in the CDFG Stream and Lakebed Alteration Agreement process.

Biological Resource Evaluation of the Lake Perris Dam Remediation Project

Legend

- Biological Survey Area
- USACOE and CDFG Jurisdiction
- Proposed Project Footprint

Plant Communities and Non-Vegetated Features

- Southern Willow Woodland and Scrub/ Mule Fat Scrub/Heliotrope Scrub/Sandbar
- RSS Riversidean Sage Scrub
- SWS Southern Willow Woodland and Scrub
- MFS Mule Fat Scrub
- FWM Freshwater Marsh
- CBS Coyote Bush Scrub
- HS/S Heliotrope Scrub/Sandbar
- NNG Non-Native Grassland
- R Ruderal
- NVF Non-Vegetated Features

Plant Communities and Non-Vegetated Features	Impacted Acres
Coyote Bush Scrub	0.003
Eucalyptus Woodland	0
Freshwater Marsh	26
Heliotrope Scrub/Sandbar	55
Mule Fat Scrub	8
Non-Native Grassland	0.02
Non-Vegetated Features	0.2
Ruderal	1
SWilwScrb/MlftScrb/HeliScrb/Sand	40
Southern Willow Woodland and Scrub	11
Total	**139**

N W E S

0 0.25 0.5 1 Miles

State Plane NAD 83 Zone 6

Date of Aerial Photo: February 2006

Impacts to USACOE and CDFG Jurisdictional Vegetation

PSOMAS

Figure 14

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Appendix C2
Riparian Impacts

ESA

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memorandum

date May 26, 2009

to TCB

from MAT

subject Perris riparian impacts

Background: DWR operates and maintains the State Water Project (SWP), supplying water to 29 contracting agencies across the state. Lake Perris is the terminal reservoir for the East Branch of the California Aqueduct, providing a key water supply to the Metropolitan Water District of Southern California (MWD or Metropolitan). Lake Perris is located within the Lake Perris State Recreation Area (SRA) within Riverside County, providing several recreational opportunities including fishing, boating, picnicking, camping, nature study, rock climbing, horseback riding, and hiking. The water storage and conveyance facilities are owned and operated by DWR, in cooperation with Metropolitan.

Perris Dam is an earthfill embankment completed in 1974 containing approximately 25 million cubic yards of compacted fill. The lake's normal operating water level is 1588 feet above mean sea level (amsl). In 2005, DWR completed a foundation study of the Perris Dam. Results of the detailed liquefaction analysis of the Perris Dam foundation indicated that seismically-induced ground shaking could result in embankment deformations due to the liquefaction potential of sediments under the dam at several locations along the 2,300-foot-long segment along the southern span (left reach) of the dam. With the lake filled to its design capacity, this could result in overtopping of the dam during a strong ground shaking event. Based on the results of this stability analysis, DWR lowered the reservoir water surface elevation by 25 feet to 1563 feet amsl, until a long-term remedial solution can be implemented. DWR installed a 2-mile long irrigation system connected to State Park water pumps and drip-line system that conveys lake water to the pre-drawdown riparian habitat that exists along the eastern edge of the original lakeshore.

Purpose: The purpose of this memo is to present the methods and results of our assessment of the current status of the 49.3 acres of mature riparian vegetation along the upper fringe of the pre-drawdown Perris Reservoir shoreline (Figure 1). We quantify and discuss the riparian fringe that has developed since the drawdown occurred. We also present potential mitigation acreage and strategies for reducing temporal loss.

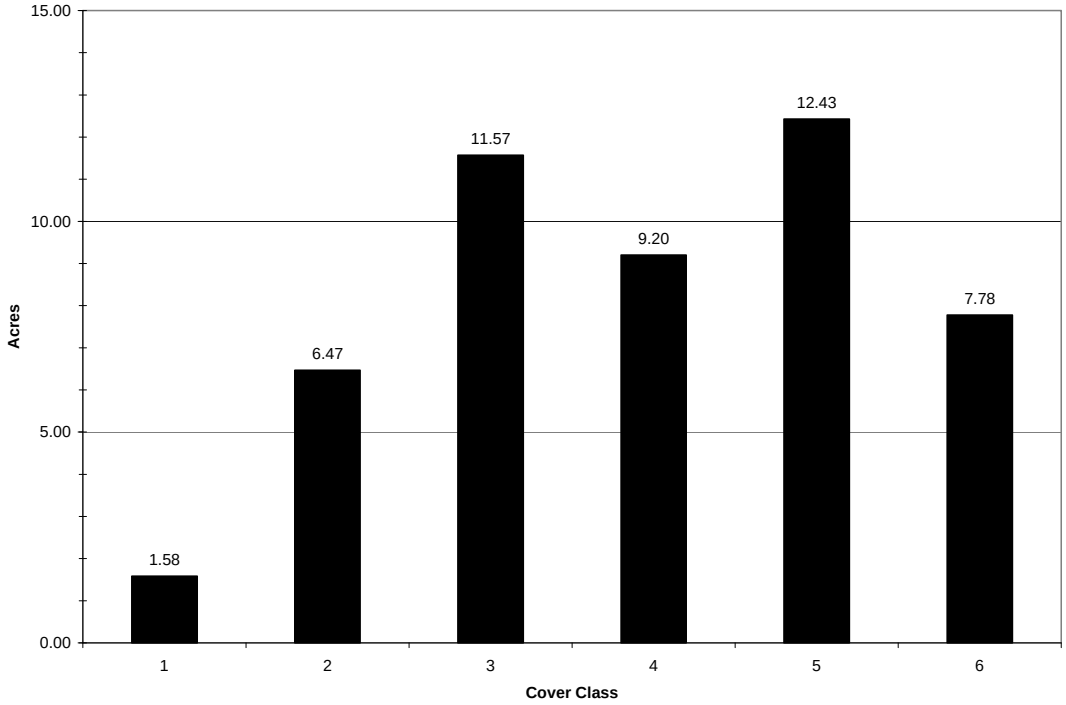
Methods: We conducted our assessment on March 31, 2009. We timed the survey to avoid the official least Bell's vireo (LBV) survey season and still have adequate regrowth; however the riparian vegetation was not fully leafed out at the time of the survey. In the field we observed that there were discrete and relatively easily distinguishable patches of riparian habitat in various conditions. We mapped the boundaries of the patches with a GPS unit (Figure 1). We used the categories shown in Table 1 to estimate survivorship in these patches.

