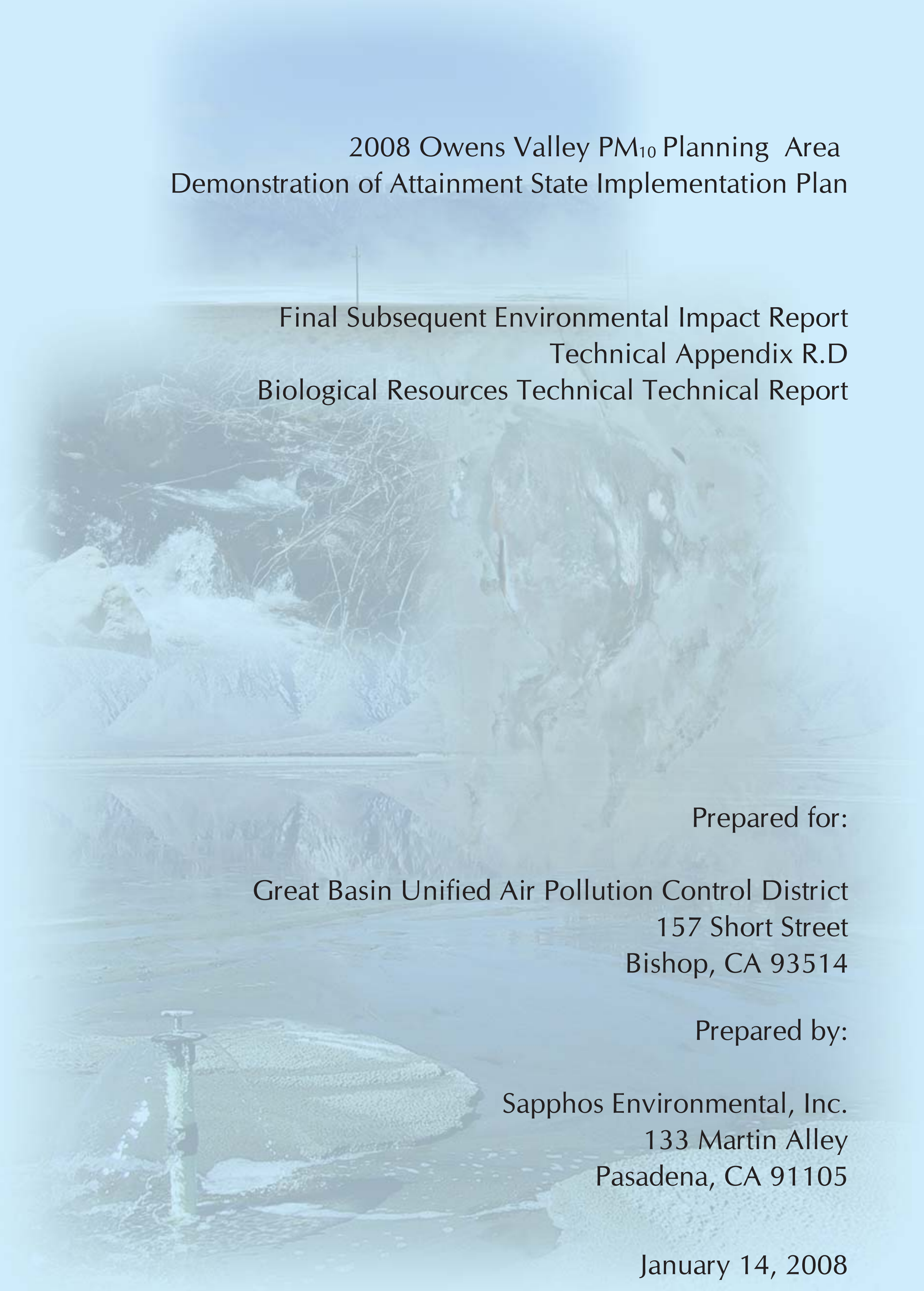
Great Basin Unified
Air Pollution Control District



2008 Owens Valley PM_{10} Planning Area
Demonstration of Attainment State Implementation Plan

Final Subsequent Environmental Impact Report
Technical Appendix R.D
Biological Resources Technical Technical Report

Prepared for:

Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514

Prepared by:

Sapphos Environmental, Inc.
133 Martin Alley
Pasadena, CA 91105

January 14, 2008

TABLE OF CONTENTS

SECTIONS **PAGE**

TABLES **PAGE**

FIGURES **FOLLOWS PAGE**

APPENDICES

SECTION ES
EXECUTIVE SUMMARY

This Biological Resources Technical Report determined that it is feasible, through project design and implementation of mitigation measures, to avoid or reduce to below the level of significance impacts from construction, operation, and maintenance of the 2008 Supplemental Control Requirements for the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (proposed project) on biological resources within the proposed project Study Area:

- 393.2 acres subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE) pursuant to Section 404 of the Clean Water Act; these areas are emissive and therefore require treatment to reduce emissions. The USACOE National Environmental Policy Act (NEPA) implementing guidelines include a categorical exclusion for habitat restoration.

- 411.8 acres of vegetated wetlands, springs/seeps, or stream channels, and 8,340.43 acres of unvegetated lake bed subject to the jurisdiction of the California Department of Fish and Game (CDFG) that would require a Streambed Alteration Agreement pursuant to the State Fish and Game Code; two (2) avoidance and minimization measures and one (1) mitigation measure were defined for a no net loss of CDFG jurisdictional areas; eleven (11) mitigation measures were defined to protect wildlife resources.

- Absence of areas designated as critical habitat or included in a conservation plan for federally or state-listed rare, threatened, or endangered species; no avoidance and minimization measures warranted.

- One state-listed species, American peregrine falcon, which is seasonally present; no avoidance and minimization measures were required.

- A total of four (4) resident sensitive wildlife species; six (6) avoidance and minimization measures were defined.

- A total of three (3) sensitive bats species; no avoidance and minimization measures warranted.

- One state-designated sensitive habitat: Dry Alkali Meadow (413 acres); three (3) mitigation measures that address avoidance and minimization of impacts to state-designated sensitive habitats and replacement of state-designated sensitive habitats, This Biological Resources Report addresses the proposed project Study Area located on seven U.S. Geological Survey (USGS) *7.5-Minute Series Topographic Quadrangles*: Bartlett,[1] Vermillion Canyon,[2] Owens Lake,[3] Keeler,[4] Dolomite,[5] Lone Pine,[6] and Olancha.[7]

The conclusions of this Biological Resources Technical Report are based on literature review, including peer-reviewed journal articles, grey literature, and database queries; coordination with USACOE, U.S. Fish and Wildlife Service, Bureau of Land Management, CDFG, Inyo County Planning Department, California Native Plant Society, and other recognized experts; and field investigations that covered more than 9,664 acres (100 percent of the proposed project Study Area).

---

[1] U.S. Geological Survey. 1988. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

[2] U.S. Geological Survey. 1988. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

[3] U.S. Geological Survey. 1988. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[4] U.S. Geological Survey. 1988. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[5] U.S. Geological Survey. 1988. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[6] U.S. Geological Survey. 1988. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

[7] U.S. Geological Survey. 1988. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

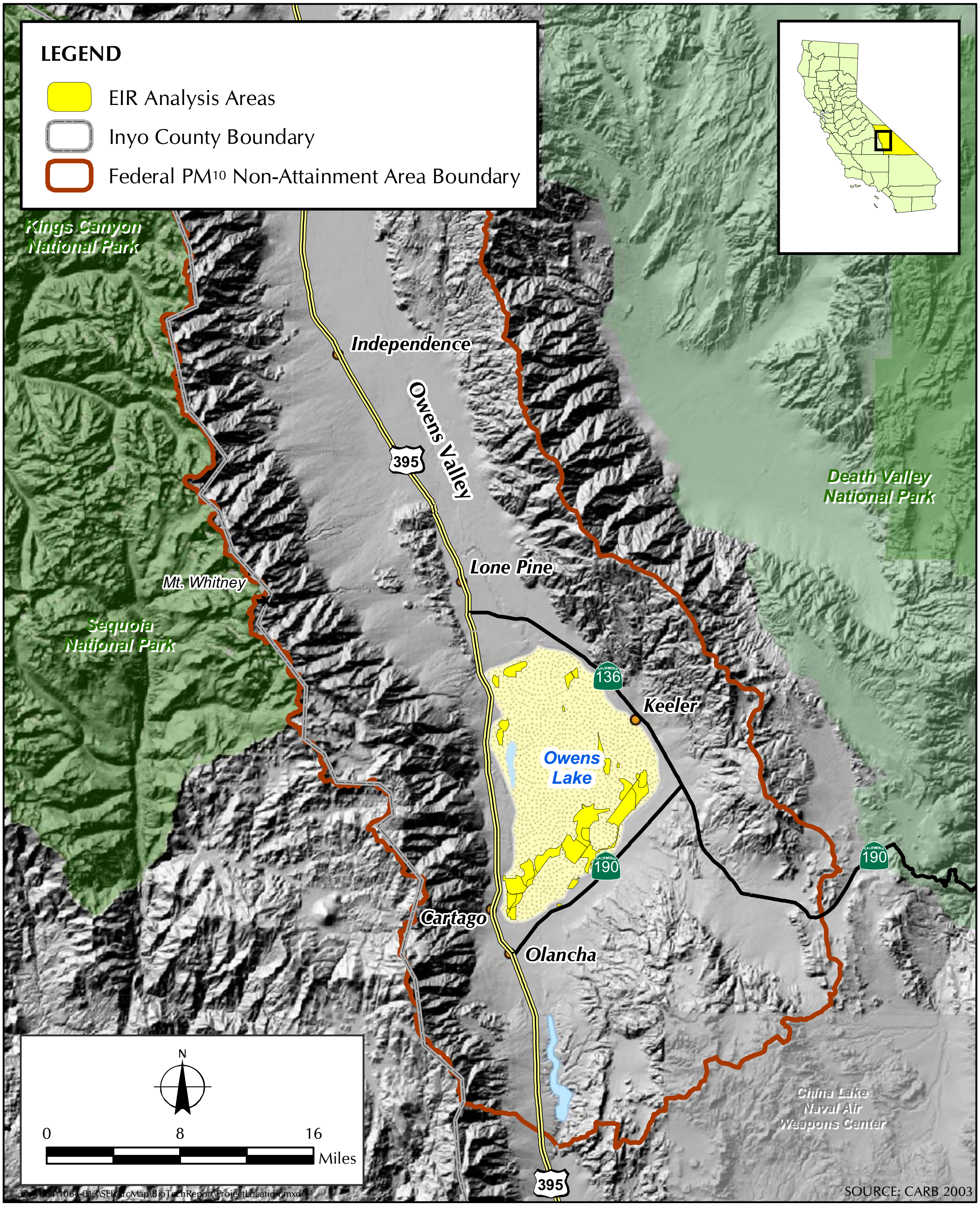
SECTION 1.0
INTRODUCTION

This Biological Resources Technical Report was prepared to characterize and evaluate the effects of the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (SIP) (proposed project) on biological resources. The proposed project would require land modifications on the Owens Lake bed to implement dust control measures (DCMs) designed to reduce fugitive dust emissions consistent with the requirements of the National Ambient Air Quality Standards (NAAQS). The proposed project includes up to 15.1 square miles (9,664 acres) within the 110-square-mile (70,000-acre) dry Owens Lake bed, located in Owens Valley, Inyo County, California (Figure 1-1, *Project Location*). The 15.1 square miles consists of 12.7 square miles of supplemental dust control areas (consisting of 9.2 square miles of Shallow Flooding and 3.5 square miles of Moat & Row DCMs), 0.5 square mile of Channel Area that may require DCMs, and 1.9 square miles of Study Area of which some or all may require controls after 2010. The Moat & Row DCM areas for this proposed project include 0.5 square mile of test sites that were approved by the California State Lands Commission (CSLC) and evaluated in previous environmental documentation.

1.1 GOAL OF THE PROPOSED PROJECT

The Great Basin Unified Air Pollution Control District (District) regulates fugitive dust (PM_{10}) emissions in the Owens Valley Planning Area (Figure 1-1) consistent with the requirements of the NAAQS. The Owens Lake bed has been the largest single source of PM_{10} emissions in the United States for many years, with annual PM_{10} emissions of more than 80,000 tons and 24-hour concentrations as high as 130 times the federal air quality standard. From 2000 through 2004, of the 100 highest 24-hour PM_{10} value days measured in the entire United States, 78 days occurred at Owens Lake, 21 days at Mono Lake, and 1 day elsewhere (i.e., El Paso, Texas). The air pollution at Owens Lake and Mono Lake is caused by the City of Los Angeles's diversion of water from the Eastern Sierra. Water historically has been diverted from the lakes to the City of Los Angeles via the Los Angeles Aqueduct.

Exposed lake bed sediments are dispersed into the air by prevailing winds. These dust storms, with the highest episodes in the spring and fall months, have the potential to cause significant ecological and human health effects. The airborne particulate matter that exists in these dust storms is small enough to travel great distances and can be inhaled deeply by humans, which may result in serious respiratory ailments. The District estimates that approximately 40,000 permanent residents that live in or visit the area are affected by Owens Lake particulate emissions. In 1987, the U.S. Environmental Protection Agency (EPA) designated the Owens Valley Planning Area as nonattainment for the NAAQS for PM_{10}. The result of this designation was that a plan, known as a SIP, was required to be prepared to demonstrate how the NAAQS would be attained. The proposed project is designed to improve air quality through the reduction of PM_{10} emissions in all of the communities in the Owens Valley, including Lone Pine, Keeler, Cartago, and Olancha, in Inyo County; the City of Ridgecrest in Kern County; Sequoia National Park; Death Valley National Park; the Manzanar National Historic Site; and the John Muir, Golden Trout, Dome Land, and South Sierra Wilderness areas. The proposed project also may improve air quality in more distant locations because, under certain circumstances, PM_{10} emissions from Owens Lake have been tracked to more densely populated sections of Southern California.



SOURCE: CARB 2003

FIGURE 1-1
Project Location

As a result of the SIP prepared by the District and approved by the U.S. EPA in 1998, the City of Los Angeles Department of Water and Power (City) began constructing DCMs on the Owens Lake bed with a goal of implementing the controls necessary to meet the federal PM_{10} standards by the end of 2006. In the same 1998 SIP, the District committed to continue to study the Owens Lake bed and to revise the SIP in 2003 to refine the actual areas necessary for control. Based on those additional studies, in November 2003, the Great Basin Governing Board adopted a revised SIP and ordered the City to implement DCMs on 29.8 square miles of the Owens Lake bed by December 31, 2006.

In addition to requiring the City to construct and begin operating 29.8 square miles of DCMs on the Owens Lake bed by the end of 2006, the 2003 SIP also contained provisions requiring the District to continue monitoring air pollution emissions from the Owens Lake bed and identify any additional areas beyond the 29.8 square miles that may require PM_{10} controls to meet the standards. The federal Clean Air Act requires all SIPs to contain "contingency measures" that will be implemented in case the initial control strategy (i.e., 29.8 square miles of controls) fails to bring the facility (lake bed) into compliance. One such contingency measure was for the Air Pollution Control Officer (APCO) to complete a Supplemental Control Requirements (SCR) analysis and determination as to whether additional dust controls are required on Owens Lake based on continuous air quality data collected.

On December 21, 2005, based on data collected between July 2002 and June 2004, the APCO completed the 2003 SIP-required supplemental SCR analysis and issued the determination that additional areas of the Owens Lake bed would require DCMs to meet the PM_{10} standards. Based on that SCR analysis and on subsequent discussions with the City, an agreement with THE CITY has been reached to construct the additional DCMs necessary to bring the Owens Lake bed into compliance with the NAAQS for PM_{10}. These additional DCMs beyond the 29.8 square miles completed at the end of 2006 are the subject of the proposed project.

1.2 PROJECT OBJECTIVES

Eight objectives have been identified for the proposed project:

- Attain the NAAQS for PM_{10} by the year 2010
- Revise the approved 2003 SIP by July 1, 2008
- Minimize (or compensate for) long-term, significant, adverse changes to sensitive resources within the natural and human environment
- Provide a high technical likelihood of success without substantial delay
- Conform substantially to adopted plans and policies and existing legal requirements
- Minimize the long-term consumption of natural resources
- Minimize the cost per ton of particulate pollution controlled
- Be consistent with the State of California's obligation to preserve and enhance the public trust values associated with Owens Lake

1.3 PURPOSE OF THE BIOLOGICAL RESOURCES TECHNICAL REPORT

This Biological Resources Technical Report was prepared to characterize and evaluate the biological resources that potentially would be affected by the implementation of the DCMs on the additional areas of the Owens Lake bed. In addition, land modifications required to accommodate the proposed project constitute a project pursuant to the State of California Environmental Quality

Act (CEQA) Guidelines. The District is the lead agency for the proposed project pursuant to CEQA. The Owens Lake bed is owned and managed by CSLC and will issue a lease to the City for implementation and operation of the DCMs on the lake bed. Therefore, the CSLC is both a Trustee Agency and a Responsible Agency. The District and the City are joint project applicants. The proposed project would be subject to discretionary approval by the District Governing Board. Acting in their capacity as a lead agency under CEQA, the District would need to determine the potential for the proposed project to result in significant impacts, to consider mitigation measures and alternatives capable of avoiding significant impacts, and to take the environmental effects of the proposed action into consideration as part of their decision-making process. This Biological Resources Technical Report constitutes the substantial evidence that was considered and evaluated to address the scope of analysis recommended in Appendix G of the State CEQA Guidelines, including Inyo County General Plan and Zoning Ordinances related to biological resources; areas potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE) pursuant to Section 404 of the Clean Water Act; riparian and other state-designated sensitive habitats, including those requiring a Streambed Alteration Agreement pursuant to Section 1600 of the State Fish and Game Code; special status species and designated critical habitat; native resident or migratory species of fish and wildlife; and the consideration of federal, state, and regional conservation plans. This Biological Resources Technical Report will constitute the substantial evidence for the environmental analysis, feasibility of mitigation measures, and findings of fact.

1.4 INTENDED AUDIENCE

This Biological Resources Technical Report provides the substantial evidence related to biological resources that will inform trustee and responsible agencies and the public regarding the potential for the proposed project to result in significant adverse impacts to biological resources and the ability of mitigation measures and alternatives to avoid or substantially reduce such impacts. The information contained in the Biological Resources Technical Report and related input received from responsible and trustee agencies and the public will be taken into consideration by the District in their decision making related to the proposed project. The Biological Resources Technical Report also will constitute the substantial evidence to be considered for related decision-making processes to be undertaken by the CSLC and the City. The information contained in this Biological Resources Technical Report has been an integral part of the project-planning-process effort to avoid and minimize impacts to biological resources to the maximum extent practicable while attaining most of the basic objectives of the project. CEQA also requires that the lead agency seek the input of responsible and trustee agencies for biological resources. This Biological Resources Technical Report documents the coordination and informal consultation that has been undertaken with the USACOE, the U.S. Department of the Interior Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), the CSLC, and the California Department of Fish and Game (CDFG).

1.5 SCOPE OF THE PROJECT

This Biological Resources Technical Report consists of a summary of the regulatory framework that guides the decision-making process, a description of the methods employed to support the characterization and evaluation of biological resources at the proposed project site, the results for baseline conditions for biological resources, the potential for the proposed project to result in significant adverse impacts to biological resources, and opportunities to avoid and minimize such impacts. This Biological Resources Technical Report addresses each of the environmental issues considered in Appendix G of the State CEQA Guidelines for biological resources:

- Related goals and policies of the Inyo County General Plan
- Potential to affect areas potentially subject to the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act
- Riparian and other state-designated sensitive habitat, including those requiring a Streambed Alteration Agreement pursuant to Section 1600 of the State Fish and Game Code
- Special-status species and designated critical habitat
- Native resident or migratory species of fish and wildlife
- Federal, state, and regional conservation plans

1.6 SOURCES OF RELEVANT INFORMATION

Information used in the preparation of this Biological Resources Technical Report was derived from an extensive literature review, including published and gray literature, and the 1997 Environmental Impact Report (EIR),[1] 1998 Addendum EIR,[2] and 2003 SIP EIR;[3] coordination; with experts knowledgeable of the biological resources identified as having the potential to occur within the proposed project site; consultation with responsible and trustee agencies; outreach to the public and interested parties; over 800 hours of field investigation and mapping; and spatial analysis using geographic information system. Sources of relevant information are cited in footnotes and compiled in Section 6, *References*.

1.7 WORKING DEFINITIONS

Special-status species are those afforded special recognition by federal, state, and/or local resource agencies or jurisdictions or by recognized resource conservation organizations. Special-status wildlife species include those that are federally listed or state listed as endangered, threatened, or candidate species pursuant to the federal Endangered Species Act, the California Endangered Species Act, other regulations enforced by a federal or state agency (e.g., BLM or USFWS), or those considered by the scientific community to be rare. For this Biological Resources Technical Report, special-status species include listed, sensitive, and locally important species.

Federally listed species are those provided with special legal protection under the federal Endangered Species Act. A federally listed endangered species is a species that is in danger of extinction throughout all or a significant portion of its range. A federally threatened species is one likely to become endangered in the absence of special protection or management efforts provided by the listing. A candidate species is one that is proposed by the federal government for listing as endangered or threatened.

---

[1] Great Basin Unified Air Pollution Control District. 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, Volumes I and II* (SCH No. 961220777). Bishop, CA.

[2] Great Basin Unified Air Pollution Control District. 1998. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Addendum No.1 to the Final Environmental Impact Report* (SCH No. 96122077). Bishop, CA.

[3] Great Basin Unified Air Pollution Control District. 2003. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, Volumes I and II* (SCH No. 2002111020). Bishop, CA.

State-Listed species are those provided special legal protection under the California Endangered Species Act. A state-listed endangered species is a species that is in danger of extinction throughout all or a significant portion of its range. A state-listed threatened species is one likely to become endangered in the absence of special protection or management efforts provided by the listing. A candidate species is one that is proposed by the federal or state government for listing as endangered or threatened.

Federally designated sensitive species are those not listed by the federal government as endangered, threatened, or candidate species but categorized by the federal government as a federal species of concern. "Federal species of concern" is a term-of-art that describes a taxon whose conservation status may be of concern to the USFWS but does not have official status. In addition, federally designated sensitive species include those that are designated as such by BLM and USFWS on lands that fall under their jurisdiction.

State-designated sensitive species are those not listed by the state government as endangered, threatened, or candidate species but categorized by the state as a species of special concern or fully protected species. A California species of special concern is defined by CDFG as being a wildlife species that has declining population levels, a limited range, and/or continuing threats that have made it vulnerable to extinction.

Locally important species are those not monitored by the resource agencies but monitored by private organizations or local municipal governments. The Inyo County General Plan does not identify any species of plant or wildlife as locally important beyond those designated by the state and federal government. For the purposes of this Biological Resources Technical Report, locally important species include those plant species recognized by the California Native Plant Society, a private organization dedicated to the conservation of native plants, as well as those recognized by Inyo County, Audubon Society, and identified in the 2003 SIP.[4]

Reconnaissance surveys refer to field surveys that were performed for special-status species of plants and wildlife (including listed, sensitive, and locally important species) that were identified as having the potential to occur at the proposed project site as a result of a literature review, agency consultation, and habitat assessment. All species with the potential to occur on site were surveyed simultaneously along transects that spanned the entire proposed project area, so that all habitat types were sampled.

Detailed field studies refer to directed studies performed for specific special-status species or groups of wildlife identified as having the potential to occur at the proposed project site as a result of a literature review, agency consultation, and habitat assessment. Detailed field studies were designed and performed to take into account the particular life history traits and habitat requirements of the species or species group of interest. Detailed field studies implemented the most recent agency-approved protocols whenever possible.

---

[4] Great Basin Unified Air Pollution Control District. 2003. *2003 Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan*. Bishop, CA.

SECTION 2.0
PROJECT DESCRIPTION

Consistent with the requirements of §15124 of the State of California Environmental Quality Act (CEQA) Guidelines, the project description of the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP)[1] (proposed project) includes the precise location and boundaries of the proposed project, a brief characterization of the existing conditions at the proposed project site, and a statement of objectives for the proposed project. Detailed descriptions of the project elements; a general delineation of the proposed project's technical, economic, and environmental characteristics; and a statement describing the proposed project were provided in the Subsequent Environmental Impact Report (EIR) in support of the 2008 SIP.

2.1 PROPOSED PROJECT LOCATION

The proposed project includes up to 15.1 square miles (9,664 acres) within the 110-square-mile (70,000-acre) dry Owens Lake bed, located within the Owens Valley, Inyo County, California (Figure 2.1-1, *Regional Vicinity Map*). The proposed project is located approximately 5 miles south of the community of Lone Pine and approximately 61 miles south of the City of Bishop. The proposed project is located approximately 10 miles to the west of Death Valley National Park, approximately 11 miles to the east of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest (Figure 2.1-1). The location of the proposed project is depicted on seven U.S. Geological Survey (USGS) 7.5-Minute Series Topographic Quadrangles: Bartlett,[2] Vermillion Canyon,[3] Owens Lake,[4] Keeler,[5] Dolomite,[6] Lone Pine,[7] and Olancha[8] (Figure 2.1-2, *USGS 7.5-Minute Map Index*). The topography of the site is exceptionally flat with an approximate elevation ranging from 3,600 feet above mean sea level (MSL) as defined by the historic shoreline to approximately 3,554 feet above MSL as defined by the remnant existing brine pool. There is only a 46-foot difference between the highest and the lowest area of the 110-square-mile lake bed. The proposed project site lies southwest of the Inyo Mountains, northwest of the Coso Range, and east of Mount Whitney in the Sierra Nevada mountain range (Figure 2.1-1). The proposed project is bounded on the north-northeast by State Highway 136, on the east by State Highway 136 and State Highway 190, on the south by the intersection of State Highway 190 and U.S. Highway 395, and on the west by U.S. Highway 395. There are three communities in the vicinity of the proposed project located in the unincorporated area of Inyo County (the community of Lone Pine to the north, the community of Keeler to the east, and the community of Olancha/Cartago to the

---

[1] PM_{10} refers to particulate matter up to 10 micrometers in size, a regulated air emission pursuant to the federal Clean Air Act Amendments of 1990.

[2] U.S. Geological Survey. 1987. 7.5-Minute Series, Bartlett, California, Topographic Quadrangle. Denver, CO.

[3] U.S. Geological Survey. 1987. 7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle. Denver, CO.

[4] U.S. Geological Survey. 1987. 7.5-Minute Series, Owens Lake, California, Topographic Quadrangle. Denver, CO.

[5] U.S. Geological Survey. 1987. 7.5-Minute Series, Keeler, California, Topographic Quadrangle. Denver, CO.

[6] U.S. Geological Survey. 1987. 7.5-Minute Series, Dolomite, California, Topographic Quadrangle. Denver, CO.

[7] U.S. Geological Survey. 1994. 7.5-Minute Series, Lone Pine, California, Topographic Quadrangle. Denver, CO.

[8] U.S. Geological Survey. 1994. 7.5-Minute Series, Olancha, California, Topographic Quadrangle. Denver, CO.

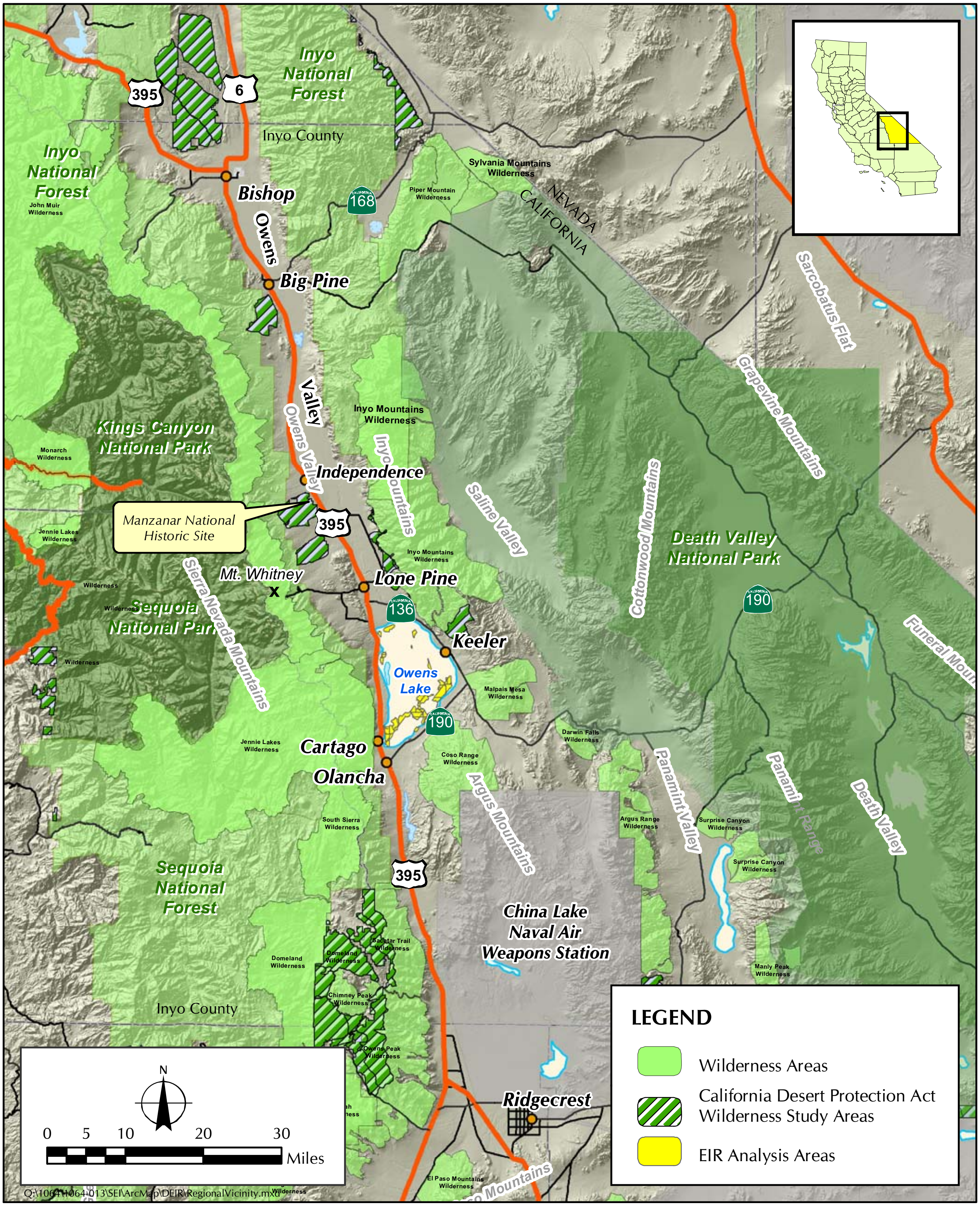


FIGURE 2.1-1
Regional Vicinity Map

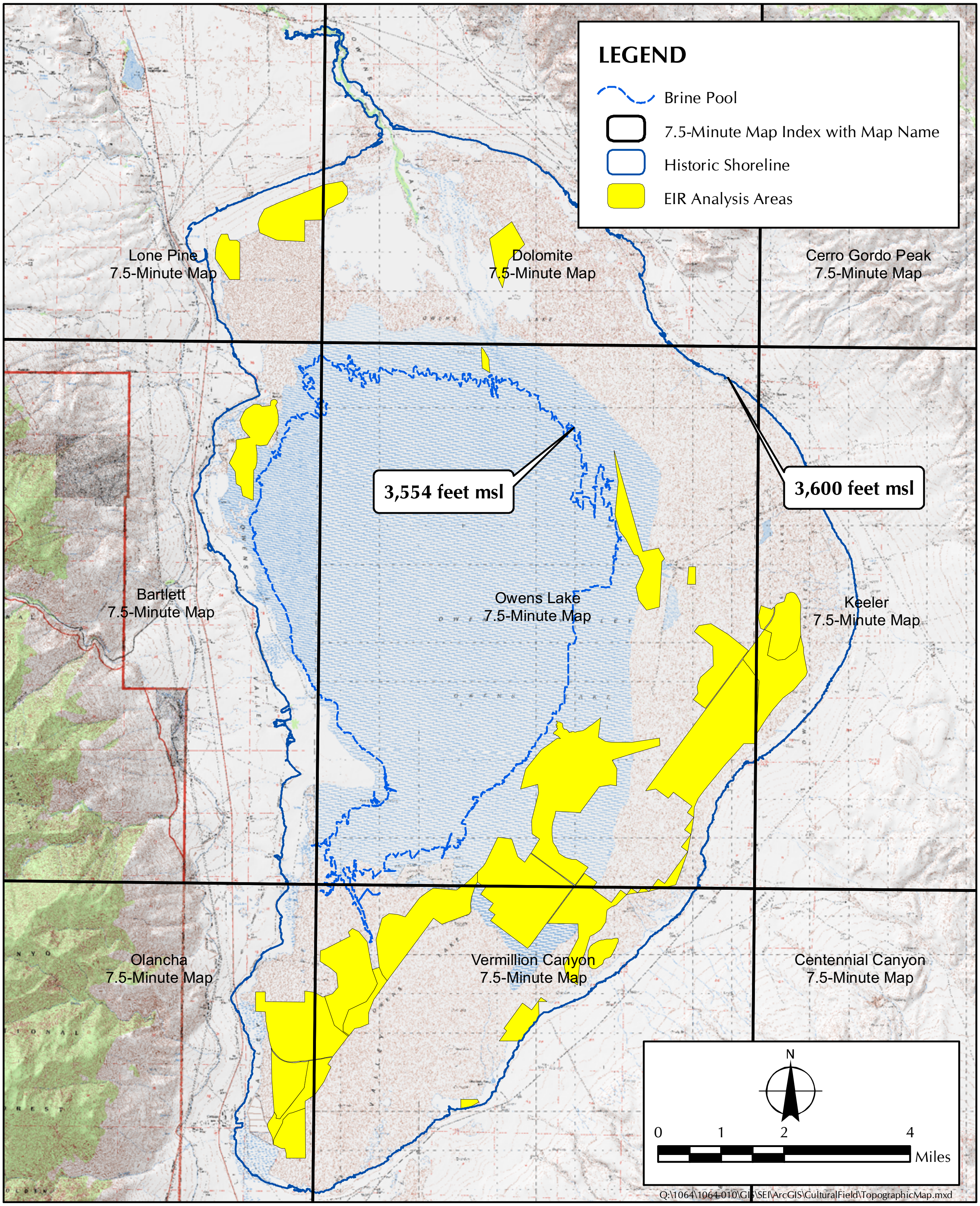


FIGURE 2.1-2

USGS 7.5-Minute Map Index

southwest) and one designated Indian reservation (Lone Pine Indian Reservation to the north) (Figure 2.1-3, *Project Vicinity Map*).[9]

2.2 EXISTING CONDITIONS

The effects of surface water diversions on Owens Lake were described in the 1997 Owens Valley PM_{10} Planning Area Demonstration of Attainment SIP Environmental Impact Report (1997 EIR) and are repeated here to create a context for understanding the environmental setting and the need for the proposed project.[10] The description provided in the 1997 EIR[11] has been updated to reflect the implementation of the 2003 SIP[12] (Figure 2.2-1, *Previous SIP Implementation Areas Addressed in the 2008 SIP*).

The City of Los Angeles Department of Public Works (City) completed installation of the North Sand Sheet Shallow Flooding Project in 2001. That project resulted in the conversion of 13.5 square miles of primarily barren playa to Shallow Flooding. The affected area was described as Zones 1 and 2 in the 1998 SIP (District 1998). Pipelines, buried power lines, and access roads were developed in conjunction with the Shallow Flooding Project. Specifically, a 210-foot-wide water conveyance pipeline corridor was developed to distribute water from the Los Angeles Aqueduct to the east side of the bed of Owens Lake. A 50-foot-wide power line easement and an 80-foot-wide north access road corridor were constructed. Compliant Shallow Flooding requires the maintenance of 75 percent surface-saturated soil or standing water within the control area between October 1 and June 30.

The City of Los Angeles completed installation of approximately 6 square miles of the Southern Zones Dust Control Project in 2002. That project resulted in the conversion of barren playa and transmontane alkaline meadow to Managed Vegetation and habitat Shallow Flooding. The Southern Zones Dust Control Project includes facilities appurtenant to the implementation of Dust Control Measures (DCMs), such as irrigation systems, drainage systems, power supply systems, and auxiliary facilities. Compliant Managed Vegetation consists of at least 50 percent of the land surface on each acre consisting of substantially evenly distributed live and dead vegetation. Managed Vegetation completed to date has been accomplished with saltgrass (*Distichlis spicata*).

In December 2006, the City of Los Angeles completed installation of Phase 5 of DCMs pursuant to the 2003 SIP to achieve a total of 29.8 square miles of dust controls, consisting of approximately 26 square miles of Shallow-flooded lake bed and 3.8 square miles of Managed Vegetation (Figure 2.2-2, *Completed Dust Control Areas, 2006*).

---

[9] Inyo County Planning Department. 5 October 2002. Map of Inyo County. Available at: http://www.sdsu.edu/Inyo/genplan.html

[10] Great Basin Unified Air Pollution Control District (District). 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, Volumes I, II, and III*. (SCH No. 961220777.) Bishop, CA.

[11] Great Basin Unified Air Pollution Control District (District). 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, Volumes I, II, and III*. (SCH No. 961220777.) Bishop, CA.

[12] Great Basin Unified Air Pollution Control District (District). November 2003b. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

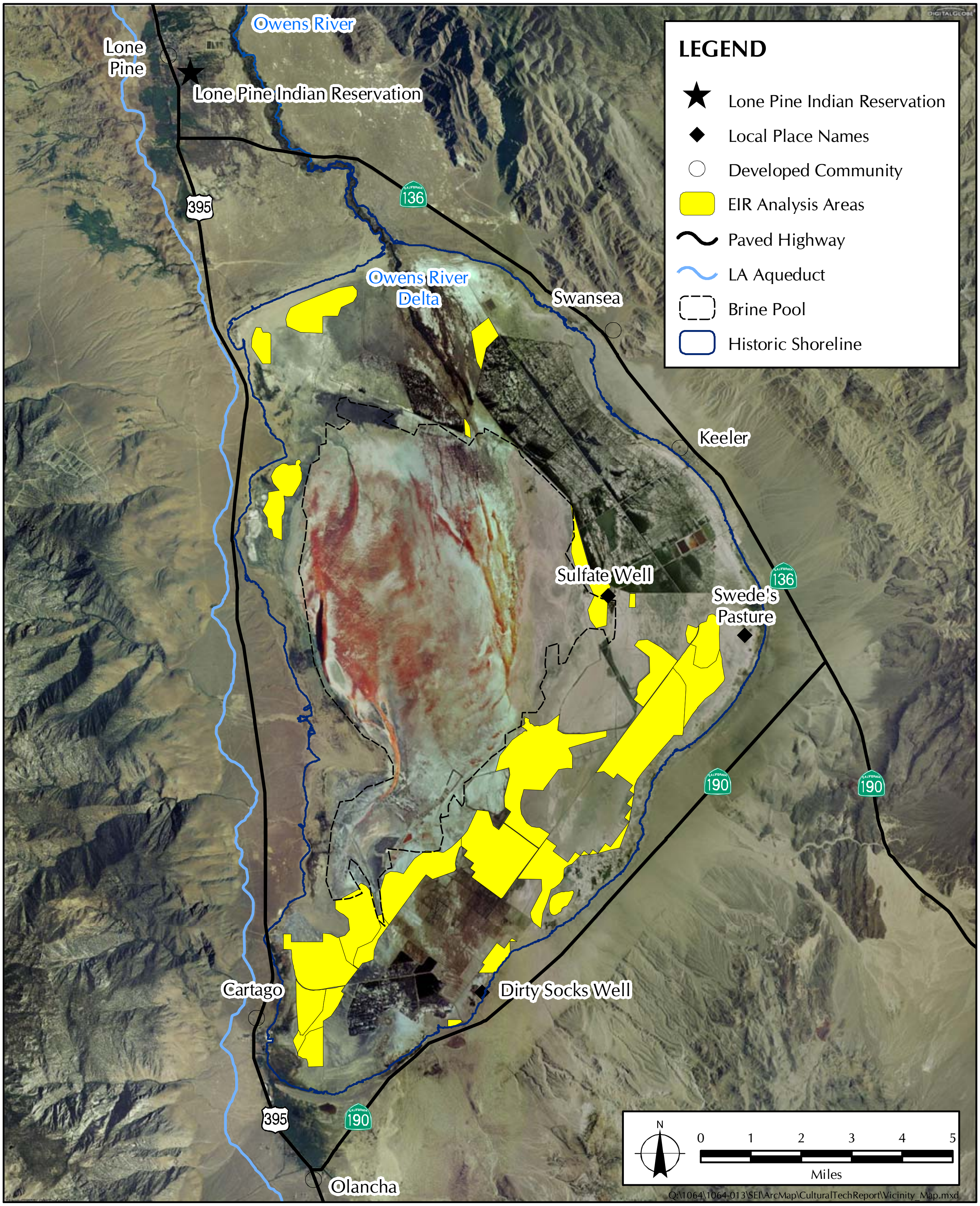


FIGURE 2.1-3

Project Vicinity Map

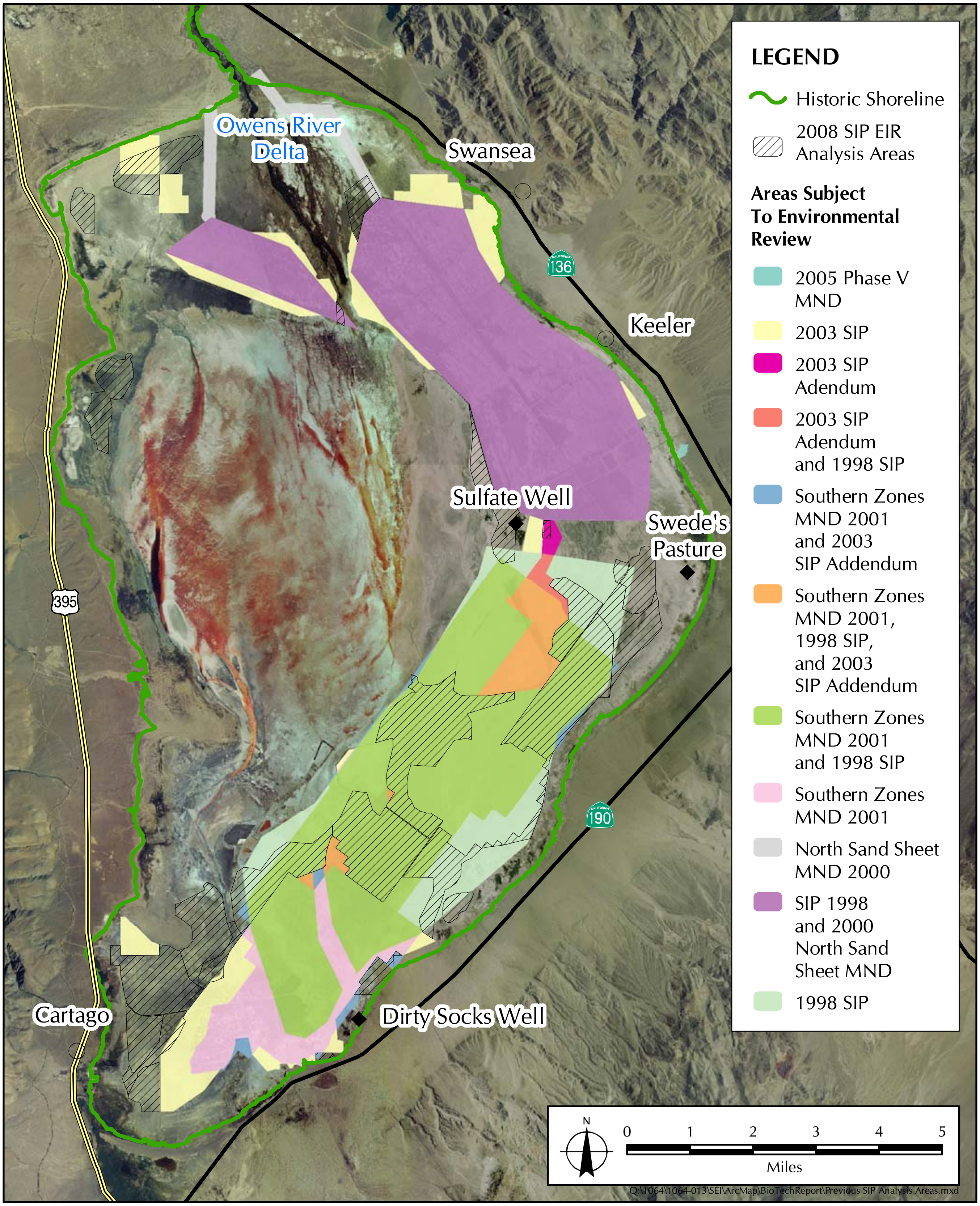


FIGURE 2.2-1

Previous SIP Implementation Areas Addressed in the 2008 SIP

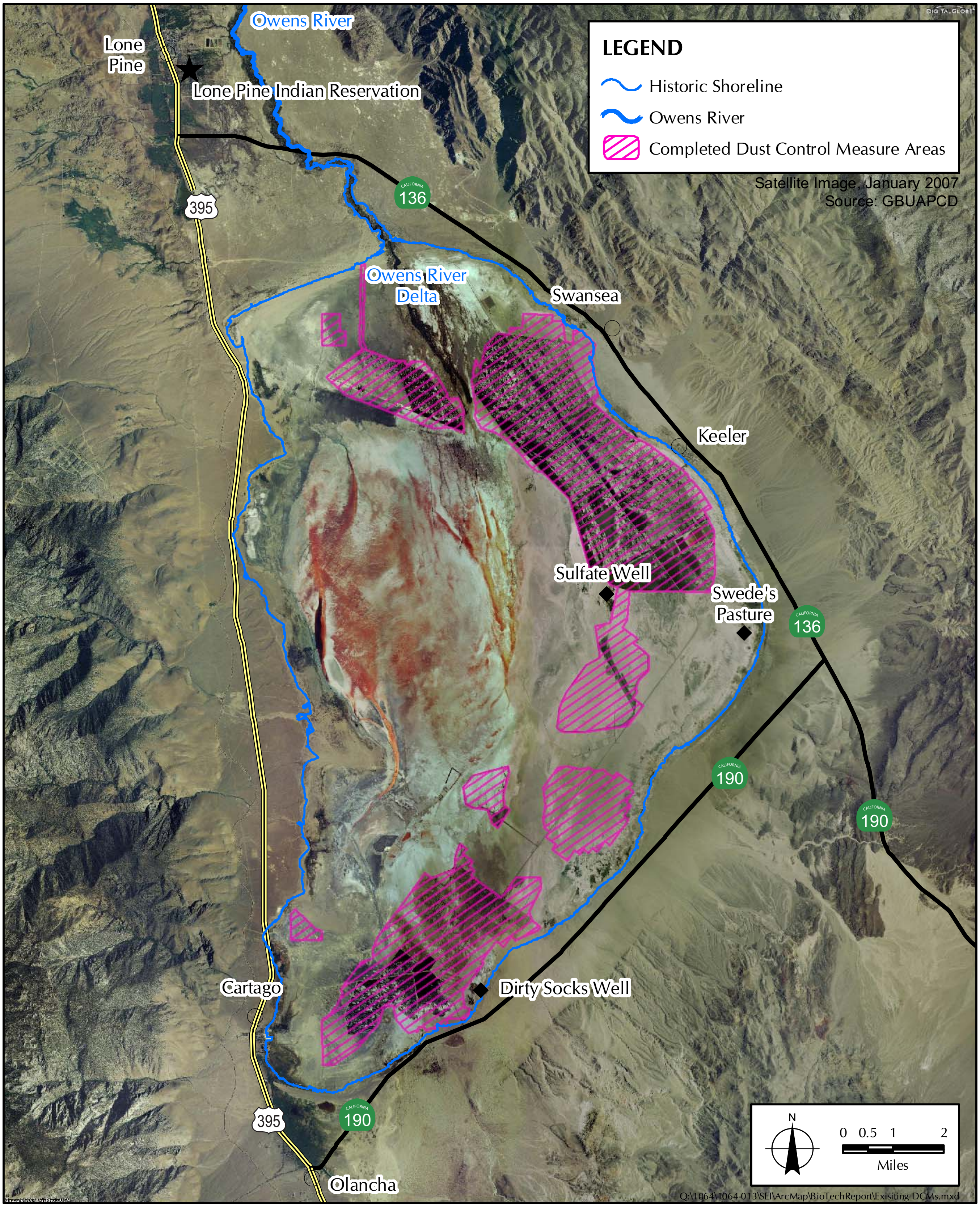


FIGURE 2.2-2

Completed Dust Control Areas, 2006

2.2.1 General Plan Land Use and Zoning

The dry Owens Lake bed is primarily owned and operated in trust for the people of the State of California by the California State Lands Commission (CSLC), and while not subject to local regulatory authority by the Inyo County, the County's General Plan recognizes the location of state and federally owned lands at Owens Lake. The Land Use element of the Inyo County General Plan designates the proposed project area as Natural Resources and State and Federal Lands.[13] This land use designation "is applied to land or water areas that are essentially unimproved and planned to remain open in character, [and] provides for the preservation of natural resources, the managed production of resources, and recreational uses."[14] The Inyo County Zoning Ordinance designates the proposed project area as predominantly OS-40: Open Space Zone, 40-acre minimum lot size.[15]

2.3 PROJECT ELEMENTS

The proposed project addresses up to 15.1 square miles (9,664 acres) for the placement of potential DCMs to ensure that the District will meet the NAAQS after 2010. Pursuant to the 2003 SIP, the Air Pollution Control Officer (APCO) determined on December 21, 2005, that supplemental control requirements were required to meet the National Ambient Air Quality Standards (NAAQS). Based on discussions between the District and the City, DCMs would be required on at least 12.7 more square miles of dry lake bed and they may be required on up to 15.1 square miles (Figure 2.3-1, *Proposed Project Elements)*. The 15.1 square miles consists of 12.7 square miles of supplemental DCAs (consisting of 9.2 square miles of Shallow Flooding and 3.5 square miles of Moat & Row DCMs), 0.5 square mile of Channel Area that would require DCMs and/or an alternative form of DCMs, and 1.9 square miles of Study Area of which some or all may require controls after 2010. The Moat & Row DCM areas for this proposed project include 0.5 square mile of test sites that were approved by the CSLC and evaluated in previous environmental documentation.[16,17] By 2010, a total of at least 42.57 square miles of DCMs are to be operational. As much as a total of 44.92 square miles of lake bed may require controls at some point. The purpose of this Biological Resources Technical Report is to analyze, based on the proposed 2008 SIP, the impacts to cultural resources from the construction of supplemental DCMs on an additional 15.1 square miles of potentially emissive lake bed, which includes 12.7 square miles of mandatory DCM area, 0.5 square mile of Channel Area, and 1.9 square miles of Study Area that may be emissive (Table 2.3-1, *Comparison of Proposed Project Elements*).