TABLE 1
SURVIVORSHIP CLASSES

Survivorship Class	Range (%)	Midpoint (%)
1	0	0
2	1-20	10
3	21-40	30
4	41-60	50
5	61-80	70
6	81-100	90

Assumptions: We used survivorship estimates based on the assumption that surviving trees and shrubs would recover to an approximate pre-drawdown cover and condition when water levels are restored. This study did not assess change in cover because no baseline cover data were available.

We also make an assumption that survivorship estimates will be a reasonable surrogate for cover estimates when determining habitat loss and potential mitigation acreage. The relationship between cover and the percentage of living plants is expected to have the best fit when riparian vegetation is not water stressed. Due to the current drawdown conditions many of the surviving plants are not producing the amount of cover expected under post-project conditions. Therefore, the relationship between survivorship and cover will be better post-project than it is now. Since post-project condition is the bench mark for determining mitigation ratios for habitat loss we felt the assumption that survivorship was an acceptable surrogate for cover was reasonable (at least for the purposes of this assessment). It was easier, faster, and more accurate to make ocular estimates of survivorship of patches than to assess cover using more labor intensive and time-consuming methods such as line transects. We feel that the use of cover would have overestimated the likely post-project impact given the timing and conditions present at the time this survey.



Results: The number of acres in each assigned survivorship class varied between 1.58 and 12.43 acres (Table 2). Approximately 60% (29.4 acres) of the 49.3 acre survey area has 50% or greater survivorship (based on mid points). Severe mortality (defined as classes one and two) accounted for 16.3% (8.1 acres) of the 49.3 acre survey area. There did not appear to be an observable spatial pattern although no spatial statistics were run.

Mitigation: For ease of calculation we converted the survivorship midpoints to morality midpoints (mortality = 1-survivorship). Table 2 shows the acres affected by the drawdown for survivorship classes one through five. For the purposes of calculation we excluded class six because we would expect some level of mortality in a pre-drawdown and post-project condition, and requiring mitigation for areas that have maintained greater than 80% survivorship (with a 90% midpoint) seems unnecessary. Based on our assumptions and calculations we estimate that approximately 23.8 acres (or 48.3%) of the original riparian fringe has been affected (Table 2).

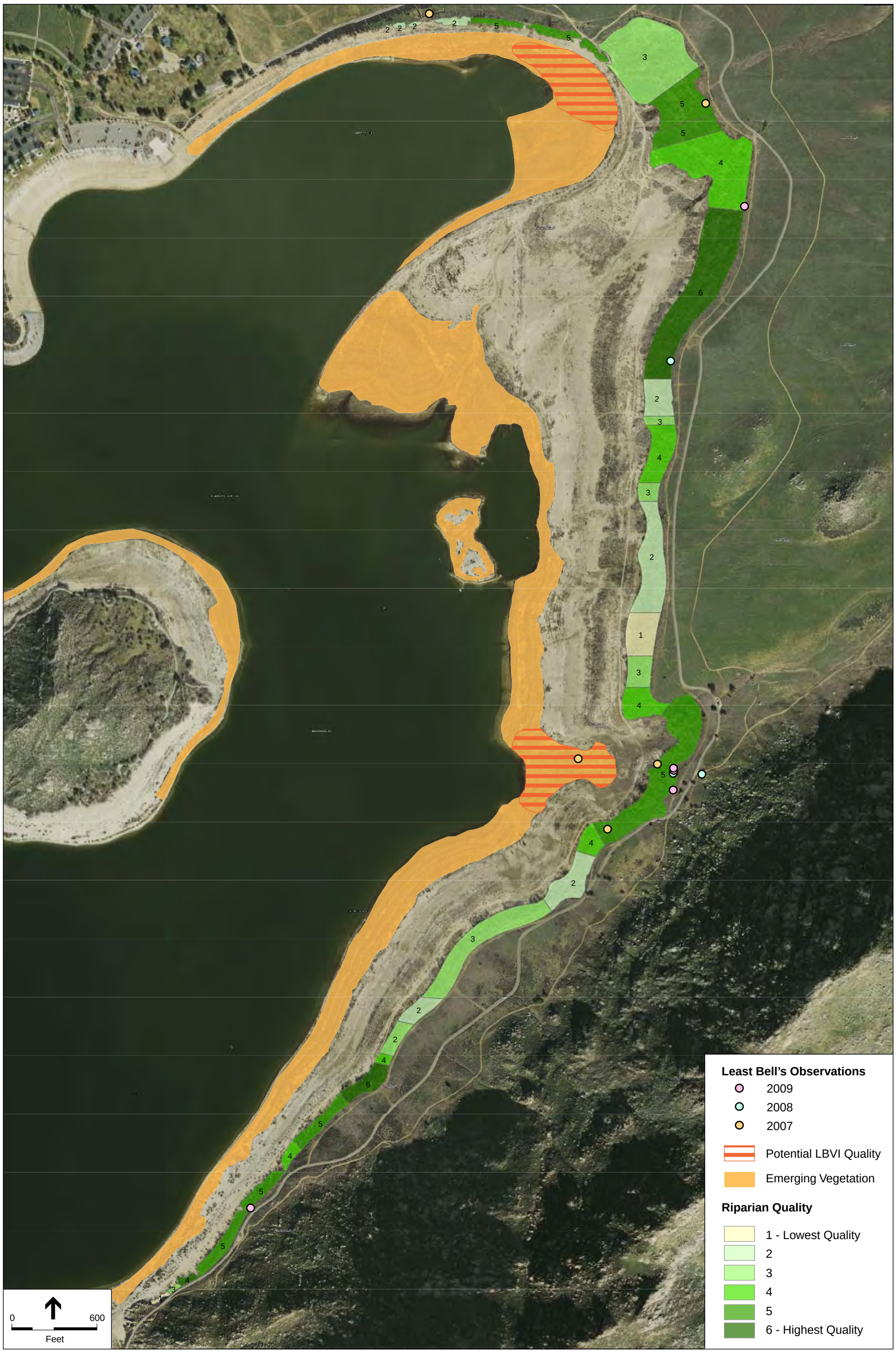
TABLE 2
CALCULATION OF MITIGATION ACREAGE

Survivorship Class	Acres in Class	Mortality	Acres Affected
1	1.58	1	1.580
2	6.47	0.9	5.823
3	11.57	0.7	8.099
4	9.20	0.5	4.600
5	12.43	0.3	3.729
		Total	**23.831**

Post-Drawdown Riparian Fringe: Since the drawdown, a new band of riparian habitat has established along the new shoreline. The acreage of the new band of habitat on the eastern shore exceeds the length of the original band (74.0 vs. 49.3 acres). While most of the habitat is relatively young, the structure and composition of the habitat in two separate areas are potentially suitable for use by LBV (Figure 1). We detected LBV in one of these patches incidentally while conducting our assessment and LBV were regularly detected in the patch during subsequent protocol surveys this year. The new growth is also providing habitat function for other riparian-associated species such as Bullock's orioles, Wilson warblers, blue grosbeak, common yellowthroat, ash-throated flycatcher, and other more cosmopolitan species. The post-drawdown riparian fringe appears to be providing some offset for the dieback of the pre-drawdown riparian fringe.