---

[13] Inyo County Planning Department. 11 December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[14] Inyo County Planning Department. 11 December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[15] County of Inyo. *County Code,* Title 18: "Zoning." Available at: http://www.countyofinyo.org/planning/zonord.html

[16] California State Lands Commission. May, 2007. CSLC Lease to LADWP for Construction, Operation, Maintenance, and Monitoring of a Moat & Row Demonstration Project from May, 2007 to May, 2010. Lease PRC 8745.9. California State Lands Commission, Title Unit, 100 Howe Avenue, Suite 100-South, Sacramento, CA 95825-8202.

[17] CSLC environmental document for lease, either Negative Declaration or Exemption

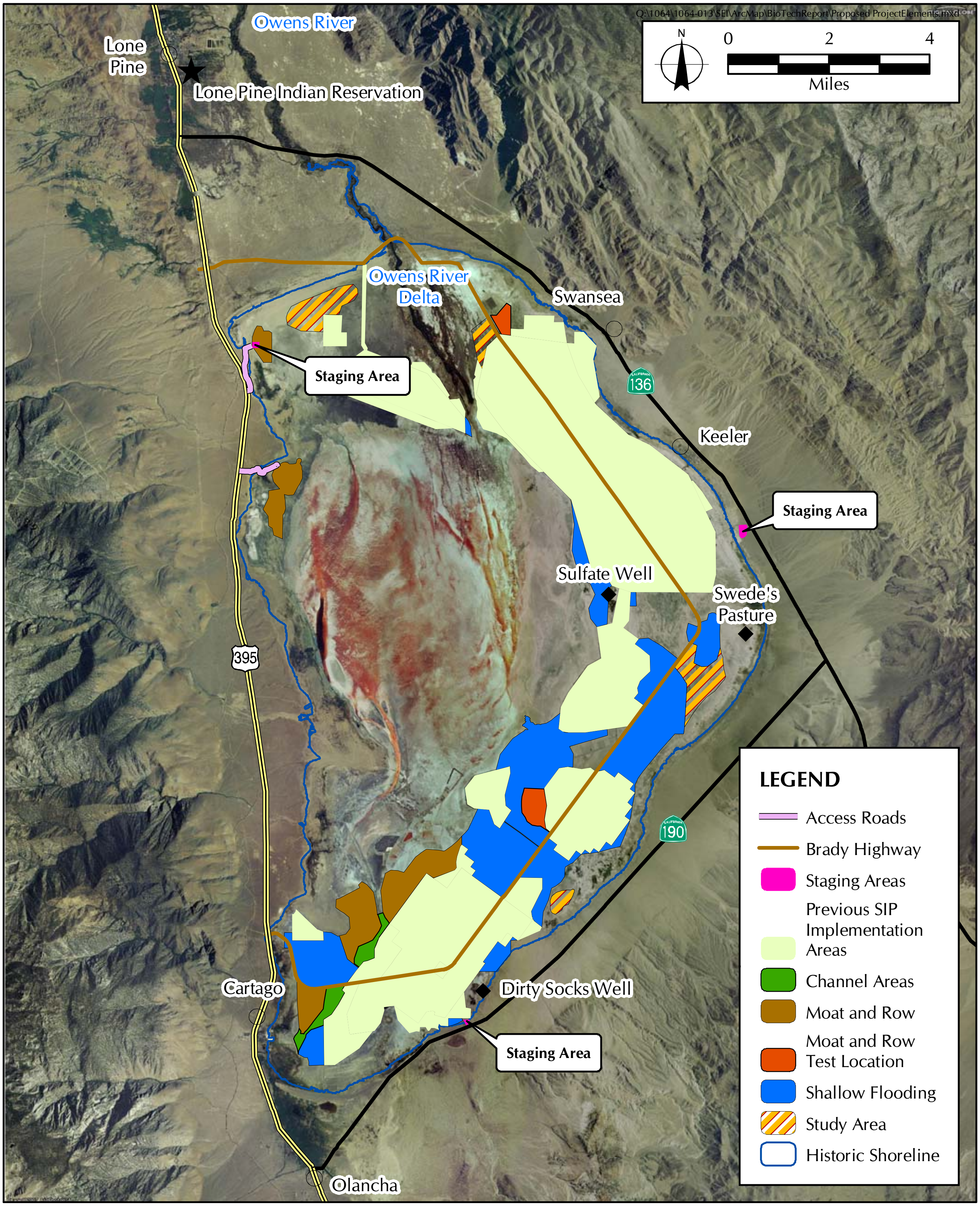


FIGURE 2.3-1

Proposed Project Elements

TABLE 2.3-1
COMPARISON OF PROPOSED PROJECT ELEMENTS

Supplemental Dust Control Area/Measure	Square Miles	Acres	Percentage
Shallow Flood	9.2	5,888	61%
Moat & Row	3.5	2,240	23%
Study Area	1.9	1,216	13%
Channel Area	0.5	320	3%
Total Proposed Project Area	15.1	9,664	100%

2.3.1 Dust Control Measures

Shallow Flooding

The performance standard for the Shallow Flooding DCM consists of achieving PM_{10} control efficiency by wetting emissive lake bed surfaces sufficiently to control PM_{10} emissions, between October 1 and June 30 of each year. The amount of water required on each lake bed area varies by the amount of PM_{10} control required in that area. Most Shallow Flooding areas require 99 percent PM_{10} reduction and will therefore have 75 percent of the control area wetted to produce standing water or surface-saturated soil. The City proposes to achieve the performance standard by releasing water along the upper edge of the Owens Lake bed and allowing it to spread and flow down-gradient toward the center of the lake.

The evaluation of this alternative is based on the assumption that an estimated approximately 2.5 acre-feet of water would be required annually to control PM_{10} emissions from an acre of lake bed. The primary management objective for Shallow Flooding would be dust control. Surface water salinity in these areas would vary over a wide range [10,000 to 450,000 milligrams/liter (mg/l) total dissolved solids (TDS)] and would at times exceed levels suitable for biological production. The Shallow Flooding would include pumps for distribution of water. These pumps produce very little noise and have not been found to adversely affect wildlife. Except for limited habitat maintenance flows, water would be turned off between July 1 and September 30 to allow for facility maintenance activities. This is typically a period when dust storms do not occur.

Moat & Row

The performance standard for the Moat & Row DCM consists of achieving PM_{10} control efficiency through the construction of moats and rows, aligned generally perpendicular to the predominant wind direction such that the majority of the saltating particles are retained within the height of the uppermost feature of the row (Figure 2.3.1-1, *Moat & Row DCM*). At the time of preparation of the EIR, the City was in the process of field testing the Moat & Row DCM at two test locations on the lake bed (Figure 2.3.1-2, *Moat & Row Test Sites*). The test locations were subject to environmental review and permitted for study purposes by the CSLC in May 2007.[18,19] In addition, the final

---

[18] California State Lands Commission. May, 2007. CSLC Lease to LADWP for Construction, Operation, Maintenance, and Monitoring of a Moat & Row Demonstration Project from May, 2007 to May, 2010. Lease PRC 8745.9. California State Lands Commission, Title Unit, 100 Howe Avenue, Suite 100-South, Sacramento, CA 95825-8202.

[19] CSLC environmental document for lease, either Negative Declaration or Exemption

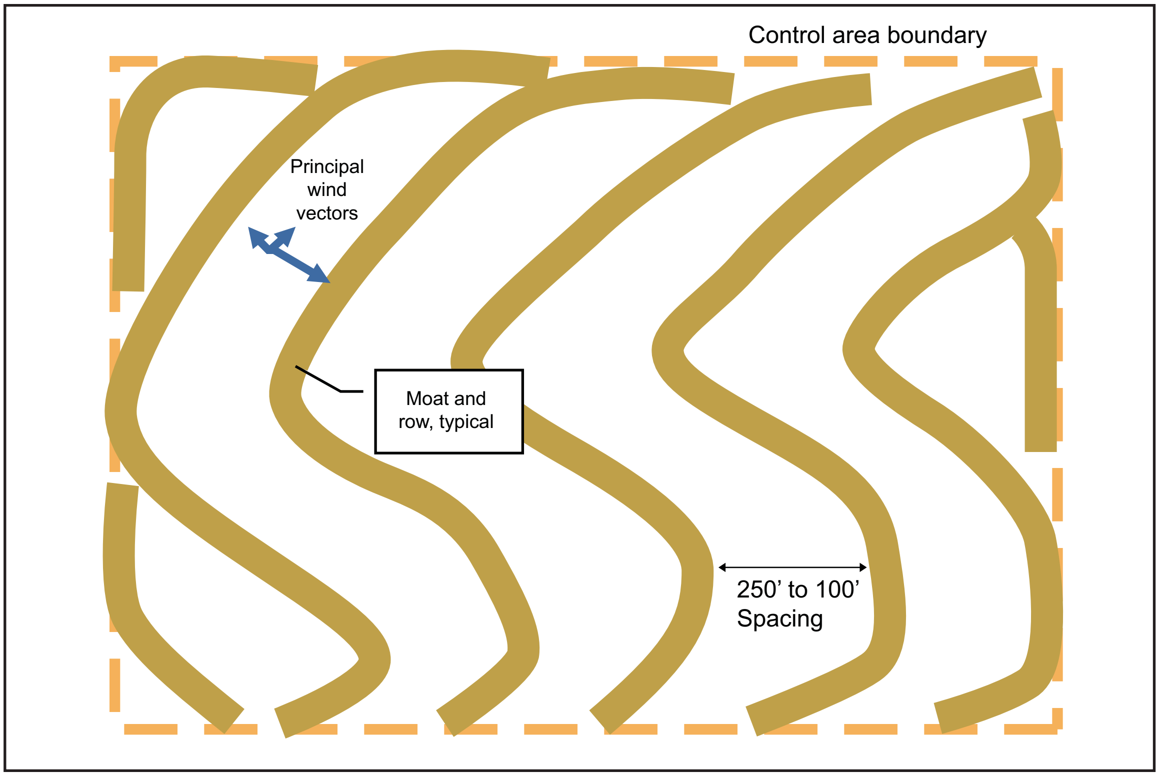


EXHIBIT 1

Moat & Row Array Plan View (Schematic)

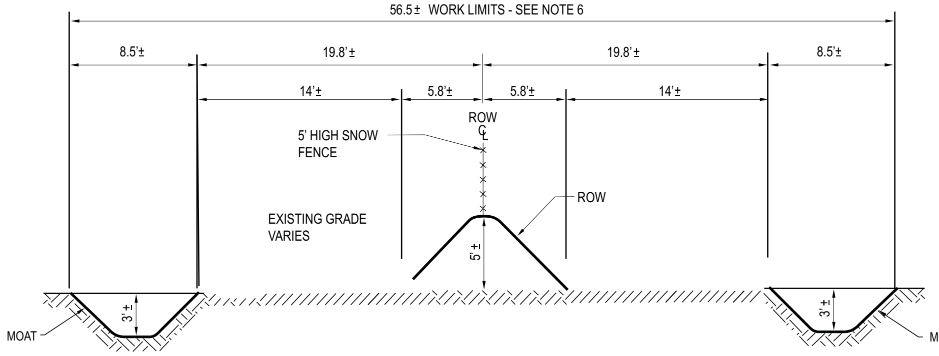


EXHIBIT 2

Profile of Moat & Row with Approximate Dimensions (Schematic)

FIGURE 2.3.1-1

Moat & Row DCM

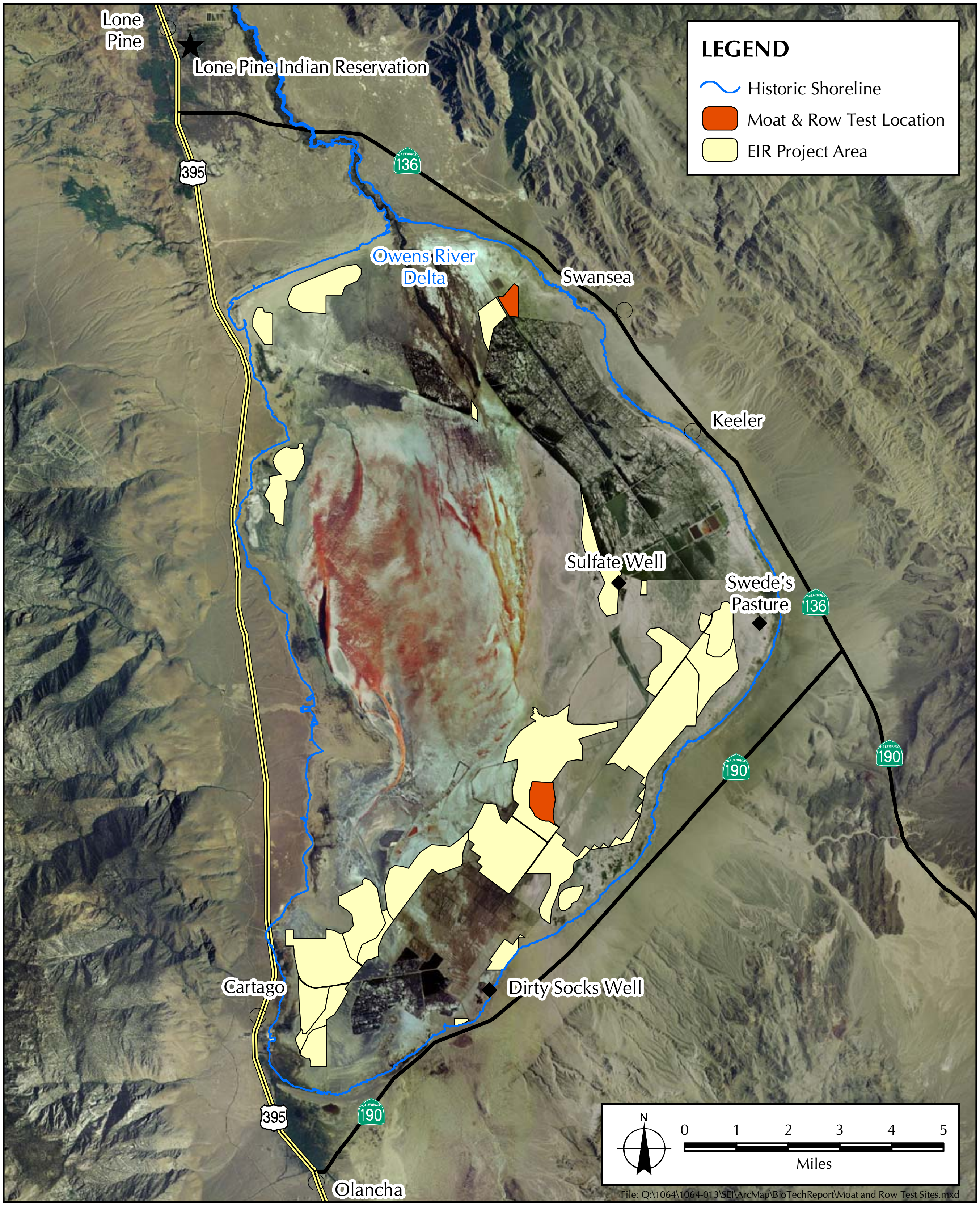


FIGURE 2.3.1-2

Moat & Row Test Sites

maintenance regime and needs would be specified in conjunction with the results of the test program.

The City proposes to achieve the performance standard through the construction of individual Moat & Row elements that would generally be aligned parallel to one another, and spaced at variable intervals, so as to minimize the fetch between rows along the predominant wind directions. The predominant winds are from the north and the south with the north-blowing wind the strongest but less frequent. It is anticipated that the Moat & Row berms would primarily be oriented perpendicular to the primary wind vector, and may be serpentine where necessary to control emissions under the full range of principal wind directions (Figure 2.3.1-2). Moats serve to capture moving soil particles, and rows physically shelter the downwind lake bed from the wind. These requirements would be anticipated to result in an array of earthen berms (rows) about 5 feet high with sloping sides (not to exceed 2:1 slopes) and a base of about 11.6 feet, an access road on both sides of the row of approximately 14 feet, flanked on the other side by ditches (moats) about 4 feet deep and about 8.5 feet at the widest point, and up to 12 feet of additional temporary construction footprint beyond the limits of the Moat & Row Arrays (Figure 2.3.1-2). For the purposes of this analysis, each Moat & Row Array element was estimated to have a total impact area of 82 feet wide.

Initial pre-test modeling indicates that Moat & Row element spacing would generally vary from 250 to 1,000 feet, depending on the surface soil type and the PM_{10} control effectiveness required on the Moat & Row area. For the purpose of the analyses in this EIR, it was assumed that the Moat & Row elements would be spaced a minimum of 250 feet apart and would not be separated by more than 1,000 feet, thus allowing up to 21 Moat & Row elements per square mile treated with this DCM (5,280 feet per mile divided by 250 feet between Moat & Row elements). Thus, for the purpose of this environmental analysis, it was assumed that the Moat & Row DCM would affect up to 33 percent of the ground surface in each square mile where it would be applied (85 feet per Moat & Row element times 21 elements per mile divided by 5,280 feet per mile). For purposes of the analysis in this EIR, both the moats and rows in Moat & Row elements were assumed to have sloped sides and not pose a barrier to wildlife movements. If moats or rows are recommended to be formed with vertical sides, additional environmental analysis would be required.

As analyzed, the Moat & Row would include placement of up to a 5-foot-high sand fence on the top of the row. As discussed above, for the purpose of this environmental analysis, it was anticipated that with a 250-foot minimum distance between elements, a maximum of 21 horizontal sand fence arrays would be installed per square mile treated with the Moat & Row DCM. The sand fences would be constructed using studded galvanized T-posts (for intermediate posts), 4″x4″ or 6″x6″ treated wood posts (for the end posts), No. 8 wire, and 2.5″-diameter polyvinyl chloride (PVC) pipes. The PVC pipes would be used to increase the stability of the intermediate posts by extending their embedment length into the playa below the existing lake bed surface. The sand fence posts may be installed up to 20 feet on center. The diameters of the post may range from 2 to 10 inches, as structurally required. Spacing of the fencing shall incorporate sufficient gaps for passage of western snowy plover chicks where occupied habitat within the Moat & Row DCM is located within 0.25 mile of man-made or naturally occurring surface water and all other resident wildlife species. These gaps or openings shall occur at a minimum of 0.25-mile intervals. The sand fence fabrics shall be composed of U.S. Fence snow fence materials (or equivalent materials) as utilized on the Moat & Row Demonstration Project. The sand fence fabric shall be sufficiently flexible, and the post caps shall be designed to prevent perching by corvids within 0.25 mile of occupied nesting shorebird habitat. If guy wires are used to stabilize sand fences, sand fence fabric would be installed to fill in the gap between the guy wire and the sand fence posts. In an effort to avoid impacts to the pubic trust visual quality values at Owens Lake bed, all fence components shall be colored in neutral earth tones to blend in with the visual character of the surrounding area.

For the purpose of this environmental analysis, maintenance activities for Moat & Row were assumed to be comparable to that required for the Shallow Flooding DCM.

As a result of the Moat & Row study program, the District anticipates that the City may wish to consider other enhancements in conjunction with the Moat & Row DCM. Such enhancements would need to be constructed in substantial conformance with the Moat & Row DCM description in this EIR and the District's 2008 SIP; in particular, the total area of disturbance is to not exceed 33 percent, with no more than 21 horizontal fence arrays per square mile, and with demonstrated ability to accommodate wildlife movement, particularly western snowy plover within 0.25 mile of surface water.

Enhancements

It is anticipated that the PM_{10} control effectiveness of Moat & Row could be enhanced by combining it with various approved DCMs and appurtenant measures, including Augmentation, Shallow Flooding, Application of Brine, Armoring, and Managed Vegetation. These enhancements would ensure that if significant dust sources (hot spots) develop within the Moat & Row areas, they would be promptly addressed. Any single method or combination of the enhancements could be implemented for both primary and secondary wind vector mitigation, where demonstrated to be in substantial conformance with the performance standards for the Moat & Row DCM and within or below the impact analysis parameters. The primary Moat & Row DCM elements include earthen Moat & Row topped with a sand fence. Enhancements to the primary Moat & Row include Managed Vegetation and irrigation and fertilization as required, Shallow Flooding facilities, and enhancing existing vegetation and natural topographic and surface drainage features at Owens Lake. Moat & Row earthwork and sand fences may also be enhanced through a number of additional methods. These measures include placing sand fences on the open playa between Moat & Row elements (as long as the total number of sand fence elements did not exceed a density of 21 per mile), adding bands of Managed Vegetation, adding water from surrounding Shallow Flooding DCAs, and enhancing or protecting existing vegetation and natural topographic and surface drainage features at Owens Lake. If utilized, these enhancements would be added during Phase 7 construction or during a later phase.

Augmentation with Additional Moat & Row Elements. This method of improving the PM_{10} control efficiency of the Moat & Row DCM involves addition of Moat & Row elements in between those originally constructed, either in a parallel or different direction. This would have the effect of shortening wind fetch in between existing Moat & Row areas, enhancing capture of mobile sand, and reducing the rate of dust emission. For the purpose of the analyses in this EIR, Moat & Row augmentation would be limited to a maximum density of 21 elements (Moat & Row topped by sand fence, Moat & Row without sand fence and/or sand fence only) per mile of this DCM, such that there is a maximum of 33 percent total ground disturbance in any DCM area. Should the City seek to exceed the 21 Moat & Row elements per mile assessed in this EIR or the 33 percent total ground disturbance, the District would need to undertake supplemental environmental analysis to determine if such enhancements could be determined to be in substantial conformance with the analysis contained in this EIR.

Shallow Flooding. Application of water to the land surface during the dust emissions season has been found to stabilize emissive areas. This Moat & Row enhancement would involve facilities similar to the laterals in Shallow Flooding DCAs, but would require less water per unit area in all but the most emissive areas. This measure would include the extension of a lateral from a Shallow Flooding DCA or the mainline to Moat & Row DCAs or the opening of a Shallow Flooding DCA controlled outlet that is adjacent to Moat & Row areas. This approach is best suited for areas that currently have patches of vegetation that would be encouraged by the addition of water. Seeding these areas with native populations of species already found in the Moat & Row DCAs would also encourage vegetative growth.

Application of Brine. This enhancement includes surface stabilization techniques, such as localized application of brine on the Moat & Row elements to enhance soil crusting. This method of dust control is currently utilized successfully on access roads throughout the proposed project site and ensures that a salt crust develops on potential emissive soils. The brine is expected to be obtained by the existing sources that the City drains from the existing Managed Vegetation and Shallow Flooding areas. It is anticipated that the brine would be applied by water trucks to the Moat & Row excavation/embankment and access road elements only. Brine would not be applied in between the Moat & Row elements.

Armoring. An additional enhancement may include armoring row elements or intervening areas with rock or gravel layers. The armoring would be limited to an application similar to the armoring that is currently implemented for the berms of the Shallow Flooding areas. This method would be limited to a maximum of 33 percent of the surface area of each square mile of the DCM. The production and transport of gravel to facilitate armoring in conjunction with the Moat & Row DCM would require additional environmental review. Similarly, the consideration of armoring in excess of the maximum 33 percent area of ground disturbance would require additional environmental review.

Vegetation. Vegetation has been shown to be effective at controlling dust and is an approved DCM. Vegetation as a Moat & Row enhancement would take place on the Moat & Row disturbed area itself and/or in between the elements to stabilize emissive or eroding areas. This would involve facilities similar to the drip irrigation system in Managed Vegetation, but with rows and plants more widely spaced, and likely planted with native drought and salt-tolerant vegetation, including, but not limited to, saltgrass. Alternatively, surface irrigation (similar to the laterals in Shallow Flooding) may be employed, particularly in the areas between Moat & Row elements. Wherever possible, subsurface drainage facilities would be avoided. As with the other Moat & Row enhancements and augmentations, the total area analyzed for impacts in this EIR is limited to 33 percent of any Moat & Row DCM area.

Vegetation reduces sand motion by acting as a natural wind break and reduces erosion problems through the holding power of root systems. The enhancement works well for sandy and loose soils, allowing the roots to take easily and nutrients to reach the roots. A broad bed vegetation concept would be considered as an enhancement to Phase 7 Moat & Row DCAs. If determined to be appropriate, the vegetation would be placed on the undisturbed playa between or around the earthen Moat & Row. Broad beds would be spaced wider and have higher beds when compared to the traditional Managed Vegetation constructed during previous phases. Irrigation, fertilization, and subsurface drainage would be provided as required.

According to the information provided to the District by the City, if determined appropriate, vegetation would be planted in between the moats and rows to assist with the reduction of dust. The exact size and shape of the blocks would be adjusted to fit site-specific conditions, including avoidance of sensitive resources. Each block would be planted with locally adapted native plant species approved by the District, or other species approved by the District. The Vegetation DCMs installed by the City in the previous areas of Managed Vegetation are planted with saltgrass. Additional species, notably salt-tolerant Owens Valley native shrubs, have performed well in some conditions and could be effectively utilized in conjunction with vegetation, upon consultation with and approval by the District and the CSLC. The typical layout of vegetation, which may be modified for enhancement with the Moat & Row for a 40-acre block includes a typical irrigation pipe layout, drip tube laterals, furrows, and flush fields. The vegetation areas may include a 16-foot-wide perimeter service road. The service roads would typically be compacted native material, but would likely be surfaced with gravel or brine if necessary to reduce dust emissions or to improve accessibility.

Turnout mainlines would convey water flow from the turnout connections to distribution manifolds and then to the vegetation areas. Turnout mainlines would be constructed of plastic pipe with sizes up to approximately 18 inches in diameter. Water would flow from the manifold to the field submains and then into a network of subsurface drip tubes, sprinklers, or gated pipe, according to the irrigation plan used.

Where drip irrigation is used, flexible risers would convey water from the buried primary submains and secondary submains to the drip tubes. The drip system would consist of plastic submain lines and lateral tubing with in-line drip emitters. Drip tubing would likely range from 0.5 to 1.5 inches in diameter. A typical drip system arrangement would likely consist of one emitter per 10 square feet, with a 2-foot emitter spacing along tubing laid at 5-foot lateral spacing intervals, although drip tube alignments and emitter spacing would be expected to vary with site conditions and local needs.

Sprinkler irrigation would potentially be used in the vegetation fields as an alternative to drip systems. Sprinklers are able to wet the entire ground surface, providing greater flexibility in leaching and reclaiming difficult soils. Where sprinkler irrigation is used, water would be distributed from the turnout mainlines through 2- to 8-inch plastic piping. Field piping would be spaced 10 to 50 feet apart, typically with risers and spray nozzles at 20- to 50-foot intervals. To minimize ground disturbance impact to sensitive areas or to implement vegetation in areas where below ground construction is difficult, above ground piping would be used to deliver water to the sprinklers. Temporary above ground piping would potentially be used in addition to permanent drip irrigation to reclaim difficult soils or to provide additional water for short-term plant establishment.

Surface irrigation would potentially be used as another alternative to drip systems in vegetation fields. In this option, water would be distributed to the blocks through 2- to 12-inch plastic piping. Actual introduction of the water into the fields would likely be accomplished through gated plastic pipe, through a series of risers similar to those used in Shallow Flooding, or by direct spillage from a pipe outlet. Spacings between rows may range from 10 to 40 feet as well as within rows, depending on the plant species being used for vegetation. Where surface irrigation is used, the blocks would typically be surrounded by low berms to contain ponded water until it seeps into the soil. Low containment berms shall be used, when deemed necessary to avoid significant movement of water off-site. These berms would be constructed of local material and may be up to 2 feet in height. The temporarily ponded water in these surface irrigated areas would generally be less than 4 inches deep, but may be deeper in some limited areas due to variation in local topography.

Fertilizer Injection and Water Treatment Systems

Existing Managed Vegetation DCM areas on Owens Lake that were previously constructed by the City contain fertilizer injection (fertigation) and water treatment systems. These facilities filter raw irrigation water and add fertilizer and water treatment chemicals prior to use of the water in the small-diameter drip irrigation systems. Based on comments received by the CSLC during the Draft EIR review period, the CSLC has taken the position that the use of such hazardous materials is a significant impact for which alternative site locations should be evaluated and that such use is not compatible with the public trust resources and values within Owens Lake. Such evaluations were not conducted as part of the analyses for this EIR. Therefore, for the purposes of this EIR and the possible use of vegetation to enhance and/or augment the PM_{10} control effectiveness in Moat & Row DCM areas, the filtering of vegetation irrigation waters is an included project component, but the fertigation and/or treatment of irrigation waters with hazardous chemicals is specifically not a component of the proposed project. The use of any such chemicals would require additional impact analyses and site alternative evaluations.

Moat & Row Enhancement Alternatives Not Included

The use of other enhancements not described above would require additional and separate environmental analysis. Other alternatives include the use of Additional Sand Fences and Tillage. The addition of sand fencing in between Moat & Row lines originally constructed, beyond the maximum of 21 fence elements per mile, would be carried out either in a parallel or different direction. This would have the effect of shortening fetch in these areas, enhancing capture of mobile sand, and reducing the rate of dust emission. Tillage between the Moat & Row lines may also serve to reduce emissivity. The suggested techniques for enhancement (Additional Sand Fences and Tillage) shall require further environmental analysis to assess the potential for significant impacts.

Study Areas

Included in the total 15.1 square miles of the total project area are 1.9 square miles of Study Area (Figure 2.3-1). These are areas where the exact location and magnitude of dust emissions is uncertain. In order to provide as extensive an impact analysis as possible, these areas would be treated as other areas requiring dust control. The District would continue to collect data in these four areas to determine their emissivity through the course of the project.

Channel Areas

In addition to the listed DCMs, this analysis addresses potential impacts to 0.5 square mile of Channel Areas (Figure 2.3-1). These areas contain natural drainage channels that have been observed to be emissive and require some level of dust control. These areas may have potentially significant resource issues and regulatory constraints that could affect the type and location of DCMs within these areas.

The Channel Area has significant topographic and biological resources that make it undesirable to construct traditional DCMs. However, only a portion of this area has been observed in the past to contribute to shoreline violations, and some of the Channel Areas that do emit dust would require relatively lower levels of control efficiency to avoid violations, as opposed to the 99 percent targeted by traditional dust control. Therefore, because existing vegetation is present within and alongside numerous and extensive Channel Areas, vegetation would be used to control dust in the Channel Area. Similarly, Surface Flooding could be used as an effective means of enhancing the coverage of existing vegetation. The effect of increasing vegetated cover would be expected to provide a level of dust control while enhancing habitat values. The required infrastructure would be designed and installed to avoid adverse impacts to existing native vegetation.

Existing vegetation in the Channel Area would be enhanced by augmenting flow in the channels seasonally when these flows have the greatest potential to promote seed dispersal and plant expansion and growth. Flows would be supplied from adjacent dedicated conveyance facilities or flooded areas containing relatively fresh to brackish water (EC<15 dS/m).[20] Flow would generally be supplied in brief, intense surges, as this has proven to be successful for riparian restoration throughout the upper and lower Owens Valley, Long Valley, Owens River Gorge, and in the Mono Basin as demonstrated by the City's restoration projects. The pulsed flow would be managed to maximize the wetted area as the flow overtops the channel banks and spreads on adjacent terraces, some of which are already vegetated.

Where plant stands are sparse, seed of native populations of species already found in the Channel Area may be dispersed onto the wetted areas. These species would include, but are not limited to, saltgrass and alkali pink (*Nitrophila occidentalis*). Where determined to be an appropriate method, seeding would be implemented using manually operated seeders to avoid disturbance to the Channel Area.

The water demand for pulse flows (flow rate or duration) would be determined considering the topography, infiltration rates, likely spreading of water, and water demands of the target vegetation. The criteria used to design the final outlet locations and flow rate performance during operation are as follows:

- Pulse flows would result in overbank flow from the channel and wetting of a broad area, while avoiding large amounts of concentrated infiltration to groundwater or impounded body of water.

- Pulse flows would result in wetting along portions of the full length of channel of interest.

The effectiveness of pulse flows would be maximized where necessary using diversions (i.e., sandbags or rock checks) to overbank surface flows toward existing vegetation stands or seeded areas. Use of intense pulsed flows and diversion techniques are in lieu of mass grading in the Channel Area. The City has indicated that it is not guaranteed that pulse flows would result in wetting of broad areas, or wet the full length of the channel.

Infrastructure within the Channel Area would be limited initially and augmented as needed to achieve maximum vegetative coverage. Overall, the infrastructure required for the enhancement of the Channel Area would be designed and installed at proposed facilities adjacent to the Channel Area to avoid negatively impacting existing vegetation within this area. The water for the pulsed flows would be supplied through a pipeline extended to the area either from new Turnout T1A or from a submain serving area T2-2. Controlled outlets and/or culverts from new or existing adjacent

---

[20] Electric conductivity (EC) is a measure of salinity in terms of total dissolved salts measured in deciSiemens per meter (dS/m). As the value decreases, salinity decreases.

Shallow Flooding areas to the Channel Area may also provide additional intermittent water with minimal intrusion of infrastructure.

If in the future vegetation coverage through flow pulses does not provide adequate dust control in the Channel Area, additional efforts to increase vegetation through surface saturation would be implemented. The initial infrastructure would accommodate potential future additions (i.e., dripline, whipline, and/or risers).

2.3.2 Other Project Elements

Other project elements include water supply conservation activities and appurtenant infrastructure that consist of water supply and conveyance, access roads, power supply, water distribution facilities (mainline, submain and lateral piping, irrigation risers, drip and spray systems, drain tile, drain pump stations, and downslope berms), staging areas, and an Effectiveness Monitoring Program.

Water Supply Conservation

Another element of the proposed project to be analyzed is the refinement of the amount of water used to control dust in Shallow Flooding DCM areas. The District's Shallow Flooding research conducted in the 1990s indicated that 99-percent control was achieved when 75 percent of an area consisted of standing water or surface-saturated soil. This is considered a conservative requirement, and the actual amount of water required to provide 99-percent control may be less than 75 percent. The City would conduct limited field testing on no more than 1.5 square miles of existing Shallow Flooding areas to refine the amount of water required to achieve 99-percent control. Based on data collected from January 2000 through June 2006, the level of control required to reduce lake bed emissions to below the federal standard has been identified for new areas of the lake bed known as the minimum dust control efficiency (MDCE). The MDCEs for the new DCAs vary from 99 percent to 0 percent. Although some of the new Shallow Flooding DCM areas would be constructed and operated to provide less than 99-percent dust control efficiency, existing Shallow Flooding DCMs would require 99-percent control efficiency and thus 75 percent of wetted area. In addition, the use of the Moat & Row DCM is expected to utilize less water when compared to Shallow Flooding.

Impacts of reducing the amount of water used to control dust in Shallow Flooding areas are analyzed in the Subsequent 2008 EIR. The 2006 Agreement between the District and the City provides that once DCMs are in place and operational on the entire 43-square-mile DCA for one full year and there have been no monitored violations of the federal standard, then the City may reduce the wetness cover on Shallow Flooding areas by an average of 10 percent over Shallow Flooding areas that require 99-percent control.[21] Further reduction can only occur as long as the standard continues to be met and with the written approval of the APCO. If areas become too dry and causes or contributes to an exceedance of the federal standard at the historic shoreline, the amount of wetness must be increased. This provision of the Agreement may eventually allow the City to save considerable amounts of water at Owens Lake.

---

[21] Great Basin Unified Air Pollution Control District and City of Los Angeles Department of Water and Power. November 2006. Settlement Agreement Resolving City's Challenge to the District's Supplemental Control Requirement (SCR) Determination for the Owens Lake Bed. Los Angeles, CA.

In addition, the District has determined, based on air quality data, that the federal standard will be attained if dust storms are eliminated from October 1 of every year through June 30 of the next year. Therefore, Shallow Flooding areas need to be wet for dust control only during that nine-month period. However, in general, dust emissions are significantly less during the beginning and end of the dust season than they are in the middle of it. In order to provide enough water for adequate dust control during the fall and late spring shoulder seasons, while at the same time acknowledging that lower levels of control efficiency are appropriate during these periods, starting in 2010 there may be a reduction in Shallow Flooding wetness from October 1 through October 15 and from May 16 through June 30. The wetness level would ramp up to maximum wetness on October 16 and then ramp down starting on May 16 through June 30. By the end of June, the wetness is allowed to be 15 percent less than the maximum.

Water Supply and Conveyance

Expanded water conveyance pipeline systems would be tied into existing mainlines on the proposed project site. The mainline capacity shall be increased by tying the existing brine line into the mainline and using the brine line in parallel with the mainline for transmission of water. In addition, paralleling of the mainline in selected reaches and tying the Lower Owens River Project directly to the submain are being considered. Those mainline improvements would be in existing disturbed operational areas or in the areas already analyzed in this EIR. The estimated water demand for the proposed project ranges between 0 and 4 acre-feet per year depending on the control measures selected and climatic and operational conditions. The source of water for this proposed project, analyzed in the 2008 Subsequent EIR, is from the Los Angeles Aqueduct. The City may seek to utilize other sources of water for dust control in the future such as groundwater from Inyo County. However, utilization of water for dust control from sources other than the Los Angeles Aqueduct would require separate environmental review and is not covered in this analysis.

Access Roads

Unpaved and gravel-paved, permanent all-year access roads would be constructed and used for construction, operation, and maintenance of the DCAs. New secondary access roads would connect to existing primary access roads. Secondary access roads would be about 10 feet wide, with centerline elevation 2 feet above existing grade and shoulder slopes of 3:1. The elevation of the access roads may increase to about 4 feet above existing grade on portions of the lake bed. Access is currently provided from U.S. Highway 395 via the existing north and south mainline pipeline access roads, from State Route 136 via the existing Sulfate Road, and from State Route 190 via the existing Dirty Socks access road. Two new secondary access roads would be constructed directly off of U.S. Highway 395 for the northwestern areas of the DCAs, with the pathway being built on existing dirt roads rather than completely new construction for access. It is not anticipated that pipelines and buried power lines would be constructed along these access roads as part of Phase 7. If required, pipelines and buried power lines would be placed and constructed under, along, or close to these access roads. All lake bed roads are to be maintained in a substantially nonemissive condition through the use of water, brine, and/or gravel. Improvements to access roads may be nonpermanent and performed when necessary, as required. These may include, but are not limited to, mats, grading, fill, compaction, and base-course at any "soft spots" encountered. Improvements to existing access road to DCA No T37-1 shall not be made, as it falls under the Bureau of Land Management's jurisdiction.

Power Supply

Up to 2,000 kilovolts of electrical power may be required to operate proposed project facilities, including the Shallow Flooding facilities. This power would be supplied from existing line power facilities to the site provided by the City. Underground power lines would be buried 18 to 30 inches below ground surface and would be located generally in the vicinity of access roads and pipelines. Up to several thousand feet of underground power line may be installed.

Existing overhead power lines run along the north end and down the east side of Owens Lake, generally paralleling the historic shoreline on the north and State Route 136 on the east. Power drops from nearby overhead lines are connected to the underground power lines that carry power to the lake bed control measure facilities.

In addition, small portable generators mounted on construction vehicles would provide some temporary construction and emergency power.

Water Distribution Facilities

Shallow Flooding areas would be subdivided into smaller irrigation blocks to improve water use efficiency. It is anticipated that approximately half of the units would be operated simultaneously, with water being supplied nearly continuously during peak demand periods.

Water distribution facilities within the irrigation blocks may include irrigation, submain pipelines, lateral pipelines, irrigation risers, drip and spray irrigation systems, tile drains, drain pump stations, ponds, whiplines, tailwater pumping stations, and side and downslope berms. The number and size of the individual irrigation blocks may vary based on the final design and layout. However, the anticipated facilities would be similar to existing facilities.

Water would be distributed to each DCA through a submain inlet for ponds or through laterals that supply the bubblers and/or whiplines. Valves on the submains or laterals would be above ground and housed in enclosures extending approximately 4 to 5 feet above grade. Valves would not be installed in below ground vaults. The irrigation risers would have a tee outlet or a 2-inch whipline connection for distribution of the water across the irrigation blocks. Submains and lateral piping would be buried up to 3 feet deep to the top of the pipeline. The irrigation risers would distribute and apply water to the lake bed surface in the Shallow Flooding areas and deliver water to the drip and/or spray system in the vegetation areas

The electrical equipment for the pumping stations and turnouts would be installed in walk-in electrical buildings similar to existing facilities on site.

Soil berms would be constructed along the down-gradient and side boundaries of each Shallow Flooding irrigation block. These berms would be keyed into the lake bed and would be used to collect excess surface water along the downslope borders of each irrigation block. Drain tiles would be provided along the down-gradient western boundary of the proposed project DCAs that would include Shallow Flooding and Managed Vegetation, if required, based on an evaluation of berm stability and potential subsurface water quality or quantity impacts. Drain tiles consist of perforated piping and capture any excess water resulting from surface application or subsurface flows. This piping would slope to drain pump stations where the water would be collected. The pumps and motors would be located above grade. The pump may recirculate water into the irrigation laterals for Shallow Flooding reuse. The top of the pumps would be 5 to 6 feet above grade. The electrical equipment for the pumping stations and turnouts would be installed in walk-in electrical buildings similar to existing facilities on site. It is anticipated that the placement of individual submain pipelines, risers, sprinklers, drip systems, berms, and access roads internal to each zone would differ based on site requirements and that final design decisions would be made by the City. An alternative construction method, consisting of larger ponds with one main source of water as currently utilized for the existing Shallow Flooding DCM, may be utilized.

Staging Areas

Three staging areas have been established to provide contractor(s) currently working on ongoing implementation of approved DCMs with storage and placement of heavy equipment and construction materials and supplies (Figure 2.3-1). One contractor staging area is located south of Sulfate Road and west of State Route 136 near their junction, just above the eastern historic shoreline of Owens Lake. A secondary contractor staging area is located above the southeast shoreline of the lake bed near Dirty Socks Spring. A third staging area is located at T-37. It is anticipated that these areas would also suffice as staging areas for construction activities associated with the proposed project.