Mitigation Strategies to Offset Temporal Loss: It is our understanding that the new fringe will be left in place during construction and will not be removed until construction is complete and the refilling of the reservoir commences. We believe there is an opportunity to offset some of the temporal loss that will occur as a result of the lag between removal of the new fringe and the recovery of the old fringe.

Te general concept is to establish patches of restored habitat in the area of the pre-drawdown habitat mapped in survivorship categories 1-3 (essentially patches with <50% survivorship). Dead trees would be removed (leaving some in place as snags as needed) and the areas recontoured into planting basins of various sizes. Cuttings from the new fringe would be installed in the basins, and temporary irrigation used to flood the basins using reservoir water. Installation would occur prior to, or concurrent with, construction activities. The basic premise is to establish habitat patches that would be 2-4 years old by the time the reservoir is refilled. This would provide a seed source within the areas most affected by the drawdown and ultimately would provide structural and age class diversity in the post-construction stands. We also recommend considering salvaging material from the new fringe prior to its post-construction removal, and establishing an onsite nursery to grow material for infill planting when water levels are returned to pre-drawdown levels. A conceptual mitigation and monitoring plan should be developed to provide more details on implementation, construction, maintenance, and monitoring of restored habitat within the pre-drawdown riparian fringe.



SOURCE: DWR, 2009; ESA, 2009.

Perris Riparian Impacts . 206008.02

Figure 1
Riparian Vegetation Assessment

Appendix C3
Waterfowl Analysis

ESA

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memorandum

date May 27, 2009

to Tom Barnes

from Mark Tucker

subject Perris Waterfowl Analysis

Purpose: The purpose of the analysis is to determine the range and limits of depths required for foraging by various waterfowl species. This memo presents the purpose, methods, and results of our analysis of the foraging habits of waterfowl at Perris Reservoir and the effects of reducing the areal extent of the 10 to 25 foot depth contour.

Methods: Our methods included (1) categorizing the waterfowl species in the Audubon Christmas Bird Count (CBC) lists into feeding guilds, (2) reviewing pertinent literature on the feeding ecology of representative species of each guild, (3) developing literature-based foraging depth thresholds for each guild, and (4) applying our findings as they relate to the Lake Perris retrofit project and the 10 foot maximum depth definition for shallow water habitat.

There is not a consistent definition of shallow water in the literature but the maximum depth of the various definitions typically falls within the 5 cm-5 meter (0.16- 16.4 feet) range. For the purpose of this memo we define shallow water habitat as submerged areas less than 10 feet deep. We also consider the loss of the deeper water foraging habitat defined as 10-25 feet.

While recognizing that some bird species will routinely switch between multiple foraging strategies based on habitat conditions and prey availability, we used the predominant feeding method to place species in guilds. Our focus was on foraging within aquatic habitats and with the exception of Cattle Egrets and Canada Goose, we did not attempt to account for upland, non-aquatic foraging when determining guild membership.

Bird species are taken from the Audubon CBC List of Waterfowl and Waterbirds in the Lake Perris/San Jacinto Area. Rather than get into details of foraging styles and postures, for the purposes of this memo reported depths were obtained from Birds of North America (BNA) Online, unless otherwise indicated.

Results: Currently, areas which would become inundated post-project to depths of 0-10 feet and 10-25 feet encompass 92.8 acres and 180.6 acres, respectively. The current borrow area configuration would affect 24.33 acres (26.2%) of the 0-10 foot depth and 85.16 acres (47.2%) of the 10-25 foot area.

The following table presents categories of feeding guilds, species within guilds, and foraging depths. Values for foraging depths were taken from BNA accounts. Foraging depths between species within guilds varied therefore the maximum reported depths for each guild was used (i.e., foraging depths represent the deepest depth utilized by a member of a particular guild). All species in the guild may forage at shallower depths.

TABLE 1
FEEDING GUILDS TABLE (MODIFIED FROM WELLER 1999)

Guild	Description	Species	Foraging Depths (Citation)
Dabbling Ducks	Ducks in the Genus *Anas* and other surface swimmers	Gadwall Mallard Cinnamon Teal Northern Shoveler Northern Pintail American Green-winged teal	< 30 cm (11.8 inches)
Diving Ducks	Ducks in the Genus Athrys and other benthic divers	Canvasback Ring-necked Duck Lesser Scaup Bufflehead Ruddy Duck American Widgeon	<3 m (9.8 feet)
Waders	Shorebirds and other birds that forage on foot in shallow water	American Avocet Black-necked Stilt White-faced Ibis Least Sandpiper Long-billed Dowitcher Kildeer	<25 cm (9.8 inches)
Shallow Water Column Divers	Grebes and other birds that dive and forage throughout the water column	Eared Grebe Western Grebe American White Pelican	<3 m (9.8 feet)
Other Water Column Divers	Cormorants	Double-crested Cormorant	<8 m (26.2 feet)
Flight feeders	Gulls	Bonaparte's Gull Ring-billed Gull California Gull	N/A
Others	Dabbles and dives Grazes Aquatic and upland feeder	American Coot Canada Goose Cattle Egret	<6 m (19.7 feet) N/A <30 cm (11.8 cm)

The majority of species on the CBC list forage in shallow water habitat (as defined in this memo). These species have the potential to be affected by the loss of shallow water habitat, especially shallow water divers. While shallow water divers will forage throughout the water column they could be negatively affected if prey species tend to congregate near the bottom or in shallow water.

Species using deeper waters include the gulls and cormorants. Gulls typically feed in deeper water at or near the surface, and employ a number of different feeding methods. California gulls in particular are highly opportunistic, generalist feeders and would likely not be affected by the loss of waters 10-25 feet deep. Bonaparte's gulls typically forage away from shore near the center of the lake, and are not expected to be affected by the loss of either depth category.