Effectiveness Monitoring Program

A dust emissions monitoring program, known as the Dust ID Program, has been established by the District. The program consists of air monitoring devices, a grid of sand motion monitoring devices deployed on the lake bed, remote cameras, visual observations, and global positioning system mapping to measure and map dust emissions from the lake bed. The District and the City, with assistance of third-party technical experts, would work cooperatively to improve the Dust ID Program by 2010. The Dust ID Program will continue to operate during and after DCM installation. The City would also install and operate additional air monitoring devices within the proposed project area.

2.4 Construction Scenario

Development of the proposed project would require approximately 1.5 years to complete from August 2008 through March 2010. The new Moat & Row DCM areas would be completed and fully operational by October 1, 2009, and the new Shallow Flooding DCM areas would be completed and operational by April 1, 2010.

A typical construction crew would be composed of about 10 workers. The majority of construction activited would involе one to three work crews.

The construction elements that would be required for the 15.1 square miles of new DCMs to meet the NAAQS standard for PM_{10} emissions by 2010 consists of eight primary activities:

- Site preparation (surface grading and earth moving)
- Berm construction and access road grading
- Mainline water delivery and drain line construction (trenching, pipeline installation, trench backfilling)
- DCM area dewatering
- Water distribution system installation within the DCM areas
- Power line and DCM controls installation

- Moat & Row shaping and enhancing
- Shallow Flooding DCM flooding

Supporting activities would include fence installation, material delivery, and transportation of crews. All site preparation and construction activity would be undertaken in accordance with applicable federal, state, and Inyo County codes.

SECTION 3.0
REGULATORY FRAMEWORK

This regulatory framework identifies the federal, state, and local statutes, ordinances, or policies governing the conservation and protection of biological resources that must be considered by the Great Basin Unified Air Pollution Control District Governing Board (District Governing Board) during the decision-making process for projects that have the potential to affect biological resources.

3.1 FEDERAL

3.1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) and its supporting federal regulations establish certain requirements that must be adhered to for any project "financed, assisted, conducted, or approved by a federal agency." The U.S. Army Corps of Engineers (USACOE) would be the lead agency pursuant to NEPA for that portion of the project requiring the issuance of a nationwide or individual permit under Section 404 of the Clean Water Act. The proposed project area contains wetlands that are subject to USACOE jurisdiction.

3.1.2 Federal Endangered Species Act

The federal Endangered Species Act (ESA) defines *species* as "endangered" and "threatened" and provides regulatory protection for listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species and conservation of designated critical habitat that the U.S. Fish and Wildlife Service (USFWS) has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "take" of species listed by USFWS as threatened or endangered. *Take* is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that take cannot always be avoided, Section 10(a) of the federal ESA includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if take is incidental and does not jeopardize the survival and recovery of the species.

Section 7(a)(2) of the federal ESA requires all federal agencies, including the USFWS and the Bureau of Land Management (BLM), to evaluate projects with respect to any species proposed for listing or already listed as endangered or threatened and any proposed or designated critical habitat for the species. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its critical habitat.

As defined in the federal ESA, "individuals, organizations, states, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding."

Due to the potential presence of federally listed species (i.e., one plant and nine wildlife) in the vicinity of the proposed project area, project compliance with the federal ESA was considered in this evaluation. The one listed plant species and nine listed wildlife species that have the potential to be present within the proposed project area are as follows: Owens Valley checkerbloom

(*Sidalcea covillei*), Owens tui chub (*Gila bicolor snyderi*), Owens pupfish (*Cyprinodon radiosus*), desert tortoise (*Gopherus agassizii*), bald eagle (*Haliaeetus leucocephalus*), Swainson's hawk (*Buteo swainsoni*), American peregrine falcon (*Falco peregrinus anatum*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), least Bell's vireo (*Vireo bellii pusillus*), and Mohave ground squirrel (*Spermophilus mohavensis*). All federally listed species were determined to be absent in the proposed project area as a result of directed surveys.

3.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union. Similar to the federal ESA, the MBTA authorizes the Secretary of the Interior to issue permits for incidental take.

Due to the presence of many migratory birds on the proposed project site, project compliance with the MBTA was considered in this evaluation. Nesting birds and the contents of the nest within the proposed project site are afforded protection during the nesting season pursuant to the MBTA.

3.1.4 Section 404 of the Federal Clean Water Act

Section 404 of the federal Clean Water Act, which is administered by the USACOE, regulates the discharge of dredged and fill material into waters of the United States. USACOE has established a series of nationwide permits that authorize certain activities in waters of the United States, provided that a proposed activity can demonstrate compliance with standard conditions. In general, USACOE requires an individual permit for an activity that will affect an area equal to or in excess of 0.3 acre of waters of the United States. Projects that result in impacts to less than 0.3 acre of waters of the United States normally can be conducted pursuant to one of the nationwide permits, if consistent with the standard permit conditions. USACOE also has discretionary authority to require an Environmental Impact Statement for projects that result in impacts to an area between 0.1 and 0.3 acre. Use of any nationwide permit is contingent on the activities having no impacts to endangered species.

Wetlands are typically not dust emissive. However, some wetland areas may have been disturbed by lake bed sediments and may require restoration to a functional wetland to gain dust emission compliance. Emissive areas are those that contain less than 50 percent vegetative cover or less than 75 percent saturated soil. Emissive versus non-emissive classifications are determined by the District. The proposed project area includes "waters of the United States" that are subject to the jurisdiction of USACOE pursuant to Section 404 of the Clean Water Act.

3.1.5 Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California[1]

The Owens Basin Wetland and Aquatic Species Recovery Plan is a recovery plan focused on delisting Owens pupfish, Owens tui chub, and fish slough milk-vetch (*Astragalus lentignosus* var. *piscinensis*), as well as protecting species of concern so that listing is unnecessary. The Owens Basin covers an area of approximately 7,900 square kilometers in east central California. The Basin

---

[1] U.S. Fish and Wildlife Service. 1998. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties*. Portland, OR.

lies along the southwest boundary of the Great Basin and the northwest boundary of the Mojave Desert and varies in elevation from 2,900 feet to 14,500 feet above mean sea level. This recovery plan covers portions of Mono and Inyo Counties. In addition, this recovery plan provides conservation measures and a strategy for recovery of the listed and proposed species, as well as the species of concern.

Due to the potential presence of Owens pupfish and Owens tui chub in the proposed project area, and other sensitive species considered in the Owens Basin Wetland and Aquatic Species Recovery Plan, project compliance with the Owens Basin Wetland and Aquatic Species Recover Plan was considered in this evaluation.

3.2 STATE

3.2.1 California Endangered Species Act

The California ESA prohibits the take of listed species except as otherwise provided in state law. Unlike the federal ESA, the California ESA applies the take prohibitions to species petitioned for listing (state candidates). State lead agencies are required to consult with the California Department of Fish and Game (CDFG) to ensure that any actions undertaken by that lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat. CDFG is authorized to enter into Memoranda of Understanding (MOUs) with individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess listed species for scientific, educational, or management purposes.

Due to the potential presence of state-listed rare, threatened, or endangered species on the proposed project site, project compliance with the California ESA was considered in this evaluation. One known state-listed species, the American peregrine falcon, is present in the proposed project area. In addition, the proposed project site is located within the historic range of several state-listed species that were the subject of directed surveys: one plant, Owens Valley checkerbloom; two fish, Owens tui chub and Owens pupfish; one reptile, desert tortoise; four birds, bald eagle, Swainson's hawk, western yellow-billed cuckoo, and least Bell's vireo; and one mammal, Mohave ground squirrel. None of the aforementioned species were determined to present as resident species within the proposed project area.

3.2.2 Sections 2080 and 2081 of the State Fish and Game Code

Section 2080 of the State Fish and Game Code (Code) states, "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act."

Pursuant to Section 2081 of the Code, the CDFG may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or MOUs under the following conditions:

- The take is incidental to an otherwise lawful activity.
- Impacts of the authorized take are minimized and fully mitigated.
- The permit is consistent with any regulations adopted pursuant to any recovery plan for the species.
- The applicant ensures adequate funding to implement the measures required by CDFG.

CDFG shall make this determination based on available scientific information and shall include consideration of the ability of the species to survive and reproduce.

Due to the potential presence of state-listed rare, threatened, or endangered species on the proposed project site, Sections 2080 and 2081 of the Code were considered in this evaluation.

3.2.3 Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The list of native plants afforded protection pursuant to the Native Plant Protection Act includes those listed as rare and endangered under the California ESA. The Native Plant Protection Act provides limitations on take as follows: "No person will import into this State, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the act. Individual landowners are required to notify the CDFG at least 10 days in advance of changing land uses to allow the CDFG to salvage any rare or endangered native plant material.

Due to the potential presence of state-listed rare, threatened, or endangered plant species on the proposed project site, the Native Plant Protection Act was considered in this evaluation. However, no plant species protected by this act have been observed within the proposed project site.

3.2.4 California Desert Native Plants Act

The California Desert Native Plants Act was passed in 1981 to protect non-listed California desert native plants from unlawful harvesting on both public- and private-owned lands. Harvest, transport, sale, or possession of specific native desert plants is prohibited unless a person has a valid permit, or wood receipt, and the required tags and seals.

3.2.5 Sections 3503 and 3503.5 of the State Fish and Game Code

These sections of the Code provide regulatory protection to resident and migratory birds and all birds of prey within the State of California, including the prohibition of the taking of nests and eggs unless otherwise provided for by the Code.

Due to the documented presence of resident and migratory birds and birds of prey on the proposed project site, Sections 3503 and 3503.5 of the Code were considered in this evaluation.

3.2.6 Section 1600 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to Sections 1600 through 1603 of the Code and require preparation of a Streambed Alteration

Agreement. Pursuant to the Code, a *stream* is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Based on this definition, a watercourse with surface or subsurface flows that support or have supported riparian vegetation is a stream and is subject to CDFG jurisdiction. Altered or artificial waterways valuable to fish and wildlife are subject to CDFG jurisdiction. CDFG also has jurisdiction over dry washes that carry water ephemerally during storm events. There are CDFG jurisdiction waterways located within the proposed project area that would be require Los Angeles Department of Water and Power to obtain a Streambed Alteration Agreement.

The CDFG has adopted the U.S. Fish and Wildlife Service wetland definition[2] as modified by the CDFG Guidance.[3]

"DEFINITION

The Commission concurs with the Department's recommendation to use the U.S. Fish and Wildlife Service's (USFWS) definition as the basis for wetland identification. When all three wetland indicators (i.e., hydric soils, wetland vegetation, and hydrology) are present, the presumption of wetland existence shall be conclusive. Where less than three indicators are present, policy application shall be supported by the demonstrable use of wetland areas by wetland-associated fish or wildlife resources, related biological activity, and wetland habitat values.

The USFWS wetland identification system should be applied by professionals trained in its methodology. The accuracy of existing wetland inventory mapping should not necessarily be assumed. The Commission supports the Department's current practice of on-site inspections of projects which would impact wetlands and strongly encourages the Department to conduct on-site inspections of such projects and particularly whenever requested to do so by project proponents or concerned public agencies."

3.3 LOCAL

3.3.1 Inyo County General Plan

The Owens Lake bed is owned and operated primarily in trust for the people of the State of California by the California State Lands Commission, and while not subject to local regulatory authority by Inyo County, the Inyo County General Plan recognizes the location of federally and state-owned lands at Owens Lake. Although the California State Lands Commission is not subject to the regulatory authority of local jurisdictions, the relevant goals and policies of the Inyo County General Plan have been summarized to inform the District Governing Board, the California State Lands Commission, other trustee and responsible agencies, and the public of the ability of the proposed project to conform to the relevant goals and policies of the Inyo County General Plan.

---

[2] Cowardin, Lewis M., et al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service.

[3] California Fish and Game Commission Policies: Wetland Resources Policy; Wetland Definition, Mitigation Strategies, and Habitat Value Assessment Strategy; Amended 1994.

The Inyo County General Plan includes goals and policies related to biological resources:[4]

- Maintain and enhance biological diversity and healthy ecosystems throughout the County of Inyo:
    - Regulatory compliance
    - Riparian habitat and wetlands preservation
    - Biodiversity restoration
    - Environmental resource areas limitation
    - Outside of habitat areas development
    - Wildlife corridors
    - Noxious weeds
    - Owens river restoration
- Provide a balanced approach to resource protection and recreational use of the natural environment:
    - Coordination on Management of Adjacent Lands
    - Appropriate Access for Recreation
    - Hunting and Fishing
    - Nature as Education

The Inyo County General Plan defines three general areas of biological resources: sensitive natural communities, special-status species, and wetlands and other waters of the United States. Pertaining to wetlands, the Inyo County General Plan Policy Goal BIO-1.2 (Preservation of Riparian Habitat and Wetlands) states that County of Inyo may consider an area a wetland if it is lacking one or more of the three parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) set forth by USACOE but provides important wetland functions and values, such as wildlife habitat and water quality maintenance.

---

[4] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

SECTION 4.0
METHODS

This section of the Biological Resources Technical Report describes the methods employed in the characterization and evaluation of biological resources at the 2008 Supplemental Control Requirements for the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (proposed project) site. The study methods were designed to provide the substantial evidence required to address the scope of analysis recommended in Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines, and other federal, state, and local statutes and regulations related to biological resources, including Inyo County General Plan goals and policies, Section 404 of the Clean Water Act, Section 1600 of the State Fish and Game Code, and the Migratory Bird Treaty Act.

4.1 INYO COUNTY GENERAL PLAN AND ORDINANCES

4.1.1 Inyo County General Plan

Although the proposed project lies within the unincorporated territory of Inyo County, the Owens Lake bed is owned and operated primarily in trust for the people of the State of California by the California State Lands Commission (CSLC), and while not subject to local regulatory authority by Inyo County, the Inyo County General Plan recognizes the location of federally and state-owned lands at Owens Lake. Although the California State Lands Commission is not subject to the regulatory authority of local jurisdictions, the relevant goals and policies of the Inyo County General Plan have been summarized to inform the Great Basin Unified Air Pollution Control District Governing Board (District Governing Board), the California State Lands Commission, other trustee and responsible agencies, and the public of the ability of the proposed project to conform to the relevant goals and policies of the Inyo County General Plan.

The first step in the evaluation process was to use geographic information systems (GIS) to overlay the proposed project Study Area boundary with the land use designation maps contained in the Conservation and Open Space element of the Inyo County General Plan.[1] Included in the review of land use designations was the consideration of the potential presence of any local conservation plans in or adjacent to the proposed project Study Area. GIS then was used to determine the corresponding zoning designations[2] and additional specifications related to the military protection review requirements zone.[3]

---

[1] Inyo County Planning Department. 15 June 2004. *Inyo County General Plan*. Chapter 1, Land Use, Conservation, and Open Space Element. Bakersfield, CA. Available at: http://www.co.Inyo.ca.us/planning/pdfs/kcgp/KCGPChp1LandUse.pdf

[2] Inyo County. February 2005. *Zoning Ordinance*, Title 19. Available at: http://www.co.Inyo.ca.us/planning/pdfs/zo/zotoc.pdf

[3] Inyo County. February 2005. *Zoning Ordinance*, Chapter 19.08, Section 19.08.160 (B1): "Height of Structures." Available at: http://www.co.Inyo.ca.us/planning/pdfs/zo/zotoc.pdf

The Conservation and Open Space element of the Inyo County General Plan was further reviewed to identify goals, policies, and compliance measures related to biological resources for integration into the regulatory framework and study methods for federal wetlands; state-designated sensitive habitats, including areas requiring a Streambed Alteration Agreement pursuant to Section 1600 of the State Fish and Game Code; and federally and state-listed threatened and endangered species.

4.2 FEDERAL WETLANDS

The purpose of the investigation was to determine the presence or absence, within the proposed project site, of wetlands afforded protection pursuant to Section 404 of the Clean Water Act.

The determination of presence or absence of federally protected wetlands, as defined in Section 404 of the Clean Water Act, conforms to the protocols specified in the *Corps of Engineers Wetlands Delineation Manual*,[4] as modified by the U.S. Supreme Court case *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99–1178 (January 9, 2001)[5] and guidance following the U.S. Supreme Court case *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers* (2006) as well as the Arid West Region supplement to the Corps of Engineers Wetland Delineation Manual.[6, 7] The determination regarding the potential presence or absence of federally protected wetlands included review of topographic maps and National Wetlands Inventory maps, interpretation of aerial photographs, spatial analysis using GIS, plant community mapping, field analysis, and coordination with the U.S. Army Corps of Engineers (Corps). The scope of the impact analysis considers the potential for the proposed project to result in direct, indirect, or cumulative impacts through direct removal, filling, hydrological interruption, or other means.

The proposed project site is located in an isolated inland basin; therefore, the legal ruling in the Supreme Court decision of the *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99–1178 (January 9, 2001) case was taken into consideration. The Solid Waste Agency of Northern Cook County (SWANCC) decision limited Corps jurisdiction of nonnavigable, isolated, and intrastate waters. In this decision, the Supreme Court struck down the Migratory Bird Rule, ruling that the Corps did not have authority under Section 404 over the isolated wetlands on SWANCC's property based on their use as habitat by migratory birds. However, the Supreme Court did not strike down any of the regulations implementing Section 404 or alter the definition of "waters of the United States." Rather, the Supreme Court concluded that the Corps could regulate isolated wetlands only if the wetlands had some connection to interstate commerce other than their use by migratory birds.

The proposed project contains areas that may be considered isolated wetlands, and therefore, the *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers* (2006) ruling was taken

---

[4] U.S. Army Corps of Engineers. January 1987. *Corp of Engineers Wetlands Delineation Manual*. Final Technical Report Y-87-1. Vicksburg, MS. Prepared by: Environmental Laboratory, U.S. Army Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, MS.

[5] U.S. Supreme Court. 9 January 2001. *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*. No. 99–1178, 531 U.S. 159.

[6] U.S. Supreme Court. 19 June 2006. *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers*. No. 126 S. Ct. 2208.

[7] U.S. Army Corps of Engineers, Engineer Research and Development Center. December 2006. *Wetlands Regulatory Assistance Program: Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Available at: http://www.usace.army.mil/cw/cecwo/reg/inte_aridwest_sup.pdf

into consideration. The Corps and U.S. Environmental Protection Agency (EPA) have issued joint memoranda regarding interpretation of wetlands in light of these cases.[8,9] The guidance memorandum ensures that agencies will continue to assert jurisdiction over traditional navigable waters (TNWs) and all wetlands adjacent to TNWs. Under the Supreme Court decision, jurisdiction may be asserted over a water, including wetlands, that is not a TNW by meeting either of the following two standards:[10]

- The first standard, based on the plurality opinion in the decision, recognizes regulatory jurisdiction over a water body that is not a TNW if that water body is "relatively permanent" (i.e., it flows year-round, or at least "seasonally," and over wetlands adjacent to such water bodies if the wetlands "directly abut" the water body (i.e., if the wetlands are not separated from the water body by an upland feature such as a berm, dike, or road). As a matter of policy, field staff will include, in the record, any available information that documents the existence of a significant nexus between a relatively permanent water body that is not perennial and a TNW.

- The second standard, for tributaries that are not relatively permanent, is based on the concurring opinion of Justice Anthony P. Kennedy and requires a case-by-case significant-nexus analysis to determine whether waters and their adjacent wetlands are jurisdictional. A significant nexus may be found where waters, including adjacent wetlands, affect the chemical, physical, or biological integrity of TNWs. Factors to be considered in the significant nexus evaluation include the following:

    - The flow characteristics and functions of the tributary itself in combination with the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of TNWs.

    - The consideration of hydrologic factors, including, but not limited to, the following:

        - Volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary
        - Proximity to the TNW
        - Size of the watershed

---

[8] U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. June 2007. *Memorandum for Directors of Civil Works and US EPA Regional Administrators, Subject: U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps) Coordination on Jurisdictional Determinations (JDs) under the Clean Water Act (CWA) Section 404 in Light of the SWANCC and Rapanos Supreme Court Decisions*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

[9] U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. June 2007. *Guidance Memorandum: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

[10] U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. June 2007. *Guidance Memorandum: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

    - Average annual rainfall
    - Average annual winter snow pack

- The consideration of ecologic factors, including, but not limited to, the following:

    - The ability for tributaries to carry pollutants and flood waters to TNWs
    - The ability of a tributary to provide aquatic habitat that supports a TNW
    - The ability of wetlands to trap and filter pollutants or store flood waters
    - Maintenance of water quality

The first step in the assessment was to determine if there were blue-line drainages, streams, lakes, wetlands, or navigable water bodies present within the Study Area. The map review included the 1:24,000 series U.S. Geological Survey (USGS) topographic maps for the following quadrangles: Bartlett,[11] Vermillion Canyon,[12] Owens Lake,[13] Keeler,[14] Dolomite,[15] Lone Pine,[16] and Olancha.[17] The project boundary was georeferenced using ArcGIS and superimposed on 24,000-scale USGS topographic quadrangles. All drainages on the topographic quadrangles within the project boundary were mapped. The digitized version of the drainage map was provided to the project-planning team in an effort to avoid these areas to the maximum extent practicable. The project proponent provided the locations of the proposed project elements, including dust control areas and roadways. Using ArcGIS, the proposed project elements were superimposed on the drainage system to determine the areas requiring characterization.

The second step in the assessment was to map potential wetlands identified on the National Wetlands Inventory.[18] National Wetlands Inventory sites were digitized and provided to the project planning team to ensure that these sites would be avoided by construction, operation, and maintenance of the proposed project.

The third step in the assessment process was to review the 1:12,000 (1 inch equals 1,000 feet) aerial imagery and infrared imagery for signatures that suggested the potential presence of aquatic or riparian vegetation, as part of the more comprehensive plant community mapping that was undertaken for the Study Area. The aerial imagery was taken on June 1, 2006, with a spatial resolution of 1.0 meter (3.00 feet). The imagery product used was derived from the IKONOS satellite sensor and was not radiometrically corrected.

---

[11] U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

[12] U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

[13] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[14] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[15] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[16] U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

[17] U.S. Geological Survey. 1994. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

[18] U.S. Fish and Wildlife Service. Last updated 21 March 2006. *National Wetlands Inventory*. Portland, OR. Available at: http://www.fws.gov/nwi

The fourth step in the assessment involved field surveys to make two determinations:

- Presence or absence of potential waters of the United States not evident on the National Wetlands Inventory or USGS maps
- Site-specific investigation of each of the seven areas potentially subject to the jurisdiction of the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act

The field team was supervised by a certified wetlands delineator that assisted in conducting the field investigations (Figure 4.2-1, *Jurisdictional Wetlands and Waters Survey Areas*).[19] All seven areas identified from the aerial imagery as having a signature that potentially denotes riparian or aquatic vegetation were investigated in the field (Table 4.2-1, *Jurisdictional Wetlands and Waters Survey Area*).

TABLE 4.2-1
JURISDICATIONAL WETLANDS AND WATERS SURVEY AREA

Wetlands survey area	Acreage	Basis for evaluation
1	9.25	National Wetlands Inventory Data and Aerial Imagery
2	18.3	Aerial Imagery
3	12.6	Aerial Imagery
4	270.04	Aerial Imagery
5	0.32	Aerial Imagery
6	170.52	Aerial Imagery
7	124.38	National Wetlands Inventory Data and Aerial Imagery

Finally, the results of the determination of presence or absence of federally protected wetlands were documented in letters and transmitted to the USACOE.[20, 21]

4.3 HABITAT CHARACTERIZATION

A habitat assessment was performed to document the presence or absence of habitat suitable to support special status species within the proposed project site and to provide a baseline description of existing biological resources, including plant communities and wetlands or stream course areas potentially subject to the jurisdiction of the California Department of Fish and Game (CDFG),

---

[19] Sapphos Environmental, Inc. (Ms. Irena Mendez, Mr. Edward Belden, and Mr. Jack Goldfarb) conducted field delineations on June 19, 21, and 22, 2007, using methods consistent with CDFG's *A Field Guide to Streambed Alteration Agreements and USACOE*.

[20] Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. 8 August 2007. Letter to Mr. Bruce Henderson, U.S. Army Corps of Engineers, Ventura, CA. Subject: Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan.

[21] Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. 7 September 2007. Letter to Mr. Bruce Henderson, U.S. Army Corps of Engineers, Ventura, CA. Subject: Clarification to Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan.

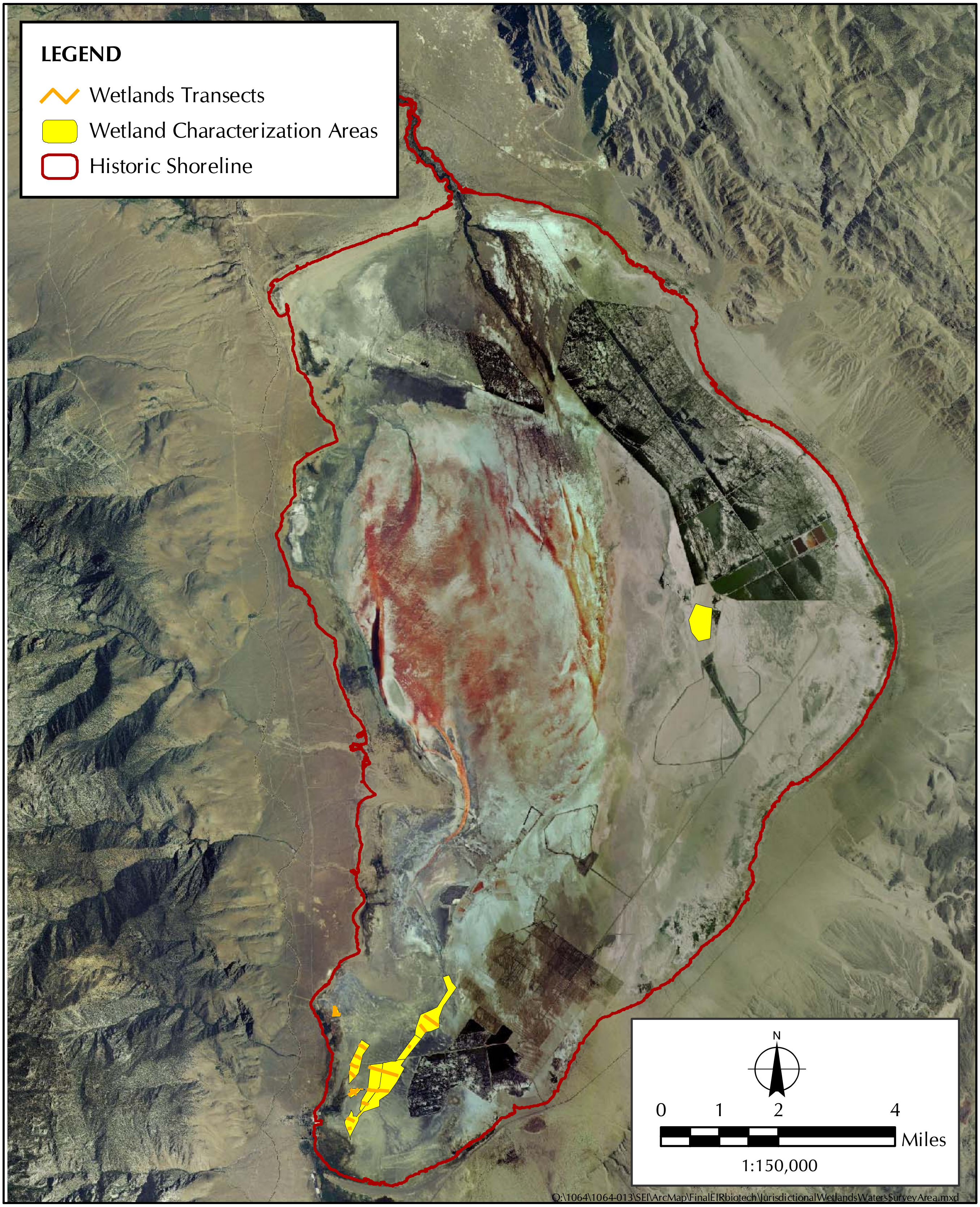


FIGURE 4.2-1

Jurisdictional Wetlands and Waters Survey Areas

pursuant to the State Fish and Game Code.

4.3.1 Plant Community Mapping

The purpose of the plant community mapping was to characterize the plant communities within the proposed project. The plant community map provided the basis for determining the presence or absence of state-designated sensitive plant communities, including wetlands, aquatic, and riparian habitats. The plant community mapping also served as one source of information for making a determination regarding the ability of the proposed project site to provide suitable habitat for sensitive plant and wildlife species.

The evaluation of plant communities was undertaken in a two-phase effort consisting of a preliminary in-house mapping effort and verification and refinement of plant community mapping in the field. The final plant community map was based on the field identification of regional assemblages of vegetation characterized by the presence of dominant plant species.[22] Plant communities were delineated in the field using 1:24,000 (1 inch equals 2,000 feet) scale 1-meter resolution printed digital color aerial photographs flown on June 1, 2006, with a spatial resolution of 1.0 meter (3.00 feet). The imagery product used was derived from the IKONOS satellite sensor and was not radiometrically corrected. The vegetation assemblages described in this report follow the system used by the CDFG, namely, the Sawyer and Keeler-Wolf classification,[23] rather than Holland classification.[24] Sawyer and Keeler-Wolf focus on floristics (i.e., the group of plant species occurring on a site) and dominance (i.e., which species are most abundant and which are less common) as the basis for their system.[25]

Botanical names and common names are according to Hickman.[26] Common names not available from Hickman are taken from Munz,[27] Dale,[28] McAuley,[29] or Roberts.[30] Ornamental plant species not found in those sources are taken from the *Sunset Western Garden Book*.[31]

Field verification of the preliminary plant community map was undertaken by Sapphos Environmental, Inc. biologists (Dr. Frank Landis, Mr. Edward Belden, Ms. Kara Donohue, and Mr. Douglas McNair) on 20, 21, and 22, June 2007. The road network on the proposed project site allowed all polygons to be surveyed by vehicle, using binoculars as necessary and early in the

---

[22] Munz, Philip A., and D.D. Keck. 1949. "California Plant Communities." *El Aliso*, *2*(1): 87–105. Berkeley: University of California Press.

[23] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento: California Native Plant Society.

[24] Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento: California Department of Fish and Game.

[25] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento: California Native Plant Society.

[26] Hickman, J.C., ed. 1993. *The Jepson Manual: Higher Plants of California*. Berkeley: University of California Press.

[27] Munz, Philip A. [1954] 2005. *A Flora of Southern California*. Berkeley: University of California Press.

[28] Dale, Nancy. 1986. *Flowering Plants: The Santa Monica Mountains, Coastal & Chaparral Regions of Southern California* (Photographs by members of the California Native Plant Society). Santa Barbara, CA: Capra.

[29] McAuley, Milt. 1985. *Wildflowers of the Santa Monica Mountains*. Canoga Park, CA: Canyon.

[30] Roberts, Fred M., Jr. January 1989. *A Checklist of the Vascular Plants of Orange County, California*. Museum of Systematic Biology: Research Series No. 6. Irvine: University of California Press.

[31] Brenzel, Kathleen Norris, ed. February 2001. *Sunset Western Garden Book*. Menlo Park, CA: Sunset.

morning to minimize air shimmer. If no plants were visible, the area was marked as barren. If plants were visible, the field crews walked to all patches and determined species composition and estimated abundance. For plant patches less than 5 meters across and not dense (i.e., not visible in aerial photographs), that area of the polygon was marked as diffuse (i.e., vegetation cover less than 1 percent in the polygon). If plant patches were visible in aerial photographs, then the plant community was delineated (Figure 4.3.1-1, *Plant Community Survey Areas*).

The results of the field mapping were incorporated into the plant community map using GIS. The total area of each plant community in acres was calculated using GIS, as well as the relative distribution or percentage of total site. All plants were identified to taxa level and compiled taxonomically in a floral compendium (Appendix A, *Floral and Faunal Compendium*).

4.3.2 Delineation of Areas Subject to the State Fish and Game Code

The purpose of this component of the work effort was to determine the presence or absence, within the proposed project site, of areas potentially requiring negotiation of a Streambed Alteration Agreement with the CDFG pursuant to Section 1600 of the State Fish and Game Code.

The first step in the assessment process involved a literature and map review of the following:

- *U.S. Geological Survey 7.5-Minute Series Topographic Quadrangle Maps*: Bartlett,[32] Vermillion Canyon,[33] Owens Lake,[34] Keeler,[35] Dolomite,[36] Lone Pine,[37] and Olancha[38]
- U.S. Department of Interior Fish and Wildlife Service National Wetlands Inventory Topographic Quadrangle Maps for Bartlett, Vermillion Canyon, Owens Lake, Keeler, Dolomite, Lone Pine, and Olancha[39]
- Soil Survey Maps[40]
- *A Field Guide to Lake and Streambed Alteration Agreements*[41]
- Land Use Element of the *Inyo County General Plan*[42]

---

[32] U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

[33] U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

[34] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[35] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[36] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

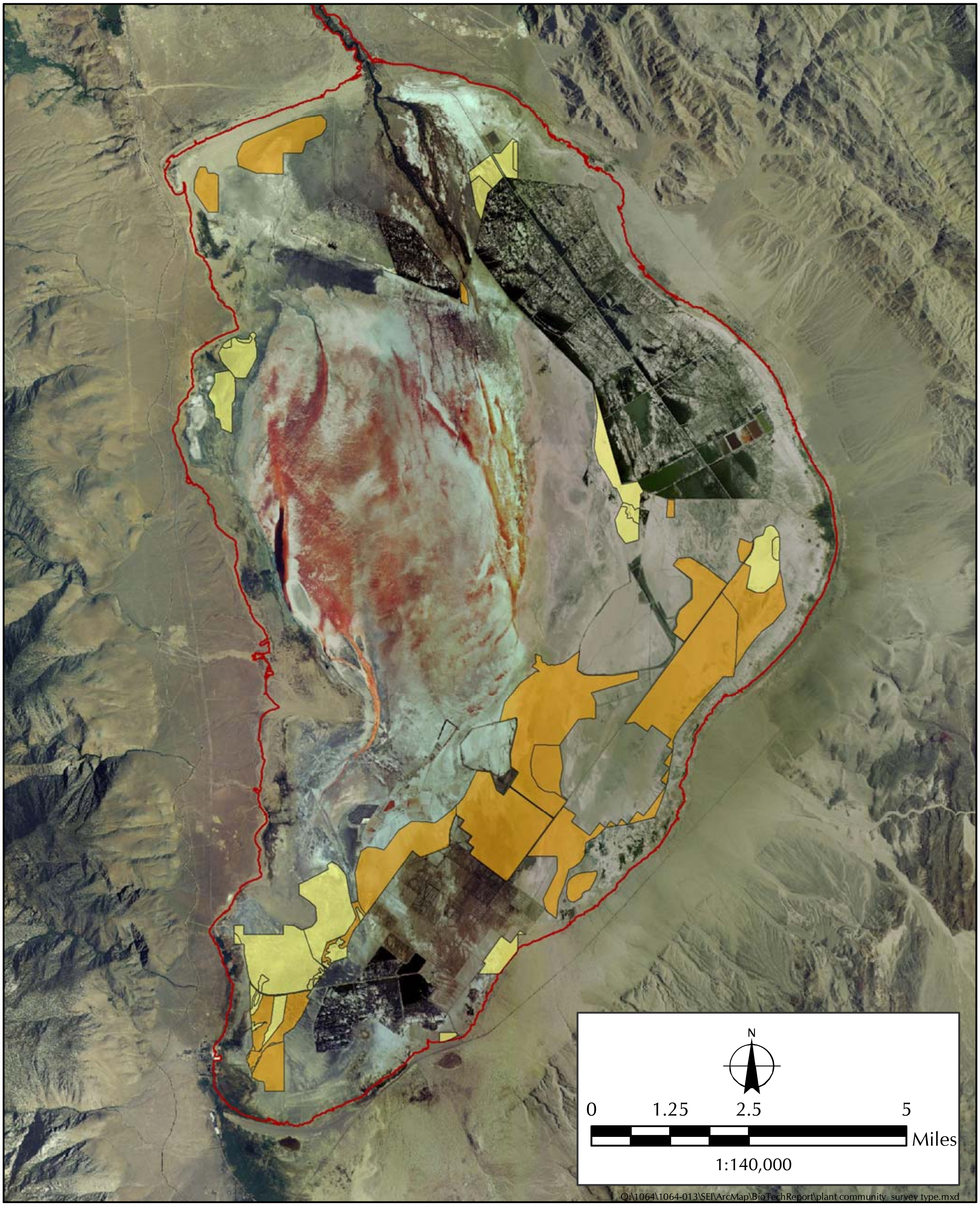
[37] U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

[38] U.S. Geological Survey. 1994. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

[39] U.S. Fish and Wildlife Service. August 1986 (Revised 1995). *National Wetlands Inventory Map, Tylerhorse Canyon, California*. Available at: http://wetlandsfws.er.usgs.gov/NWI/index.html

[40] City of Los Angeles Department of Water and Power. May 2004. Owens Lake Dust Mitigation Project Phase IV Inyo County. Prepared by: CH2M HILL, Santa Ana, CA.

[41] California Department of Fish and Game, Environmental Services Division. 1994. *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600–1607, California Fish and Game Code*. Sacramento, CA.



Survey Method

🟧 Windshield

🟨 Walked

□ Historic Shoreline

FIGURE 4.3.1-1

Plant Community Survey Areas

- State of California Regional Water Quality Control Board Basin Plan for the Lahontan Region[43]

- National Flood Insurance Program Flood Insurance Rate Maps for Inyo County[44]

- Aerial photograph of the proposed project site (1 inch equals 1,000 feet)

- Topographic map of the proposed project site (1 inch equals 1,000 feet)

These resources were analyzed to determine the presence of hydric soils, blue-line drainages, and the potential presence of drainages/isolated washes and intermittently flooded features. In addition, groundwater and flood data were analyzed to determine project impacts and or constraints to the proposed project. Utilizing GIS software (ESRI ArcGIS, Version 9.1), the total length of all drainage features within the proposed project site was determined to locate the potential presence of features subject to CDFG jurisdiction pursuant to Section 1600 of the State Fish and Game Code. In addition, locations of proposed project elements (i.e., dust control areas and roads) were plotted on 1:12,000 (1 inch equals 1,000 feet) aerial photographs, as well as saved as GIS layers for use in a Global Positioning System (GPS) with submeter accuracy (Trimble GPS Pro-XT) for use in the field. The same seven areas identified as having the potential to be subject to the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act were identified as having the potential to be subject to Section 1600 of the Fish and Game Code and numbered on 1:12,000 (1 inch equals 1,000 feet) aerial images and were scheduled for field investigation (Figure 4.2-1 and Table 4.2-1).

Sapphos Environmental, Inc. (Dr. Irena Mendez, Mr. Edward Belden, and Mr. Jack Goldfarb) conducted field surveys of the seven areas potentially subject to the jurisdiction of CDFG, on 19, 21, and 22, June 2007, using methods consistent with CDFG's *A Field Guide to Streambed Alteration Agreements* (Figure 4.2-1).[45] Each area was located utilizing GPS and aerial photographs. Once located, transects were established across the wetlands areas to characterize physical features and collect qualitative data for each site, utilizing standard data sheets (Appendix B, *Jurisdictional Characterization Report*). All survey areas were inspected for the presence of a channel, defined bed and bank, and the presence or absence of aquatic habitats, or wetlands or riparian vegetation. The beginning and end of each transect was recorded utilizing a GPS. For each potential feature, captured data included, but was not limited to, type of vegetation present, presence of defined water flow area, presence of polygonal cracking, ordinary high water mark (OHWM), water stains, riparian or desert wash associated vegetation, or other indicators of directed/channelized water flow. The investigation then proceeded on a systematic course to determine if there were any wetlands or connections to wetlands that are potentially subject to Section 404 of the Clean Water Act by examining the evolution and terminus of each drainage and the potential for interstate

---

[42] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[43] California Regional Water Quality Control Board (RWQCB), Lahontan Region. 1995. *Water Quality Control Plan for the Lahontan Region; North and South Basins.* Lahontan, CA.

[44] Federal Emergency Management Agency. 1986. *Flood Insurance Rate Map, Inyo County, California*; Map Number 0600731275C and 0600731475C, Effective 1986. Contact: 500 C Street, South, Washington, DC 20472.

[45] California Department of Fish and Game Environmental Services Division. 1994. *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600–1607, California Fish and Game Code*. Sacramento, CA.

commerce, including recreation and industry. The potential connection to federally protected wetlands was determined by mapping the terminus of drainages that crossed the Study Area.

Photographs were taken to document each potential drainage feature. Measurement and photograph sites for each potential drainage feature were located on a 1:12,000 (1 inch equals 1,000 feet) scale topographic map. All observations were recorded on the data sheets (Appendix B). Areas potentially requiring a Streambed Alteration Agreement from the CDFG were calculated using GPS data in addition to aerial photos, which were scanned and rectified for use in GIS-based calculations.

4.4 SPECIAL STATUS SPECIES: LISTED, CANDIDATE, SENSITIVE, AND LOCALLY IMPORTANT SPECIES

The purpose of the literature review and field surveys of special status species, within and adjacent to the project Study Area, was to assess the potential for the proposed project to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the CDFG or U.S. Fish and Wildlife Service (USFWS).

4.4.1 Literature Review

Prior to conducting field surveys within the proposed project site, a query of the California Natural Diversity Database (CNDDB)[46,47] and a review of the California Native Plant Society (CNPS) database was undertaken to identify special status species, including listed, sensitive, and locally important species with the potential to occur within, and adjacent to, the proposed project site. The query was conducted for the seven USGS 7.5-Minute Series Topographic Quadrangles (Bartlett,[48] Dolomite,[49] Keeler,[50] Lone Pine,[51] Olancha,[52] Owens Lake,[53] Vermillion Canyon[54]) that include the proposed project area and 10 of the surrounding quadrangles (Centennial Canyon,[55], Cerro Gordo Peak,[56] Cirque Peak,[57] Haiwee Pass,[58] Haiwee Reservoirs,[59] Mt. Langley, [60] New York

---

[46] California Department of Fish and Game. 2004. *Rarefind 2: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

[47] California Department of Fish and Game. 2005. *Rarefind 3: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

[48] U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

[49] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[50] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[51] U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

[52] U.S. Geological Survey. 1994. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

[53] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[54] U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

[55] U.S. Geological Survey. 1987. *7.5-Minute Series, Centennial Canyon, California, Topographic Quadrangle*. Denver, CO.

[56] U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

[57] U.S. Geological Survey. 1988. *7.5-Minute Series, Cirque Peak, California, Topographic Quadrangle*. Denver, CO.

[58] U.S. Geological Survey. 1994. *7.5-Minute Series, Haiwee Pass, California, Topographic Quadrangle*. Denver, CO.

Butte,[61] Templeton Mountain,[62] Union Wash,[63] Upper Centennial Flat[64]). The typical quadrangle search would include any quadrangle that is directly adjacent to quadrangles that contain the proposed project area. Due to the dramatic change in elevation of habitats in adjacent quadrangles when compared to the proposed project area, the CNDDB search excluded quadrangles characterized by high-elevation areas in the Sierra and the Inyo Mountain ranges. The species list was revised based on a review of published and unpublished literature, comparing each species' habitat and range to the characteristics present within the proposed project site. Other reviewed literature included the following: Conservation and Open Space element of the Inyo County General Plan;[65] Owens Basin Wetlands and Aquatic Species Recovery Plan: Inyo and Mono Counties, California;[66] previously completed environmental documentation, including recent field efforts conducted between April 2002 and May 2006 in preparation of the 2003 State Implementation Plan Environmental Impact Report (EIR); and several subsequent documents.[67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85, 86,87,88,89,90,91]

---

[59] U.S. Geological Survey. 1994. *7.5-Minute Series, Haiwee Reservoirs, California, Topographic Quadrangle*. Denver, CO.

[60] U.S. Geological Survey. 1993. *7.5-Minute Series, Mt. Langley, California, Topographic Quadrangle*. Denver, CO.

[61] U.S. Geological Survey. 1987. *7.5-Minute Series, New York Butte, California, Topographic Quadrangle*. Denver, CO.

[62] U.S. Geological Survey. 1988. *7.5-Minute Series, Templeton Mountain, California, Topographic Quadrangle*. Denver, CO.

[63] U.S. Geological Survey. 1982. *7.5-Minute Series Union Wash, California Topographic Quadrangle*. Denver, CO.

[64] U.S. Geological Survey. 1982. *7.5-Minute Series Upper Centennial Flat, California Topographic Quadrangle*. Denver, CO.

[65] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[66] U.S. Fish and Wildlife Service. 2006. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California*.

[67] California Department of Fish and Game. 1994. *Final Report: Riparian and Wetland Breeding Bird Surveys, Inyo County, California, with Emphasis on the Yellow-billed Cuckoo and the Snowy Plover*. Contract No. FG-23 19. Prepared by Kern River Research Center, Weldon, CA.

[68] Great Basin Unified Air Pollution Control District. June 1994. *Owens Valley* PM_{10} *Planning Area Best Available Control Measures State Implementation Plan*. Bishop, CA.

[69] Great Basin Unified Air Pollution Control District. 23 October 1996. *Owens Lake* PM_{10} *Planning Area Demonstration of Attainment State Implementation Plan, Project Alternatives Analysis*. Bishop, CA.

[70] Great Basin Unified Air Pollution Control District. 2 July 1997. *Owens Valley* PM_{10} *Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report*. State Clearinghouse No. 96122077. Bishop, CA.

[71] Great Basin Unified Air Pollution Control District. 1998. *Survey of Aquatic Invertebrates Associated with Irrigation Waters on Owens Lake at the Agrarian Project Site and the South Flood Irrigation Project Site*. Prepared by: Dr. David Herbst, Bishop, CA.

[72] Great Basin Unified Air Pollution Control District. 16 November 1998. *Owens Valley* PM_{10} *Planning Area Demonstration of Attainment State Implementation Plan, Addendum No. 1 to the Final Environmental Impact Report*. State Clearinghouse No. 96122077. Bishop, CA.

[73] Great Basin Unified Air Pollution Control District. 2000. *Biological and Cultural Resource Assessment for Two New Air Monitoring Sites at Owens Valley, Inyo County, CA*. Bishop, CA.

[74] City of Los Angeles Department of Water and Power. February 2000. *Initial Study for North Sand Sheet Shallow Flooding Project; Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M HILL, Santa Ana, CA.

[75] City of Los Angeles Department of Water and Power. 2001. *Rare Plant Survey Report Owens Dry Lake Dust Control Project Sites*. Los Angeles, CA.

4.4.2 Agency Consultation

Coordination was undertaken with resource agencies and experts in the field to further evaluate the potential presence of special status species. Agencies contacted included the USFWS, Bureau of Land Management (BLM), the CDFG, and Inyo County. Coordination was initiated in January 2007. Correspondences with the various agencies are provided in chronological order.

Informal consultation was undertaken with the USFWS to review the scope of federally listed, candidate, and other sensitive species that have the potential to occur in the proposed project area and field methods to be used in assessing the presence or absence of these species:

- Donohue, Kara, Sapphos Environmental, Inc., Pasadena, CA. 24 January 2007. Letter to Carl Benz, U.S. Fish and Wildlife Service, Ventura, CA.
- Benz, Carl, U.S. Fish and Wildlife Service, Ventura, CA. 10 April 2007. Letter to Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.
- Donohue, Kara, Sapphos Environmental, Inc., Pasadena, CA. 23 July 2007. Email

---

[76] City of Los Angeles Department of Water and Power. August 2001. *Mitigated Negative Declaration Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by CH2M HILL, Santa Ana, CA.

[77] CH2MHILL. 2001. *Summary of Surveys for Shorebirds and Other Waterbirds at Owens Lake in 2001*. Prepared by T.D. Ruhlen and G.W. Page, Point Reyes Bird Observatory, Stinson Beach, CA.

[78] CH2MHILL. 2002. *Summary of Surveys for Snowy Plovers at Owens Lake, March 1 through April 30, 2002*. Prepared by: T.D. Ruhlen and G.W. Page, Point Reyes Bird Observatory, Stinson Beach, CA.

[79] Sapphos Environmental, Inc. 2002. *MFR 01, Initiation of Wildlife Monitoring at Owens Lake*. Pasadena, CA.

[80] Sapphos Environmental, Inc. 2002. *MFR 02, Wildlife Monitoring at Owens Lake May 2002*. Pasadena, CA.

[81] Sapphos Environmental, Inc. 2002. *MFR 03, Wildlife Monitoring at Owens Lake June 2002*. Pasadena, CA.

[82] Sapphos Environmental, Inc. 2002. *MFR 04, Wildlife Monitoring at Owens Lake July 2002*. Pasadena, CA.

[83] CH2MHILL. July 2004. *Results of the 2004 Breeding Season Surveys for Snowy Plovers, American Avocets, and Common Ravens at Owens Lake*. Prepared by: Page, G. W., and T. D. Ruhlen, Point Reyes Bird Observatory, Stinson Beach, CA.

[84] Sapphos Environmental, Inc. 21 September 2004. *Biological Resources Technical Report: Bartlett Point and Ash Point Air Quality Monitoring Stations*. Pasadena, CA.

[85] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House No. 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[86] Point Reyes Bird Observatory. 2004. *Results of the 2004 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

[87] Point Reyes Bird Observatory. 2005. *Results of the 2005 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

[88] Point Reyes Bird Observatory. 2006. *Results of the 2006 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

[89] Point Reyes Bird Observatory. 2001. *Summary of Surveys for Snowy Plovers at Owens Lake in 2001*. Petaluma, CA.

[90] Point Reyes Bird Observatory. 2002. *Summary of Surveys for Breeding Snowy Plovers and American Avocets at Owens Lake in 2002*. Petaluma, CA.

[91] Ruhlen T. D., G. W. Page, and L. E. Stenzel. 2006. "Effect of a Changing Environment on Nesting Snowy Plovers at Owens Lake, California." *Western Birds*, *37*: 126–138.

correspondence with Carl Benz, U.S. Fish and Wildlife Service, Ventura, CA.

- Benz, Carl, U.S. Fish and Wildlife Service, Ventura, CA. 23 July 2007. Email correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Informal consultation was undertaken with the BLM to review the scope of sensitive species that have the potential to occur in the proposed project area and field methods to be used in assessing the presence or absence of these species:

- Donohue, Kara, Sapphos Environmental, Inc., Pasadena, CA. 24 January 2007. Email correspondence with Terry Russi, Bureau of Land Management, Bishop, CA.
- Russi, Terry, Bureau of Land Management, Bishop, CA. 25 January 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.
- Halford, Anne, Bureau of Land Management, Bishop, CA. 25 January 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.
- Donohue, Kara, Sapphos Environmental, Inc., Pasadena, CA. 23 July 2007. Email correspondence with Anne Halford, Bureau of Land Management, Bishop, CA.
- Halford, Anne, Bureau of Land Management, Bishop, CA. 24 July 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Informal consultation was undertaken with the CDFG to review the scope of state-listed, candidate, and other sensitive species that have the potential to occur in the proposed project area and field methods to be used in assessing the presence or absence of these species:

- Donohue, Kara, Sapphos Environmental, Inc., Pasadena, CA. 24 January 2007. Email correspondence with Julie Vance, California Department of Fish and Game, Fresno, CA.
- Vance, Julie, California Department of Fish and Game, Fresno, CA. 25 January 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.
- Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 29 January 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

- Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 25 July 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

- Meeting between Great Basin Unified Air Pollution Control District (District, T. Schade), California Department of Fish and Game (B. Henderson), California State Lands Commission via teleconference (J. Brown, et al.), and Sapphos (M. Campbell and E. Belden) conducted on 3 May 2007 to review the work plan.

- Site visit conducted by the Eastern Sierra Audubon Society (M. Prather), the California Department of Fish and Game, Los Angeles Department of Water and Power, the District, and Audubon California conducted on April 16 and 17, 2007. The goal was to evaluate wildlife issues on the lake and the future of the management of the area.

- Donohue, Kara, Sapphos Environmental, Inc., Pasadena, CA. 17 July 2007. E-mail correspondence with Bradley Henderson, California Department of Fish and Game, Bishop, CA.

- Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 17 July 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

- Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 19 July 2007. E-mail correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

4.4.3 Habitat Assessment

The review of previously prepared environmental documents and agency consultation identified a total of 71 special status species, including 1 listed plant species and 9 listed wildlife species, 38 sensitive wildlife species, and 12 locally important plant species and 11 locally important wildlife species have the potential to be present within the region of the proposed project area based on habitat requirements and known historic range (Table 4.4.3-1, *Listed Species with the Potential to Occur in the Region of the Proposed Project Site,* Table 4.4.3-2, *Sensitive Species with the Potential to Occur in the Region of the Proposed Project Site,* and Table 4.4.3-3, *Locally Important Species with the Potential to Occur in the Region of the Proposed Project Site*). Habitat assessment field surveys were undertaken to confirm potentially suitable habitat for the 71 special status species, as well as to determine the presence/absence of special status species.

TABLE 4.4.3-1
LISTED SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE

Species	Status	Habitat	Occurrence
Plants			
Owens Valley checkerbloom (*Sidalcea covillei*)	SE	Associated with alkaline meadows in Owens Valley at elevation range of 1,075–1,425 meters.	Surveyed for in 1995–1996, 1999–2001, and 2003 Dust Control Project sites, but not found; not found at two air quality monitoring sites during surveys on west side of Owens Lake 2004; determined absent as a result of presence/absence surveys of supplemental DCM sites in 2007.
Wildlife			
Owens tui chub (*Gila bicolor snyderi*)	FE, SE	Endemic to the Owens River basin in a variety of habitats needing clear, clean water and aquatic vegetation	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; historic distribution includes several sites along Owens River in Long Valley and Owens Valley, Fish Slough, and irrigation ditches and ponds near Bishop, Big Pine, and Lone Pine; known occurrences include Cabin Bar Ranch south of Olancha approximately 5.5 miles from the proposed project. The Cabin Bar Ranch population has been extirpated. Habitat not found in proposed project site.
Owens pupfish (*Cyprinodon radiosus*)	FE, SE	Found among shallow water habitats in the Owens Valley preferring warm, clear water	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; historic distribution includes Sierra Nevada and Owens Valley region; known occurrence near Independence and Warm Springs near Big Pine approximately 35 miles from the proposed project. Habitat not found in proposed project site.
Desert tortoise (*Gopherus agassizii*)	FT, ST	Requires friable soils for burrow construction in open desert scrub, desert wash, and Joshua tree woodland	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; potential burrows found; known south of Owens Valley; an adult was observed in July 1995 to the east of Owens Lake. Habitat not found in proposed project site.

TABLE 4.4.3-1
LISTED SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Bald eagle (*Haliaeetus leucocephalus*)	FPD, SE	Scarce migrants may occur at sites in the desert where suitable avian prey is concentrated, such as waterbird populations on flooded areas of Owens Lake	Surveyed for in 1996 and spring 2003 at Dust Control Project sites, but not found. Habitat not found in proposed project site.
Swainson's hawk (*Buteo swainsoni*)	ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah, with suitable grasslands nearby that contain adequate rodent populations; migrants may occur throughout the desert	Not found during 2002–2003 surveys within the proposed project area; no appropriate habitat exists within the proposed project area; found during directed surveys along the Owens River in 1996 approximately less than 1 mile from the proposed project. Habitat not found in proposed project site.
American peregrine falcon (*Falco peregrinus anatum*)	SE	Scarce migrants may occur at sites in the desert where suitable avian prey is concentrated, such as shorebird populations at flooded areas on Owens Lake	One seen near Cartago Creek during 1995–1996 surveys; none observed during spring 2003 surveys within the proposed project site; one observed during snowy plover surveys 2007.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Prefers low riparian habitats in vicinity of water or dry river bottoms below 2,000 feet	Surveyed for in 1995–1996 and spring 2003 at Dust Control Project sites, but not found; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; habitat assessment performed in 2002–2003 and no suitable vireo habitat found within the proposed project area; suitable habitat does exist in the Owens River delta, adjacent to the proposed project site approximately less than 1 mile from the proposed project. Habitat not found in proposed project site.

TABLE 4.4.3-1
LISTED SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Mohave ground squirrel (*Spermophilus mohavensis*)	ST	Prefers sandy gravelly soils in open desert scrub, alkali scrub and Joshua tree woodland	Surveyed for in 1995–1996 at Dust Control Project sites, but not found; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; habitat assessment in 2003 determined no suitable habitat present within the proposed project area; record from south of Owens Lake along State Highway 136 approximately less than 1 mile from the proposed project. Habitat not found in proposed project site.

KEY:
FE = Listed as endangered under the federal ESA
FC = Listed as candidate under the federal ESA
FT = Listed as threatened under the federal ESA
PE = Proposed to be listed as endangered under the federal ESA
SE = Listed as endangered by the State of California
SR = Listed as rare by the State of California
ST = Listed as threatened under the State of California

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE

Species	Status	Habitat	Occurrence
Wildlife			
Owens speckled dace (*Rhinicthys osculus ssp.*)	CSC	Fresh water streams and seeps including the Owens River Delta and creeks within the Owens Valley	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; 1989 surveys found species in northern Owens Valley habitats occupied by brown trout; historically known to occupy springs and streams (including Owens River and Fish Slough) throughout Owens Valley, Long Valley, Benton Valley, and springs at Little Lake. Habitat not found in proposed project site.
Owens sucker (*Catostomus fumeiventris*)	CSC	Freshwater streams and seeps, including the Owens River Delta and creeks within the Owens Valley	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; 1989 surveys found species in northern Owens Valley habitats occupied by brown trout. Habitat not found in proposed project site.
Northern sagebrush lizard (*Sceloporus graciosus graciosus*)	BLM	Occurs in many habitats, chiefly at higher montane elevations where it prefers open ground with scattered low bushes	Not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; unlikely but may possibly occur in vicinity of Owens Lake. Habitat not found in proposed project site.
Double-crested cormorant (*Phalacrocorax auritus*) (Rookery sites)	CSC	Nests in colonies in large inland lakes and along the coast, and found at Owens Lake during spring and autumn migration	Not found during spring 2003 surveys within the proposed project area; found at Dirty Socks Spring in 2002 at the edge of the project area; one observed flying over supplemental DCM in 2007.
Western least bittern (*Ixobrychus exilis hesperis*)	CSC	Nests among fresh and brackish marshes with dense and tall aquatic and semiaquatic vegetation	Not found during 1995–1996 and 2002–2003 surveys within the Dust Control Project sites; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; suitable habitat was absent in 2003 within the proposed project area; found at Cottonwood Marsh in 1995 and Cottonwood Springs in 1996. Habitat not found in proposed project site.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
White-faced ibis (*Plegadis chihi*) (Rookery sites)	CSC	Migratory through this region in California; forages in brine pools and shallow water habitats	Found flying over Owens Lake during 2002 surveys; not found during spring 2003 surveys within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found foraging at Olancha Ponds and Cartago Creek in fall 1995, spring 1996, and spring 2003. Observed in areas adjacent to supplemental DCMs in 2007; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Osprey (*Pandion haliaetus*) (Nesting)	CSC	Found near open bodies of water	One individual seen within the shallow flood prototype area at Owens Lake during 1995–1996 surveys; not found during 2002–2003 surveys; suitable habitat for this species does not exist within the proposed project area. Habitat not found in proposed project site.
Northern harrier (*Circus cyaneus*) (Nesting)	CSC	Nests in riparian habitats and forages over open grasslands, marshes, and wetland areas	Found in marsh areas (nesting) during 1995–1996 and 2002 surveys at Owens River Delta, Keeler Ponds, and Swedes Pasture; not found during spring 2003 surveys within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; observed foraging over supplemental DCMs in 2007.
Sharp-shinned hawk (*Accipiter striatus*) (Nesting)	CSC	Nests in thick oak and willow riparian habitats	Found south of State Highway 136 in winter 1995–1996; not found during 2002–2003 surveys within proposed project area. Habitat not found in proposed project site.
Cooper's hawk (*Accipiter cooperi*) (Nesting)	CSC	Nests in thick oak and willow riparian habitats	Found in Owens River delta in 1995–1996; found roosting along the Owens River delta during 2002–2003 surveys; not found during spring 2003 within the proposed project area. Habitat not found in proposed project site.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Ferruginous hawk (*Buteo regalis*) (Wintering)	CSC	Nests on steep cliff faces or atop tall species of trees with snags	Found near Dirty Socks and Owens River delta during 1995–1996 and 2002 surveys; not found during spring 2003 surveys within proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Golden eagle (*Aquila chrysaetos*) (Nesting and wintering)	CSC FPS	Nests on steep cliff faces or atop tall species of trees with snags	Found foraging in Owens River delta in 1995–1996; found frequently foraging along margins of Owens Lake; not found during spring 2003 surveys within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; observed flying over proposed project site in 2007.
Merlin (*Falco columbarius*) (wintering)	CSC	Migrant and winter residents found in areas in the desert where suitable avian prey is concentrated, such as shorebirds	Found wintering in the Owens River delta in January 1996; not found during spring 2003 surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Prairie falcon (*Falco mexicanus*)	CSC	Nests on cliff faces	Found at Cottonwood Spring, Cartago Creek, northeast of Dirty Socks, Swedes Pasture, and Owens River delta during 1995–1996 surveys; not found during 2002–2003 surveys within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; one observed foraging over supplemental DCM in 2007.
Western snowy plover (*Charadrius alexandrinus nivosus*)	CSC	Prefers sandy beaches, salt pond levees and shores of large alkali lakes	Observed nesting on playa during May 1989, 1993, 1996, and during 2001–2006 surveys; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; observed during directed snowy plover surveys in 2007.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Mountain plover (*Charadrius montanus*)	CSC	Agricultural fields and meadow areas	Four observed at meadow at Keeler Ponds (Horse Pasture) in 1995, 0.5 mile north of project site; otherwise surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites and was not found. Habitat not found in proposed project site.
Long-billed curlew (*Numenius americanus*) (Nesting)	CSC	Migratory through this region in California; forages in brine pools and shallow water habitats	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; not found during spring 2003 surveys within proposed project area; observed in evaporation ponds at Cartago Creek in January 1996 and Ash Creek Meadows in May 1996. Habitat not found in proposed project site.
California gull (*Larus californicus*) (Nesting colony)	CSC	Resides and nests in desert scrub habitats	Found foraging in Shallow Flooding areas in 2002–2003; found flying over the proposed project area and foraging adjacent to the proposed project area during spring 2003 surveys; found during April 2006 surveys at Shallow Flooding areas; found during 1995–1996 surveys at North Seep, Cottonwood Marsh, Sulfate Well, and the Great Basin Unified Air Pollution Control District experimental shallow flood plot; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; observed adjacent to supplemental DCMs in 2007; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Burrowing owl (*Athene cunicularia*) (Burrow sites)	CSC	Nests and resides in desert scrub and agricultural habitats	Found during autumn 1995 surveys west of Point Bartlett; found along Cottonwood Creek during 2002 surveys; not found during spring 2003 surveys within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004. The Great Basin Unified Air Pollution Control District has documented use of pipes for burrows within Dust Control Project Areas. Habitat not found in proposed project site.
Vaux's swift (*Chaetura vauxi*) (Nesting)	CSC	Nests on open grassland areas with exposed surfaces	Surveyed for in 1995–1996 and 2002 at Dust Control Project sites, but not found; not found during spring 2003 within the proposed project site; present as a vernal and autumnal migrant in Owens Valley. Habitat not found in proposed project site.
Loggerhead shrike (*Lanius ludovicianus*) (Nesting)	CSC	Nests and resides in desert scrub and savannah woodland habitats	Found at Keeler Ponds and Cottonwood Creek during 1995–1996 and 2002 surveys and found along the Owens River delta during 2002–2003 surveys; not found during spring 2003 surveys within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found during April 2006 surveys when it was common at Managed Vegetation areas within the proposed project site; observed adjacent to supplemental DCMs in 2007; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
California horned lark (*Eremophila alpestris actia*)	CSC	Nests on open grassland areas with exposed surfaces	Through agency consultation, it was determined the proposed project area is outside of the geographical range of California horned lark. California horned lark occurs on the central and southern coastal slope and in the San Joaquin Valley.
Le Conte's thrasher (*Toxostoma lecontei*)	CSC	Resides in desert habitats; primarily in open desert wash, desert scrub, alkali desert scrub, desert succulent scrub	Found in saltbush scrub habitats during 2002 surveys within the proposed project area; not found during spring 2003 within the proposed project area; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found during 1995–1996 surveys in shadscale scrub north of Keeler Ponds, near Owens River, northeast of Dirty Socks, and Cottonwood Creek. Habitat not found in proposed project site.
Virginia's warbler (*Vermivora luciae*) (Nesting)	CSC	Migrant along riparian margins	Not found during 2002–2003 surveys at Dust Control Project sites; not found during spring 2003 within the proposed project area; found in migration along Cartago Creek in 1995–1996 surveys. Habitat not found in proposed project site.
Yellow warbler (*Dendroica petechia brewsteri*) (Nesting)	CSC	Nests in willow riparian habitats	Not found during spring 2003 surveys within proposed project area; suitable habitat does not exist within the proposed project area (regardless, listed as potentially present); found along Owens River delta in 1995–1996 and 2002. Habitat not found in proposed project site.
Yellow-breasted chat (*Icteria virens*) (Nesting)	CSC	Resides in low, dense riparian habitat consisting of willow, blackberry, wild grape	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; suitable habitat does not exist within the proposed project area (regardless, listed as potentially present); found south

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
			of Cabin Bar Ranch in July 1995, but not found during 1996. Habitat not found in proposed project site.
Tricolored blackbird (*Agelaius tricolor*) (Nesting)	CSC	Nests in emergent wetland vegetation, which includes bullrush and tules	Surveyed for in 1995–1996 and 2002 at Dust Control Project sites, but not found; not found during spring 2003 surveys within the proposed project area; observed foraging over meadows in Owens River Delta, Horse Pasture, and Dirty Socks in 1995–1996. Habitat not found in proposed project site.
Pallid bat (*Antrozous pallidus*)	CSC, BLM	Resides in deserts, grasslands, shrublands; most common in open, dry habitats with rock areas	Not found during 1995–1996 at Dust Control Project sites; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found foraging over meadows at Owens River delta, Keeler Ponds, and Dirty Socks in 1995–1996; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Townsend's big-eared bat (*Corynorhinus townsendii*)	CSC, BLM	Lives in a variety of habitats throughout the desert regions of California; forages over mesic and riparian corridors	Surveyed for in 1995–1996 at Dust Control Project sites, but not found; found east of State Highway 136 outside of project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Pale big-eared bat (*Corynorhinus townsendii pallescens*)	CSC, BLM	Lives in a wide variety of habitats, but most common in mesic sites	This subspecies no longer has special status due to inclusion in Townsend's big-eared bat.
Spotted bat (*Euderma maculatum*)	CSC, BLM	Lives in a variety of habitats throughout California	Found foraging over Owens Lake during 1995–1996 and 2003 surveys; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Western small-footed myotis (*Myotis ciliolabrum*)	BLM	Found throughout the desert; solitary species	Found foraging over aquatic habitats in 1995–1996 at Dust Control Project Site; found foraging over Owens Lake in 2003; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004. Habitat not found in proposed project site.
Long-eared myotis (*Myotis evotis*)	BLM	Found in coniferous forests; migrates through riparian habitat in Owens River Valley	Found in 1996 at cattle tank north of North Seep and west of Keeler; found in autumn 1995 and spring 1996 in Owens Lake area. Habitat not found in proposed project site.
Long-legged (hairy-winged) myotis (*Myotis volans*)	BLM	Found in the desert up to 2,500 meters in forested regions and brushy areas; roosts in buildings, trees, and crevices	Found foraging over aquatic habitats in 1995–1996 at Dust Control Project Site; possibly detected by acoustic signature in 2003 at Owens Lake. Habitat not found in proposed project site.
Yuma myotis (*Myotis yumanensis*)	BLM	Found in the desert, especially along wooded canyon bottoms; common in southeastern California; colonial species, roosting in caves and old buildings	Found foraging over aquatic habitats in 1995–1996 at Dust Control Project Site; found foraging over Owens Lake in 2003. Habitat not found in proposed project site.
Owens Valley vole (*Microtus californicus vallicola*)	CSC	Found in friable soils of wetlands and lush grassy ground in the Owens Valley	Surveyed for during May 1990 survey in support of Lake Minerals project;[92] several found during 1996 surveys at the north flood irrigation plot site; found during focused surveys in Swedes Pasture and Dirty Socks Spring; sign found at Sulfur Springs and Sulfur Springs Road in 2003; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; determined absent as a result of small mammal trapping for supplemental DCMs in 2007.

---

[92] Inyo County, California State Lands Commission and U.S. Bureau of Land Management. 1994. *Draft Environmental Impact Report/Environmental Impact Statement, Owens Lake Soda Ash Company Soda Ash Mining and Processing Project*. Bishop, CA.

TABLE 4.4.3-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Southern grasshopper mouse (*Onychomys torridus ramona*)	CSC	Present in prairies and deserts in grass, sagebrush, greasewood with sandy or gravelly soil	Two found during 2003 surveys; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004. Habitat not found in proposed project site.
American badger (*Taxidea taxus*)	CSC	Most numerous in California in the Great Basin region, fluctuating with populations of squirrels and pocket gophers, in open areas including deserts	During surveys for predatory mammals conducted in the fall of 1995; one badger sign, a badger dig, was observed in the shadscale scrub west of the Owens River riparian area. Habitat not found in proposed project site.

KEY:
CSC = California Species of Special Concern
BLM = BLM Sensitive species
FPS = Federally Protected Species

TABLE 4.4.3-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE

Species	Status	Habitat	Occurrence
Plants			
Sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*)	CNPS 1B	Typically associated with Joshua tree woodland, Mojavean desert scrub of Inyo County at elevation range of 1,000–1,675 meters	Observed among scrub habitat near Dirty Socks well, Owens Lake basin; surveyed for in 1995–1996, 1999–2001, and 2003–2004 at Dust Control Project sites and proposed project area, but not found. Habitat not found in proposed project site.
Parish's popcorn-flower (*Plagiobothrys parishii*)	CNPS 1B	Great Basin scrub	Found north of Cartago, Inyo County; threatened by groundwater pumping; flowering period is May–June (and uncommonly in November). Habitat not found in proposed project site.
Darwin rock cress (*Arabis pulchra* var. *munciensis*)	CNPS 2	Found on limestone among Chenopod scrub, Mohavean desert scrub in Inyo County at elevation range of 1,100–2,075 meters	Not found during 1995–1996, 1999–2001, and 2003 surveys at Dust Control Project sites or within the proposed project area. Habitat not found in proposed project site.

TABLE 4.4.3-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Naked milk-vetch (*Astragalus serenoi* var. *shockleyi*)	CNPS 2	Found on course granitic alluvium among Chenopod scrub, Great Basin scrub at elevation range of 1,500–2,250 meters	Not found during 1995–1996 and 1999–2001 surveys at Dust Control Project sites; not found during 2003 focused surveys within the proposed project area. Habitat not found in proposed project site.
Inyo phacelia (*Phacelia inyoensis*)	CNPS 1B	Found in alkaline meadows and seeps of Inyo County at elevation range of 900–3,200 meters	Surveyed for in 1999–2001 at Dust Control Project sites, but not found; not found during 2003–2004 focused surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Creamy blazing star (*Mentzelia tridentata*)	CNPS 1B	Found in Mojavean desert scrub at elevation range of 700–1,160 meters; flowing period is March–May	Habitat not found in proposed project site.
Booth's evening primrose (*Camissonia boothii* ssp. *boothii*)	CNPS 2	Typically associated with Joshua tree woodland and pinyon and juniper woodland; observed among stabilized dunes at Owens Lake basin at elevation range of 900–2,400 meters; blooms April to September	Surveyed for in 1995–1996 and 1999–2001 at Dust Control Project sites, but not found; not found during 2003–2004 focused surveys within the proposed project area. Habitat not found in proposed project site.
Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)	CNPS 2	Associated with desert dunes, Great Basin scrub of Inyo County at elevation range of 700–1,625 meters; blooms April to May	Surveyed for in 1999 and 2001 at Dust Control Project sites, but not found; not found during 2003–2004 focused surveys within the proposed project area. Habitat not found in proposed project site.
Narrow-leaved cottonwood (*Populus angustifolia*)	CNPS 2	Found along creeks and rivers in riparian forest of Inyo County at elevation range of 500–2,125 meters; flowering period is March–April	Surveyed for in 1995–1996 and 1999–2001 at Dust Control Project sites, but not found; not found during 2003 focused surveys within the proposed project area. Habitat not found in proposed project site.
Nevada oryctes (*Oryctes nevadensis*)	CNPS 2	Found in dry, sandy soil in washes and open scrub habitat in the Owens Valley at elevation range of 1,100–2,550 meters	Surveyed for in 1995–1996 and 1999–2001 at Dust Control Project sites, but not found; not found during 2003–2004 focused surveys within the proposed project area. Habitat not found in proposed project site.

TABLE 4.4.3-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Inyo County star-tulip (*Calochortus excavatus*)	CNPS 1B	Found among alkaline meadows in shadscale scrub at elevation range of 1,150–2,000 meters	Surveyed for in 1995–1996, 1999, 2000, and 2001 at Dust Control Project sites, but not found; not found during 2003–2004 focused surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Alkali cord grass (*Spartina gracilis*)	CNPS 4	Found in alkali meadows and seeps of Inyo County; observed at Owens Lake basin at elevation range of 1,000–2,100 meters; blooms June to August	Surveyed for in 1995–1996 and 1999–2001 at Dust Control Project sites, but not found; not found during 2003–2004 focused surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Wildlife			
Moth (no common name) (*Tescalsia guilianata*)	Locally rare	Dune and alkali meadow habitats	Found at Olancha Dunes and Southwest Seeps during 1995–1996 surveys; not found during 2003 surveys within the proposed project area; suitable habitat was found in dunes and sand hummocks during 2003 surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Monarch butterfly (*Danaus plexippus*)	Locally rare	Riparian and woodland habitats; found near Olancha in autumn 1995	Found in Owens River delta during 1995–1996 surveys; adults, milkweed, or larval host plants during the 2003 surveys were not found; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.

TABLE 4.4.3-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Alkali skipper (*Pseudocopaeodes eunus*)	Locally rare	Dune and alkali meadow habitats	Observed at Dirty Socks during 1995–1996 surveys; not found during 2003 surveys within the proposed project area; suitable habitat was found in saltgrass dominated transmontane alkaline meadow during 2003 surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Owens valley tiger beetle (*Cicindela tranquebarica inyo*)	Locally rare	Dune and alkali meadow habitats	Found at Olancha Pond, Dirty Socks, and Swedes Pasture during 1995–1996 surveys; found in saltgrass dominated transmontane alkaline meadow during 2003 surveys within the proposed project area; observed within the Channel Area as a result of presence/absence surveys in supplemental DCMs in 2007.
Alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*)	Locally rare	Dune and alkali meadow habitats	Found at Dirty Socks, southwest seep, and northwest of Dirty Socks during 1995–1996 surveys; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Slender-girdled tiger beetle (*Cicindla tenuicincta*)	Locally rare	Dune and alkali meadow habitats	Observed at southwest seep, and northeast of Dirty Socks during 1995–1996 surveys; not found during 2003 surveys within the proposed project area; suitable habitat was found in saltgrass dominated transmontane alkaline meadow during 2003 surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.

TABLE 4.4.3-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT SITE, Continued

Species	Status	Habitat	Occurrence
Owens dune weevil (*Trigonoscuta owensii*)	Locally rare	Dune and alkali meadow habitats	Found at Olancha Dunes and dunes northeast of Keeler during 1995–1996 surveys; found during 2003 surveys within the proposed project area; suitable habitat was found in dunes and sand hummocks during 2003 surveys within the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Willet (*Catoptrophorus semipalmatus*)	Locally rare	Found in marshes and Shallow Flooding areas during winter and spring	Found during winter 2002–2003 surveys in Shallow Flooding areas; not found during spring 2003 surveys in the proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Franklin's gull (*Larus pipixcan*)	Locally rare	Uses ponds, shallow-flood areas, and fields for foraging, including habitat elements within the proposed project area	Not found during spring 2003 surveys. Suitable habitat (shallow-flood areas) is present determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.
Nuttall's woodpecker (*Picoides nuttallii*)	Locally rare	Found in woodlands, riparian areas, and scrublands; nests in Owens River delta riparian areas	Found foraging south of State Route 136 in Modoc-Great Basin habitat in 1995–1996 surveys; not found during spring 2003 surveys within proposed project area. Suitable habitat does not exist within the proposed project area.
Sage sparrow (*Amphispiza belli*) (desert populations only)	BCC	Found in sagebrush, arid bushland, and chaparral habitats. Desert populations breed during winter in the Owens Valley.	Observed at Bartlett Spring during initial site visit in January 2007; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007.

KEY:

CNPS ranking system =

List 1B: Rare, threatened or endangered in California and elsewhere.
List 2: Plants is rare, threatened or endangered in California but more common elsewhere.
List 3: Plants about which we need more information.
List 4: Plants of limited distribution.
Threat ranks:
0.1: Seriously threatened in California.
0.2: Fairly threatened in California.
0.3: Not very threatened in California.

Locally rare = Designated as locally important by Inyo County, the Audubon Society, CDFG, and/or the 1997 EIR

The habitat assessment for the 71 special status species was ground-truthed in the field concurrent with the plant community map ground-truthing by Sapphos Environmental, Inc. on 20, 21, and 22, June 2007. Field surveys for special status species were undertaken by Sapphos Environmental, Inc. biologists under the direction of Dr. Irena Mendez. A total of 120 staff hours were dedicated to the undertaking of the plant community mapping, habitat assessment, and presence/absence surveys. Potentially suitable habitats were delineated in the field using 1:24,000 (1 inch equals 2,000 feet) scale 1-meter resolution printed digital color aerial photographs flown on June 1, 2006 with a spatial resolution of 1 meter (3 feet). The imagery product used was derived from the IKONOS satellite sensor and was not radiometrically corrected. The field verification was undertaken concurrently with plant community mapping. The surveys allowed 100 percent visual coverage of each vegetated area. The field mapping was supported by a Garmin GPS unit. During field visits, observations of plant and wildlife species and habitat transition zones were recorded on aerial photographs and the locations recorded on GPS units.

All survey personnel were experienced in the undertaking of field surveys for special status species, as well as knowledgeable of the identification and ecology of all species (Appendix C, *Resumes*). All survey personnel were familiar with both federal and state statutes related to listed and sensitive species and their collection, in addition to being experienced with analyzing the impacts of development on special status species, their habitats, and communities. Surveyors had in-depth knowledge and familiarity with the species of the area, including rare, threatened, and endangered species. In addition, field teams were knowledgeable of the habitat requirements for each of the target species, locations of various habitats within the proposed project site, and characteristics and vegetative habitat of each target species. Surveyors walked meandering transects along suitable habitat areas, searching for the appropriate target species by carefully scrutinizing the vegetation and habitat.

While walking transects, habitat was assessed for each special status species and relevant habitat was scrutinized for target species. Invertebrates and reptiles were searched for by visually inspecting the ground and turning over rocks, as well as searching under vegetation. A visual and auditory search was performed for birds. Mammals were surveyed by sight and investigation of diagnostic sign (i.e., track, scat, nests, and burrows). All plant and wildlife species were identified to species level and compiled taxonomically in a floral and faunal compendium (Appendix A).

Presence/absence surveys were conducted in potentially suitable habitat for listed plant and wildlife species identified as a result of the habitat assessment. For these species, presence/absence surveys covered 100 percent of potentially suitable habitat in conjunction with surveys completed for plant community mapping and habitat assessment.

4.4.3.1 Sensitive Species

Presence/absence surveys were conducted in potentially suitable habitat for sensitive plant and wildlife species identified as a result of the habitat assessment. For these species, presence/absence surveys covered 100 percent of potentially suitable habitat in conjunction with surveys completed for plant community mapping and habitat assessment.

4.4.3.2 Locally Important Species

Presence/absence surveys for all locally important species that have the potential to occur within the proposed project Study Area were completed in conjunction with the plant community mapping and habitat assessment. For these species, presence/absence surveys covered 100 percent of potentially suitable habitat.

4.5 DETAILED FIELD SURVEYS

This section describes the detailed field studies performed for specific special status species identified as having the potential to occur within the proposed project site as a result of a literature review, agency consultation, and habitat assessment. Detailed field studies were designed and performed to take into account the particular life history traits and habitat requirements of the target species. Detailed field studies implemented the most recent agency-approved protocols whenever possible.

4.5.1 Owens Valley Vole

The 150 acres identified as potentially suitable habitat for the Owens Valley vole, a state-designated sensitive species, were the subject of detailed field surveys. Small mammal trapping was conducted to determine the presence/absence of the Owens Valley vole at three locations within the proposed project location: a proposed Shallow Flooding site, a previously established revegetation site, and a wet meadow site (Figure 4.5.1-1, *Owens Valley Vole Survey Area*). Sapphos Environmental, Inc. wildlife biologists (Mr. CJ Randel and Mr. Andrew Keller) conducted three, 5-day trapping sessions at each site from 1–6 April, 3–8 June, and 24–29 June, 2007. A total of 100 Sherman live traps were placed 15 meters on center in a 4 × 25 arrangement. All traps were baited with mixture of commercial bird seed and peanut butter and opened 1/2 hour before sunset. Traps were checked for captures no later than 1/2 hour after sunrise. All captured individuals were identified to the species level and recorded.

4.5.2 Western Snowy Plover

Point Reyes Bird Observatory surveyed the proposed project site between 8 May and 16 June 2007. Area searches, rather than transects, were used for all areas to allow observers flexibility in moving toward locations they suspected might be suitable for nesting snowy plovers. They scanned for plovers with binoculars and spotting scopes from enough stationary points to cover the entire area selected for coverage each survey day. It was not possible to cover all portions of some DCM areas in a single day, requiring observers to return to survey another part of the area on a subsequent day (Appendix D, *Results of Surveys for Nesting Snowy Plovers in Supplemental Dust Control Measure Areas at Owens Lake in 2007).*

If a plover was located, it was watched carefully to see if it would return to a nest. Data collected on each observation of a plover, group of plovers, nest, or brood included date, latitude, and longitude. Latitude and longitude (UTM/NAD83) were taken using a Garmin GPS unit.

Annually, since 1994, a lake-wide survey for snowy plovers has been conducted in late May or early June to provide an index of the number of snowy plovers at Owens Lake. The 2007 survey was conducted from 21–26 May.

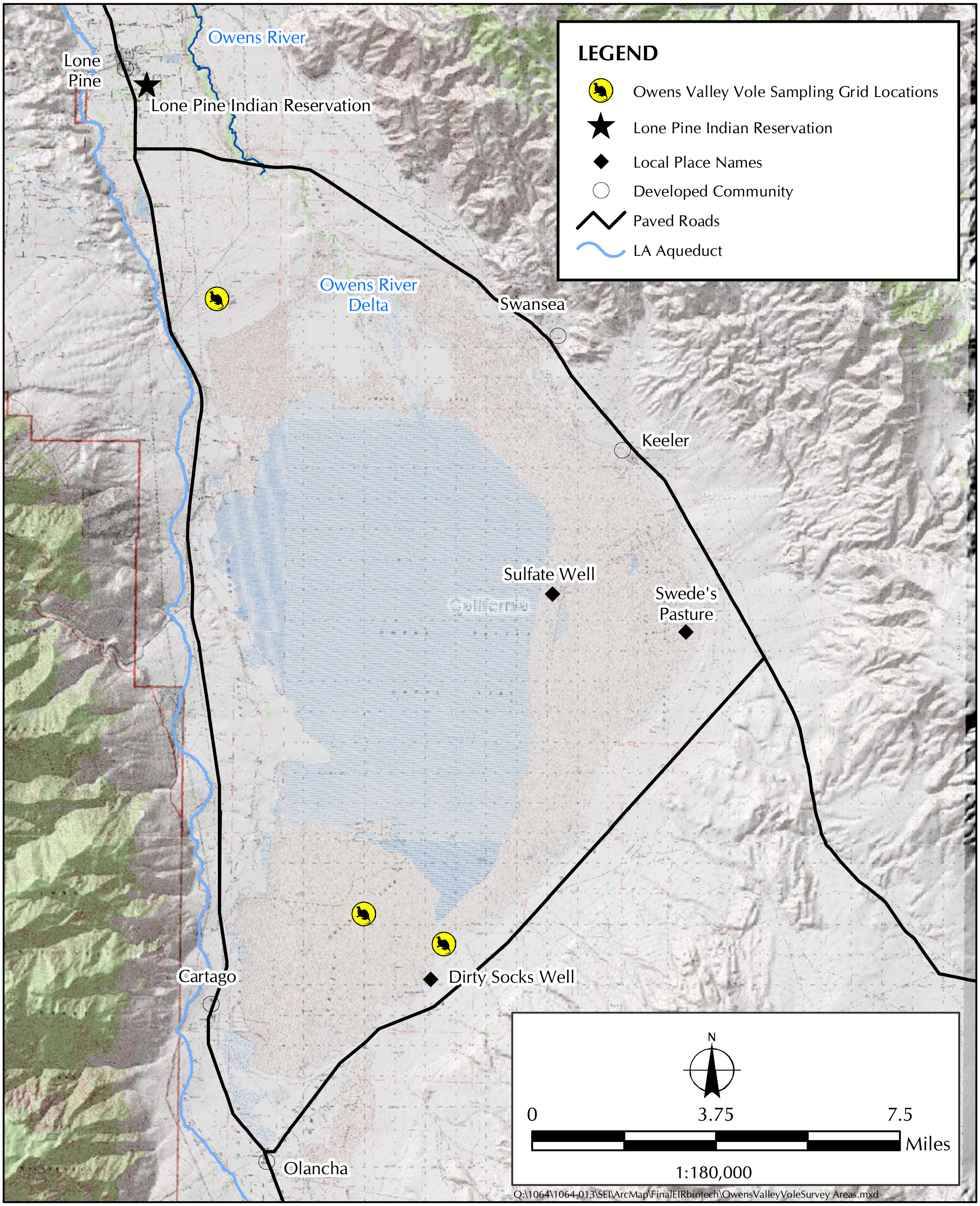


FIGURE 4.5.1-1

Owens Valley Vole Survey Area

4.6 NATIVE RESIDENT OR MIGRATORY SPECIES OF FISH AND WILDLIFE

This section documents the methods used to address the potential for the project to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or to impede the use of native wildlife nursery sites.

4.6.1 Fish

Concurrent with methods utilized during the field efforts associated with delineating wetlands and other State and Federal waters (described in Section 4.2), field efforts associated with plant community mapping (i.e., Section 4.3.1), delineation of areas subject to CDFG jurisdiction (i.e., Section 4.3.2), the literature review (i.e., Section 4.4.1), agency consultation (i.e., Section 4.4.2), and habitat assessment (i.e., Section 4.4.3), the possible presence of native resident or migratory species of fish at the proposed project site was evaluated.

4.6.2 Herpetofauna

Concurrent with methods utilized during the field efforts associated with wetlands and waters (described in Section 4.2), field efforts associated with plant community mapping (i.e., Section 4.3.1), delineation of areas subject to CDFG jurisdiction (i.e., Section 4.3.2), the literature review (i.e., Section 4.4.1), agency consultation (i.e., Section 4.4.2), and habitat assessment (i.e., Section 4.4.3), the possible presence of native resident or migratory species of herpetofauna at the proposed project site was evaluated.

4.6.3 Birds

Prior to on-site surveys, Sapphos Environmental, Inc. conducted a literature review to determine elevation range and habitat associations for listed, sensitive, as well as unlisted species of migratory avian species. Presence/absence surveys for migratory and nonbreeding raptors were undertaken in all suitable habitats. These surveys were guided by the description of habitat characteristics and the known range of each species provided by the CNDDB and other published references for each of the species.[93,94,95]

4.6.4 Mammals

Prior to on-site surveys, Sapphos Environmental, Inc. conducted a literature review to determine elevation range and habitat associations for listed, sensitive, and unlisted species of mammalian species. Coordination with agencies and field experts was conducted to determine the potential presence of mammals at the proposed project site.

---

[93] Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1989. *California's Wildlife, Volume I: Amphibians and Reptiles.* Sacramento: California Department of Fish and Game.

[94] Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. *California's Wildlife, Volume II: Birds.* Sacramento: California Department of Fish and Game.

[95] U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station. July 1990. "Sampling Methods for Terrestrial Amphibians and Reptiles." *General Technical Report PNW-GTR-256*. Portland, OR.

A site assessment for migratory bat species was conducted by Sapphos Environmental, Inc. (Ms. Kara Donohue). The site assessment was guided by the description of habitat characteristics and the known range of each species provided by the CNDDB and other published references for each of the species.[96,97,98]

4.7 CONSISTENCY WITH FEDERAL, STATE, AND REGIONAL CONSERVATION PLANS

Coordination was undertaken with the National Park Service,[99] the USFWS,[100] the USDOI BLM, [101] the USFS,[102] the CSLC,[103] and CDFG[104] to determine if there if the proposed project site lies within or adjacent to an adopted Habitat Conservation Plan or Natural Community Conservation Plan. In addition, as indicated in Section 4.1, the Land Use and Open Space and Conservation Elements of the Inyo County General Plan[105] were reviewed to determine if the proposed project has the potential adversely affect any regional conservation plans.

---

[96] Jameson, E.W., Jr., and H.J. Peeters. 2004. *Mammals of California*. Berkeley: University of California Press.

[97] Ingles, L.G. 1965. *Mammals of the Pacific States*. Stanford: Stanford University Press.

[98] Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. *California's Wildlife, Volume III: Mammals*. Sacramento: California Department of Fish and Game.

[99] Knight, Misty, National Park Service, Independence, CA. 24 July 2007. Telephone conversation with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

[100] Benz, Carl, U.S. Fish and Wildlife Service, Ventura, CA. 23 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

[101] Halford, Anne, Bureau of Land Management, Bishop, CA. 24 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

[102] Hennessy, Mary Beth, U.S. Forest Service, Bishop, CA. 24 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA

[103] Schade, T., Great Basin Unified Air Pollution Control District; B. Henderson, California Department of Fish and Game; J. Brown et al., State Lands Commission (via teleconference); and M. Campbell and E. Belden, Sapphos Environmental, Inc. 3 May 2007. Meeting.

[104] Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 25 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

[105] Inyo County Planning Department. 15 June 2004. *Inyo County General Plan*. Chapter 1, Land Use, Conservation, and Open Space Element. Bakersfield, CA. Available at: http://www.co.Inyo.ca.us/planning/pdfs/kcgp/KCGPChp1LandUse.pdf

SECTION 5.0
RESULTS

This section of the Biological Resources Technical Report characterizes the environmental baseline conditions for biological resources, within the 2008 Supplemental Control Requirements for the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (proposed project) area, the potential for the proposed project to result in significant impacts to biological resources, and the effectiveness of mitigation measures to reduce impacts to below the level of significance. The results address the scope of analysis recommended in Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines, including Inyo County General Plan and Zoning Ordinances related to biological resources; areas potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE) pursuant to Section 404 of the Clean Water Act; riparian and other state-designated sensitive habitats, including those requiring a Streambed Alteration Agreement pursuant to Section 1600 of the State Fish and Game Code; special status species and designated critical habitat; native resident or migratory species of fish and wildlife; and the consideration of federal, state, and regional conservation plans.

5.1 INYO COUNTY GENERAL PLAN AND ORDINANCES

5.1.1 Existing Conditions

The Land Use element of the Inyo County General Plan designates the proposed project area as Natural Resources and State and Federal Lands.[1] This land use designation "is applied to land or water areas that are essentially unimproved and planned to remain open in character, [and] provides for the preservation of natural resources, the managed production of resources, and recreational uses."[2] The Inyo County Zoning Ordinance designates the proposed project area as predominantly OS-40: Open Space Zone, 40-acre minimum lot size.[3]

Environmental baseline conditions have been addressed in relation to the Inyo County General Plan goals and policies related to biological resources: [4]

- Approximately 413 acres of DAM and 411.8 acres of jurisdictional "waters" and wetlands
- Biodiversity of the Owens Lake bed within the proposed project area is relatively low as it is dominated, 90.78 percent by barren playa
- Owens Lake bed within the proposed project area is a part of the larger wildlife movement corridor that includes the entirety of the Owens Valley

---

[1] County of Inyo Planning Department. 11 December 2001. *Land Use Element of the County of Inyo General Plan Update*. Independence, CA.