Double-crested cormorants are the only species with the potential to be affected by the loss of waters 10-25 feet deep. Cormorants can forage below the reported depth but this increases transit time and decreases foraging time, making it more beneficial for them to feed in shallow water. However, cormorants are water column divers and

will take prey from within the water column regardless of the bottom depth. Optimal foraging models predict optimal foraging depth should be shallower than the depth of highest prey density, even if the depth of the highest prey density is within easy reach (Mori 1998). Given the prey availability and alternate forging sites at the reservoir, cormorants will likely continue to utilize Perris reservoir after project completion.

Conclusions: The excavation of the borrow area would result in the loss of much of the available freshwater marsh and shallow water habitat (i.e., water less than 10 feet deep) along the northeastern edge of the lake. The proposed project would reduce the shallow water habitat from approximately 93 acres under pre-drawdown conditions, to approximately 69 acres, a loss of 24 acres. We would expect some relationship between bird response and depth diversity. The remaining shallow water habitat is expected to continue to support waterfowl and waterbirds at some level, but the level of avian response to the loss of foraging habitat is unknown. It should be noted that DWR has funded 15 acres of a CDFG waterfowl pond rehabilitation project at the San Jacinto Wildlife Area to mitigate for the loss of waterfowl hunting opportunities at Lake Perris.

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Mori, Yoshihisa 1998. Optimal choice of foraging depth in divers. J. Zool., Lond. 245: 279-283

SOURCE: DWR, 2009; ESA, 2009.

Perris Waterfowl Analysis . 206008.02

Figure 1
Aquatic Resources

Appendix C4
Fisheries Impact Analysis

ESA

Mike Podlech

Aquatic Ecologist

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Memorandum

To: Tom Barnes, Environmental Science Associates

From: Mike Podlech, Aquatic Ecologist

CC:

Date: August 31, 2007

Re: Lake Perris Dam Retrofit Fisheries Impact Assessment

This technical memorandum presents an assessment of the potential and actual effects of a water storage drawdown on the fisheries resources of Lake Perris and offers mitigation recommendations. The assessment presented in this memorandum is based primarily on pre- and post-drawdown fish population data collected by the California Department of Fish and Game (CDFG 2006a, 2006b), personal observations of CDFG staff (Giusti, pers. comm.), and drawdown effects documented at other reservoirs.

Background

The Department of Water Resources (DWR) operates the State Water Project (SWP), which supplies water to numerous communities and millions of people throughout California. The SWP includes an extensive system of aqueducts and pipelines that convey water from the Feather River and Sacramento River watersheds through the Central Valley, terminating at Lake Perris in Riverside County. Lake Perris is entirely within the Lake Perris State Recreation Area (LPSRA) located between the cities of Moreno Valley and Perris in an unincorporated area of Riverside County, approximately 15 miles south of the City of Riverside and 65 miles east of the City of Los Angeles.

Perris Dam is an earthfill dam completed in 1974 that impounds the Lake Perris reservoir. The dam and lake are owned and operated by DWR, in cooperation with the Metropolitan Water District of Southern California (MWDSC), which supplies water for municipal and industrial uses throughout southern California. Water is conveyed from the East Branch Aqueduct of the SWP to Lake Perris via the Santa Ana Valley Pipeline. Lake Perris has a capacity of approximately 127,000 acre-feet (af) and a surface area of 2,292 acres when filled to normal design capacity, with a pool elevation of 1,588 feet above mean sea level (AMSL)[1]. The dam crest elevation is 1,600 feet AMSL. Lake Perris is a multi-purpose

[1] The elevations stated in this document are based on the National Geodedic Vertical Datum of 1929 which was used for the original construction of the dam. This remediation project will use NAVD 88. The difference is about 2.5 feet.

reservoir used for water supply, recreation, fish and wildlife habitat, and emergency water storage. The recreational opportunities at Lake Perris include swimming, boating, camping, hunting, fishing, horseback riding, hiking, rock climbing, and bird and animal watching. The LPSRA has approximately 1.1 million visitors each year.

In 2005, DWR completed a geotechnical investigation and seismic assessment of Perris Dam and concluded that the southeastern reach of the dam, (the "left reach"), is underlain by soil lenses prone to liquefaction. During strong seismic-related shaking, these soils could cause earthquake-induced deformation of the dam. The deformations could lower the dam crest enough to allow overtopping. As a safety precaution, the lake has been drawn down to a maximum elevation of 1,563 feet AMSL, resulting in a current surface area of 1,882 acres. Thus the current surface area of the lake is approximately 410 acres (18%) less than during normal reservoir operations. This water level restriction resulted in a capacity loss of approximately 52,000 af, leaving the reservoir operating at approximately 60% of its normal capacity. The surface area extent of the 2005 drawdown is depicted in Figure 1.

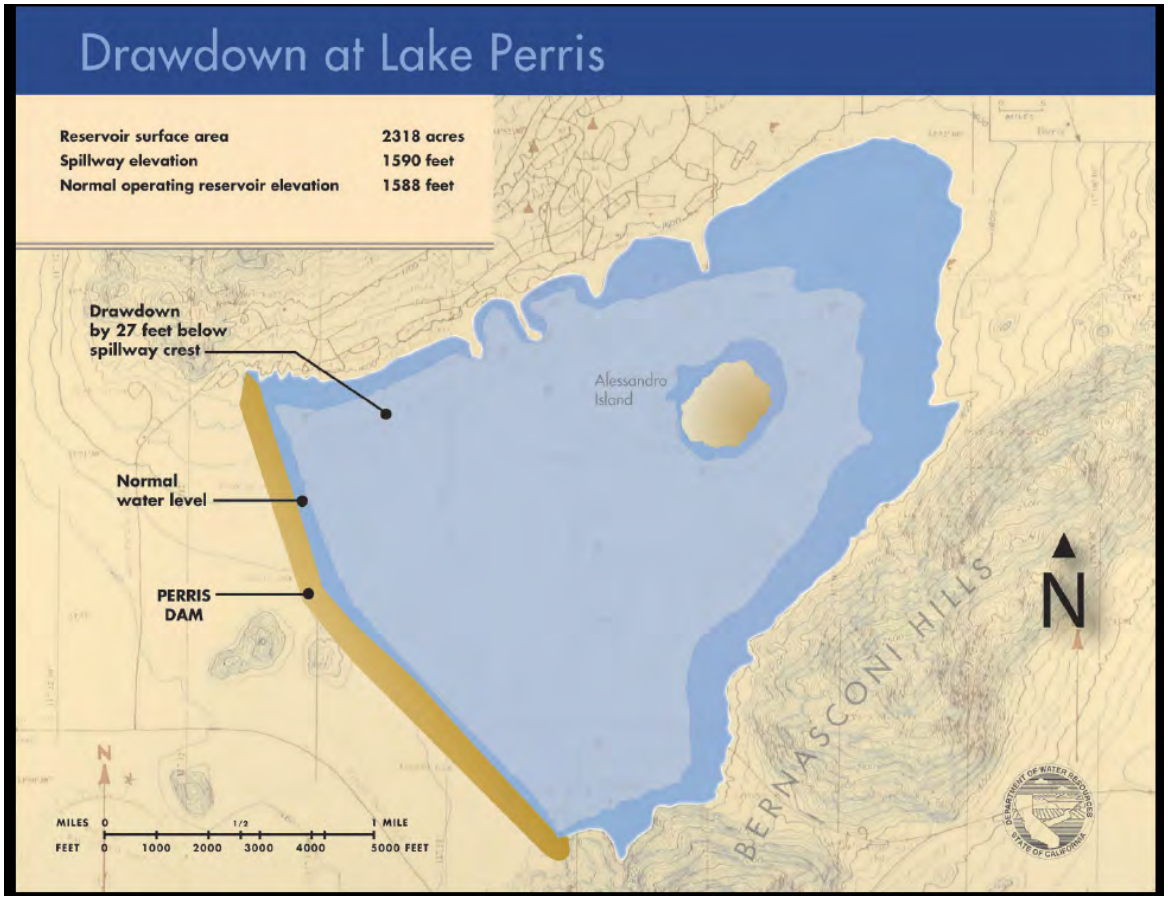

Figure 1. Extent of 2005 drawdown of Lake Perris (please note differences in elevation described in footnote 1)

DWR proposes to remediate the unsafe dam, construct a new outlet tower, and install a new emergency outlet release facility. The proposed project would seismically upgrade the dam and return the reservoir to its design capacity and water elevation. Approximately 2 million cubic yards of soil required for project construction will be excavated from within the currently exposed lakebed at the east end of the lake.

Fisheries Resources of Lake Perris

Lake Perris is managed for a recreational fishery. Largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), and bluegill (*Lepomis macrochirus*) are commonly caught species. Other species that are known to occur in Lake Perris include spotted bass (*Micropterus punctulatus*), flathead catfish, (*Pylodictis olivaris*), green sunfish (*Lepomis cyanellus*), redear sunfish (*Lepomis microlophus*), and black crappie (*Pomoxis nigromaculatus*) (CDFG, 2006b; Drake 1985). Rainbow trout (*Oncorhynchus mykiss*) are planted by CDFG from October through May while water temperatures in the lake are sufficiently cool to support the species, but this species spawns in flowing water in streams and rivers and does not reproduce in lakes. Brief life history summaries for the three most abundant shallow water fish species in Lake Perris (CDFG, 2006b) are provided below.

Largemouth bass

Largemouth bass spawning occurs in the spring when water temperatures reach about 60°F. Males build the nests in two to eight feet of water. Largemouth bass prefer to nest in quieter, more vegetated water, but will use any substrate besides soft mud, including submerged logs. Once the female has laid eggs in the nest (2,000 to 43,000) she is chased away by the male who then guards the eggs. The young, called fry, hatch in five to ten days. Fry remain in a group or "school" near the nest and under the male's watch for several days after hatching. Juvenile largemouth bass may continue to congregate in schools, but adults are usually solitary. Largemouth bass hide among plants, roots or limbs to strike their prey. Fry feed primarily on zooplankton and insect larvae. At about two inches in length they become active predators. Adults feed almost exclusively on other fish and large invertebrates such as crayfish. Larger fish prey upon smaller bass. The average lifespan of largemouth bass is approximately 16 years.

Bluegill

Bluegills begin spawning when water temperatures reach about 70°F. Spawning may peak in May or June, but continues until water temperatures cool in the fall. Because of their long spawning season, bluegills have very high reproductive potential, which often results in overpopulation in the face of low predation or low fishing pressure. Nests are created in shallow water, one to two feet in depth, primarily in gravel substrates. Fifty or more nests may be crowded into a small area, thus creating a spawning bed. Males guard the nest until the eggs hatch and fry leave. Young fish feed on plankton, but as they grow the diet shifts to aquatic insects and larvae.

Redear sunfish

Redear sunfish spawn during the warm months of late spring and early summer, and in deeper water than most other sunfish, congregating in spawning beds. Nests are saucer-shaped depressions in gravel or silt, and are sometimes so close they almost touch. There are usually one or two peaks of activity during the spawning season. Redear sunfish feed primarily on snails as a major food item, although insect larvae may also be found in their diet. The species is usually found near the bottom in warm water with little current and abundant aquatic vegetation. Redears normally reach sexual maturity by the end of their second year.

General Lake Ecology

Lakes and reservoirs typically contain distinct zones of biological communities linked to their physical structure. The littoral zone is the near-shore area where sunlight penetrates all the way to the substrate and allows for aquatic plant growth. Light levels of about 1% or less of surface values usually define this depth. The 1% light level also defines the euphotic zone of the lake, which is the layer from the surface down to the depth where light levels become too low for photosynthesis. The higher plants (macrophytes) in the littoral zone, in addition to being a food source and a substrate for algae and invertebrates, provide important habitat for fish and other organisms.

The limnetic zone is the open water area where light does not generally penetrate all the way to the bottom. The bottom sediment, known as the benthic zone, has a surface layer abundant with organisms. Most of the organisms in the benthic zone are invertebrates, such as insect larvae (midges, mosquitoes, black flies, etc.) or small crustaceans. The productivity of this zone largely depends upon the organic content of the sediment, the amount of physical structure, and in some cases upon the rate of fish predation. Sandy substrates contain relatively little organic matter (food) for organisms and poor protection from predatory fish. Higher plant growth is typically sparse in sandy sediment, because the sand is unstable and nutrient deficient. A rocky bottom has a high diversity of potential habitats offering protection (refuge) from predators and substrate for attached algae. A flat mucky bottom offers abundant food for benthic organisms but is less protected and may have a lower diversity of structural habitats, unless it is colonized by higher plants.