[2] County of Inyo Planning Department. 11 December 2001. *Land Use Element of the County of Inyo General Plan Update*. Independence, CA.

[3] County of Inyo. County Code, Title 18: "Zoning." Available at: http://www.countyofinyo.org/planning/zonord.html

[4] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

- Proposed project area is relatively free of noxious weeds
- At its nearest location, the proposed project area is located 0.5 mile east of the Lower Owens River Project area

5.1.2 Impact Analysis

Construction, operation, and maintenance of the dust control measures (DCMs) on 9,664acres (13.3 percent) within the 70,000 acres of the Owens Lake bed would be consistent with Inyo County General Plan land use designation and zoning, in that the DCMs are capable of maintaining the open character of land.

5.1.2.1 Riparian Habitat and Jurisdictional "Waters" and Wetlands

Conversion of up to 413 acres of DAM constitutes a significant impact requiring the consideration of mitigation measures and alternatives. Conversion of up to 411.8 acres of jurisdictional "waters" and wetlands constitutes a significant impact requiring the consideration of mitigation measures and alternatives.

5.1.2.2 Biodiversity

The proposed project would be expected to result in a net increase in biodiversity through the addition of 5,228 acres of Shallow Flooding. The ability of Moat & Row and the Study Areas to increase biodiversity has not been demonstrated. Treatment of the Channel Area with habitat restoration that reduces PM_{10} emissions has the potential to increase biodiversity.

5.1.2.3 Wildlife Corridors

Construction, operation, and maintenance of DCMs on 9,664 acres would not be expected to impede wildlife movement through the Owens Valley.

5.1.2.4 Noxious Weeds

Construction, operation, and maintenance of the DCMs required as a result of the 1998 State Implementation Plan (SIP) and the 2003 SIP have not resulted in a significant increase in noxious weeds; therefore, the proposed project is not expected to result in significant adverse impacts related to a substantial increase in noxious weeds.

5.1.2.5 Lower Owens River Project

The 9,664 acres of DCMs would not encroach on the Lower Owens River Project.

5.1.3 Mitigation Measures

Although, Inyo County does not have regulatory authority over the Owens Lake bed due to the fact that is owned and managed by the State Lands Commission, the conversion of riparian and wetland habitats is inconsistent with the goals and policies of the Inyo County General Plan related to conservation of these habitats. Mitigation measures for the conversion of riparian habitats and jurisdictional waters are provided in the related portions of the environmental analysis.

5.2 FEDERAL WETLANDS

5.2.1 Existing Conditions

As a result of the review of topographic maps, the National Wetlands Inventory Map, aerial photographs, and field investigation and spatial analysis of seven potential jurisdictional areas, four areas comprising 393.2 acres, were determined to be subject the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act.

Two of these USACOE jurisdictional areas consist of connected surface and subsurface flows from Cartago Creek to the existing brine pool previously determined to be under federal jurisdiction.[5] The other USACOE jurisdictional area consists of a spring, which also connects surface and subsurface flows to the existing jurisdictional brine pool.

The spatial analysis was further augmented by a review of the National Wetlands Inventory Map (Figure 5.2.1-1, *National Wetlands Inventory Resources*). There are 15.45 acres of wetlands designated on the National Wetlands Inventory within the proposed project Study Area. Of these 15.45 acres, 4.8 acres were determined to be under the jurisdiction of the USACOE.

The proposed project site was determined to be characterized by drainages potentially meeting the definition of "wetlands adjacent to traditional navigable waters," "isolated," "non-navigable tributaries," and "wetlands adjacent to non-navigable tributaries." The project area is characterized by small and larger alluvial fans. Many of the alluvial fans dissipate water to small relatively shallow channels that are not well defined. The channels change on a yearly basis and although deposition occurs, the fans are rapidly permeable and do not convey much water except in large storm events. Other potential jurisdictional areas include spring fed outflow channels, and springs. Only portions of the areas contained evidence of above ground connection with the existing brine pool previously delineated in June 1994 in conjunction with the proposed Owens Lake Soda Ash Company Soda Ash Mining and Processing Project and determined to be under the jurisdiction of the USACOE based on an ordinary high water mark of 3,553.55 feet. No aquatic vertebrates were observed during field surveys of drainages within the proposed project Study Area.

Field surveys were conducted for all areas potentially requiring DCMs pursuant to the 2008 SIP, including all areas mapped as lacustrine wetlands in the National Wetland Inventory. Site inspections were completed under the supervision of a certified wetland delineator. It was determined that some areas that are mapped in the National Wetland Inventory as lacustrine wetlands are not subject to California Department of Fish and Game (CDFG) jurisdiction, which is based on a systematic investigation consistent with CDFG Guidance documents:

- Areas lacked one or more wetland indicators: soil, hydrology, or vegetation
- Field inspection determined that areas do not conform to U.S. Forest and Wildlife Service mapping criteria for lacustrine wetlands
- Field inspection determined that areas do not conform to the CDFG definition of a "lake"
- Field inspections revealed that the sites were characterized by barren playa with an absence of wetland associated fish and wildlife resources

---

[5] Great Basin Unified Air Pollution Control District. April 1996. *Delineation of the Waters of the United States for the Owens Lake Playa. Prepared for U.S. Army Corps of Engineers*. Prepared by: Jones & Stokes Associates, Sacramento, CA.

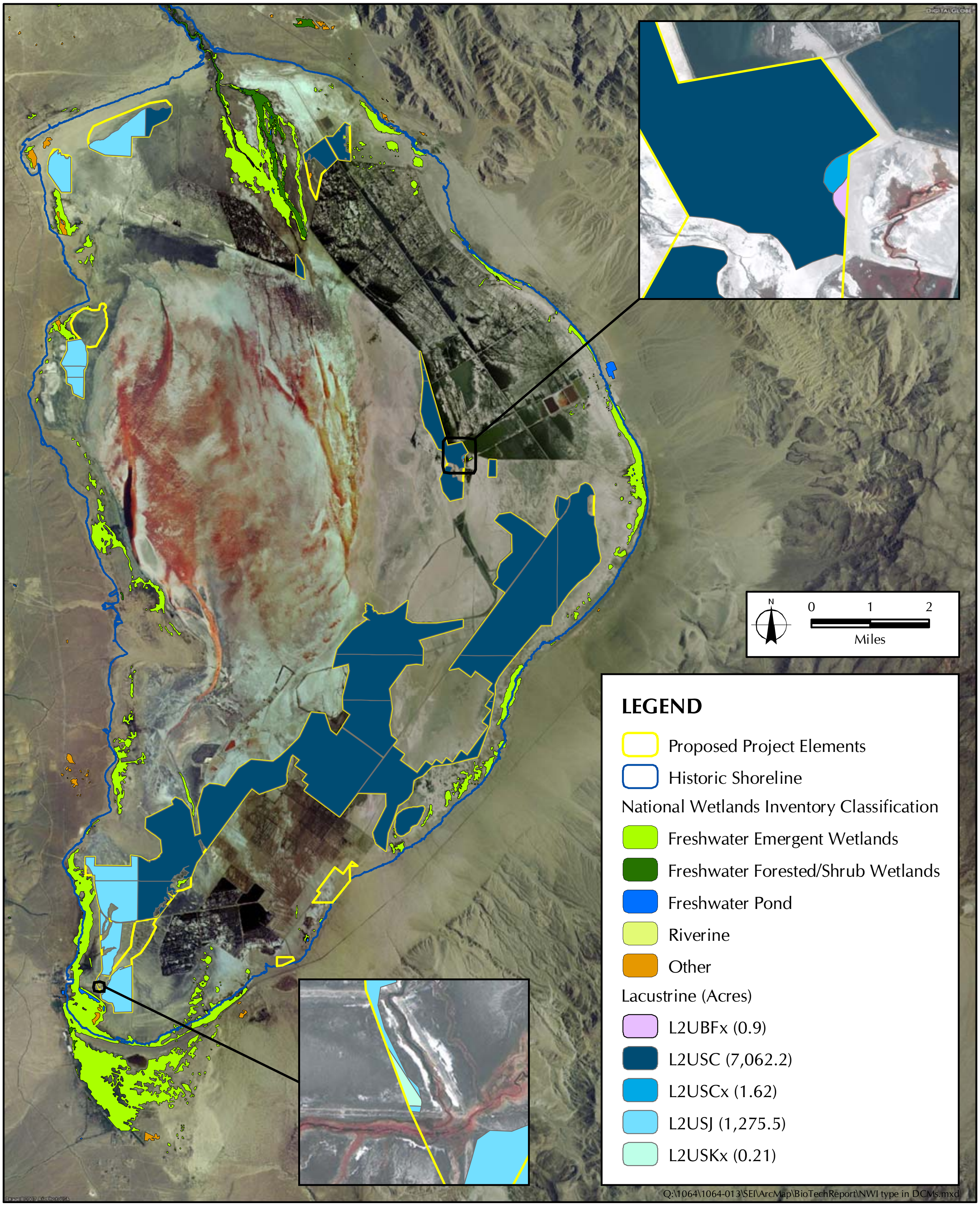


FIGURE 5.2.1-1

National Wetland Inventory Resources

5.2.2 Impact Analysis

Construction, operation, and maintenance of DCMs, including Shallow Flooding, Moat & Row, Managed Vegetation, and gravel cover, within the 5 areas supporting 393.2 acres that are subject to the jurisdiction of the USACOE pursuant to Section 404 of the Clean Water Act (Figure 5.2.2-1, *Jurisdictional Waters Analysis)* would constitute a significant adverse impact requiring the consideration of mitigation measures. The determination of areas subject to USACOE jurisdiction pursuant to Section 404 of the Clean Water Act is an interpretation based on recent guidance released by the USACOE and the U.S. Environmental Protection Agency (EPA) regarding Clean Water Act jurisdiction following the U.S. Supreme Court's decision in Rapanos v. United States & Carabell v. United States [6] and is subject to interpretation by the USACOE and the EPA.

5.2.3 Mitigation Measures

The USACOE requires the stepwise consideration of mitigation measures. The project applicant must first demonstrate that the impact cannot be avoided. In this case, the Great Basin Unified Air Pollution Control District (District) has compiled the data to demonstrate that 393.2 acres is emissive and therefore requires treatment to reduce emissions. Impacts to 393.2 acres of USACOE jurisdictional areas may require the project applicant to apply for an individual permit pursuant to Section 404 of the Clean Water Act. The intent of the project applicant is to utilize a modified best available control measure (BACM) DCM that provides reliable dust control while enhancing habitat values such as manual revegetation and passive irrigation. Pursuant to coordination with the USACOE conducted on August 30, 2007, with an increase in habitat values, no additional mitigation is anticipated in support of the individual permit process.

5.3 RIPARIAN AND OTHER STATE-DESIGNATED HABITAT

5.3.1 Existing Conditions

5.3.1.1 Plant Communities

The proposed project area contains two plant communities: Dry Alkali Meadow (DAM) and Shadscale. The majority of the proposed project area is dominated by open playa with little or no vegetation present (Figure 5.3.1.1-1, *Plant Community Map*). Acreage for each plant community is summarized in Table 5.3.1.1-1, *Plant Communities Present within the Proposed Project Study Area*. The plant community mapping evaluated all but 0.5 square mile of Moat & Row test sites; these areas were covered by City of Los Angeles Department of Water and Power (City) contractors.

---

[6] U.S. Supreme Court. 19 June 2006. *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers*. No. 126 S. Ct. 2208.

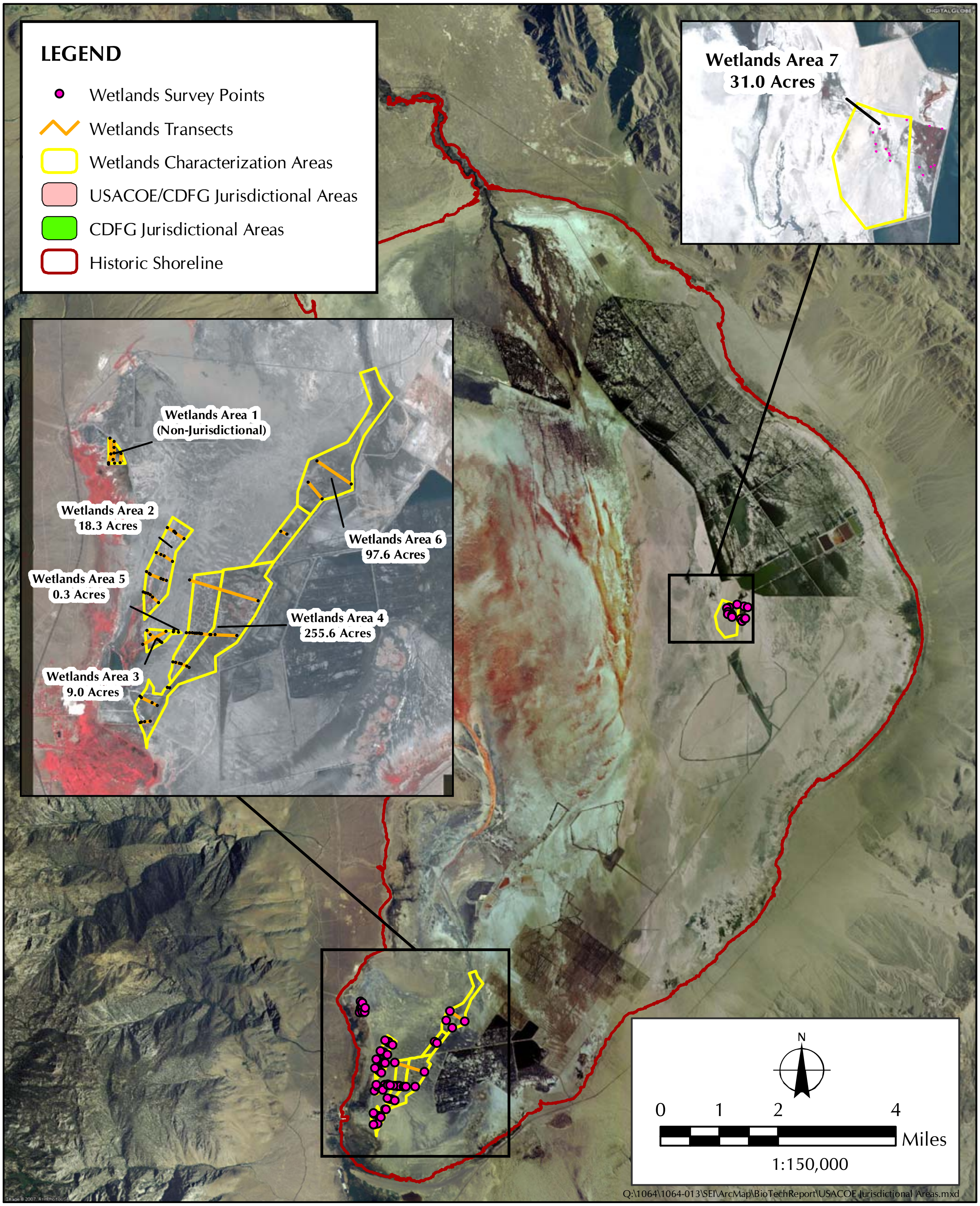


FIGURE 5.2.2-1

Jurisdictional Waters Analysis

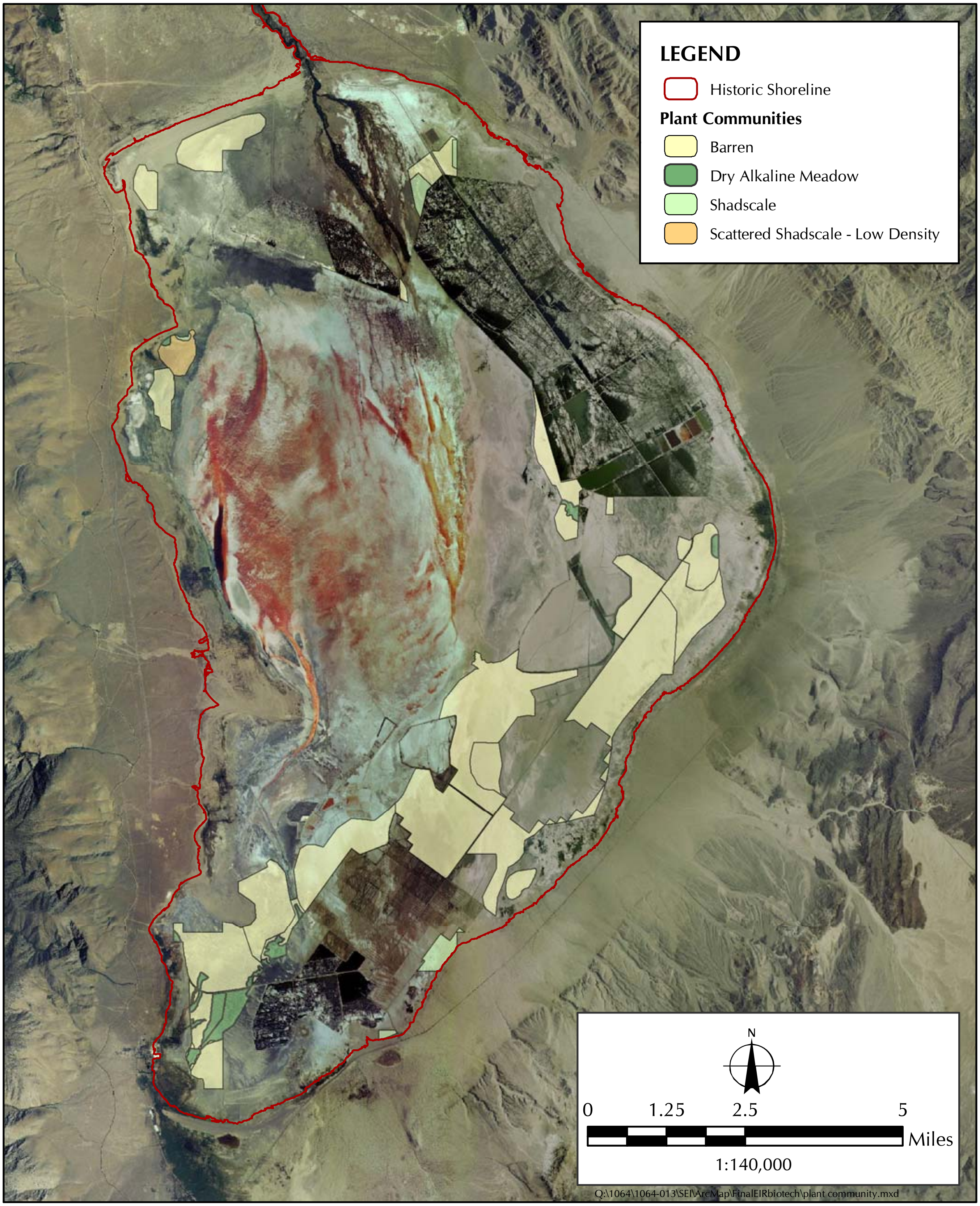


FIGURE 5.3.1.1-1
Plant Community Map

TABLE 5.3.1.1-1
PLANT COMMUNITES PRESENT WITHIN THE PROPOSED PROJECT STUDY AREA

Plant community	Element code/type	Current status	Acres (Percentages)
Barren	N/A	N/A	8,506 (91%)
Dry Alkali Meadow, a type of TAM	41.200.00 (CNDDB) 45310 (Holland)*	G3, S2.1	413 (4%)
Shadscale	36.320.00 (CNDDB) 36140 (Holland)	G4, S3.2	425 (5%)
Total			9,344 (100%)

KEY:

Gx = Global ranks (CNDDB)
  G1: Fewer than 6 viable occurrences worldwide and/or 2,000 acres
  G2: 6 to 20 viable occurrences worldwide and/or 2,000–10,000 acres
  G3: 21–100 viable occurrences worldwide and/or 10,000–50,000 acres
  G4: Greater than 100 viable occurrences worldwide and/or greater than 50,000 acres
  G5: Community demonstrably secure due to worldwide abundance

Sx = State ranks (CNDDB; the state rank is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation. Threat designation does not constitute legal protective status.)
  S1: Fewer than 6 viable occurrences statewide and/or fewer than 2,000 acres
  S2: 6 to 20 viable occurrences statewide and/or 2,000–10,000 acres
  S3: 21 to 100 viable occurrences statewide and/or 10,000–50,000 acres
  S4: Greater than 100 viable occurrences statewide and/or greater than 50,000 acres
  S5: Community demonstrably secure statewide
  Threat ranks (CNDDB)
  x.1: Very threatened
  x.2: Threatened
  x.3: No current threats known

* = Pursuant to Holland, merits special consideration

SOURCES:

California Department of Fish and Game. 2005. *Rarefind3: California Natural Diversity Database*. Sacramento, CA.

Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Game.

Barren

Barren alkali playas dominate the proposed project area covering 8,506 acres. No vascular plants grow in these areas.

Dry Alkali Meadow

DAM covers approximately 413 acres of the proposed project site. Saltgrass (*Distichlis spicata*) dominates this habitat type. This plant community is a type of TAM. The most common co-occurring plant species occurring in DAM are alkali pink (*Nitrophila occidentalis*), shadscale (*Atriplex confertifolia*), and Parry's saltbush (*Atriplex parryi*), which occur on slight rises within the saltgrass clumps. On the western edge, particularly in the southwestern corner, are a number of additional species in low numbers, including common three-square (*Schoenoplectus pungens*), baltic rush (*Juncus balticus*), and many upland species listed in the floral compendium (Appendix

A, *Floral Compendium*). This community corresponds to Sawyer and Keeler-Wolf's Saltgrass series (CNDDB Code 41.200.00) and Holland's Alkali Meadow (Element Code: 45310).

Shadscale

Shadscale-dominated habitat occurs on approximately 425 acres of the proposed project site. Parry's saltbush also occurs in this type, and is considered by other investigators to be a local dominant. This community type includes a few other species such as: saltgrass, greasewood (*Sarcobatus vermiculatus*), and bush seepweed (*Suaeda moquinii*). This community corresponds to Sawyer and Keeler-Wolf's Shadscale series (CNDDB Code 36.320.00) and Holland's Shadscale scrub (Element Code: 36140).

State-Designated Sensitive Plant Communities

There are no riparian plant communities present within the proposed project area. The barren playa and shadscale scrub plant communities that are present with the proposed project area are not state-designated sensitive plant communities. The 413 acres of DAM constitute a state-designated sensitive plant community. In addition, some DAM exists within the 0.8 acre of temporary impacts created by the 50-foot-wide construction zone buffer.

5.3.1.2 Areas Subject to Section 1600 of the State Fish and Game Code

Within the TAM vegetation, there are six areas, comprising 411.8 acres that were determined to be subject to the jurisdiction of the CDFG pursuant to Section 1600 of the State Fish and Game Code.

5.3.2 Impact Analysis

Barren

Construction, operation, and maintenance of the proposed project would result in the conversion of 8,506 acres of barren playa to DCMs, which does not constitute a significant impact.

Dry Alkali Meadow

Construction, operation, and maintenance of the proposed project result in the conversion of up to 413 acres of DAM to DCMs. These impacts are considered significant, therefore requiring the consideration of mitigation measures and alternative measures.

5.3.2.1 Areas Subject to Section 1600 of the State Fish and Game Code

Construction, operation, and maintenance of the proposed project would convert 411.8 acres of TAM vegetation that has been determined to be subject to the jurisdiction of the CDFG to DCMs, requiring the consideration of mitigation measures. These areas are largely coterminous with the areas determined to be subject to the jurisdiction of the USACOE.

Construction, operation, and maintenance of the proposed project on approximately 411.8 acres of vegetated wetlands, springs/seeps, or stream channels under the jurisdiction of the CDFG will require notification of activities to be undertaken on the lake bed to the CDFG. Upon completion of the notification package, the CDFG shall determine whether the activity may substantially adversely affect an existing fish or wildlife resource, including the western snowy plover or its nursery locations. If the CDFG determines that the activity may adversely affect an existing fish or wildlife resource, including the western snowy plover or its nursery locations, the CDFG shall provide a draft lake or streambed alteration agreement describing reasonable measures necessary to protect the resource. It is anticipated that these measures will not substantially differ from the ones provided in Section 5.4.3, *Mitigation Measures*, of this Biological Resources Technical Report.

A review of relevant guidance documents demonstrates that the approximately 411.8 acres that were determined to be subject to the jurisdiction of the CDFG, accurately reflects the limits of CDFG jurisdiction. CDFG's jurisdiction is consistent with Streambed Alteration Agreements negotiated between CDFG and the City for DCMs required pursuant to the 1998 SIP and the 2003 SIP. The delineation of areas subject to the jurisdiction of CDFG considered all areas mapped as lacustrine wetlands pursuant to the National Wetland Inventory. The U.S. Army Corps of Engineers has determined that the surface of Owens Lake has been permanently lowered as a result of combined natural and human forces. Therefore, areas mapped by the National Wetland Inventory due to their presence within the historic lake bed that are located above the upper limits of lake inundation and which demonstrate no riparian or aquatic habitat values were not included in the limits of areas subject to the jurisdiction of the CDFG as depicted in Figure 5.2.2-1. This interpretation is consistent with the CDFG definition of the term "lake" in the July 2, 1990, Memorandum for the Record (Jurisdictional Issues in the Application of Fish and Game Code Sections 1601 and 1603), which states, "a considerable body of standing water in a depression of land or expanded part of a closed basin serving to drain surrounding country; or a body of water of considerable size surrounded by land; a widened portion of a river or lagoon."[7] This definition applies only to the area within Owens Lake known as the Brine Pool. The areas of Owens Lake that are mapped as lacustrine wetlands in the National Wetland Inventory that were excluded from the mapping of CDFG jurisdiction currently support barren playa and do not conform to the definition of the lacustrine systems as defined by the USFWS. The USFWS definition of lacustrine systems includes permanently flooded lakes and reservoirs (e.g., Lake Superior), intermittent lakes (e.g., playa lakes), and tidal lakes with ocean-derived salinities below 0.5 percent (e.g., Grand Lake, Louisiana).[8] Typically, there are extensive areas of deep water and considerable wave action. The lacustrine wetlands mapped in Figure 5.2.1-1, include extensive areas that do not have the appropriate hydrology, soils, or habitat values to render them subject to CDFG jurisdiction.

Indirect impacts to state-designated sensitive habitats may occur as a result of the proposed project from invasive-weed species being introduced into TAM areas as a result of construction and maintenance activities. TAM areas are susceptible to invasive species such as saltcedar (*Tamarix* spp.) that increase water stresses of adjacent native plant species and reduce the suitability of the habitat for native wildlife species. Mitigation measures are designed to address potential significant indirect impacts to sensitive habitats from implementation of the proposed project.

Shadscale

Construction, operation, and maintenance of the proposed project would result in the conversion of 425 acres of shadscale scrub to DCMs, which does not constitute a significant impact.

---

[7] California Fish and Game Commission Policies: Wetland Resources Policy; Wetland Definition, Mitigation Strategies, and Habitat Value Assessment Strategy; Amended 1994.

[8] Cowardin, Lewis M., et al. 1979 *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service.

5.3.3 Mitigation Measures

Mitigation measures have been incorporated in the project design to decrease direct and indirect impacts to existing plant communities. Three additional mitigation measures are listed below in addition to the mitigation measure set forth for reducing the impacts to wetlands (Section 5.2.3)

5.3.3.1 Marking of Nonemissive Wetland and Upland Scrub Areas

To reduce the potential impacts to nonemissive wetland vegetation communities from the proposed project to below the level of significance, the City shall clearly mark the boundary of construction zones (including the 50-foot-buffer) within 50 feet of the boundary of nonemissive wetland areas and upland scrub communities to prevent incursion into these vegetation communities from construction activities. Construction zone buffers are not allowed to impact wetland or sensitive areas.

- Construction zone boundaries near nonemissive areas shall be clearly marked using stakes less than 72 inches (originally 60 inches) high, spaced 10 feet apart, along the edges of spring mounds, and spaced 0.25 mile apart along other vegetated edges. Marking shall occur prior to the initiation of construction activities. Construction buffer areas outside of the dust control boundaries shall not exceed 50 feet in width and shall be reduced as required to prevent construction activities from impacting adjacent vegetated areas. No temporary or permanent access routes through vegetated areas will be established, except those specified in the Project Description. Incursions into established vegetated areas that cause measurable loss of plant cover will require revegetation with suitable local, native plant species.

- Proof of compliance with this mitigation measure shall be verified by submitting a written report to the District and CDFG detailing the type and locations of delineated wetland and upland areas. This report shall be submitted prior to the start of construction activities. The mitigation plan must contain a schedule and protocol for achieving revegetation within two years of any impacts to vegetation caused by access routes or construction activities outside the areas specified in the Project Description

5.3.3.2 Exotic Pest Plant Control Program

To minimize direct impacts to riparian and wetland communities caused by installation of dust control measures to below the level of significance, the City shall obtain a Programmatic Streambed Alteration Agreement (SAA) for all existing or proposed activities that may impact areas subject to the jurisdiction of the CDFG pursuant to Section 1600 of the California Fish and Game Code that require the approval of the CDFG in the form of an SAA. If previous phases or the proposed work covered by the 2008 SIP and EIR do not require SAAs, then they will not be incorporated into the Programmatic SAA. The City shall also institute a wetland mitigation program prior to the initiation of construction activities as recommended by the CDFG. The program shall be designed to emphasize restoration of equivalent functions and values of wetlands within the project area as compared to pre-project impacts.

- The project proponent shall continue the exotic plant control program resulting from the 2003 SIP within all current and previously construction of DCMs after full build-out of the project (April 1, 2010). The goals of the program shall be consistent with the goals specified in the Inyo County General Plan, and the U.S. Fish and Wildlife Service (USFWS) Owens Basin Wetland and Aquatic Species Recovery Plan for the portion of the plan included within the proposed project area.

- The program shall be written by a pest management specialist or other person familiar with exotic plant species management. Measures for control shall include all best management practices involving prudent and safe use of control measures such as herbicides, brushing, direct weed removal, and other control measures. The program shall include yearly monitoring to ensure that exotic plant species are being sufficiently controlled.

- The exotic plant species control program shall be submitted to both the Great Basin Unified Air Pollution Control District and the State Lands Commission, and approved by the District prior to the initiation of exotic plant control activities. All pesticide use shall be undertaken by a State-certified and licensed pesticide applicator. Annual written monitoring reports documenting exotic plant location, type, pretreatment abundance, control type used, and control efficacy shall be delivered to the District within four months following the end of each calendar year. A copy of the control program and resulting monitoring reports shall be provided to the State Lands Commission and to the CDFG.

5.3.3.3 Wetland Mitigation Program

To minimize direct impacts to riparian and wetland communities caused by installation of DCMs to below the level of significance, the City shall obtain a Programmatic SAA for all existing or proposed activities that may impact areas subject to the jurisdiction of the CDFG pursuant to Section 1600 of the California Fish and Game Code that require the approval of the CDFG in the form of an SAA. If previous phases or the proposed work covered by the 2008 SIP and EIR do not require SAAs, then they will not be incorporated into the Programmatic SAA. The City shall also institute a wetland mitigation program prior to the initiation of construction activities as recommended by the CDFG. The program shall be designed to emphasize restoration of equivalent functions and values of wetlands within the project area as compared to pre-project impacts.

- A TAM management plan shall be created by the City to monitor the designated wetland mitigation areas for appropriate coverage of native species and for change in extent of TAM over a five-year period, postconstruction; and to conduct weed abatement in wetland areas in and within 500 feet of the project area. The management plan shall monitor wetland mitigation areas for five years, postconstruction, with specific goals for native plant species coverage and management of invasive, nonnative plant species. The TAM management plan shall be approved by the District prior to the initiation of construction activities. A copy of the management plan and subsequent monitoring reports shall be provided to the CDFG and to the California State Lands Commission (CSLC).

- Calculations of dry TAM impacts from implementation of the project are estimates based on the mapped extent of TAM areas within the project area and a determination of whether an area is emissive or nonemissive based on dust monitoring data. The total acreage of wetland mitigation for dry TAM shall be two times (2:1) the actual direct and indirect impact area caused to dry TAM by both construction and postconstruction activities. If any unanticipated postconstruction impacts to riparian communities proximal to Shallow Flooding DCMs occur as a result of project construction or operation, the City would be required to designate additional wetland mitigation areas and incorporate design parameters that would result in the replacement of equivalent functions and values to the impacted moist or saturated TAM wetlands within two years of the initiation of the replacement effort. Significant impacts would include loss of vegetative cover due to ground disturbance or change in species composition attributable to drying of springs or ponds, which does not self-repair within two years of detection.

- Managed Vegetation would not be suitable mitigation for impacts to moist or saturated TAM communities. In addition to mitigating impacts to wetlands caused by the project, the City shall fully compensate for the loss of TAM associated with implementation and operation of DCMs. The City shall compensate for all loss of TAM that occurs. Mitigation for impacts to all TAM associated with construction and operation of DCMs constructed between 1998 and 2008 (prior to the project) will be replaced at a ratio of 1 acre of wetland replacement for every acre of wetland impact (1:1 replacement ratio). Replacement wetlands will consist of similar habitat function and values as the wetland that is lost. Banked mitigation credits may be applied for in-kind mitigation. The City of Los Angeles Department of Water and Power shall designate the wetland mitigation area in a Managed Vegetation area that is within the lake bed. The City of Los Angeles Department of Water and Power currently has a bank of 53.9 acres of excess of installed Transmontane Alkali Meadow that may count towards the total number of acres that would be required as mitigation. All wetland replacement described in this mitigation measure shall be approved by the Great Basin Unified Air Pollution Control District, the CDFG, and U.S. Army Corps of Engineers, and will be constructed and fully functional no later than April 1, 2010.

5.4 SPECIAL STATUS SPECIES: LISTED, CANDIDATE, SENSITIVE, AND LOCALLY IMPORTANT

5.4.1 Existing Conditions

5.4.1.1 Listed Species

As a result of the habitat assessment, potentially suitable habitat was identified for two listed species: one plant, Owens Valley checkerbloom (*Sidalcea covillei*); and one bird, American peregrine falcon (*Falco peregrinus anatum*).

5.4.1.1.1 Plants

Owens Valley Checkerbloom

The Owens Valley checkerbloom was determined to be absent from the proposed project area as a result of directed surveys conducted during the blooming period. The Owens Valley checkerbloom is a perennial herb listed by the State of California as endangered. This species is a perennial herb with pale pinkish-lavender flowers and blooms during May and June. Owens Valley checkerbloom occurs throughout the Owens Valley in alkaline meadows. It is found in moist alkaline meadows and seeps between 3,500–4,700 feet above mean sea level (MSL). Based on the review of the California Natural Diversity Database (CNDDB), it was determined that the three closest occurrences are 1.4 miles west of the intersection of 395 and 136; 2.4 miles west southwest of the intersection of 395 and 136; and 2.4 miles southwest of the intersection of 395 and 136. The assessment of potentially suitable habitat for Owens Valley checkerbloom was based on habitat characteristics, including plant community associations and elevations, for positive records for this species derived from the a query of the most recent CNDDB records and literature review. As a result of the habitat assessment, habitat suitable to support Owens Valley checkerbloom was not identified within the DAM plant community of the proposed project site.

5.4.1.1.2 Wildlife

The American peregrine falcon is listed as endangered under the state Endangered Species Act. The entire proposed project area was determined to be suitable foraging habitat for the American peregrine falcon.

The habitat assessment revealed a lack of suitable habitat for eight additional species considered during the literature review: Owens tui chub (*Gila bicolor snyderi*), Owens pupfish (*Cyprinodon radiosus*), desert tortoise (*Gopherus agassizii*), bald eagle (*Haliaeetus leucocephalus*), Swainson's hawk (*Buteo swainsoni*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), least Bell's vireo (*Vireo bellii pusillus*), and Mohave ground squirrel (*Spermophilus mohavensis*).

American Peregrine Falcon

As a result of directed surveys, the proposed project area was determined to be devoid of suitable nesting habitat. As a result of the habitat assessment, plant community mapping, and presence/absence surveys, suitable foraging habitat for American peregrine falcon was found throughout the proposed project site, primarily in areas close to marsh habitats and Shallow Flooding areas. American peregrine falcon is a state endangered species. CNDDB records for this species are suppressed. A single peregrine falcon was observed foraging during western snowy plover surveys; however, it was not possible to determine whether this individual was of the *anatum* subspecies.

Owens Tui Chub and Owens Pupfish

Owens tui chub and Owens pupfish were determined to be absent as a result of presence/absence surveys. There is no suitable habitat within the proposed project area for Owens tui chub or Owens pupfish. Owens tui chub and Owens pupfish are both state and federally endangered species. These two fishes occur in aquatic habitats in the Owens Basin. Owens tui chub and Owens pupfish were not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and were determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species. The proposed project site lacks aquatic habitats such as rivers or pools supporting fish populations.

Although Owens pupfish and Owen tui chub are not present in the area, the U.S. Fish and Wildlife Service has completed the Owens Basin Wetland and Aquatic Species Recovery Plan, which includes portions of the western margin of Owens Lake between the Owens River Delta and Olancha (Figure 5.4.1.1.2-1, *Southern Owens Conservation Area*).

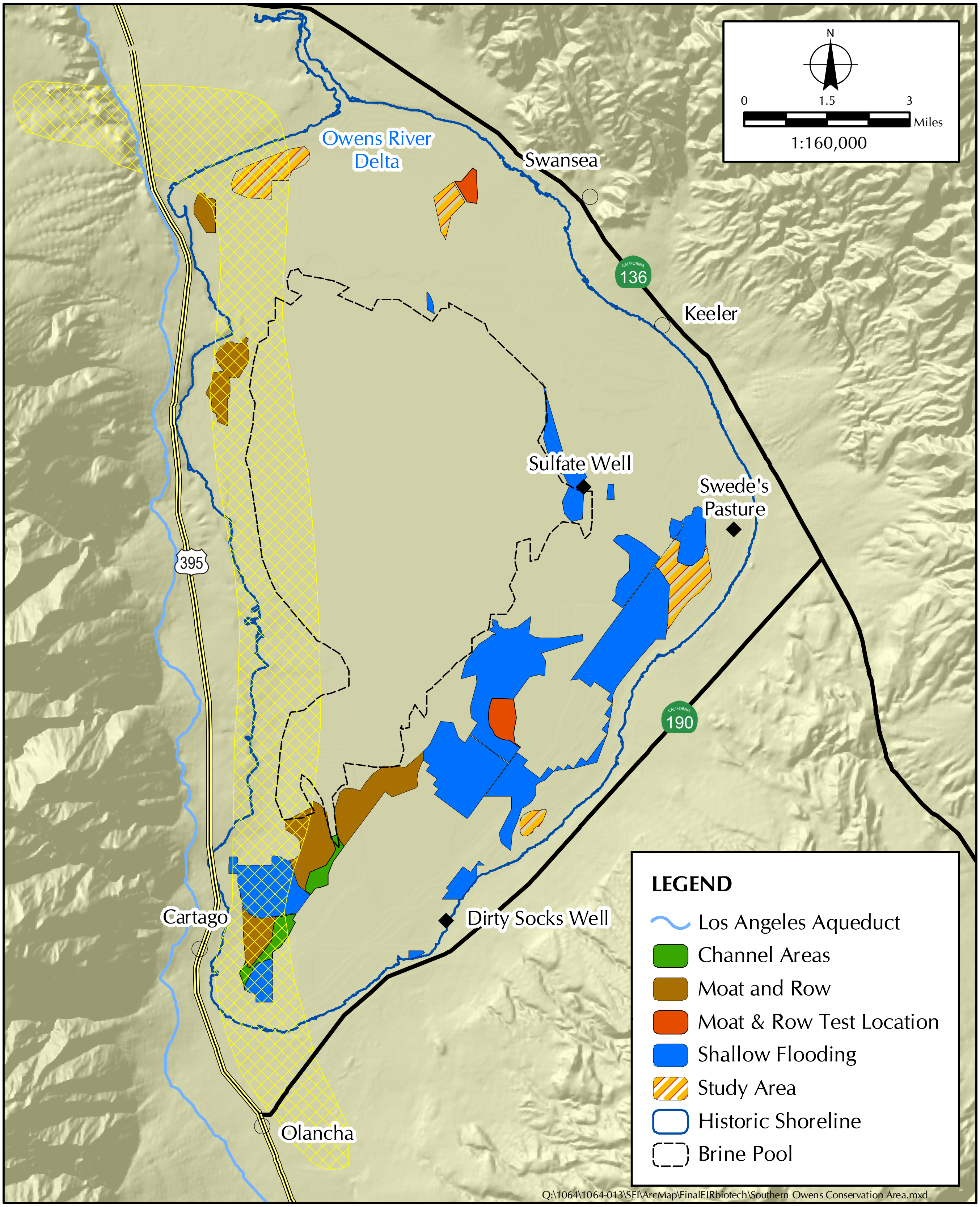


FIGURE 5.4.1.1.2-1

Southern Owens Conservation Area

Desert Tortoise

This species was determined to be absent as a result of presence/absence surveys. There is no suitable habitat within the proposed project area. Desert tortoise is a state and federally threatened species. Desert tortoise is typically found on flats and alluvial fans with scattered shrubs and herbaceous plants growing in between. Soils range from sand to sandy-gravel. Desert tortoise was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and was determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species. The proposed project site lacks friable soils in open desert scrub, desert wash, and Joshua tree woodland habitats.

Bald Eagle

Bald eagle was determined to be absent as a result of presence/absence surveys. There is no suitable nesting habitat within the proposed project area. The bald eagle is a state-endangered and federally threatened species. Bald eagles are found in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers. The bald eagle was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and was determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species. The proposed project area lacks proximity to a water body supporting a fish population.

Swainson's Hawk

Swainson's hawk was determined to be absent as a result of presence/absence surveys. There is no suitable habitat within the proposed project area. Swainson's hawk is a state-threatened species. Swainson's hawk breeds in areas with few trees adjacent to grasslands with adequate rodent populations. Swainson's hawk was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and was determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species. The proposed project site lacks nest sites as well as a large rodent population.

Western Yellow-Billed Cuckoo and Least Bell's Vireo

Western yellow-billed cuckoo was determined to be absent as a result of presence/absence surveys. The western yellow-billed cuckoo is a state-threatened species. The least Bell's vireo is listed by both the state and federal governments as endangered. Western yellow-billed cuckoo and least Bell's vireo require riparian woodland habitats for all or portions of their life cycle. Western yellow-billed cuckoo and least Bell's vireo were not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and were determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species. The proposed project lacks riparian woodland habitat suitable to support these two species.

Mohave Ground Squirrel

Mohave ground squirrel was determined to be absent as a result of presence/absence surveys. The Mohave ground squirrel is listed as threatened under the state Endangered Species Act. Habitat suitable to support Mohave ground squirrel consists of desert scrub, alkali scrub, and Joshua tree woodland habitats. The Mohave ground squirrel was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and was determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species. The proposed project lacks desert scrub, alkali scrub, and Joshua tree woodland habitats suitable to support the Mohave ground squirrel.

5.4.1.2 Sensitive Species

As a result of the habitat assessment, potentially suitable habitat was identified for 8 sensitive wildlife species that were then the subject of detailed surveys:

- Northern harrier (*Circus cyaneus*) (Nesting)
- Merlin (*Falco columbarius*)
- Prairie falcon (*Falco mexicanus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Pallid bat (*Antrozous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Spotted bat (*Euderma maculatum*)
- Owens Valley vole (*Microtus californicus vallicola*)

Although double-crested cormorant (*Phalacrocorax auritus*), white-faced ibis (*Plegadis chihi*), California gull (*Larus californicus*), long-billed curlew (*Numenius americanus*), and golden eagle (*Aquila chrysaetos*) were observed adjacent to the proposed project site, no suitable habitat existed within the proposed project site. California horned lark was eliminated based on the proposed project site being outside of this species range. California horned lark occurs on California's central and southern coastal slope and in the San Joaquin Valley.[9]

5.4.1.2.1 Plants

There were no federal or state-designated plants identified as being present within the proposed project area as a result of directed surveys.

5.4.1.2.2 Wildlife

Northern Harrier

There was no suitable breeding habitat for northern harrier breeding, identified within the proposed project site as a result of directed surveys. The proposed project site lacks riparian habitats and open grasslands. Northern harriers, a California species of special concern, were occasionally seen foraging near the proposed project site. Northern harriers nest in riparian habitats and forage over open grasslands. CNDDB records for this species are suppressed. Northern harriers were not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys, and was determined not likely to occur at the proposed project site due to the absence of habitat suitable to support this species.

---

[9] Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 19 July 2007. Email correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Merlin

Suitable winter foraging habitat exists within the proposed project site. Merlin is a California species of special concern. CNDDB records for this species are suppressed. Merlins are found in open areas where suitable avian prey is concentrated.

Prairie Falcon

A single prairie falcon, a state species of special concern, was observed foraging within the proposed project area. CNDDB records for this species are suppressed. Prairie falcons are a desert and grassland species that nest in cliffs and prey mainly on birds and squirrels.

Western Snowy Plover

Western snowy plover is a California species of special concern. Based on the review of the CNDDB, it was determined that the three closest occurrences include two records within Owens Lake and one record 7.5 miles northwest of Keeler. The presence of western snowy plover at Owens Lake is well documented. Western snowy plover breeds on barren to sparsely vegetated ground at alkaline or saline lakes, reservoirs, and ponds.[10] At the Owens Lake, snowy plovers nest in relatively flat areas of barren playa with sandy and gravelly substrate and other gravel-covered surfaces, including berms and roadways. In 1997, prior to the installation of DCMs, there were 16,161 acres of snowy plover habitat (Figure 5.4.1.2.2-1, *Pre-1997 Estimated Western Snowy Plover Habitat at Owens Lake*). The construction and operation of Shallow Flooding DCMs required as a result of the 1998 SIP and 2003 SIP has substantially increased the western snowy plover habitat at Owens Lake to an estimated 34,359 acres of snowy plover habitat (Figure 5.4.1.2.2-2, *Current Estimated Western Snowy Plover Habitat at Owens Lake*). Implementation of the 2008 SIP would result in approximately 46,932 acres of snowy plover habitat (Figure 5.4.1.2.2-3, *Post-2008 Estimated Western Snowy Plover Habitat at Owens Lake*).