In addition to light penetration, temperature and oxygen concentrations influence the extent and suitability of fisheries habitat in lakes and reservoirs (Hayes et al., 1999). The waters of shallow lakes tend to mix from top to bottom, resulting in constant temperature and oxygen concentrations with depth. Deeper water bodies, such as Lake Perris, however, generally stratify (i.e., have layers of different water temperature) during summer months. Typically, the epilimnion (surface layer) occupies the upper several feet of the lake and contains relatively warm temperatures and relatively high concentrations of dissolved oxygen. Warmwater littoral fishes such as largemouth bass and bluegill are generally found in the epilimnion. The metalimnion is the next layer and is characterized by a gradual decrease in water temperatures. Toward the bottom of the metalimnion, coldwater fish such as rainbow trout may be present. The extent of the metalimnion is highly variable and depends on lake size, wind exposure, and the time of year. The deepest layer in stratified lakes is the hypolimnion. This layer is the coolest part of the lake and may support coldwater fishes if sufficient oxygen is available. In lakes with low productivity, dissolved oxygen concentrations are often high in the metalimnion and hypolimnion; in productive lakes, decomposing organic material depletes oxygen, sometimes to the point that there is insufficient oxygen to support any fish species.

Effects of Reservoir Drawdown

Long-term drawdowns of reservoirs can adversely impact fish populations. The most significant effect is the loss of important spawning and rearing habitat through exposure of the littoral zone and the associated loss of macrophytes. The littoral zone also serves as important cover habitat for smaller fish, which are forced into deeper water habitat where they are more vulnerable to predation when water elevations are reduced. The reduction in surface area, shoreline length, and water volume associated with drawdowns leads to the concentration of fish into a smaller area, leading to increased competition for food sources and further vulnerability of small fish to predation. Physically, the reduction in reservoir volume may lead to changes in the stratified zones (e.g., reduction of metalimnion due to increased water temperatures), increased erosion of exposed shorelines through wave action, and water quality deterioration (e.g., increase of nutrient concentrations and decrease in dissolved oxygen due to lower dilution of nutrient-rich sediments).

CDFG has monitored fish population in Lake Perris since at least 1992, including in 2006 after the October 2005 drawdown (CDFG, 2006b). Data presented in two internal reports (CDFG, 2006a; CDFG, 2006b), as well as personal CDFG staff observations (Giusti, pers. comm.) provide indications of the initial response of the Lake Perris fish population to the drawdown. Based on survey data and statistical population estimates, CDFG concluded in 2006 that the pre-drawdown population of 12-inch or larger largemouth bass of approximately 20,000 had been reduced to approximately 12,000 to 13,000 fish in 2006 (CDFG, 2006a). The observed reduction in the bass population of approximately 43% is consistent with the percentage of water volume reduction in the lake. The relative abundance of largemouth bass has also decreased since the drawdown. In 1996, largemouth bass accounted for 55% of all fish sampled, but only 15% of sampled fish in 2006. The observed reduction in the bass population of the lake is at least partially responsible for a 75% reduction in bass tournaments held at Lake Perris (Giusti, pers. comm.).

CDFG has also observed a shift in the population structure of the Lake Perris fishery. The length frequency distribution of largemouth bass, bluegill, and redear sunfish has increased since the drawdown, suggesting that smaller-sized individuals of these species are being lost due to (a) increased predation and (b) reduced or eliminated recruitment due to the overall reduction in suitable spawning habitat (CDFG, 2006b). Furthermore, the rate at which fish were being captured during the 2006 surveys was significantly higher than during previous years, suggesting that the reduced volume of the lake has concentrated fish to the extent where they are easier to catch (CDFG, 2006b).

Similar effects of decreases in the overall abundance of littoral fish, decreased abundance of smaller (juvenile) fish, and an increase in the relative abundance of larger fish has been documented from other reservoirs experiencing long-term drawdowns (e.g., Paller, 1997).

In addition to the observed biological changes in Lake Perris, the drawdown has also resulted in observed physical changes. Shallow water habitat (3 to 10 feet in depth) in Lake Perris has been largely eliminated. Prior to the drawdown, the visibility in the water column ranged from approximately 6 to 8 feet, but is now typically less than 2 feet (Giusti, pers. comm.). It is unclear whether this increased turbidity of the water is due to increased erosion and sedimentation or algal blooms resulting from increased nutrient concentrations, or a combination of both.

Given the post-drawdown condition of the Lake Perris fishery through 2006, it appears likely that the observed conditions will continue to adversely affect the fish population. Unless a new littoral zone with adequate plant growth and cover can be established at the new lake surface, either naturally or through habitat restoration efforts, spawning success and recruitment will continue to be low for littoral species such as bass, bluegill, and redear sunfish. As larger fish die due to age, competitive pressures, or recreational capture, populations will likely continue to decline. Once the relative abundance of large fish is reduced and aquatic vegetation becomes re-established, spawning success and the survival of juvenile fish may increase again and populations may stabilize at the lower levels the reduced lake appears to be able to support.

In addition to the effects of the 2005 drawdown, the overall dam remediation project proposed by DWR is likely to further impact the fishery of Lake Perris. A further, albeit temporary, drawdown of the lake will likely occur during the construction phase of the project. This could adversely affect the rate at which aquatic vegetation and fish are able to colonize new habitat. Furthermore, a total of approximately 2 million tons of soil will be excavated from a borrow pit at the east end of the lake (Figure 2). The excavation will result in a reduction of shallow water habitat and a concomitant increase in deep water habitat in the lake once it is refilled.

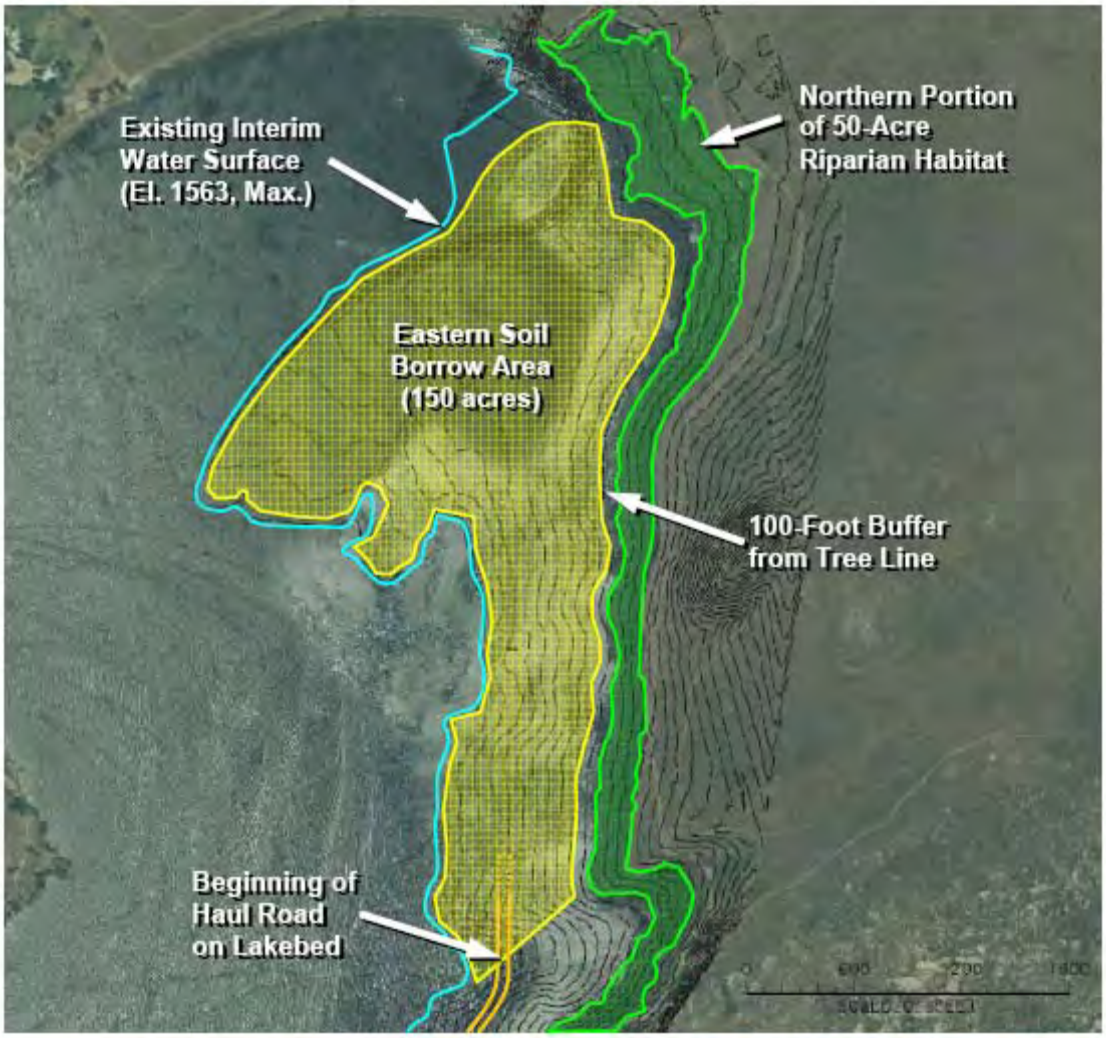

Figure 2. Proposed soil borrow pit at the eastern end of Lake Perris.

Mitigation Recommendations

Mitigation measures are intended to either (a) avoid adverse impacts on the environment from occurring or (b) to mitigate for unavoidable adverse impacts. In the case of the Lake Perris drawdown, the adverse impacts on the fishery have already occurred and are likely to continue. Thus, these effects may be temporarily mitigated through active habitat creation (e.g., aquatic vegetation plantings, installation of cover structures, etc.) and permanently mitigated once the lake is refilled (e.g., restoration of historic littoral zone). The potential effects of the proposed additional drawdown during project construction and the use of the eastern lake bed as a borrow pit, on the other hand, requires appropriate mitigation measures aimed at avoiding and/or reducing the extent and significance of those impacts. The following recommendations for mitigating the impacts of the Perris Dam Remediation Project are separated into (a) short-term measures intended on managing the fishery during the ongoing drawdown phase, (b) measures intended to avoid and minimize further impacts during project construction, and (c) post-construction measures intended to assist the recovery of the fish population.

With regards to mitigation category (c) above, it should be noted that some research has shown that natural recovery of fish populations after extended drawdowns may occur fairly rapidly even in the absence of mitigation/restoration measures. For example, Paller (1997) found that the drawdown of a reservoir in South Carolina to 50% of its original surface area and volume for 3.5 years resulted in significant reductions in fish abundance and species diversity, changes in relative fish abundance, and changes in the size structure of individual fish species. However, within 9 months of refilling the reservoir, the fish community had recovered in terms of number of species and overall fish abundance, and had nearly recovered in term of species composition. However, size structures after the refill were different from before the drawdown with large individuals being less abundant and smaller individuals being more abundant after refill (Paller, 1997). However, this rapid recover is in contrast to recent CDFG experiences at Lake Silverwood, where recovery from drawdown effects took approximately 10 years, even though mitigation measures such as stocking of largemouth bass and control of undesirable species such as common cap and goldfish were implemented (Giusti, pers. comm.).

(a) Short-term Measures

- Initiate a fishery assessment and monitoring program to establish pre-project conditions and provide baseline information to assist in the development of a fishery restoration plan and post-project adaptive management (see below).

- Initiate stocking program consisting of juvenile fish of desirable species (e.g., largemouth bass, bluegill, redear sunfish, and channel catfish) to maintain a balanced population structure.

- Temporarily modify recreational fishing size and bag limits to reduce recreational fishing pressures.

- Install habitat enhancement structures (e.g., hardwood brush shelters, pipe caves, rock reefs) in remaining shallow water areas to increase spawning success and survival of smaller fish.

(b) Construction Phase Measures

- A further construction-related drawdown should only be conducted outside the spring spawning and summer rearing season (i.e., during the winter).

- The proposed borrow pit should be located below the elevation of the original shallow water habitat areas (i.e., 0 to 10 feet water depth) to avoid the permanent loss of these areas.

- Install habitat enhancement structures (e.g., hardwood brush shelters, pipe caves, rock reefs) in currently exposed areas of the lake to aid recovery of the fishery after refilling.

(c) Post-filling Measures

- DWR should adaptively manage the Lake Perris fishery through recovery. Adaptive management efforts, conducted in coordination with CDFG, should be based on annual fish population monitoring data and may include activities such as stocking, habitat restoration, and control of undesirable species.

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Appendix C5
Least Bell's Vireo Survey

ESA

PSOMAS

Balancing the Natural and Built Environment

Date: July 2009

To: Environmental Science Associates.
(Mr. Tom Barnes, Mr. Mark Tucker)

From: Psomas
(Mr. Gregg Miller)

Subject: Lake Perris 2009 Least Bell's Vireo Surveys

The purpose of this memo is to document the results of the 2009 focused survey for least Bell's vireo (*Vireo bellii pusillus*) (LBV) at Lake Perris. The purpose of the LBV surveys is to determine the presence or absence of LBV in suitable habitat in the proposed project site. The survey was conducted at the request of DWR and was performed following U.S. Fish and Wildlife Service protocols.