As a result of the research undertaken in preparation of the 2003 SIP, a population of 272 western snowy plovers was defined as the baseline population for Owens Lake. The lake-wide survey for the 2003 SIP observed a total of 401 snowy plovers and the years following implementation of the 2003 SIP observed 658 in 2004, 505 in 2005, and 602 in 2006. The lake-wide survey for western snowy plover conducted in 2007 recorded 421 snowy plovers, which appears to correlate a range-wide decline recorded for the western snowy plovers in 2007.[11] A total of 81 individual adult plovers, 22 nests, and 5 broods were observed during 2007 snowy plover surveys at the proposed project site. Adult plovers, nests, and broods were found in both Channel Areas. Adult plovers and nests were found in two of the four Study Areas (Figure 5.4.1.2.2-4, *Proposed Project Area: 2007 Adult Western Snowy Plover Observations* and Figure 5.4.1.2.2-5, *Proposed Project Area: 2007 Western Snowy Plover Nests and Broods*). The others held no adults, nests, or broods. Eleven of 23 DCM areas had adult plovers, 7 had nests, and 3 had broods (Figure 5.4.1.2.2-4 and Figure 5.4.1.2.2-5). No evidence of plovers was detected in 12 DCM areas (Appendix E, *Results of Surveys for Nesting Snowy Plovers in Supplemental Dust Control Measure Areas at Owens Lake in 2007*). During a lake-wide survey of snowy plovers in 1978, 499 individual birds were observed. In 1999, plover numbers reached a low of 22 individuals in a lake-wide survey.

---

[10] Page, G. W., J. S. Warriner, J. C. Warriner, and P. W. C. Paton. 1995. Snowy Plover (Charadrius alexandrinus). In The Birds of North America, No. 154 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

[11] Page, Gary, Point Reyes Bird Observatory, Petaluma, CA. 5 June 2007. E-mail correspondence with Edward Belden, Sapphos Environmental, Inc., Pasadena, CA.

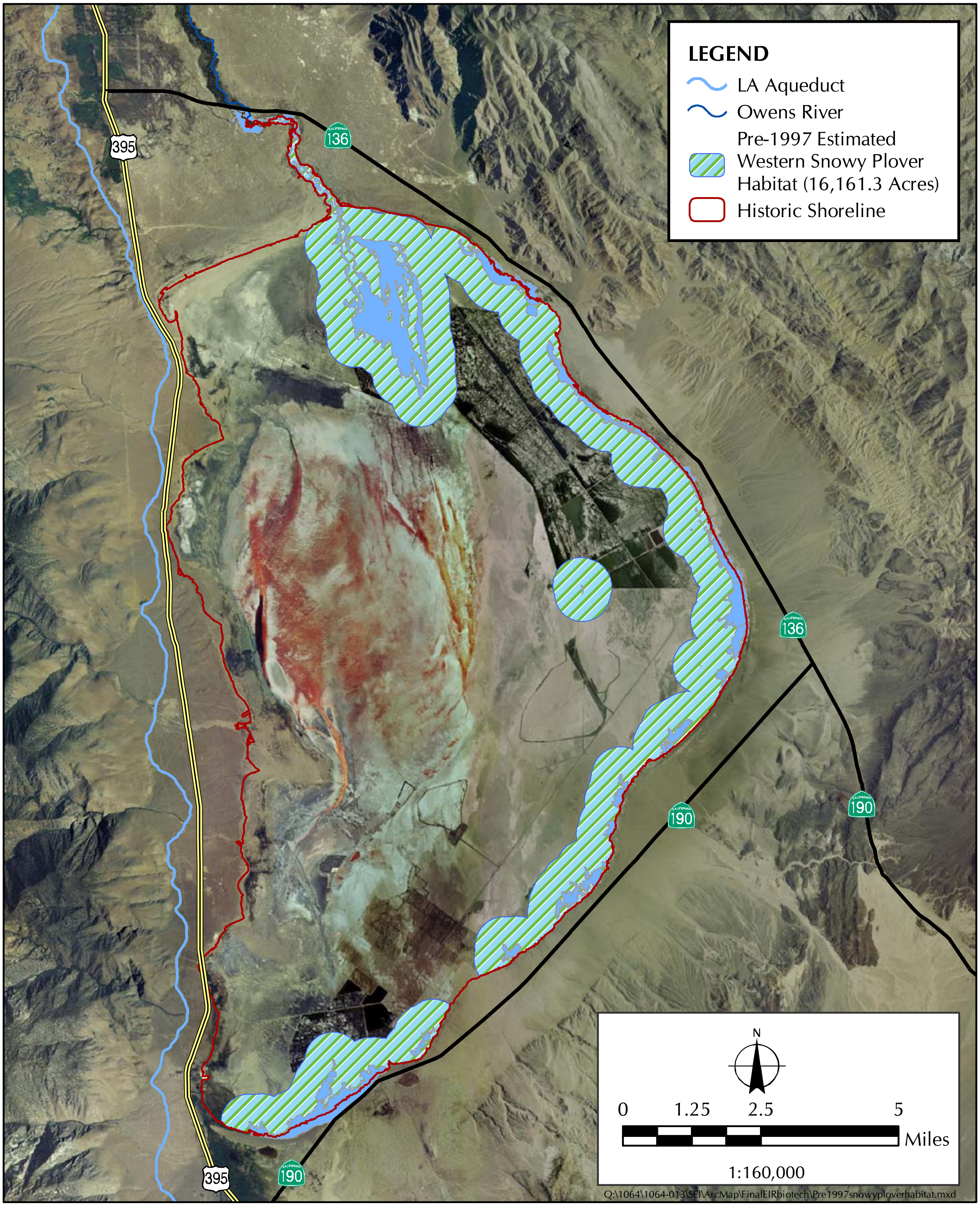


FIGURE 5.4.1.2.2-1

Pre-1997 Estimated Western Snowy Plover Habitat at Owens Lake

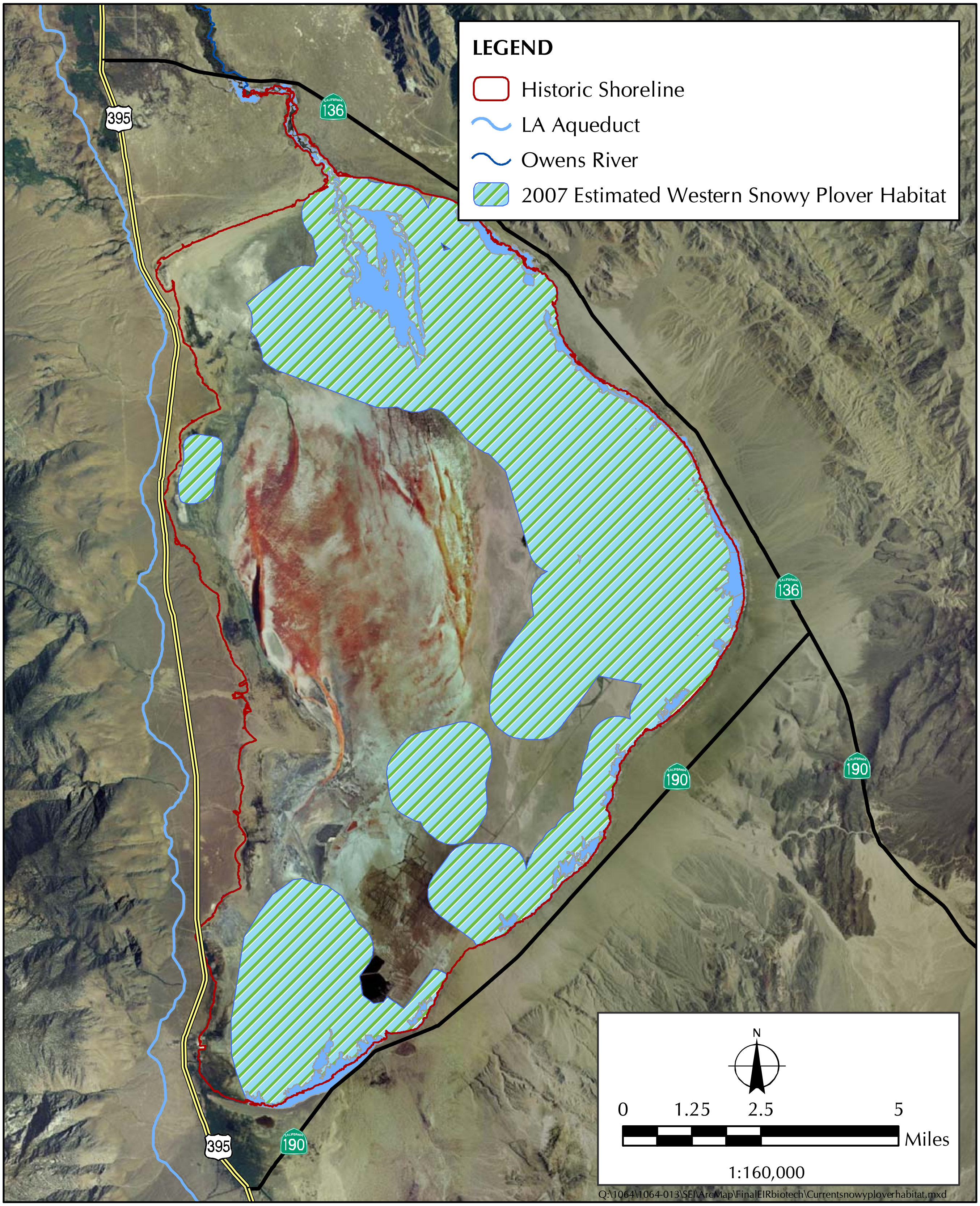


FIGURE 5.4.1.2.2-2

Current Estimated Western Snowy Plover Habitat at Owens Lake

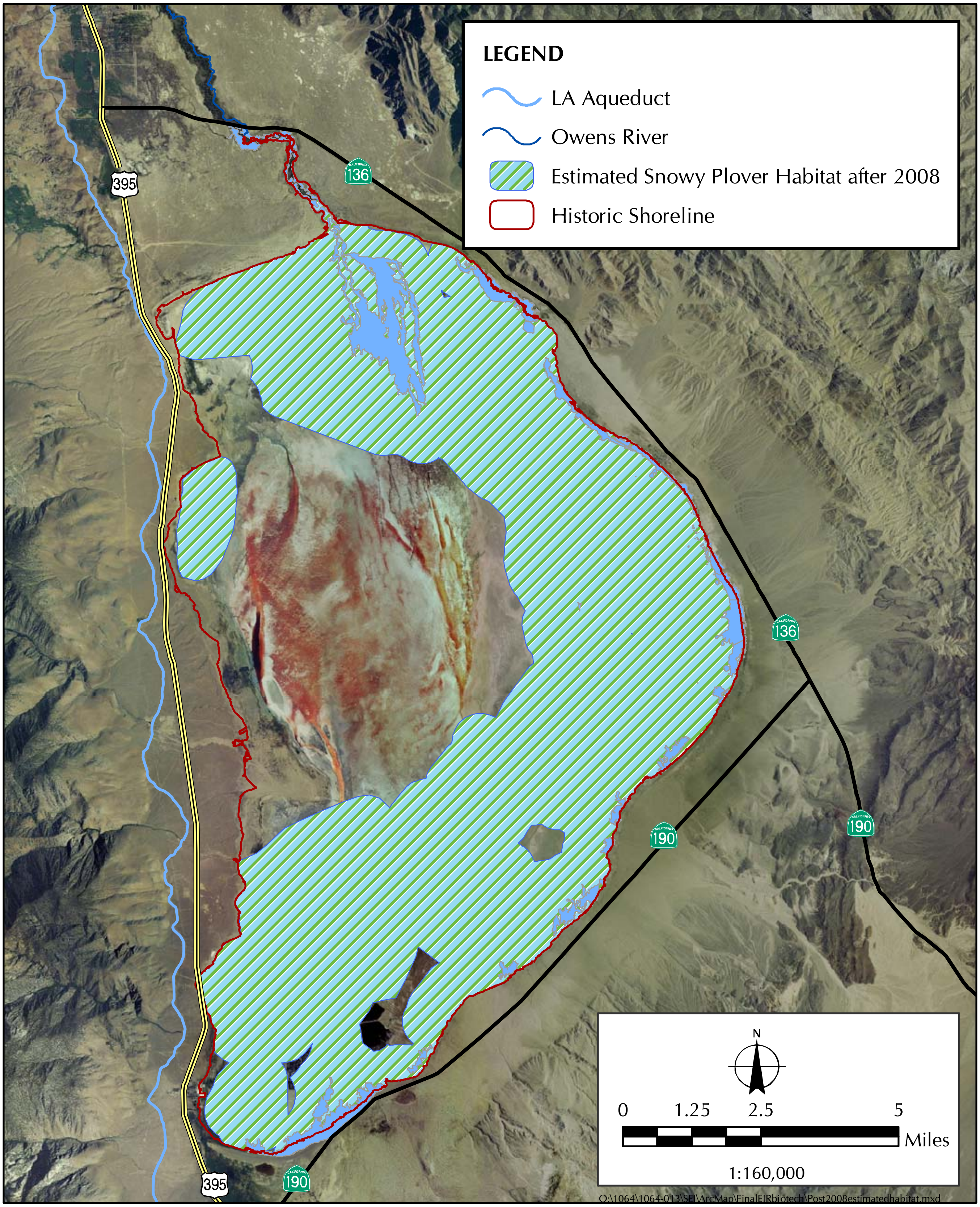


FIGURE 5.4.1.2.2-3

Post-2008 Estimated Western Snowy Plover Habitat at Owens Lake

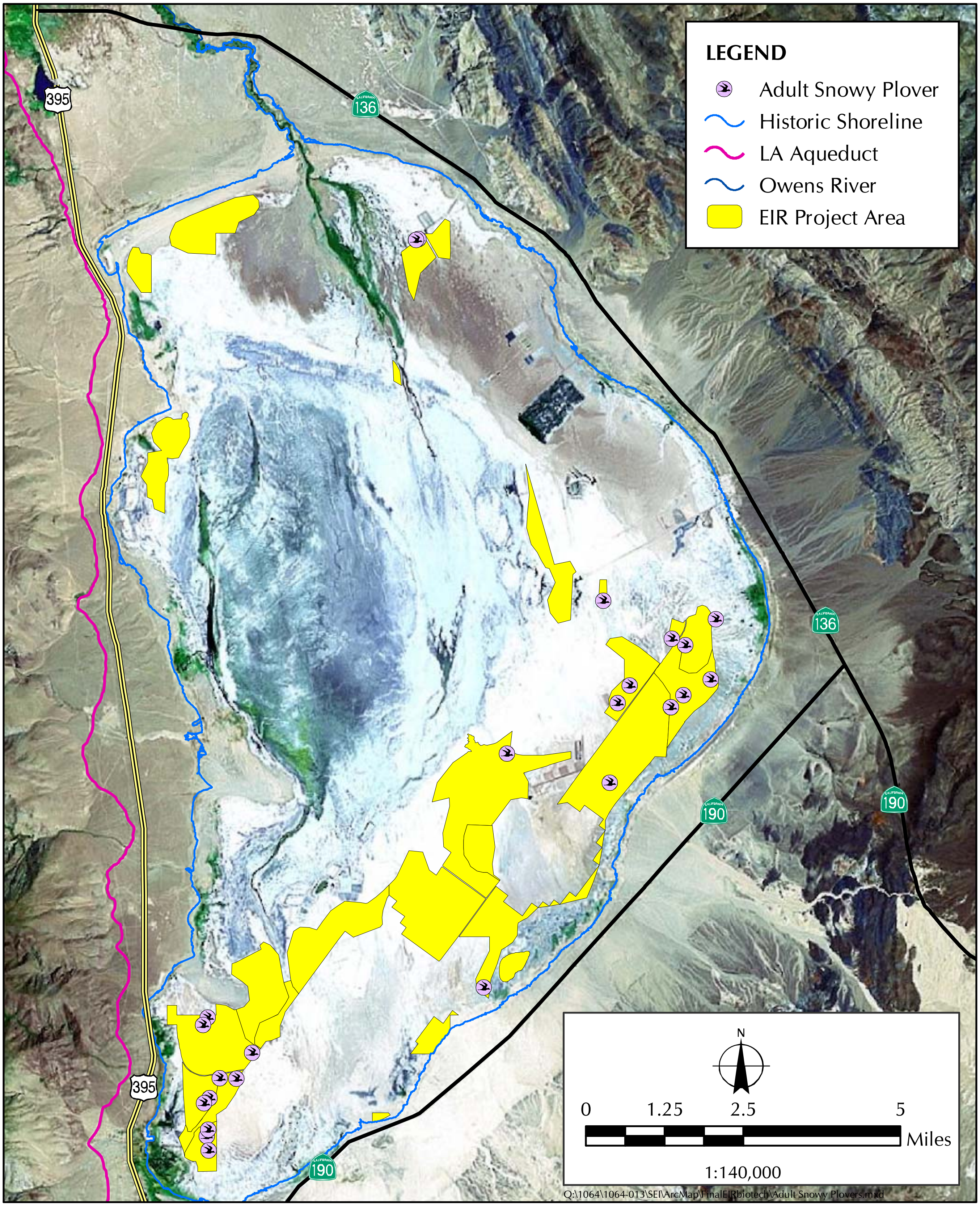


FIGURE 5.4.1.2.2-4

Proposed Project Area: 2007 Adult Western Snowy Plover Observations

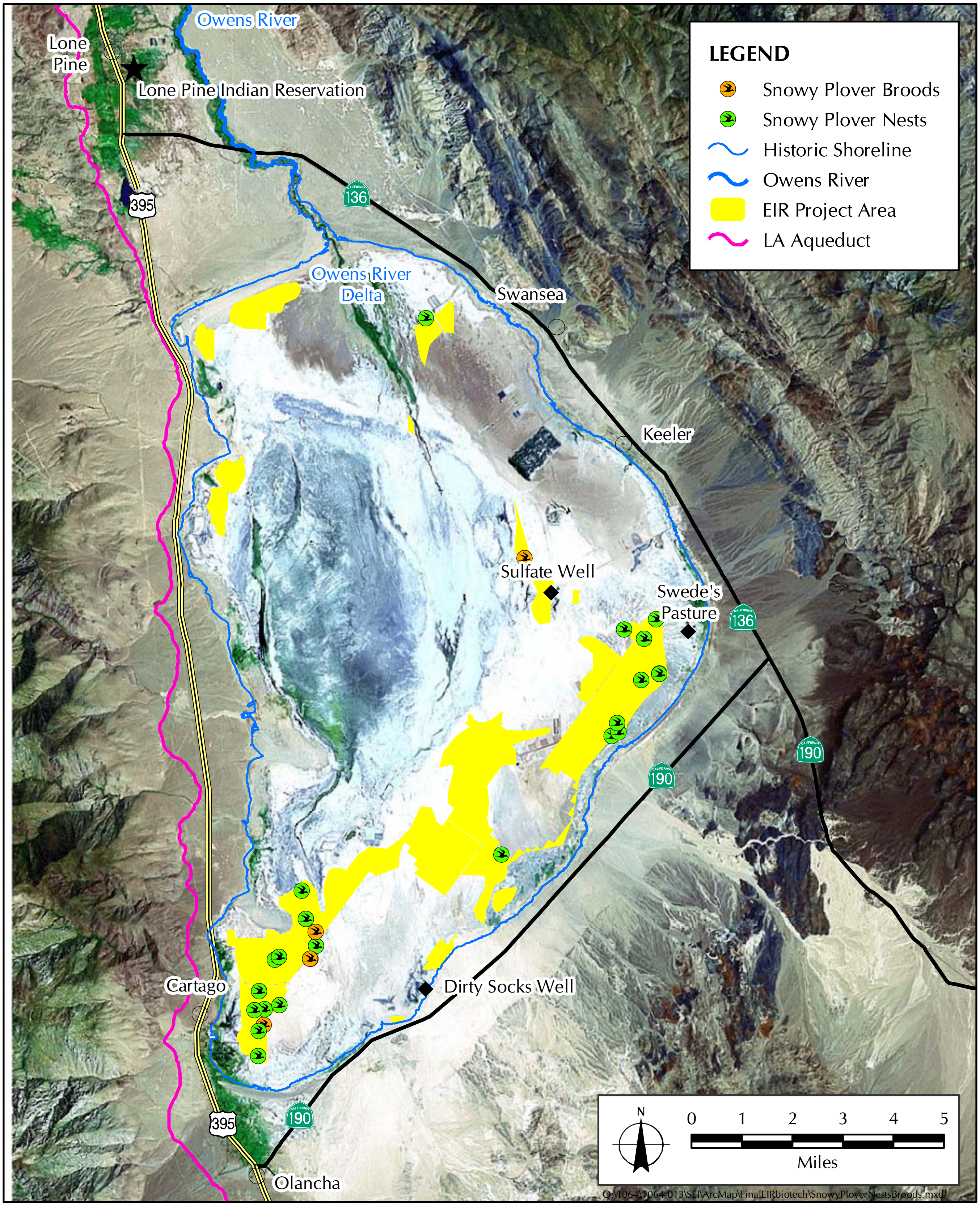


FIGURE 5.4.1.2.2-5

Proposed Project Area: 2007 Western Snowy Plover Nests and Broods

The 2007 survey at Owens Lake followed a very dry winter and the amount of surface water at seeps along the shore of the lake was reduced over other years. This may have affected the distribution of the plovers and resulted in PRBO's surveys failing to detect plovers in the D2 and D4 area (Appendix E). The 421 adult plovers detected on the lake-wide survey in 2007 were down from the 602 recorded in 2005.[12] There were 505 and 658, respectively, on the 2005 and 2004 lake-wide surveys.[13] Lower plover numbers also appears to have occurred on the California coast in 2007. Lower than average over-winter survival from cold weather may have affected both groups of birds. Regardless, the lower number of birds at Owens Lake in 2007 probably reduced the numbers that could be expected on surveys and caused an underestimate of the use of some areas (Appendix E).

Pallid Bat, Townsend's Big-eared Bat, Spotted Bat

There is no roosting habitat within the proposed project area for pallid bat, Townsend's big-eared bat or spotted bat; therefore, bats utilize the lake bed for foraging only. However, these special-status bat species (all California species of concern and BLM sensitive species) have the potential to occur within the proposed project site based on habitat requirements. Based on the review of the CNDDB, it was determined that the three closest occurrences of pallid bat include three records within Owens Lake. Based on the review of the CNDDB, it was determined that the three closest occurrences of Townsend's big-eared bat include 16 miles east of Lone Pine, 2.2 miles north northwest of Keeler, and 11 miles southeast of Lone Pine. Based on the review of the CNDDB, it was determined that the closest occurrences of spotted bat include six records within Owens Lake.

Owens Valley Vole

Owens Valley vole, a state species of special concern, is found in friable soils of wetlands and lush grassy ground in the Owens Valley. Based on the review of the CNDDB, it was determined that the closest occurrences include four records located approximately 500 feet east of U.S. 395 in Olancha. Marginally suitable habitat occurs in the proposed project site, and Owens Valley vole has been found during focused surveys in other parts of Owens Lake.

Owens Valley vole was not observed within the proposed project area as a result of directed surveys. Based on the results from CNDDB records and literature review, the proposed project Study Area was determined to have limited areas of potentially suitable habitat for the Owens Valley vole. The assessment of potentially suitable areas was determined based upon the specific habitat requirements of the Owens Valley vole. Criteria used for the delineation of Owens Valley vole included areas of wet meadow and lush grassy ground (e.g., alfalfa fields) with the presence of small mammal sign, specifically, scat, tracks, runs and burrows within and adjacent to the proposed project area; and areas proposed for Shallow Flooding. A reconnaissance-level survey conducted on January 17, 2007, identified marginal habitats on the northern and western areas of the proposed project site which were then subject to detailed surveys. Sapphos Environmental, Inc. conducted small mammal trapping at three locations within the proposed project location, including a proposed Shallow Flooding site, previously established re-vegetation site, and a wet meadow site.

---

[12] Point Reyes Bird Observatory. 2005. *Results of the 2005 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

[13] Point Reyes Bird Observatory. 2004. *Results of the 2004 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

5.4.1.3 Locally Important Species

Based on a review of the CNDDB and California Native Plant Society (CNPS) inventory, 12 locally important plant species and 11 locally important wildlife species are known to occur within the vicinity of the proposed project Study Area.[14,15] As a result of the habitat assessment, potentially suitable habitat was identified for three locally important plant species and six locally important wildlife species that were then the subject of detailed surveys:

- Inyo phacelia (*Phacelia inyoensis*)
- Inyo County star-tulip (*Calochortus excavatus*)
- Alkali cord grass (*Spartina gracilis*)
- Moth (no common name) (*Tescalsia giulianiata*)
- Alkali skipper (*Pseudocopaeodes eunus*)
- Owens Valley tiger beetle (*Cicindela tranquebarica inyo*)
- Alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*)
- Slender-girdled tiger beetle (*Cicindla tenuicincta*)
- Owens dune weevil (*Trigonoscuta owensii*)

Based on literature review and a habitat suitability analysis, nine of these plant species and five of these wildlife species were determined unlikely to occur within the Study Area: sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*), Parish's popcorn-flower (*Plagiobothrys parishii*), Darwin rock cress (*Arabis pulchra* var. *munciensis*), naked milk-vetch (*Astragalus serenoi* var. *shockleyi*), creamy blazing star (*Mentzelia tridentata*), Booth's evening primrose (*Camissonia boothii* ssp. *boothii*), sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*), narrow-leaved cottonwood (*Populus angustifolia*), Nevada oryctes (*Oryctes nevadensis*), monarch butterfly (*Danaus plexippus*), willet (*Catoptrophorus semipalmatus*), Franklin's gull (*Larus pipixcan*), Nuttall's woodpecker (*Picoides nuttallii*), and sage sparrow (*Amphispiza belli*). These species were not carried forward for further analysis.

5.4.1.3.1 Plants

<u>Inyo Phacelia</u>

Inyo phacelia was determined to be absent within the proposed project area as a result of detailed field surveys of the plant community that provides potentially suitable habitat for this species, undertaken during the flowering period. Inyo phacelia is designated as a list 1B plant (rare, threatened, or endangered in California and elsewhere) by CNPS. Inyo phacelia has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the closest occurrences are four records located approximately 1.8 miles west of the U.S. 395/State Route (SR) 136 intersection.

---

[14] California Department of Fish and Game. 2005. *Rarefind 3: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

[15] California Native Plant Society. 2005. *Inventory of Rare and Endangered Plants*. Available at: http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi

Inyo County Star-tulip

Inyo County star-tulip was determined to be absent within the proposed project area as a result of directed surveys of the plant community that provides potentially suitable habitat for this species undertaken during the flowering period. Inyo County star-tulip is designated as a list 1B plant (rare, threatened, or endangered in California and elsewhere) by CNPS. Inyo County star-tulip has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the three closest occurrences are 2.5 miles southwest, 2.4 miles west southwest, and 2.9 miles west of the U.S. 395/SR 136 intersection.

Alkali Cord Grass

Alkali cord grass was determined to be absent within the proposed project area as a result of directed surveys of the plant community that provides potentially suitable habitat for this species, undertaken during the flowering period. Alkali cord grass is designated as a list 4 plant (Plant considered to be of limited distribution) by CNPS. Alkali cord grass has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of Alkali cord grass.

Sanicle Cymopterus

Sanicle cymopterus is not expected to occur within the proposed project area due to lack of suitable Joshua tree woodland and Mojavean desert scrub habitat. Sanicle cymopterus is designated as a 1B plant (rare, threatened, or endangered in California and elsewhere) by CNPS.

Parish's Popcorn-flower

Parish's popcorn-flower is not expected to occur within the proposed project area due to lack of suitable Great Basin scrub habitat. Parish's popcorn-flower is designated as a 1B plant (rare, threatened, or endangered in California) by CNPS.

Darwin Rock Cress

Darwin rock cress is not expected to occur within the proposed project area due to lack of suitable limestone within Chenopod scrub and Mojavean desert scrub habitat. Darwin rock cress is designated as a 2 plant (rare, threatened, or endangered in California, but common elsewhere) by CNPS.

Naked Milk-vetch

Naked milk-vetch is not expected to occur within the proposed project area due to lack of suitable course granitic alluvium within Chenopod scrub and Great Basin scrub habitat. Naked milk-vetch is designated as a 2 plant (rare, threatened, or endangered in California, but common elsewhere) by CNPS.

Creamy Blazing Star

Creamy blazing star is not expected to occur within the proposed project area due to lack of suitable Mojavean desert scrub habitat. Creamy blazing star is designated as a 1B plant (rare, threatened, or endangered in California and elsewhere) by CNPS.

Booth's Evening Primrose

Booth's evening primrose is not expected to occur within the proposed project area due to lack of suitable Joshua tree woodland and pinyon and juniper woodland habitat. Booth's evening primrose is designated as a 2 plant (rare, threatened, or endangered in California, but common elsewhere)by CNPS.

Sagebrush Loeflingia

Sagebrush loeflingia is not expected to occur within the proposed project area due to lack of suitable desert dunes and Great Basin scrub habitat. Sagebrush loeflingia is designated as a 2 plant (rare, threatened, or endangered in California, but common elsewhere) by CNPS.

Narrow-leaved Cottonwood

Narrow-leaved cottonwood is not expected to occur within the proposed project area due to lack of suitable riparian forest habitat. Narrow-leaved cottonwood is designated as a 2 plant (rare, threatened, or endangered in California, but common elsewhere) by CNPS.

Nevada Oryctes

Nevada oryctes is not expected to occur within the proposed project area due to lack of suitable dry, sandy soil in washes and open scrub habitat. Nevada oryctes is designated as a 2 plant (rare, threatened, or endangered in California, but common elsewhere) by CNPS.

5.4.1.3.2 Wildlife

Tescalsia Giulianiata

Tescalsia giulianiata has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of *Tescalsia giulianiata*. *Tescalsia giulianiata* was not observed during detailed field surveys of the plant community that provides potentially suitable habitat for this species: DAM, a type of TAM (100-percent survey).

Alkali Skipper

Alkali skipper has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of alkali skipper. Alkali skipper was not observed during detailed field surveys of the plant community that provides potentially suitable habitat for this species: DAM, a type of TAM (100-percent survey).

Owens Valley Tiger Beetle

Owens Valley tiger beetle has been determined to be present on the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of Owens Valley tiger beetle. A single Owens Valley tiger beetle was observed in a Channel Area during detailed field surveys of the plant community that provides potentially suitable habitat for this species: DAM, a type of TAM (100-percent survey).

Alkali Flats Tiger Beetle

Alkali flats tiger beetle has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of alkali flats tiger beetle. Alkali flats tiger beetle was not observed during detailed field surveys of the plant community that provides potentially suitable habitat for this species: DAM, a type of TAM (100-percent survey).

Slender-girdled Tiger Beetle

Slender-girdled tiger beetle has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of slender-girdled tiger beetle. Slender-girdled tiger beetle was not observed during detailed field surveys of the plant community that provides potentially suitable habitat for this species: DAM, a type of TAM (100-percent survey).

Owens Dune Weevil

Owens dune weevil has been determined to be absent from the proposed project area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. A review of the CNDDB revealed no close occurrences of Owens dune weevil. Big Owens dune weevil was not observed during detailed field surveys of the plant community that provides potentially suitable habitat for this species: DAM, a type of TAM (100-percent survey).

5.4.2 Impact Analysis

5.4.2.1 Listed Species

5.4.2.1.1 Plants

Owens Valley Checkerbloom

The implementation of supplemental DCMs would not result in negative impacts to Owens Valley checkerbloom. The proposed project Study Area has been extensively surveyed and the species was determined to be absent as a result of all previous and current field surveys. Therefore, construction, operation, and maintenance of the proposed supplemental DCMs would not result in direct, indirect, or cumulative effects to the survival or recovery of the Owens Valley checkerbloom.

5.4.2.1.2 *Wildlife*

Owens Tui Chub and Owens Pupfish

The proposed project would not affect any existing habitat for Owens pupfish or Owens tui chub. The proposed Shallow Flooding and Managed Vegetation DCMs provide habitat values and functions that are consistent with the policies and conservation measures of the U.S. Fish and Wildlife Service's Owens Basin Wetland and Aquatic Species Recovery Plan. There is inadequate available data regarding habitat values and functions of the Moat & Row DCM to make such a determination. The proposed project would be expected to results in approximately 760 acres of the Moat & Row DCM, 750 acres of Shallow Flooding DCM, 371 acres of Study Area (where a variety of DCMs will be applied, if required), and 160 acres of Channel Area (where habitat restoration is proposed) within the U.S Fish and Wildlife Service's Owens Basin Wetland and Aquatic Species Recovery Plan. Where Moat & Row is proposed for areas currently barren playa, it is anticipated that it would be consistent with the Recovery Plan. Where Moat & Row would affect transmontane alkali meadow habitat and aquatic habitat within the Recovery Plan area, it would require the consideration of mitigation measures to ensure no net loss of habitat values and functions to demonstrate consistency with the Recovery Plan.

American Peregrine Falcon

American peregrine falcon will potentially be impacted by the placement of DCMs on playa that is suitable foraging habitat for the species. American peregrine falcon are expected to experience an overall benefit from implementation of the proposed project due to an increase in the amount of suitable foraging habitat for waterfowl and shorebirds within Shallow Flooding areas, resulting in an increase in the prey base for the American peregrine falcon.

5.4.2.2 Sensitive Species

5.4.2.2.1 *Plants*

There are no federal or state-designated sensitive plant species present within the proposed project area; therefore, the proposed project would not be expected to result in significant impacts to biological resources related to sensitive plant species.

5.4.2.2.2 *Wildlife*

Northern Harrier

There are no anticipated significant impacts to biological resources related to northern harrier. Northern harrier are expected to experience an overall benefit from implementation of the proposed project due to an increase in the amount of suitable foraging habitat for prey species within Shallow Flooding areas, resulting in an increase in the prey base.

Merlin

There are no anticipated significant impacts to biological resources related to merlin. Merlin are expected to experience an overall benefit from implementation of the proposed project due to an increase in the amount of suitable foraging habitat for waterfowl and shorebirds within Shallow Flooding areas, resulting in an increase in the prey base.

Prairie Falcon

There are no anticipated significant impacts to biological resources related to prairie falcon. Prairie falcon are expected to experience an overall benefit from implementation of the proposed project due to an increase in the amount of suitable foraging habitat for waterfowl and shorebirds within Shallow Flooding areas, resulting in an increase in the prey base.

Western Snowy Plover

There are no anticipated significant impacts to biological resources related to western snowy plover. During a lake-wide survey of snowy plovers in 1978, 499 individual birds were observed. In 1999, plover numbers reached a low of 22 individuals in a lake-wide survey. The lake-wide survey for the 2003 SIP observed a total of 401 snowy plovers and the years following implementation of the 2003 SIP observed 658 in 2004, 505 in 2005, and 602 in 2006 lake-wide surveys for snowy plover. The lake-wide survey for western snowy plover conducted in 2007 recorded 421 snowy plovers, which may be related to a decline of snowy plovers observed by other researchers in the west. The 2002 lake-wide survey of 272 plovers has been determined to be the baseline population prior to the implementation of the 2003 SIP. Western snowy plover are expected to experience an overall benefit from implementation of the proposed project due to an increase in the amount of suitable foraging habitat created within the Shallow Flooding areas. However, there is expected to be some minor loss of nesting habitat within the proposed project area that would require consideration of mitigation measures. Western snowy plover may also be directly impacted through construction and maintenance activities on the Owens Lake bed that could potentially result in mortality to individuals through vehicle strikes and other human encounters.

Pallid Bat, Townsend's Big-eared Bat, Spotted Bat

The implementation of the proposed project would not be expected to result in significant adverse impacts to sensitive bat species. The proposed project is not expected to impact foraging activity for bat species.

Owens Valley Vole

Owens Valley vole was determined to be absent from the proposed project site through small mammal trapping. Therefore, implementation of the proposed project would not be expected to result in impacts to Owens Valley vole.

5.4.2.3 Locally Important Species

5.4.2.3.1 Plants

The implementation of supplemental DCMs would not result in impacts to locally important plant species. All locally important plant species were determined to be absent as a result of detailed field surveys; therefore, construction, operation, and maintenance of the proposed project would not result in direct, indirect, or cumulative effects to the survival or recovery of these locally important plant species.

5.4.2.3.2 Wildlife

The implementation of supplemental DCMs would not result in impacts to locally important wildlife species. One locally important wildlife species was determined to be present (Owens Valley tiger beetle) and all other locally important wildlife species were determined to be absent as a result of detailed field surveys. Enhancements to wetland habitats on the lake bed are expected to result in an overall benefit to locally important wildlife species; therefore, construction, operation, and maintenance of the proposed project would not result in direct, indirect, or cumulative effects to the survival or recovery of these locally important wildlife species.

5.4.3 Mitigation Measures

5.4.3.1 Listed Species

Construction, operation, and maintenance of the proposed project would not result in direct impacts to Owens Valley checkerbloom or American Peregrine falcon or directly or indirectly affect the potential for survival or recovery of these species in the wild. Therefore, the consideration of mitigation measures for listed species is not warranted.

5.4.3.2 Sensitive Species

Northern Harrier, Merlin, and Prairie Falcon

Construction, operation, and maintenance of the proposed project would not result in direct negative impacts to northern harrier, merlin, or prairie falcon or directly or indirectly affect the potential for survival or recovery in these species in the wild. Therefore, the consideration of mitigation measures for northern harrier, merlin, or prairie falcon is not warranted.

Western Snowy Plover

The proposed project area contains known nesting sites for the western snowy plover. The proposed DCMs could potentially impact nesting habitat for the western snowy plover through construction operations disturbing the birds during the nesting season or by removing suitable nesting habitats through implementation of DCMs. Despite these impacts, it is expected that the overall impact of the proposed project will be beneficial for western snowy plover by increasing the amount of available foraging habitat and providing a reliable water source for foraging and support of nestlings.

Lake Bed Worker Education Program. To minimize potential direct impacts to western snowy plover from construction activities to below the level of significance, the City shall continue the Lake Bed Worker Education Program consistent with the previous approach and per CDFG recommendations.

- The program shall mirror the program instituted for workers for the 1997 EIR and shall focus on western snowy plover identification, basic biology and natural history, alarm behavior of the snowy plover, and applicable mitigation procedures required of the City and construction personnel.

- The program shall be conducted by a biologist familiar with the biology of the western snowy plover at Owens Lake and familiar with special status plant and wildlife species of the Owens Lake basin. The biologist shall be approved by the District prior to implementation of the education program. The qualifications of the biologist shall be submitted to CDFG for review.

- The education program shall be based on the 1997 program EIR and shall include relevant updates by the biologist. The education program shall explain the need for the speed limit in the snowy plover buffer areas and the identification and meaning of buffer markers. All construction, operation, and maintenance personnel working within the project area shall complete the program prior to their working on the lake bed. A list of existing personnel who have completed the program shall be submitted to the District prior to the start of any work on the lake bed. A list of new personnel who have participated and completed the education program shall be submitted monthly to the District. A copy of the worker education program shall be provided to CDFG and the CSLC.

Preconstruction Surveys for Western Snowy Plover. To minimize potential impacts to western snowy plover within the proposed project area due to construction and ongoing maintenance activities, the City shall conduct a preconstruction survey for western snowy plover in all potential snowy plover habitat prior to any construction activity that is performed during the snowy plover breeding season (March 15 to August 15).

- Preconstruction surveys will be performed no more than seven days prior to the start of ground-disturbing activities.

- The City shall place a 200-foot buffer around all active snowy plover nests that are discovered within the construction area. Green-colored stakes of less than 60 inches in height with yellow flagging will be used to mark buffer edges, with stakes spaced at eight approximately equidistant locations.

- The location [global positioning system (GPS) coordinates] and current status of the nest shall be reported within 24 hours of discovery to the District. Maps of snowy plover nest locations shall be posted at the construction office and made available to all site personnel and District staff.

- The activity of the nest shall be monitored by a biological monitor approved by the District, as per existing guidelines for the North Sand Sheet and Southern Zones dust control projects and any revisions to the monitoring protocol that have been approved by CDFG. Active snowy plover nests shall be monitored at least weekly. The qualifications of the biological monitor will be submitted to CDFG for review.

- The nest buffer shall remain in place until such time as the biological monitor determines that the nest is no longer active and that fledglings are no longer in danger from proposed construction or maintenance activities in the area. Buffers shall be more densely marked where they intersect project-maintained roads. Vehicles shall be allowed to pass through nest buffers on maintained roads at speeds less than 15 miles per hour, but shall not be allowed to stop or park within active nest buffers. Permitted activity within the nest buffer shall be limited to foot crews working with hand tools and shall be limited to 15-minute intervals, at least one hour apart, within a nest buffer at any one time. Compliance with this mitigation measure shall be confirmed by the District through issuance of a weekly written report by the City to the District.

Snowy Plover Nest Speed Limit. To minimize potential impacts to western snowy plover and other sensitive biological resources, the City shall implement a 30 miles per hour speed limit within all active construction areas during construction of DCMs.

- Speed limits shall be 15 miles per hour within active snowy plover nest buffers. Vehicles can only pass through active nest buffers and shall not be parked within active nest buffers. Designated speed limits for other construction areas outside of active nest buffers shall be maintained at 30 miles per hour where it is determined to be safe according to vehicle capabilities, weather conditions, and road conditions. Site personnel and District staff shall be informed daily of locations where active nest buffers overlap with roads in the construction area.

- Signs shall be posted that clearly state required speed limits. The number of speed limit signs shall be kept at a minimum by posting at all entry points to the lake and by active snowy plover nest areas to reduce potential perches for raptors and other snowy plover predators and shall be outfitted with Nixalite or the functional equivalent if greater than 72 inches (increased from the original 60 inches) in height at entry points to the lake and 60 inches in height by active snowy plover nest areas.

- Contractor education seminars shall clearly explain the need for speed limits within the project area and the consequences for noncompliance. Compliance with this mitigation measure shall be confirmed by the District through issuance of a summary written report by the City to the District after completion of the education seminar and posting of speed limits. A copy of the summary report shall be provided to CDFG.

Lighting Best Management Practices. To minimize impacts to resident wildlife species, the City shall institute all best management practices to minimize lighting impacts on nocturnal wildlife. Previous construction has occurred during nighttime hours to complete construction schedules and to prevent personnel from working during times of high temperatures.

- If night work is deemed necessary, then construction crews shall make every effort to shield lighting on equipment downward and away from natural vegetation communities or playa areas, and especially away from known nesting areas for snowy plovers during the nesting season (March to August).

- All lighting, in particular any permanent lighting, on newly built facilities shall be minimized to the greatest extent possible, while still being in compliance with all applicable safety requirements. Required lighting shall be shielded so that light is directed downward and away from vegetation or playa areas. Proof of compliance with this mitigation measure shall be confirmed by the District, and a copy of the compliance record shall be provided to CDFG.

Plover Identification Training. To minimize potential impacts to western snowy plover within dust control areas, foot crews and all-terrain vehicle operators that must enter flood panels with active western snowy plover nests to conduct maintenance shall be briefed in plover identification, nest identification, and adult alarm behavior.

- Crews shall receive this training from a biologist knowledgeable in western snowy plover biology at Owens Lake as part of the contractor education program. The qualifications of the biological monitor shall be submitted to CDFG for review. Maintenance crews shall utilize hand tools and ATVs only to conduct maintenance activities during this time period in Shallow Flooding panels where snowy plovers may be present. Crews shall minimize time within the Shallow Flooding and playa areas to the greatest extent possible. In the event a crew discovers an active nest, a biologist will be contacted to mark the nest.

- If crews are working within an active nest buffer, they shall be limited to 15 minutes out of every hour within the buffer. If an unanticipated take to western snowy plovers or an active snowy plover nest occurs during any maintenance activities, a project biologist shall document the impact and report the incident to the District and CDFG within 48 hours of the event.

- A take in this case would be defined as a mortality to adults, chicks, or fledglings, or a modification in adults' behavior due to human pressure that results in a loss of a nest and its contents.

- Proof of compliance with this mitigation measure shall be verified by submitting copies of any incident reports to the District, the State Lands Commission, and the CDFG.

- Emergency repair activities are exempt from the requirements of this provision. An emergency is defined in the State CEQA Guidelines, Section 15269, as "a sudden, unexpected occurrence that presents a clear and imminent danger, demanding action to prevent or mitigate loss of or damage to life, health, property, or essential public services." Emergency repairs as defined under the 2003 SIP revision and the 1998 SIP are further defined as those repairs that must be completed immediately to protect human health and safety, ensure the project is in compliance with required air quality standards, or protect project infrastructure from significant and immediate damage that could result in the failure of a dust control measure to maintain compliance with required air quality standards. In the event that an emergency repair must be performed on a Shallow Flooding panel during the snowy plover breeding season, a qualified biological monitor shall be present on site during the duration of the repair activity to document any impacts to western snowy plover adults, juveniles, or active nests. The District and CDFG shall be notified within 24 hours of the start of all emergency repair activities. A copy of the biological monitor's written report shall be provided to the District and CDFG within 48 hours of completion of the emergency repair activity. Any appropriate mitigation that may be required from impacts to western snowy plovers shall be negotiated between the City and CDFG based on the report provided by the biological monitor. A copy of the negotiated agreement between the City and CDFG shall be provided to the District and the CSLC.

Toxicity Monitoring Program. To help reduce impacts to native wildlife communities from the proposed project to below the level of significance, the City shall continue the toxicity monitoring program to investigate the potential of bioaccumulation of heavy metals and other potential toxins in wildlife from feeding in dust control areas.

- A copy of the long-term monitoring program shall be submitted to the District and the California States Lands Commission prior to the start of any construction. Monitoring shall take place in all dust control areas within the Owens Lake as well as at all spring and outflow areas within 500 feet of the construction boundaries. The purpose of the monitoring program shall be to determine if bioaccumulation of toxins is occurring within native wildlife populations attributable to the Dust Control Mitigation Program. Procedures for bioaccumulation monitoring shall follow existing permits issued by the Lahontan Water Quality Control Board (LWQCB) and any subsequent water quality monitoring requirements deemed necessary by the LWQCB.

- All monitoring shall be conducted by individuals familiar with the native wildlife species of the Owens Lake bed. Monitoring personnel shall be approved by the District prior to implementation of the long-term monitoring. The monitoring plan shall include adaptive management procedures and mitigation procedures to follow in the instance that signs of toxicity do develop in native wildlife populations that are attributable to the Dust Control Mitigation Program. Management procedures would be implemented depending on the type and extent of impact that was observed and could potentially, but not necessarily, include covering of dust control areas to prevent wildlife utilization, hazing of wildlife to prevent utilization of dust control areas, or any other appropriate measures. Any adaptive management measures that would potentially be implemented shall be approved by the District and the CDFG prior to implementation.