Prior to conducting the focused surveys, Psomas searched the most recent version of the California Natural Diversity Data Base CNDDB output for the Perris Quadrangle (CDFG 2008), the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) (RCIP 2003), MSHCP monitoring reports (RCA 2007) and previous Lake Perris LBV survey reports (Psomas 2007, 2008) to determine to what extent LBV may occur on and adjacent to the site.

The surveys were conducted in two areas: 1) the southern willow scrub along the eastern lakeshore and 2) the southern willow scrub immediately west of and below the dam. The survey areas contains appropriate southern willow scrub habitat for the LBV. The characteristic plant species of the southern willow scrub habitat found within the survey areas include: Gooding's black willow (*Salix gooddingii*), red willow (*Salix laevigata*), mule fat (*Baccharis salicifolia*), tarragon (*Artemisia dracunculus*), dock (*Rumex crispus*), Fremont's cottonwood (*Populus fremontii*), and umbrella sedge (*Cyperus involucratus*). Where present in the southern willow scrub habitat, understory species included annual bur ragweed (*Ambrosia acanthicarpa*), southwestern spinyrush (*Juncus acutus*), and bromes (*Bromus diandrus*, *B. madritensis* ssp. *rubens*).

The surveys were performed by Psomas Senior Biologist; Mr. Gregg Miller. The LBV surveys were conducted following the federal survey guidelines (USFWS 2001). Eight (8) surveys for LBV were conducted on April 10, 13, 20, 23, May 1, 4, 11, 14, 21, 26, June 1, 9, 11, 15, 22, and 25, 2009.

Surveys were conducted by walking slowly watching and listening for LBV. Surveys were conducted in the morning between dawn and 11:00 AM, during weather conducive to observing LBV. Surveys were not conducted during inclement weather. Field notes in standard museum format were recorded during surveys. Locations of LBV observations were taken with a hand held GPS unit.

LBV were observed nine times in three distinct locations during the surveys. The general observation locations are shown on Figure 1 Least Bells Vireo Sightings (2009). Based on observed behavior, time and location of observations there is a minimum of one LBV territory in the southern willow scrub in the drawdown area along the eastern lakeshore.

Survey dates, times and conditions are shown in Table 1 *Survey Information*.

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Table 1
Survey Information

Survey Information						
Date	**Eastern Shore**	**Below Dam**	**Time**	**Temp.**	**Wind**	**Cloud Cover**
April 10, 2009	X		7:00 am – 9:00 am	65°F	5-10 mph	overcast
April 13, 2009		X	7:00 am – 9:10 am	55°F	0 mph	clear
April 20, 2009	X		6:30 am – 10:00 am	58°F	0 mph	clear
April 23, 2009		X	6:30 am – 8:00 am	55°F	0 mph	overcast
May 1, 2009	X		6:40 am – 9:45 am	55°F	0 mph	overcast
May 4, 2009		X	6:45 am – 8:00 am	60°F	0 mph	clear
May 11, 2009	X		6:15 am – 10:00 am	56°F	0-5 mph	clear
May 14, 2009		X	6:30 am – 8:15 am	56°F	0 mph	clear
May 21, 2009	X		6:15 am – 9:30 am	58°F	0 mph	clear
May 26, 2009		X	6:30 am – 8:15 am	58°F	0 mph	overcast
June 1, 2009	X		6:15 am – 9:45 am	60°F	0 mph	overcast, misty
June 9, 2009		X	9:00 am – 10:30 am	61°F	0-7 mph	overcast
June 11, 2009	X		6:45 am – 10:00 am	61°F	1-8 mph	overcast
June 15, 2009		X	8:30 am – 10:00 am	65°F	0-5 mph	overcast
June 22, 2009	X		6:20 am – 9:45 am	57°F	0 mph	clear
June 25, 2009		X	6:40 am – 8:30 am	67°F	0 mph	partly cloudy

Other species of wildlife observed during the surveys are included in Table 2, *Other Wildlife Observed*.

Table 2
Other Wildlife Observed

Scientific Name	Common Name
Reptiles	
Uta stansburiana	Northern side-blotched lizard
Cnemidophorus tigris	Western whiptail
Pituophis melanoleucus	Gopher snake
Birds	
Callipepla californica	California quail
Cathartes aura	Turkey vulture
Pandion haliaetus	Osprey
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	Red-tailed hawk
Falco sparverius	American kestrel
Zenaida macroura	Mourning dove
Geococcyx californianus	Greater roadrunner
Calypte anna	Anna's hummingbird
Picoides nuttallii	Nuttall's woodpecker
Sayornis nigricans	Black Phoebe

Sayornis saya	Say's phoebe
Myiarchus cinerascens	Ash-throated Flycatcher
Tyrannus vociferans	Cassin's kingbird
Tyrannus verticalis	Western kingbird
Vireo bellii pusillus	Least Bell's vireo
Corvus brachyrhynchos	American Crow
Corvus corax	Common raven
Tachycineta thalassina	Violet-green Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Psaltriparus minimus	Bushtit
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	House Wren
Phainopepla nitens	Phainopepla
Dendroica coronata	Yellow-rumped Warbler
Dendroica townsendi	Townsend's Warbler
Dendroica occidentalis	Hermit Warbler
Geothlypis trichas	Common Yellowthroat
Wilsonia pusilla	Wilson's Warbler
Piranga ludoviciana	Western Tanager
Pipilo maculatus	Spotted towhee
Pipilo crissalis	California towhee
Melospiza melodia	Song Sparrow
Pheucticus melanocephalus	Black-headed grosbeak
Passerina caerulea	Blue Grosbeak
Agelaius phoeniceus	Red-winged blackbird
Molothrus ater	Brown-headed Cowbird
Icterus bullockii	Bullock's Oriole
Carpodacus mexicanus	House finch
Carduelis psaltria	Lesser goldfinch
Carduelis lawrencei	Lawrence's goldfinch
Carduelis tristis	American goldfinch
Mammals	
Spermophilus beecheyi	California ground squirrel
Sylvilagus audubonii	Audubon's cottontail
Mephitis mephitis	Striped skunk
Canis latrans	Coyote

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LBV Sightings 2009
Biological Survey Area Boundary
Project Footprint

0 3,500
Feet

SOURCE: GlobeXplorer, 2007; ESA, 2010.

DWR - Perris Dam Remediation Program . 206008.02

Figure 1
Least Bell's Vireo Sightings (2009)