- Monitoring shall be conducted on a semiannual basis (two times per year) during each year that monitoring is conducted. If, after the completion of the 14-year monitoring schedule, it is determined that there is no evidence of toxicity issues in native wildlife populations, then the monitoring program may be discontinued. If monitoring determines that impacts to native wildlife species are occurring, then the monitoring shall continue on a semiannual basis in every year until significant impacts are not detected, and the monitoring sequence shown in Table 5.4.3.2-1, *Postconstruction Bioaccumulation Monitoring Schedule*) shall resume at the Year 3 monitoring event and shall continue at the intervals shown in Table 5.4.3.2-1. Written monitoring reports shall be provided to the District, CDFG, LWQCB, and the State Lands Commission by the approved biological monitor within four months following the end of the monitoring year.

TABLE 5.4.3.2-1
POSTCONSTRUCTION BIOACCUMULATION MONITORING SCHEDULE

Year 1 monitoring event	Year 2 monitoring event	Year 3 monitoring event	Year 4 monitoring event
2010	2011	2012	2013
Year 5 monitoring event	**Year 6 monitoring event**	**Year 9 monitoring event**	**Year 14 monitoring event**
2014	2015	2018	2023

Long-Term Monitoring Program for Snowy Plovers. To minimize impacts to western snowy plover, the City shall implement a long-term monitoring program for all dust control areas covered under all environmental documents produced for the dust control program.

- Postconstruction surveys shall be conducted 1, 2, 3, 4, 5, 7, 9, and 14 years after after completion of construction activities. The final western snowy plover monitoring schedule for all DCM measures on the Owens Lake bed shall be coordinated so that long-term monitoring for all DCMs covered within this document, as well as for preceding environmental documents, are conducted simultaneously.

- The goals of the monitoring are to confirm that overall numbers of snowy plovers within the dust control areas do not decrease due to implementation of the 2008 SIP relative to baseline plover population numbers prior to implementation of the 2008 SIP as shown by the 2002 plover report for Owens Lake, which found the population to be 272 plovers. Monitoring shall be conducted by a qualified biologist familiar with the natural history and habitat requirements of western snowy plovers within the Owens Lake basin. The qualifications of the biological monitor shall be submitted to the CDFG for review. The monitoring methodology shall be consistent with the methodology used for the Owens Lake 2002 plover surveys. Annual summary reports for the monitoring efforts shall be filed with the District, the State Lands Commission, and CDFG by December 31 of each monitoring year.

- The District shall require adaptive management changes to operation and maintenance of DCMs if it determines that a decline in snowy plover numbers is occurring that is directly attributable to operation or maintenance procedures of the Owens Lake Dust Mitigation Program. The District shall consult with the City, State Lands Commission, and CDFG prior to implementing adaptive management changes. At the time that adaptive management changes are implemented, monitoring shall continue for a minimum of five years after implementation of adaptive management procedures to ensure that the procedures are having the desired effect on the lake-wide snowy plover population. If after the Year 5 monitoring event it is determined that no adverse impacts to the western snowy plover population at Owens Lake are occurring as a result of the project, then the long-term monitoring program and subsequent reporting shall be discontinued.

- Proof of compliance with measure shall be through issuance of a written monitoring summary report for each monitoring year. Reports shall be submitted to the District by December 31 of each monitoring year. The report will document survey locations and dates, the number of plovers observed, and an estimate of the total plover population. A copy of the yearly summary reports shall be provided to the CDFG and the CSLC.

Corvid Management Plan. To reduce impacts to western snowy plover and other migratory shorebirds within the proposed project area, the City shall continue the corvid management plan to reduce potential impacts to western snowy plover and other shorebird reproduction within the proposed project area, or comparable corvid control measures to the satisfaction of the CDFG that are capable of achieving the same performance standard of no substantial net increase in corvid predation of native nesting shore birds (including eggs).

- Components of the corvid management plan shall include lake bed trash management procedures associated with DCMs, utilization of Nixalite or the functional equivalent on all structures greater than 72 inches in height to minimize perching of corvids and raptor species on dust control equipment where they can easily observe shorebirds during the nesting season, burial of power and communication lines on all lake bed areas below the elevation of 3,600 feet, and use of harassment techniques for corvids in specific instances where corvids are proving to be particularly harmful to nesting shorebirds. Specifically in conjunction with the Moat & Row DCM, the corvid management techniques shall be expanded to specify that the sand fence fabric shall be sufficiently flexible and the post caps shall be designed to prevent perching by corvids within 0.25 miles of occupied nesting shorebird habitat.

- The corvid management plan shall be prepared and implemented by a wildlife biologist familiar with the sensitive shorebird populations within the project area and familiar with corvid management techniques. The qualifications of the wildlife biologist shall be submitted to CDFG for review.

- Lethal methods of corvid control such as shooting or poisoning shall not be implemented initially due to public and government agency concerns in the project region for such control methods and to prevent putting workers at risk from such control measures. If it is later determined that corvids are having a significant impact on shorebird populations within the project area and direct removal of corvids is a viable alternative, proposed control methods would be presented to the District and CDFG for approval prior to implementation of the additional control measures.

- The corvid management plan shall include a yearly written report estimating the lake bed nesting and foraging corvid population size, documenting the results of the corvid management techniques, documenting the observed effectiveness of the techniques in minimizing corvid impacts on shorebirds within the lake bed, and suggesting improvements for corvid management within the lake bed.

- A copy of the corvid management plan shall be submitted to and approved by CDFG, the State Lands Commission, and the District prior to implementation of the plan. Copies of the yearly reports shall be submitted to the District and CDFG no later than December 31 of each corvid management year.

- If after five years of reporting, the District determines that the corvid management program is effective, and corvids are not impacting snowy plover populations, then the reporting schedule shall phase out. However, the corvid management practices shall continue to be continuously implemented. Effectiveness may be determined based on the corvid population size on the lake bed.

Habitat Management Program for Nesting Snowy Plovers. To minimize potential impacts to nesting western snowy plover from shutdown of Shallow Flooding panels on June 30, a habitat management program shall be implemented by the City on all Owens Lake bed Shallow Flooding areas to mimic the natural summer drying of seeps and springs in the area.

- Each year Shallow Flooding lateral lines shall be slowly turned off from July 1 to July 21 to allow snowy plover broods to complete their nesting cycle. Consult Figure 5.4.3.2-1, *Conceptual Owens Lake Operational Calendar*, and Figure 5.4.3.2-2, *Shallow Flooding Management for the Month of July*, for a conceptual picture of Shallow Flooding panel operation. The City has the option of surveying within 0.5 mile of Shallow Flooding areas for snowy plovers. If active snowy plover nests or young are not present on or within a 0.5-mile radius of Shallow Flooding areas, then the habitat flows described above would not be needed in those areas and the Shallow Flooding panels may be shut down as the City determines necessary.

- A final operations plan detailing the drying operations shall be submitted to the District for approval, and a copy shall be provided to CDFG prior to startup of new Shallow Flooding operations.

Wildlife Movement Barriers. To minimize potential direct impacts from the installation of sand fencing atop the rows of Moat & Row areas to migratory corridors used by wildlife such as flightless juvenile shorebirds and herpetofauna. For purposes of the analysis, moats in Moat & Rows were assumed to have sloped sides and not pose a barrier to wildlife movements. If moats or rows are recommended to be formed with vertical sides, additional environmental analysis would be required. The frequency of the gaps or the provisions of openings has been decreased from 100-foot intervals to 0.25-mile intervals.

- The City shall include gaps in sand fencing and appropriate moat design allowing wildlife movement on the lake bed.

- Any other barrier with vertical sides, such as a vertical moat, would also require gaps. Gaps in the fence shall be no more than 0.25 mile apart and may consist of either breaks in the fencing or openings within a fence.

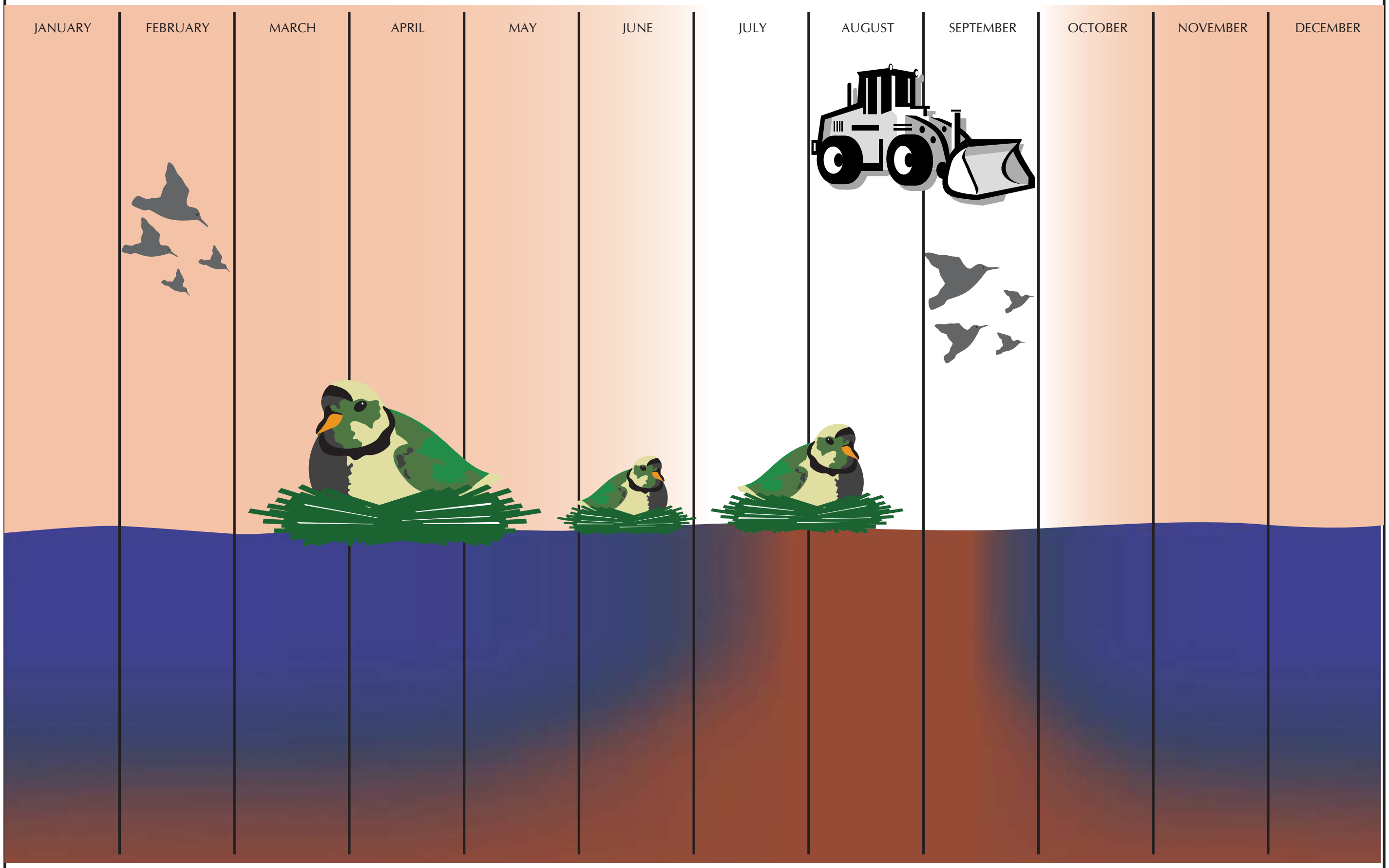
- Alternative may include culvers and/or passage holes where wildlife could travel under berms or rows, voids in the fencing mesh, gaps between in segments, and open row corners. Moats will be required to be designed to prevent trapping of wildlife.

- Potential methods may include, but are not limited to, gentle side slopes, ramps, and culvert. The size of gaps or alternatives to gaps in the sand fencing and the design of moats will be submitted to and approved by the CDFG.

Long-term Habitat Management Plan. To avoid direct and cumulative impacts to native wildlife communities that may result from the proposed project, a wildlife area management plan would be prepared pursuant to the CDFG requirements by a qualified biologist familiar with the habitats and species present at Owens Lake and knowledgeable of wildlife management techniques.[16] The qualifications of the biologist shall be submitted to the CDFG for review. The wildlife area

---

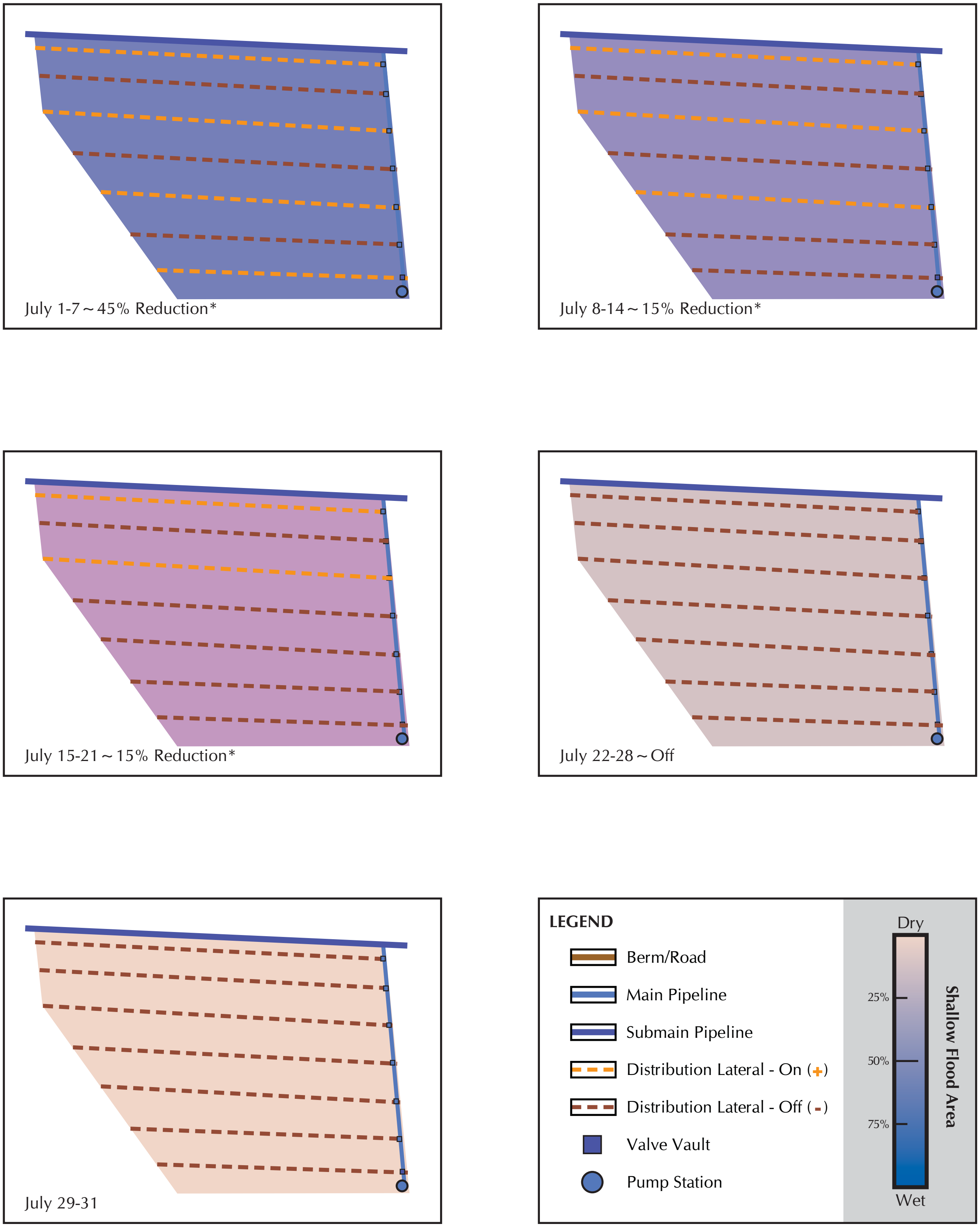
[16] Thayer, Paul, California State Lands Commission, Sacramento, CA, 27 March 2007, letter to Mr. Graham Chisholm, Audubon California, Emeryville, CA.



LEGEND

🟧 Dust Storm 🟦 Wet Soil 🟫 Dry Soil

FIGURE 5.4.3.2-1
Conceptual Owens Lake Operational Calendar



* Percent reduction of water applied to achieve level of control efficiency on June 30.

FIGURE 5.4.3.2-2
Shallow Flooding Management for the Month of July

management plan shall be submitted to both the CDFG and the State Lands Commission for comment, with final approval by the CDFG by April 1, 2009, and with the approved wildlife area management plan to be fully implemented by April 1, 2010. Components of the plan shall include, at a minimum, the goals and objectives of the wildlife area management plan, a description of baseline conditions of plant and wildlife resources, effects on biological resources as a result of implementation of dust control measures, descriptions of biological elements targeted for management, long-term goals, and a description of the operations and maintenance tasks required to complete each goal. The Long-term Hydrologic Monitoring Program (LTHMP) area shall encompass all emissive areas subject to dust control measures on lands owned by the CSLC and lands owned by the City of Los Angeles Department of Water and Power. In recognition of the public trust values related to resident and migratory wildlife resources at Owens Lake, the CDFG and the CSLC have acknowledged the benefit of a LTHMP as a tool for ensuring compatibility between the construction, maintenance, and operation of the State Implementation Plan and the protection of public trust values. The LTHMP shall include, at a minimum, the following objectives:

- No net loss of riparian or aquatic baseline habitat values and functions or total acres of these habitats.

- 1,000 acres managed in perpetuity for shorebirds in Zone II, in consultation with the CDFG.

- 137 acres managed in perpetuity as Habitat Shallow Flooding in the vicinity of Dirty Socks, in consultation with the CDFG.

- Manage 1,000 acres (comprised of areas that are 100 acres or greater in size) in perpetuity of deep-water habitat at a water depth equal to or deeper than 12 inches, in consultation with CDFG to support focal migratory waterfowl determined to be present during 1995–1997 baseline surveys in support of the 1998 SIP (wood duck (*Aix sponsa*), green-winged teal (*Anas crecca*), mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), among others).

- Maintain a baseline population of 272 snowy plovers.

- In addition to the 1,000 acres of Shorebird habitat in Zone II, the City shall maintain a minimum of 523 acres of habitat for snowy plovers in perpetuity at Owens Lake in consultation with the CDFG. Suitability of Shallow Flood habitat for snowy plover consists of a mix of exposed sandy or gravelly substrate suitable for nesting in close proximity to standing water equal to or greater than 12 inches in depth.

- 17.5 acres of proposed DCMs that are within CDFG's Cartago Springs Wildlife Area must be compatible with the designated land use, and the CDFG has determined that habitat Shallow Flooding or habitat restoration would be compatible with the Cartago Springs Wildlife Area's designated use (Figure 5.4.3.2-3, *Cartago Springs Wildlife Area*).

Preparation of the Wildlife Area Management Plan shall be subject to the oversight of the CDFG. The CSLC shall be consulted for comments on the Plan, and as land owner, shall be provided

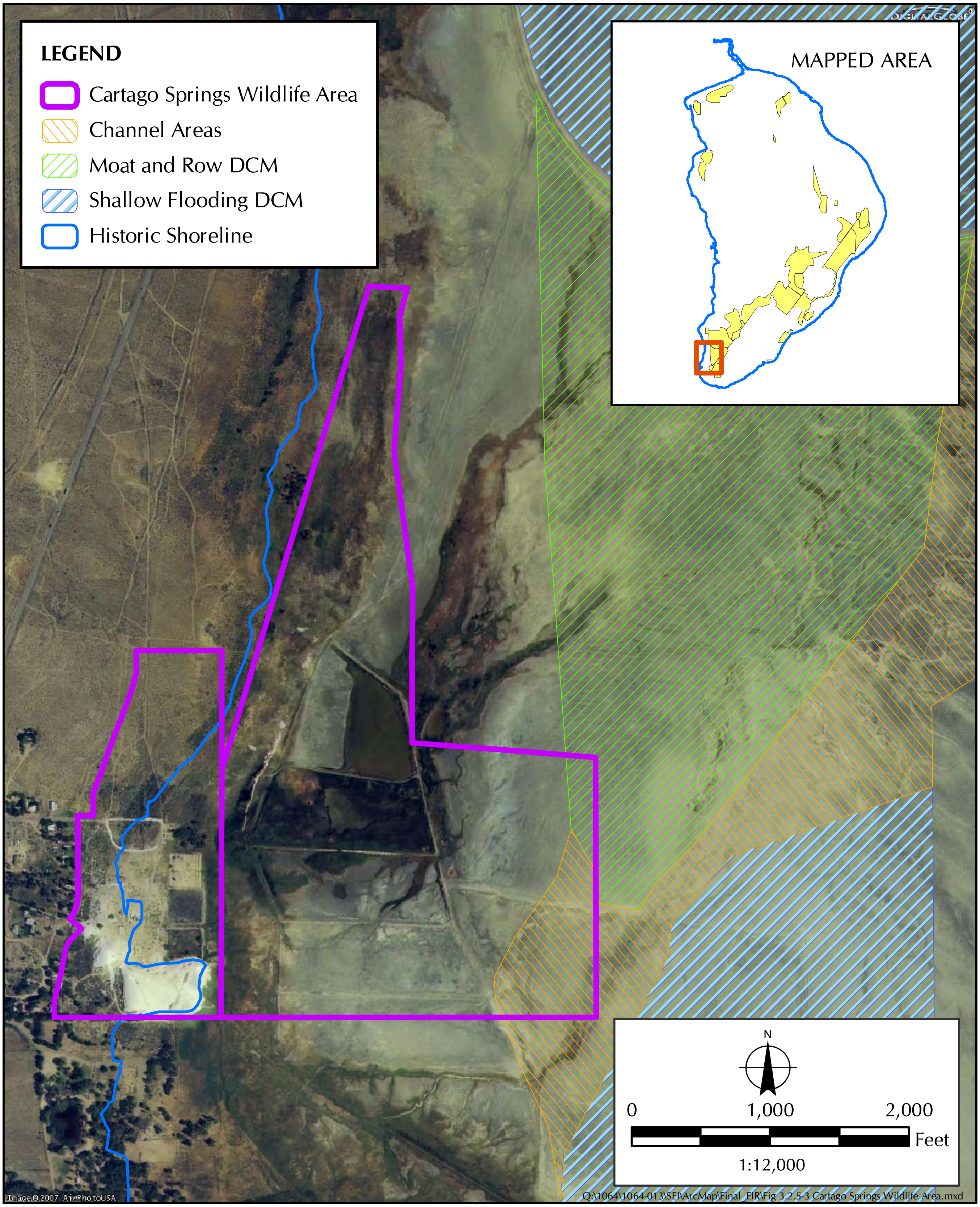


FIGURE 5.4.3.2-3

Cartago Springs Wildlife Area

copies of all monitoring and compliance reports prepared pursuant to the Plan. The Wildlife Area Management Plan shall include yearly monitoring, including a written report documenting the results of the wildlife management techniques, recording the observed effectiveness of the techniques and suggesting improvements for wildlife area management within the lake bed. Copies of the yearly reports shall be submitted to the CSLC, Great Basin Unified Air Pollution Control District, and the CDFG no later than December 31 of each wildlife management year. If after 5 years of reporting in 2015, the CDFG determines that the wildlife area management program is effective, then the reporting schedule shall phase out in the same time frame as shown in Table 5.4.3.2-1. However, the wildlife management practices shall be continuously implemented.

Pallid Bat, Townsend's Big-eared Bat, Spotted Bat, Owens Valley Vole

Construction, operation, and maintenance of the proposed project would not be expected to result in significant adverse impacts or affect the potential survival or recovery of sensitive bat species or Owens Valley vole. Therefore, the consideration of mitigation measures for these species is not warranted.

5.4.3.3 Locally Important Plant Species

Construction, operation, and maintenance of the proposed project would not affect the potential survival or recovery of locally important plant or wildlife species; therefore, the consideration of mitigation measures for these species is not warranted.

5.5 NATIVE RESIDENT OR MIGRATORY SPECIES OF FISH AND WILDLIFE

5.5.1 Existing Conditions

5.5.1.1 Mammals

Sapphos Environmental, Inc. conducted small mammal trapping at three locations within the proposed project location, including a proposed Shallow Flooding site, previously established re-vegetation site, and a wet meadow site. The proposed Shallow Flooding site had the lowest capture rate of 2 percent, with only deer mice captures. Deer mice captured at the proposed Shallow Flooding site were observed, post-release, returning to areas previously re-vegetated. Small mammal trapping efforts in the established re-vegetated grid resulted in the capture of two species, deer mouse (*Peromyscus maniculatus*) and Merriam's kangaroo rat (*Dipodomys merriamii*), with a capture rate of 7.3 percent. The Bartlett Springs wet meadow site and associated margin had moderate capture rates of 4.6 percent with the highest diversity of small mammals captured with five species represented: little pocket mouse (*Perognathus longimembris*), western harvest mouse (*Reithrodontomys megalotis*), Merriam's kangaroo rat, chisel-toothed kangaroo rat (*Dipodomys microps*), and Panamint kangaroo rat (*D. panamintinus*).

The proposed project site is located in close proximity to a calving area for tule elk (*Cervus elaphus nannodes*) (Figure 5.5.1.1-1, *Nursery Locations)*. In addition, the Owens River delta is a calving area for the Owens Valley population of tule elk. Tule elk occur in wooded, shrubby, grassland, and riparian habitats. One of nine Owens Valley Tule elk calving areas exists on the north end of Owens Lake. The calving period for Tule elk occurs from May to June. This is the period Tule elk would be expected to found on the lake bed. The Owens Valley Tule elk herd is managed at a population size of 300 individuals through hunting.

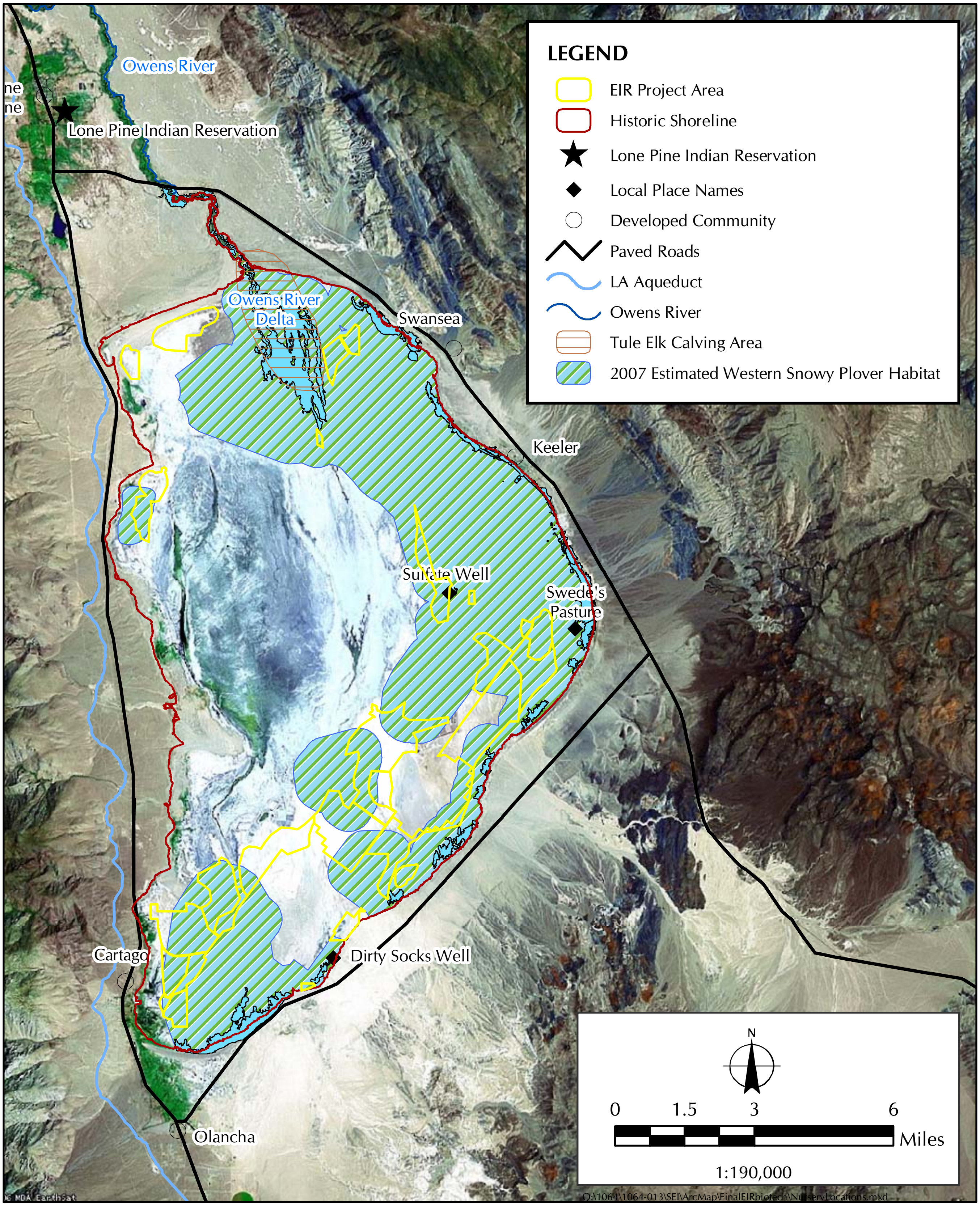


FIGURE 5.5.1.1-1
Nursery Locations

5.5.1.2 Resident or Migratory Birds

The proposed project area supports breeding areas for the western snowy plover and other shorebirds protected under the Migratory Bird Treaty Act. The Owens Valley is part of the Pacific Flyway for migrating shorebirds, waterfowl, and other species. The National Audubon Society and Bird Life International have designated Owens Lake as a Nationally Important Bird Area. Owens Lake is specifically mentioned in the U.S. Shorebird Conservation Plan as an important shorebird breeding area, especially for western snowy plover.

In addition to the special status species identified in the proposed project site, five species were observed within supplemental DCM areas during surveys. These include Say's phoebe (*Sayornis saya*), western kingbird (*Tyrannus verticalis*), common raven (*Corvus corax*), barn swallow (*Hirundo rustica*), and savannah sparrow (*Passerculus sandwichensis*). Each of these species were observed foraging, but none of these species were found to be breeding within the supplemental DCM areas.

5.5.1.3 Herpetofauna

As a result of the literature review and habitat assessment, three commonly occurring species of herpetofauna were found to be present within the proposed project site, including desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), and common side-blotched lizard (*Uta stansburiana*). One individual of each species was observed.

5.5.1.4 Fish

No fish species were identified within the proposed project Study Area.

5.5.2 Impact Analysis

5.5.2.1 Mammals

The construction, operation, and maintenance of the proposed project would not be expected to result in significant adverse impacts to, or adversely affect, the survival and recovery in the wild of common small mammal species that may be resident in the vicinity of the proposed project area and that may forage within the proposed project Study Area.

The proposed project site is outside of the Tule elk calving ground on the Owens Lake bed and would not be expected to result in significant adverse impacts to, or adversely affect, the survival and recovery in the wild of Tule elk that may be resident during the calving period in the vicinity of the proposed project area.

5.5.2.2 Resident or Migratory Birds

Due to the lack of suitable breeding and migratory stopover habitat, the proposed project would not result in significant adverse impacts to, or adversely affect the survival of common birds identified within the proposed project Study Area. Therefore, direct, indirect, or cumulative impacts would not be anticipated for common bird species.

5.5.2.3 Herpetofauna

Due to the low numbers of herpetofauna, the proposed project would not result in significant adverse impacts to, or adversely affect the survival of common herpetofauna identified within the proposed project Study Area. Therefore, direct, indirect, or cumulative impacts wound not be anticipated for common herpetofauna.

5.5.2.4 Fish

No fish species were identified within the proposed project Study Area; therefore, there would no anticipated impacts to biological resources related to migratory fish.

5.5.3 Mitigation Measures

5.5.3.1 Mammals

Construction, operation, and maintenance of the proposed project would not affect the potential survival of common resident small mammal species or Tule elk; therefore, the consideration of mitigation measures for these species is not warranted.

5.5.3.2 Resident or Migratory Birds

Construction, operation, and maintenance of the proposed project would not affect the potential survival or recovery of resident or migratory bird species; therefore, the consideration of mitigation measures for these species is not warranted.

5.5.3.3 Herpetofauna

Construction, operation, and maintenance of the proposed project would not affect the potential survival or recovery of common resident herpetofauna species; therefore, the consideration of mitigation measures for these species is not warranted.

5.5.3.4 Fish

No fish species were identified within the proposed project Study Area; therefore, no mitigation measures were required.

5.6 CONSISTENCY WITH FEDERAL, STATE, AND REGIONAL CONSERVATION PLANS

5.6.1 Existing Conditions

5.6.1.1 Habitat Conservation Plans and Natural Community Conservation Plans

No Habitat Conservation Plan or Natural Community Conservation Plan has been adopted or proposed for the proposed project area.[17,18] The proposed project area is adjacent to the West

---

[17] Wong, Darrel, State of California, The Resources Agency, Department of Fish and Game, Bishop, CA. 2 October 2002. Personal communication with Sapphos Environmental, Inc., Pasadena, CA.

[18] Walker, George, U.S. Department of the Interior, Fish and Wildlife Service, Barstow, CA. 2 October 2002. Personal communication with Sapphos Environmental, Inc., Pasadena, CA.

Mojave Plan,[19] but outside of the Plan's boundaries.

5.6.1.2 Basin Wetland and Aquatic Species Recovery Plan

The proposed project is located within the Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California[20]

5.6.1.3 Lower Owens River Project

The Inyo County General Plan Policy Goal BIO-1.8 (Owens River Restoration), which is the applicable policy goal for management of Owens Lake, states that Inyo County will work with the City and regulatory agencies to complete the restoration of habitat values along the historic Owens River channel as mitigation for degradation resulting from water export activities. This policy applies to the portion of the Owens River identified as the Lower Owens River Project. An associated policy, Inyo County Land Use Policy LU-1.16, states that all General Plan land use designations shall allow for the implementation of Enhancement/Mitigation Projects and/or mitigation measures as described in Inyo County, the City's Long Term Ground Water Management Agreement[21] and/or the 1991 Final Environmental Impact Report that addressed that agreement.[22]

5.6.1.4 State Wildlife Area or Ecological Reserve

CDFG owns 200 acres at Cartago Springs, which is planned to be designated as either a State Wildlife Area or an Ecological Reserve. Management plans will be written for conservation and management of this property, but currently the site is undesignated.

5.6.2 Impact Analysis

5.6.2.1 Habitat Conservation Plans and Natural Community Conservation Plans

There are no adopted or proposed Habitat Conservation Plans or Natural Community Conservation Plans within or adjacent to the proposed project area; therefore there would be no impacts to biological resources related to consistency with adopted Habitat Conservation Plans or Natural Community Conservation Plans.

---

[19] Bureau of Land Management. January 2005. *Final Environmental Impact Report and Statement for the West Mojave Plan*. Moreno Valley, CA. Available at: http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-Chapter1_Bookmarks.pdf

[20] U.S. Fish and Wildlife Service. 2006. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California*.

[21] Inyo County. 1991. *Superior Court of California, County of Inyo, Case No. 12908*. Agreement between Inyo County and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County. Available at: http://www.inyowater.org/Water_Resources/long_term_water_agreement.pdf

[22] City of Los Angeles Department of Water and Power. 1991. *Water from the Owens Valley to Supply the Second Los Angeles Aqueduct 1970 to 1990, 1990 Onward, Pursuant to a Long Term Groundwater Management Plan Environmental Impact Report*. SCH #89080705. Los Angeles, CA. Available at: http://www.inyowater.org/Water_Resources/1991eir/default.htm

5.6.2.2 Owens Basin Wetland and Aquatic Species Recovery Plan

The Owens Basin Wetland and Aquatic Species Recovery Plan for Inyo and Mono Counties describes 16 recommended conservation areas that are integral to the recovery plan. One of the conservation areas, the Southern Owens Conservation Area, is located along the western perimeter of the Owens Lake. Implementation of DCMs within the Southern Owens Conservation Area would need to be consistent with the goals and objectives specified in the recovery plan (Figure 5.4.1.1.2-1).

Areas proposed for DCMs within the boundary of the Southern Owens Conservation Area are comprised of 1,577 acres of barren playa, 280 acres of dry alkaline meadow, 176 acres of low density scattered shadscale, and 9 acres of shadscale (Figure 5.3.1.1-1). DCMs proposed for 280 acres of dry alkaline meadow would need to be consistent with the goals and objectives specified in the recovery plan.

5.6.2.3 Inyo County General Plan: Owens River Restoration

The proposed project area is located approximately 0.5 mile away from the Lower Owens River Project and would not be expected to conflict with that project or impede the implementation of that project.

5.6.2.4 State Wildlife Area or Ecological Reserve

The proposed project area is located outside of this property owned by CDFG. This property would not be expected to be designated as either a State Wildlife Area or an Ecological Reserve in the future.

5.6.3 Mitigation Measures

There are no significant impacts to biological resources related to consistency with adopted federal, state, or regional conservation plans; therefore, mitigation measure are not required.

SECTION 6.0
REFERENCES

Benz, Carl, U.S. Fish and Wildlife Service, Ventura, CA. 23 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Brenzel, Kathleen Norris, ed. February 2001. *Sunset Western Garden Book*. Menlo Park, CA: Sunset.

Bureau of Land Management. January 2005. *Final Environmental Impact Report and Statement for the West Mojave Plan*. Moreno Valley, CA. Available at: http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-Chapter1_Bookmarks.pdf

California Department of Fish and Game Environmental Services Division. 1994. *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600–1607, California Fish and Game Code*. Sacramento, CA.

California Department of Fish and Game. 1994. *Final Report: Riparian and Wetland Breeding Bird Surveys, Inyo County, California, with Emphasis on the Yellow-billed Cuckoo and the Snowy Plover*. Contract No. FG-23 19. Prepared by Kern River Research Center, Weldon, CA.

California Department of Fish and Game. 2004. *Rarefind 2: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

California Department of Fish and Game. 2005. *Rarefind 3: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

California Native Plant Society. 2005. *Inventory of Rare and Endangered Plants*. Available at: http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi

California Regional Water Quality Control Board (RWQCB), Lahontan Region. 1995. *Water Quality Control Plan for the Lahontan Region; North and South Basins*. Lahontan, CA.

CH2MHILL. 2001. *Summary of Surveys for Shorebirds and Other Waterbirds at Owens Lake in 2001*. Prepared by T.D. Ruhlen and G.W. Page, Point Reyes Bird Observatory, Stinson Beach, CA.

CH2MHILL. 2002. *Summary of Surveys for Snowy Plovers at Owens Lake, March 1 through April 30, 2002*. Prepared by: T.D. Ruhlen and G.W. Page, Point Reyes Bird Observatory, Stinson Beach, CA.

CH2MHILL. July 2004. *Results of the 2004 Breeding Season Surveys for Snowy Plovers, American Avocets, and Common Ravens at Owens Lake*. Prepared by: Page, G. W., and T. D. Ruhlen, Point Reyes Bird Observatory, Stinson Beach, CA.

City of Los Angeles Department of Water and Power. 1991. Water from the Owens Valley to Supply the Second Los Angeles Aqueduct 1970 to 1990, 1990 Onward, Pursuant to a Long Term Groundwater Management Plan Environmental Impact Report. SCH #89080705. Los Angeles, CA. Available at: http://www.inyowater.org/Water_Resources/1991eir/default.htm

City of Los Angeles Department of Water and Power. February 2000. *Initial Study for North Sand Sheet Shallow Flooding Project; Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M HILL, Santa Ana, CA.

City of Los Angeles Department of Water and Power. 2001. *Rare Plant Survey Report Owens Dry Lake Dust Control Project Sites*. Los Angeles, CA.

City of Los Angeles Department of Water and Power. August 2001. *Mitigated Negative Declaration Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by CH2M HILL, Santa Ana, CA.

City of Los Angeles Department of Water and Power. May 2004. Owens Lake Dust Mitigation Project Phase IV Inyo County. Prepared by: CH2M HILL, Santa Ana, CA.

County of Inyo Planning Department. 11 December 2001. *Land Use Element of the County of Inyo General Plan Update*. Independence, CA.

County of Inyo Planning Department. 5 October 2002. *Map of Inyo County*. Available at: http://www.sdsu.edu/Inyo/genplan.html

County of Inyo. County Code, Title 18: "Zoning." Available at: http://www.countyofinyo.org/planning/zonord.html

Dale, Nancy. 1986. *Flowering Plants: The Santa Monica Mountains, Coastal & Chaparral Regions of Southern California* (Photographs by members of the California Native Plant Society). Santa Barbara, CA: Capra.

Federal Emergency Management Agency. 1986. *Flood Insurance Rate Map, Inyo County, California*; Map Number 0600731275C and 0600731475C, Effective 1986. Contact: 500 C Street, South, Washington, DC 20472.

Great Basin Unified Air Pollution Control District. 16 November 1998. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Addendum No. 1 to the Final Environmental Impact Report*. State Clearinghouse No. 96122077. Bishop, CA.

Great Basin Unified Air Pollution Control District. 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, Volumes I and II* (SCH No. 961220777). Bishop, CA.

Great Basin Unified Air Pollution Control District. 1998. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Addendum No.1 to the Final Environmental Impact Report* (SCH No. 96122077). Bishop, CA.

Great Basin Unified Air Pollution Control District. 1998. *Survey of Aquatic Invertebrates Associated with Irrigation Waters on Owens Lake at the Agrarian Project Site and the South Flood Irrigation Project Site*. Prepared by: Dr. David Herbst, Bishop, CA.

Great Basin Unified Air Pollution Control District. 2 July 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report*. State Clearinghouse No. 96122077. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2000. *Biological and Cultural Resource Assessment for Two New Air Monitoring Sites at Owens Valley, Inyo County, CA*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2003. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, Volumes I and II* (SCH No. 2002111020). Bishop, CA.

Great Basin Unified Air Pollution Control District. 2003. *2003 Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2007. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan Subsequent Environmental Impact Report*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 23 October 1996. *Owens Lake PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Project Alternatives Analysis*. Bishop, CA.

Great Basin Unified Air Pollution Control District. April 1996. *Delineation of the Waters of the United States for the Owens Lake Playa. Prepared for U.S. Army Corps of Engineers*. Prepared by: Jones & Stokes Associates, Sacramento, CA.

Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House No. 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

Great Basin Unified Air Pollution Control District. June 1994. *Owens Valley PM_{10} Planning Area Best Available Control Measures State Implementation Plan*. Bishop, CA.

Great Basin Unified Air Pollution Control District. November 2003. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA. 2–6.

Halford, Anne, Bureau of Land Management, Bishop, CA. 24 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 25 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Henderson, Bradley, California Department of Fish and Game, Bishop, CA. 19 July 2007. Email correspondence with Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

Hennessy, Mary Beth, U.S. Forest Service, Bishop, CA. 24 July 2007. E-mail correspondence with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA

Hickman, J.C., ed. 1993. *The Jepson Manual: Higher Plants of California*. Berkeley: University of California Press.

Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento: California Department of Fish and Game.

Ingles, L.G. 1965. *Mammals of the Pacific States*. Stanford: Stanford University Press.

Inyo County Planning Department. 15 June 2004. *Inyo County General Plan*. Chapter 1, Land Use, Conservation, and Open Space Element. Bakersfield, CA. Available at: http://www.co.Inyo.ca.us/planning/pdfs/kcgp/KCGPChp1LandUse.pdf

Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

Inyo County. 1991. Superior Court of California, County of Inyo, Case No. 12908. Agreement between Inyo County and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County. Available at: http://www.inyowater.org/Water_Resources/long_term_water_agreement.pdf

Inyo County. February 2005. *Zoning Ordinance*, Chapter 19.08, Section 19.08.160 (B1): "Height of Structures." Available at: http://www.co.Inyo.ca.us/planning/pdfs/zo/zotoc.pdf

Inyo County. February 2005. *Zoning Ordinance*, Title 19. Available at: http://www.co.Inyo.ca.us/planning/pdfs/zo/zotoc.pdf

Jameson, E.W., Jr., and H.J. Peeters. 2004. *Mammals of California*. Berkeley: University of California Press.

Knight, Misty, National Park Service, Independence, CA. 24 July 2007. Telephone conversation with Ms. Kara Donohue, Sapphos Environmental, Inc., Pasadena, CA.

McAuley, Milt. 1985. *Wildflowers of the Santa Monica Mountains*. Canoga Park, CA: Canyon.

Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. August 2007. Letter to Mr. Bruce Henderson, U.S. Army Corps of Engineers, Ventura, CA. Subject: Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan.

Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. 4 September 2007. Letter to Mr. Bruce Henderson, U.S. Army Corps of Engineers, Ventura, CA. Subject: Clarification to Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan.

Munz, Philip A. [1954] 2005. *A Flora of Southern California*. Berkeley: University of California Press.

Munz, Philip A., and D.D. Keck. 1949. "California Plant Communities." *El Aliso*, *2*(1): 87–105. Berkeley: University of California Press.

Page, Gary, Point Reyes Bird Observatory, Petaluma, CA. 5 June 2007. E-mail correspondence with Edward Belden, Sapphos Environmental, Inc., Pasadena, CA.

Point Reyes Bird Observatory. 2001. *Summary of Surveys for Snowy Plovers at Owens Lake in 2001*. Petaluma, CA.

Point Reyes Bird Observatory. 2002. *Summary of Surveys for Breeding Snowy Plovers and American Avocets at Owens Lake in 2002*. Petaluma, CA.

Point Reyes Bird Observatory. 2004. *Results of the 2004 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

Point Reyes Bird Observatory. 2005. *Results of the 2005 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

Point Reyes Bird Observatory. 2006. *Results of the 2006 Breeding Season Surveys for Snowy Plovers and Common Ravens at Owens Lake*. Petaluma, CA.

Roberts, Fred M., Jr. January 1989. *A Checklist of the Vascular Plants of Orange County, California*. Museum of Systematic Biology: Research Series No. 6. Irvine: University of California Press.

Ruhlen T. D., G. W. Page, and L. E. Stenzel. 2006. "Effect of a Changing Environment on Nesting Snowy Plovers at Owens Lake, California." *Western Birds*, *37*: 126–138.

Sapphos Environmental, Inc. (Ms. Irena Mendez, Mr. Edward Belden, and Mr. Jack Goldfarb) conducted field delineations on June 19, 21, and 22, 2007, using methods consistent with CDFG's *A Field Guide to Streambed Alteration Agreements and USACOE*.

Sapphos Environmental, Inc. 2002. *MFR 01, Initiation of Wildlife Monitoring at Owens Lake*. Pasadena, CA.

Sapphos Environmental, Inc. 2002. *MFR 02, Wildlife Monitoring at Owens Lake May 2002*. Pasadena, CA.

Sapphos Environmental, Inc. 2002. *MFR 03, Wildlife Monitoring at Owens Lake June 2002*. Pasadena, CA.

Sapphos Environmental, Inc. 2002. *MFR 04, Wildlife Monitoring at Owens Lake July 2002*. Pasadena, CA.

Sapphos Environmental, Inc. 21 September 2004. *Biological Resources Technical Report: Bartlett Point and Ash Point Air Quality Monitoring Stations*. Pasadena, CA.

Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento: California Native Plant Society.

Schade, T., Great Basin Unified Air Pollution Control District; B. Henderson, California Department of Fish and Game; J. Brown et al., State Lands Commission (via teleconference); and M. Campbell and E. Belden, Sapphos Environmental, Inc. 3 May 2007. Meeting.

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. June 2007. *Memorandum for Directors of Civil Works and US EPA Regional Administrators, Subject: U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps) Coordination on Jurisdictional Determinations (JDs) under the Clean Water Act (CWA) Section 404 in Light of the SWANCC and Rapanos Supreme Court Decisions*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. June 2007. *Guidance Memorandum: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

U.S. Army Corps of Engineers, Engineer Research and Development Center. December 2006. *Wetlands Regulatory Assistance Program: Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Available at: http://www.usace.army.mil/cw/cecwo/reg/inte_aridwest_sup.pdf

U.S. Army Corps of Engineers. January 1987. *Corp of Engineers Wetlands Delineation Manual*. Final Technical Report Y-87-1. Vicksburg, MS. Prepared by: Environmental Laboratory, U.S. Army Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, MS.

U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station. July 1990. "Sampling Methods for Terrestrial Amphibians and Reptiles." *General Technical Report PNW-GTR-256*. Portland, OR.

U.S. Fish and Wildlife Service. 2006. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties*. Portland, Oregon.

U.S. Fish and Wildlife Service. August 1986 (Revised 1995). *National Wetlands Inventory Map, Tylerhorse Canyon, California*. Available at: http://wetlandsfws.er.usgs.gov/NWI/index.html

U.S. Fish and Wildlife Service. Last updated 21 March 2006. *National Wetlands Inventory*. Portland, OR. Available at: http://www.fws.gov/nwi

U.S. Geological Survey. 1982. *7.5-Minute Series Union Wash, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1982. *7.5-Minute Series Upper Centennial Flat, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Bartlett, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Centennial Canyon, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Dolomite, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Keeler, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series New York Butte, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Owens Lake, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1988. *7.5-Minute Series Cirque Peak, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1988. *7.5-Minute Series Templeton Mountain, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1993. *7.5-Minute Series Mt. Langley, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1994. *7.5-Minute Series Haiwee Pass, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1994. *7.5-Minute Series Haiwee Reservoirs, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1994. *7.5-Minute Series Lone Pine, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1994. *7.5-Minute Series Olancha, California, Topographic Quadrangle*. Denver, CO.

U.S. Supreme Court. 19 June 2006. *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers*. No. 126 S. Ct. 2208.

U.S. Supreme Court. 9 January 2001. *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*. No. 99–1178, 531 U.S. 159.

Walker, George, U.S. Department of the Interior, Fish and Wildlife Service, Barstow, CA. 2 October 2002. Personal communication with Sapphos Environmental, Inc., Pasadena, CA.

Wong, Darrel, State of California, The Resources Agency, Department of Fish and Game, Bishop, CA. 2 October 2002. Personal communication with Sapphos Environmental, Inc., Pasadena, CA.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1989. *California's Wildlife, Volume I: Amphibians and Reptiles*. Sacramento: California Department of Fish and Game.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. *California's Wildlife, Volume II: Birds*. Sacramento: California Department of Fish and Game.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. *California's Wildlife, Volume III: Mammals*. Sacramento: California Department of Fish and Game.

APPENDIX A
FLORAL AND FAUNAL COMPENDIUM

APPENDIX A
FLORAL COMPENDIUM

Technical note: Family delineations here follow the current Angiosperm Phylogeny Group II descriptions,[1] rather than the families given in the Jepson Manual.[2] The difference here is the merging of the Capparaceae into the Brassicaceae.

All plants listed were observed on site during surveys during spring 2007.

Non-native species are indicated by an asterisk (*).

AIZOACEAE – FIG MARIGOLD FAMILY

- *Sesuvium verrucosum*
  - sea purslane

ASTERACEAE – COMPOSITE FAMILY

- **Lactuca serriola*
  - prickly lettuce
- *Solidago spectabilis*
  - Nevada goldenrod

BORAGINACEAE - BORAGE FAMILY

- *Heliotropium curassavicum*
  - wild heliotrope

BRASSICACEAE – MUSTARD FAMILY

(Includes old Capparaceae)

- *Cleomella obtusifolia*
  - Mojave stinkweed
- *Lepidium* prob. *virginicum*
  - Virginia pepperweed

CHENOPODIACEAE – GOOSEFOOT FAMILY

- *Atriplex confertifolia*
  - shadscale
- *Atriplex parryi*
  - Parry's saltbush
- **Atriplex rosea*
  - tumbling oracle
- *Nitrophila occidentalis*
  - alkali pink
- *Sarcobatus vermiculatus*
  - greasewood
- *Suaeda moquinii*
  - bush seepweed

---

[1] Stevens, P.F. 2006. May 2006. Web site. "Angiosperm Phylogeny. Version 7." Available at http://www.mobot.org/MOBOT/research/APweb/.

[2] Hickman, J.C. 1993. *The Jepson Manual.* Berkeley, CA: University of California Press.

CYPERACEAE – SEDGE FAMILY

Schoenoplectus prob. *americanus*
bulrush
Schoenoplectus pungens
common three-square

JUNCACEAE – RUSH FAMILY

Juncus balticus
Baltic rush

JUNCAGINACEAE – ARROW-GRASS FAMILY

Triglochin concinna var. *debilis*
Arrow-grass

POACEAE – GRASS FAMILY

Distichlis spicata
saltgrass
Festuca sp.
fescue
Hordeum jubatum
foxtail barley
**Polypogon monspeliensis*
rabbit's foot grass

TAMARICACEAE – TAMARISK FAMILY

**Tamarix* spp.
salt cedar

APPENDIX A
FAUNAL COMPENDIUM

Species observed within the area of the proposed project site are indicated by a plus sign (+). Special status species observed outside of the supplemental DCM areas are indicated by a number sign (#). Non-native species are indicated by an asterisk (*).

TERRESTRIAL INSECTS

CICINDELIDAE – TIGER BEETLES

Cicindela tranquebarica inyo
Owens Valley tiger beetle
Cicindela willistoni pseudosenilis
alkali flats tiger beetle
Cicindela tenuicincta
slender-girdled tiger beetle

TERRESTRIAL VERTEBRATES

REPTILES

RANIDAE – TRUE FROGS

Lithobates catesbeianus
bullfrog

TESTUDINIDAE – LAND TORTOISES

Gopherus agassizii
Desert tortoise

IGUANIDAE - IGUANID LIZARDS

Dipsosaurus dorsalis+
desert iguana

CROTAPHYTIDAE - COLLARED AND LEOPARD LIZARDS

*Gambelia wislizeni*i
long-nosed leopard lizard

PHRYNOSOMATIDAE

Callisaurus draconoides+
zebra-tailed lizard
Phrynosoma platyrhinos
Desert horned lizard
Sceloporus magister+
Desert spiny lizard
Uta stansburiana+
common side-blotched lizard

TEIIDAE - WHIPTAIL LIZARDS

Aspidoscelis tigris+
Western whiptail

COLUBRIDAE - COLUBRID SNAKES

Lampropeltis getula
California kingsnake
Masticophis flagellum
Red coachwhip
Pituophis catenifer
Gopher snake

VIPERIDAE - VIPERS

Crotalus cerastes
*S*idewinder

BIRDS

PODICIPEDIDAE – GREBES

Podiceps nigricollis+
eared grebe

PHALACROCORACIDAE – CORMORANTS

Phalacrocorax auritus+#
double-crested cormorant

ANATIDAE - WATERFOWL

Anser albifrons
greater white-fronted goose
Anas americana
American widgeon
Anas strepera+
gadwall
Anas platyrhynchos+
mallard
Anas crecca+
green-winged teal
Anas cyanoptera+
cinnamon teal
Anas clypeata+
northern shoveler
Oxyura jamaicensis+
ruddy duck

ARDEIDAE - HERONS

Ardea herodias+
great blue heron
Ardea alba+
great egret
Butorides virescens
green heron
Botaurus lentiginosus
American bittern

THRESKIORNITHIDAE – IBISES AND SPOONBILLS

Plegadis chihi+#
White-faced Ibis

ACCIPITRIDAE - HAWKS

Circus cyaneus+
northern harrier
Buteo jamaicensis+
red-tailed hawk
Aquila chrysaetos+#
golden eagle

FALCONIDAE - FALCONS

Falco sparverius+
American kestrel
Falco peregrinus+
peregrine falcon
Falco mexicanus+
prairie falcon

RALLIDAE - RAILS AND GALLINULES

Rallus limicola+
Virginia rail
Porzana carolina+
sora
Fulica americana+
American coot

RECURVIROSTRIDAE – AVOCETS AND STILTS

Himantopus mexicanus+
black-necked stilt
Recurvirostra Americana+
American avocet

CHARADRIIDAE - PLOVERS

Charadrius vociferus+
killdeer
Charadrius alexandrinus nivosus+
western snowy plover

SCOLOPACIDAE - SANDPIPERS

- *Calidris alpine*
  - dunlin
- *Calidris minutilla*
  - least sandpiper
- *Calidris mauri*
  - western sandpiper
- *Catoptrophorus semipalmatus*
  - willet
- *Tringa melanoleuca*
  - greater yellowlegs
- *Numenius americanus*+#
  - long-billed curlew
- *Gallinago delicata*
  - Wilson's snipe
- *Phalaropus tricolor*+
  - Wilson's phalarope

LARINAE – GULLS

- *Larus californicus*+#
  - California gull
- *Larus Philadelphia*
  - Bonaparte's gull

COLUMBIDAE - PIGEONS AND DOVES

- *Streptopelia decaocto*+
  - Eurasian collared-dove
- *Zenaida asiatica*+
  - white-winged dove
- *Zenaida macroura*+
  - mourning dove

STRIGIDAE - TRUE OWLS

- *Bubo virginianus*
  - great horned owl

CAPRIMULGIDAE - GOATSUCKERS

- *Chordeiles acutipennis*+
  - lesser nighthawk

PICIDAE - WOODPECKERS

- *Colaptes auratus*+
  - northern flicker
- *Picoides nuttallii*
  - Nuttall's woodpecker

TYRANNIDAE - TYRANT FLYCATCHERS

Sayornis nigricans
black phoebe
Sayornis saya+
Say's phoebe
Tyrannus verticalis+
western kingbird

LANIIDAE - SHRIKES

Lanius ludovicianus+#
loggerhead shrike

CORVIDAE - JAYS AND CROWS

Corvus corax+
common raven
Pica hudsonia
black-billed magpie

ALAUDIDAE - LARKS

Eremophila alpestris+
horned lark

HIRUNDINIDAE - SWALLOWS

Tachycineta bicolor
tree swallow
Hirundo pyrrhonota+
cliff swallow
Hirundo rustica+
barn swallow

AEGITHALIDAE – BUSHTITS

Psaltriparus minimus
bushtit

TROGLODYTIDAE - WRENS

Thryomanes bewickii
Bewick's wren
Cistothorus palustris+
marsh wren

TURDIDAE - THRUSHES

Sialia currucoides+
mountain bluebird

MIMIDAE - THRASHERS

Mimus polyglottos
northern mockingbird
Toxostoma lecontei
Le Conte's thrasher

STURNIDAE - STARLINGS

**Sturnus vulgaris*+
European starling

MOTACILLIDAE - PIPITS

Anthus rubescens+
American pipit

PARULIDAE - WOOD WARBLERS

Dendroica coronata
yellow-rumped warbler
Geothlypis trichas+
common yellowthroat

EMBERIZIDAE - BUNTINGS AND SPARROWS

Amphispiza belli+#
sage sparrow
Passerculus sandwichenis+
savannah sparrow
Melospiza melodia+
song sparrow
Melospiza lincolnii
Lincoln sparrow
Zonotrichia leuchophrys+
white-crowned sparrow

ICTERIDAE - BLACKBIRDS AND ORIOLES

Agelaius phoeniceus+
red-winged blackbird
Sturnella neglecta+
western meadowlark
Xanthocephalus xanthocephalus+
yellow-headed blackbird
Euphagus cyanocephalus+
Brewer's blackbird
Icterus bullockii+
Bullock's oriole

FRINGILLIDAE - FINCHES

Carpodacus mexicanus+
house finch
Carduelis psaltria+
lesser goldfinch

PASSERIDAE - OLD WORLD SPARROWS

**Passer domesticus*+
house sparrow

MAMMALS

VESPERTILIONIDAE - VESPER BATS

Antrozous pallidus
pallid bat
Corynorhinus townsendii
Townsend's big-eared bat
Eptesicus fuscus
big brown bat
Euderma maculatum
spotted bat
Lasionycteris noctivagans
silver-haired bat
Lasiurus blossevillii
western red bat
Lasiurus cinereus
hoary bat
Myotis yumanensis
Yuma myotis
Myotis evotis
long-eared myotis
Myotis thysanodes
fringed myotis
Myotis volans
long-legged myotis
Myotis californicus
California myotis
Myotis ciliolabrum
small-footed myotis
Pipistrellus hesperus
western pipistrelle
Tadarida brasiliensis
free-tailed bat

MOLOSSIDAE - FREE-TAILED BATS

Tadarida brasiliensis
Mexican free-tailed bat
Eumops perotis
western mastiff bat

LEPORIDAE - HARES AND RABBITS

Sylvilagus audubonii+
desert cottontail
Lepus californicus+
black-tailed jackrabbit

SCIURIDAE - SQUIRRELS

Ammospermophilus leucurus+
white-tailed antelope squirrel
Spermophilus beecheyi+
California ground squirrel
Spermophilus mohavensis
Mohave ground squirrel

GEOMYIDAE

Thomomys bottae operarius
Owens pocket gopher
Thomomys bottae perpes
pocket gopher

HETEROMYIDAE - POCKET MICE AND KANGAROO RATS

Chaetodipus formosus mohavensis
long-tailed pocket mouse
Dipodomys merriami+
Merriam's kangaroo rat
Dipodomys microps+
chisel-toothed kangaroo rat
Dipodomys panamintinus+
Panamint kangaroo rat
Dipodomys deserti deserti
desert kangaroo rat
Perognathus longimembris+
little pocket mouse

CASTORIDAE – BEAVER

Castor canadensis
beaver

MURIDAE - MICE, RATS, AND VOLES

Reithrodontomys megalotis+
western harvest mouse
Peromyscus maniculatus+
deer mouse
Peromyscus crinitus stephensi
canyon mouse
Peromyscus boylii rowleyi
brush mouse
Onychomys torridus clarus
southern grasshopper mouse
Neotoma lepida lepida
desert woodrat
Microtus californicus vallicola
Owens Valley vole

MURIDAE – MICE

Mus musculus
house mouse

CANIDAE - WOLVES AND FOXES

Canis latrans+
coyote
Urocyon cinereoargenteus
grey fox
Vulpes vulpes
red fox
Vulpes macrotis
kit fox

PROCYONIDAE – RACOON

Bassariscus astutus nevadensis
ringtail
Procyon lotor
racoon

MUSTELIDAE - WEASELS, SKUNKS, AND OTTERS

Mustela frenata inyoensis
Inyo long-tailed weasel
Taxidea taxus
American badger
Mephitis mephitis occidentalis
striped skunk
Spilogale putorius gracilis
western spotted skunk

FELIDAE – CATS

Lynx rufus baileyi
bobcat

CERVIDAE - DEERS

Cervus elaphus nanodes
Tule elk
Odocoileus hemionus+
mule deer

APPENDIX B
JURISDICTIONAL CHARACTERIZATION REPORT

APPENDIX B
JURISDICTIONAL CHARACTERIZATION REPORT

SUMMARY

This Jurisdictional Characterization Report was prepared to fully characterize the proposed supplemental dust control areas for the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (proposed project) site with respect to existing wetlands potentially under the jurisdiction of the U.S. Army Corps of Engineers (USACOE) or the California Department of Fish and Game (CDFG) as well as potential impacts to jurisdictional areas in light of planning and regulatory statutes and guidelines.

As a result of reviewing aerial imagery, previously prepared wetlands delineations, field investigations, and coordination with the USACOE and the CDFG, seven areas have been identified as containing wetland habitats comprised of vegetated wetlands, spring/seeps, or stream channels potentially under the jurisdiction of the USACOE or the CDFG within the proposed project site. These areas range in size from 9 acres south of the Rio Tinto Minerals (formerly U.S. Borax) facility to 439 acres along Cartago Creek. As a result of the review of the National Wetland Inventory, lacustrine wetlands have also been identified as potentially subject to CDFG jurisdiction. Lacustrine wetlands comprised of barren lake bed range in size from 0.21 acre for areas designated as lacustrine, littoral, unconsolidated shore, artificially flooded, excavated (L2USKx) to 7,062.2 acres for areas designated as lacustrine, littoral, unconsolidated shore, seasonally flooded (L2USC).

The characterization of areas potentially under the jurisdiction of the USACOE and CDFG was based on the presence of hydrological features, a defined bed and bank, and wetlands vegetation. The characterization was performed on June 19, 21, and 22, 2007. Of the seven potential wetland areas, four areas constituting 393.2 total acres are subject to USACOE jurisdiction pursuant to Section 404 and Section 401 of the Clean Water Act (Figure 1, *Jurisdictional Waters of the United States Analysis*). Six areas constituting 411.8 total acres of vegetated wetlands, springs/seeps or stream channels are subject to CDFG jurisdiction pursuant to Section 1600 of the State Fish and Game Code (Figure 2, *Jurisdictional Waters of the State Analysis*). Based on the review of the National Wetland Inventory, in addition to vegetated wetlands, springs/seeps, and stream channels, there are an estimated 8,340.43 acres of lake bed, designated as lacustrine wetlands subject to CDFG jurisdiction pursuant to Section 1600 of the State Fish and Game Code.[1]

METHODS

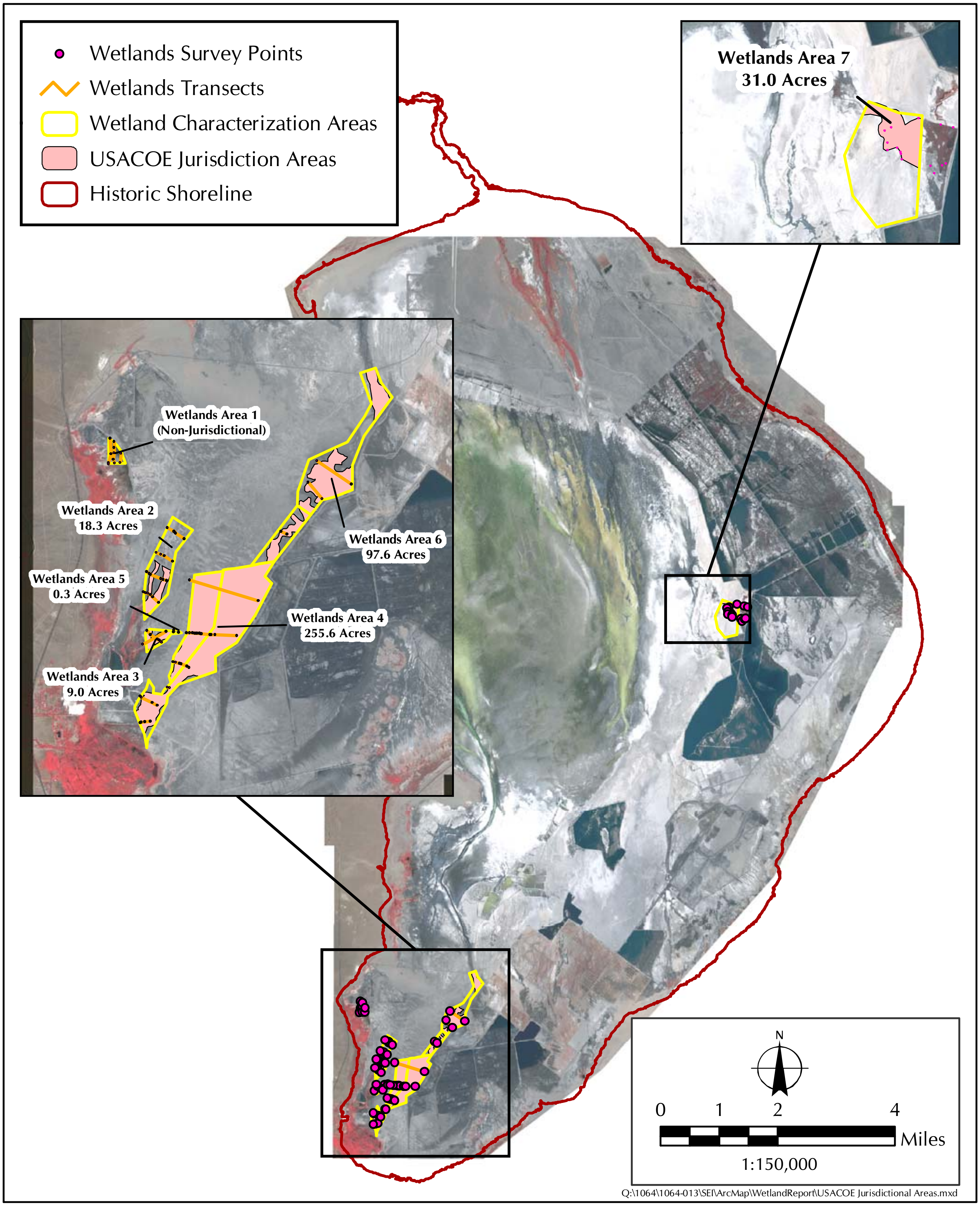
The purpose of this work effort was to determine the presence or absence, within the proposed project site, of areas potentially under the jurisdiction of USACOE and CDFG jurisdiction.

Federal Jurisdictional Wetlands

The purpose of the investigation was to determine the presence or absence of wetlands afforded protection pursuant to Section 404 of the Clean Water Act within the proposed project site.

---

[1] The estimate of CDFG lake bed jurisdiction is based on the National Wetland Inventory broad-scale mapping of lacustrine wetlands. The acres of lacustrine wetlands may change based on a more detailed examination.



Q:\1064\1064-013\SEI\ArcMap\WetlandReport\USACOE Jurisdictional Areas.mxd

FIGURE 1

Jurisdictional Waters of the United States Analysis

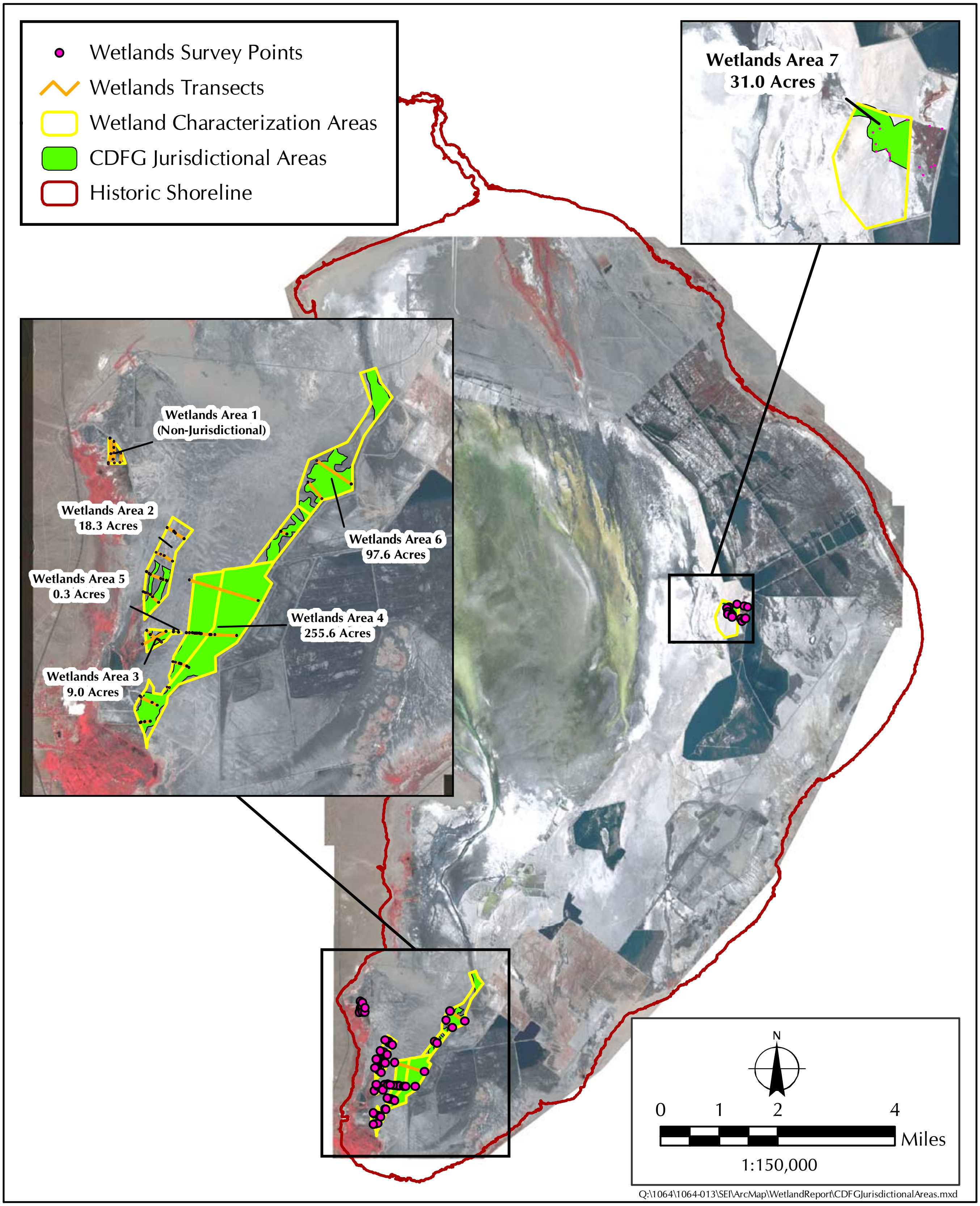


FIGURE 2

CDFG Jurisdictional Waters Analysis

The determination of presence or absence of federally protected wetlands, as defined in Section 404 of the Clean Water Act, conforms to the protocols specified in the *Corps of Engineers Wetlands Delineation Manual*,[2] as modified by the U.S. Supreme Court case, *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99-1178 (January 9, 2001)[3] and guidance following the U.S. Supreme Court case, *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers* (2006).[4] The determination regarding the potential presence or absence of federally protected wetlands included review of topographic maps and National Wetlands Inventory maps, interpretation of aerial photographs, spatial analysis using geographic information system (GIS), plant community mapping, field analysis, and coordination with the USACOE. The scope of the impact analysis considers the potential for the proposed project to result in direct, indirect, or cumulative impacts through direct removal, filling, hydrological interruption, or other means.

The proposed project site is located in an isolated inland basin; therefore, the legal ruling in the Supreme Court decision of the *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, No. 99-1178 (January 9, 2001) case was taken into consideration. The Solid Waste Agency of Northern Cook County (SWANCC) decision limited USACOE jurisdiction of non-navigable, isolated, and intrastate waters. In this decision, the Supreme Court struck down the Migratory Bird Rule, ruling that the USACOE did not have authority under Section 404 over the isolated wetlands on SWANCC's property based on their use as habitat by migratory birds. However, the Supreme Court did not strike down any of the regulations implementing Section 404 or alter the definition of "waters of the United States." Rather, the Supreme Court concluded that the USACOE could regulate isolated wetlands only if the wetlands had some connection to interstate commerce other than their use by migratory birds.

The proposed project contains areas that may be considered isolated wetlands; therefore, the *Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers* (2006) ruling was taken into consideration. The USACOE and U.S. Environmental Protection Agency (EPA) have issued joint memorandums regarding interpretation of wetlands in light of these cases.[5,6] The guidance memorandum ensures that agencies will continue to assert jurisdiction over traditional navigable waters (TNWs) and all wetlands adjacent to TNWs. Under the Supreme Court decision, jurisdiction can be asserted over a water, including wetlands, that is not a TNW by meeting either of the following two standards:[7]

---

[2] U.S. Army Corps of Engineers. January 1987. *Corp of Engineers Wetlands Delineation Manual*. Final Technical Report Y-87-1. Vicksburg, MS. Prepared by: Environmental Laboratory, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

[3] U.S. Supreme Court. 9 January 2001. *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*. No. 99-1178, 531 U.S. 159.

[4] U.S. Supreme Court. 19 June 2006. *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers*. No. 126 S. Ct. 2208.

[5] U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency. June 2007. *Memorandum for Directors of Civil Works and US EPA Regional Administrators*. Subject: U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps) Coordination on Jurisdictional Determinations (JDs) under the Clean Water Act (CWA) Section 404 in Light of the SWANCC and Rapanos Supreme Court Decisions. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

[6] U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency. June 2007. *Guidance Memorandum: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

[7] U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency. June 2007. *Guidance Memorandum: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. Washington, DC. Available at: http://www.usace.army.mil/cw/cecwo/reg/cwa_guide/cwa_guide.htm

- The first standard, based on the plurality opinion in the decision, recognizes regulatory jurisdiction over a water body that is not a TNW if that water body is "relatively permanent" [i.e., it flows year-round, or at least "seasonally," and over wetlands adjacent to such water bodies if the wetlands "directly abut" the water body (i.e., if the wetlands are not separated from the water body by an upland feature such as a berm, dike, or road)]. As a matter of policy, field staff will include, in the record, any available information that documents the existence of a significant nexus between a relatively permanent water body that is not perennial and a TNW.

- The second standard, for tributaries that are not relatively permanent, is based on the concurring opinion of Justice Anthony P. Kennedy, and requires a case-by-case "significant nexus" analysis to determine whether waters and their adjacent wetlands are jurisdictional. A "significant nexus" may be found where waters, including adjacent wetlands, affect the chemical, physical or biological integrity of TNWs. Factors to be considered in the "significant nexus" evaluation include:

    - The flow characteristics and functions of the tributary itself in combination with the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of TNWs.
    - The consideration of hydrologic factors including, but not limited to, the following:
        - Volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary
        - Proximity to the traditional navigable water
        - Size of the watershed
        - Average annual rainfall
        - Average annual winter snow pack

    - The consideration of ecologic factors including, but not limited to, the following:
        - The ability for tributaries to carry pollutants and flood waters to TNWs
        - The ability of a tributary to provide aquatic habitat that supports a traditional navigable water
        - The ability of wetlands to trap and filter pollutants or store flood waters
        - Maintenance of water quality

The first step in the assessment was to determine if there were blue-line drainages, streams, lakes, wetlands, or navigable water bodies present within the study area. The map review included the 1:24,000 series U.S. Geological Survey (USGS) topographic maps for the following quadrangles: Bartlett,[8] Vermillion Canyon,[9] Owens Lake,[10] Keeler,[11] Dolomite,[12] Lone Pine,[13] and Olancha.[14] The

---

[8] U.S. Geological Survey. 1987. 7.5-Minute Series Bartlett, CA, Topographic Quadrangle. Denver, CO.

[9] U.S. Geological Survey. 1987. 7.5-Minute Series Vermillion Canyon, CA, Topographic Quadrangle. Denver, CO.

[10] U.S. Geological Survey. 1987. 7.5-Minute Series Owens Lake, CA, Topographic Quadrangle. Denver, CO.

project boundary was geo-referenced using ArcGIS and superimposed on 24,000-scale USGS topographic quadrangles. All drainages on the topographic quadrangles within the project boundary were mapped. The digitized version of the drainage map was provided to the project planning team in an effort to avoid these areas to the maximum extent practicable. The project proponent provided the locations of the proposed project elements, including dust control areas and roadways. Using ArcGIS, the proposed project elements were superimposed on the drainage system to determine the areas requiring characterization.

The proposed project site was determined to be characterized by drainages potentially meeting the definition of "wetlands adjacent to traditional navigable waters," "isolated," "non-navigable tributaries," and "wetlands adjacent to non-navigable tributaries" by reviewing the 24,000-scale topographic map and aerial imagery, and noting that the region is characterized by small and larger alluvial fans. Many of the alluvial fans dissipate water to small relatively shallow channels that are not well defined. The channels change on a yearly basis and although deposition occurs, the fans are rapidly permeable and do not convey much water except in large storm events. Other potential jurisdictional areas include spring feed outflow channels, and springs. Only portions of the areas contained evidence of above-ground connection with the existing brine pool previously delineated in June 1994 in conjunction with the proposed Owens Lake Soda Ash Company Soda Ash Mining and Processing Project and determined to be under the jurisdiction of the USACOE based on an ordinary high water mark of 3,553.55 feet. The investigation then proceeded on a systematic course to determine if there were any wetlands or connections to wetlands that are potentially subject to Section 404 of the Clean Water Act by examining the evolution and terminus of each drainage, and the potential for interstate commerce, including recreation and industry. The potential connection to a federally protected wetland was determined by mapping the terminus of drainages that crossed the study area.

The second step in the assessment was to map potential wetlands identified on the National Wetlands Inventory.[15] National Wetlands Inventory sites comprised of vegetated wetlands, spring/seeps, or stream channels were digitized and provided to the project planning team to ensure that these sites would be avoided by construction, operation, and maintenance of the proposed project.

The third step in the assessment process was to review the 1:12,000 (1 inch equals 1,000 feet) aerial imagery and color-infrared imagery for signatures that suggested the potential presence of aquatic or riparian vegetation, as part of the more comprehensive plant community mapping that was undertaken for the study area. The aerial imagery was flown on June 1, 2006 with a spatial resolution of 1 meter (3 feet). The imagery product used was derived from the IKONOS satellite sensor and was not radiometrically corrected.

The fourth step in the assessment involved field surveys to make two determinations: (1) presence or absence of potential waters of the United States not evident on the National Wetlands Inventory or USGS maps, and (2) site-specific investigation of each of the potential seven wetland areas to assess the presence or absence of aquatic, wetland, or riparian vegetation (Figure 3, *Jurisdictional*

---

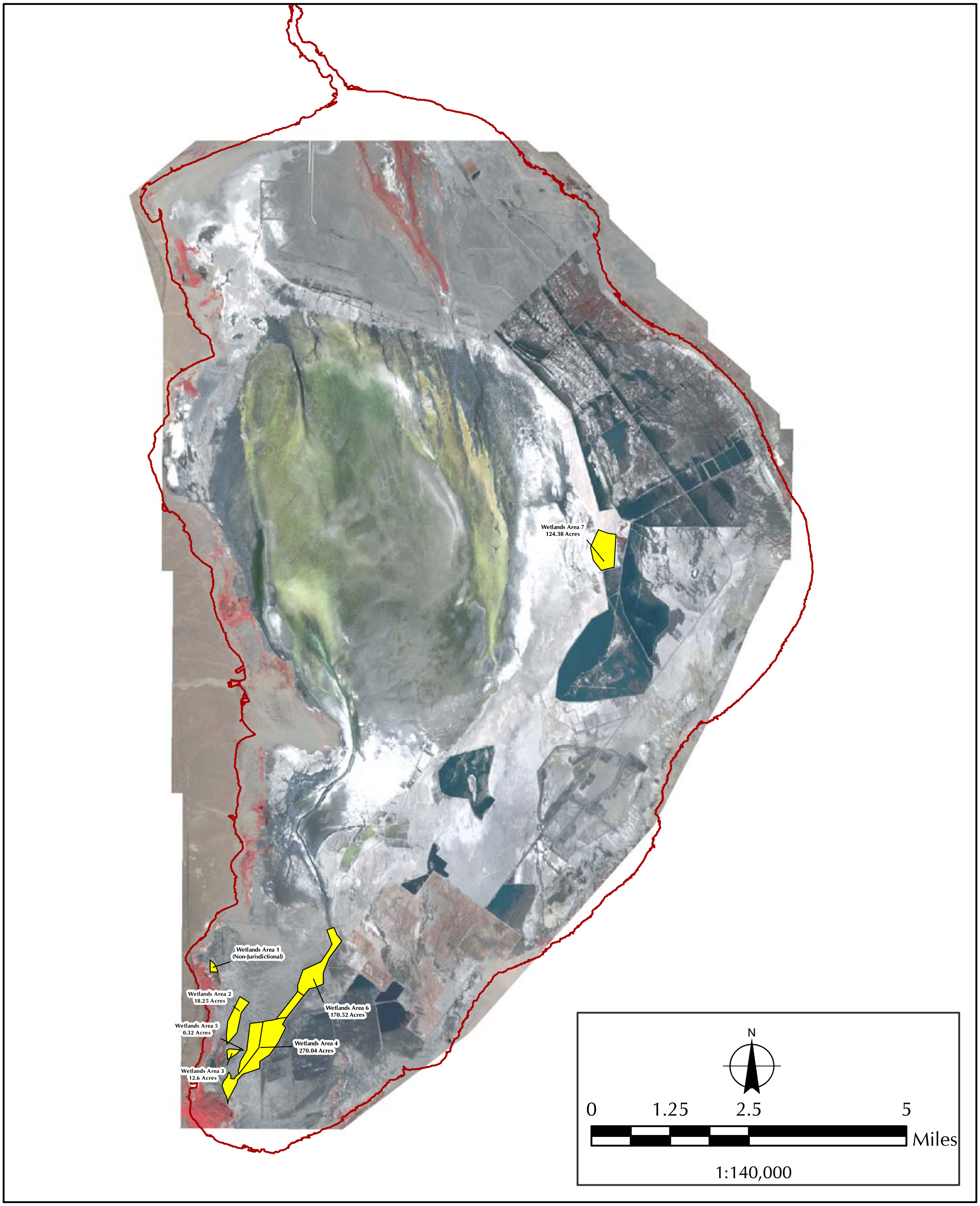
[11] U.S. Geological Survey. 1987. 7.5-Minute Series Keeler, CA, Topographic Quadrangle. Denver, CO.

[12] U.S. Geological Survey. 1987. 7.5-Minute Series Dolomite, CA, Topographic Quadrangle. Denver, CO.

[13] U.S. Geological Survey. 1994. 7.5-Minute Series Lone Pine, CA, Topographic Quadrangle. Denver, CO.

[14] U.S. Geological Survey. 1994. 7.5-Minute Series Olancha, CA, Topographic quadrangle. Denver, CO.

[15] U.S. Fish and Wildlife Service. Updated 21 March 2006. *National Wetlands Inventory*. Portland, OR. Available at: http://www.fws.gov/nwi/



🟨 Survey Areas

▢ Historic Shoreline

FIGURE 3
Jurisdictional Survey Areas

Survey Area). The field team was supervised by a certified wetland delineator that assisted in conducting the field investigations.[16] All areas identified from the aerial imagery as having a signature that potentially denotes riparian or aquatic vegetation were investigated in the field.

Finally, the results of the determination of presence or absence of federally protected wetlands were documented in a letter and transmitted to the USACOE.[17],[18]

Delineation of Areas Subject to the State Fish and Game Code

The first step in the assessment process involved a literature and map review of the following:

- U.S. Geological Survey (USGS) 7.5-minute series Bartlett,[19] Vermillion Canyon,[20] Owens Lake,[21] Keeler,[22] Dolomite,[23] Lone Pine,[24] and Olancha[25] topographic quadrangle maps
- U.S. Department of Interior Fish and Wildlife Service National Wetlands Inventory maps for the Bartlett, Vermillion Canyon, Owens Lake, Keeler, Dolomite, Lone Pine, and Olancha topographic quadrangle[26]
- Soil Survey Maps[27]
- *A Field Guide to Lake and Streambed Alteration Agreements*[28]
- Land Use element of the *Inyo County General Plan*[29]
- State of California Regional Water Quality Control Board Basin Plan for the Lahontan Region[30]

---

[16] Sapphos Environmental, Inc. (Ms. Irena Mendez, Mr. Edward Belden, and Mr. Jack Goldfarb) conducted field delineations on June 19, 21, and 22, 2007, using methods consistent with CDFG's *A Field Guide to Streambed Alteration Agreements* and with the USACOE.

[17] Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. August 2007. Letter to Mr. Bruce Henderson, U.S. Army Corps of Engineers, Ventura, CA. Subject: Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan.

[18] Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. 7 September 2007. Letter to Mr. Bruce Henderson, U.S. Army Corps of Engineers, Ventura, CA. Subject: Clarification to Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan.

[19] U.S. Geological Survey. 1987. 7.5-Minute Series Bartlett, CA, Topographic Quadrangle. Denver, CO.

[20] U.S. Geological Survey. 1987. 7.5-Minute Series Vermillion Canyon, CA, Topographic Quadrangle. Denver, CO.

[21] U.S. Geological Survey. 1987. 7.5-Minute Series Owens Lake, CA, Topographic Quadrangle. Denver, CO.

[22] U.S. Geological Survey. 1987. 7.5-Minute Series Keeler, CA, Topographic Quadrangle. Denver, CO.

[23] U.S. Geological Survey. 1987. 7.5-Minute Series Dolomite, CA, Topographic Quadrangle. Denver, CO.

[24] U.S. Geological Survey. 1994. 7.5-Minute Series Lone Pine, CA, Topographic Quadrangle. Denver, CO.

[25] U.S. Geological Survey. 1994. 7.5-Minute Series Olancha, CA, Topographic quadrangle. Denver, CO.

[26] U.S. Fish and Wildlife Service. August 1986 (Revised 1995). *National Wetlands Inventory Map, Bartlett, Vermillion Canyon, Owens Lake, Keller, Dolomite, Lone Pine, Olancha, California*. Available at: http://wetlandsfws.er.usgs.gov/NWI/index.html

[27] City of Los Angeles Department of Water and Power. May 2004. Owens Lake Dust Mitigation Project Phase IV Inyo County. Prepared by: CH2M HILL, Santa Ana, CA.

[28] California Department of Fish and Game, Environmental Services Division. 1994. *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600–1607, California Fish and Game Code*. Sacramento, CA.

[29] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

- National Flood Insurance Program Flood Insurance Rate Maps for Inyo County[31]
- Aerial photograph of the proposed project site (1 inch equals 1,000 feet)
- Topographic map of the proposed project site (1 inch equals 1,000 feet)

These resources were analyzed to determine the presence of blue-line drainages, including the presence of drainages/isolated washes and intermittently flooded features, associated riparian vegetation as well as barren lake bed. Utilizing GIS software (ESRI ArcGIS, Version 9.1), the total length of each drainage feature within the proposed project site was determined in order to locate the potential presence of features subject to CDFG jurisdiction pursuant to Section 1600 of the State Fish and Game Code. In addition, locations of proposed project elements (i.e., dust control areas and roads) were plotted on 1:12,000 (1 inch equals 1,000 feet) aerial photographs, as well as saved as GIS layers for use in a global positioning system (GPS) with sub-meter accuracy (Trimble GPS Pro-XT) for use in the field. A total of seven wetland areas were evaluated and numbered on 1:12,000 (1 inch equals 1,000 feet) aerial images.

Sapphos Environmental, Inc. (Dr. Irena Mendez, Mr. Edward Belden, and Mr. Jack Goldfarb) conducted field surveys of the seven wetland areas on June 19, 21 and 22, 2007 using methods consistent with CDFG's *A Field Guide to Streambed Alteration Agreements*.[32] Each wetland area was located utilizing GPS and aerial photographs. Once located, transects were established across the wetland areas to characterize physical features and collect qualitative data for each site, utilizing standard data sheets (Attachment 1, *Data Sheets*). All wetland areas were inspected for the presence of a channel, defined bed and bank, and associated riparian vegetation. The beginning and end of the wetland areas was recorded utilizing GPS. For each potential wetland feature, captured data included, but was not limited to, type of vegetation present, presence of defined water flow area, presence of polygonal cracking, ordinary high water mark (OHWM), water stains, riparian or desert wash associated vegetation, or other indicators of directed/channelized water flow.

Photographs were taken to document each potential drainage feature. Measurement and photograph sites for each potential drainage feature were located on a 1:12,000 (1 inch equals 1,000 feet) scale topographic map. All observations were recorded in field notes (Attachment 1). Areas potentially requiring a Streambed Alteration Agreement from the CDFG were calculated using GPS data in addition to aerial photos, which were scanned and rectified for use in GIS-based calculations.

RESULTS

Literature Review

As a result of a comprehensive literature review, including previously completed jurisdictional delineations,[33] seven potential wetland areas were identified within the proposed project area. A

---

[30] California Regional Water Quality Control Board, Lahontan Region. 1995. *Water Quality Control Plan for the Lahontan Region; North and South Basins*. South Lake Tahoe, CA.

[31] Federal Emergency Management Agency. 1986. *Flood Insurance Rate Map, Inyo County, California*; Map Number 0600731275C and 0600731475C, Effective 1986. Washington, DC.

[32] California Department of Fish and Game, Environmental Services Division. 1994. *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600–1607, California Fish and Game Code*. Sacramento, CA.

[33] Great Basin Unified Air Pollution Control District. April 1996. *Delineation of the Waters of the United States for the Owens Lake Playa*. Prepared for: U.S. Army Corps of Engineers. Prepared by: Jones & Stokes Associates, Sacramento, CA.

total of seven sites were identified as areas of potential impact to waters of United States pursuant to the Clean Water Act Section 404, and the State, pursuant to Section 1600 of the State Fish and Game Code. These seven sites correspond to areas where the proposed dust control areas intersect wetland features or wetland vegetation.

A review of the National Wetlands Inventory (Figure 4, *National Wetlands Inventory Areas*) indicated that there are 15.45 acres of wetlands designated on the National Wetlands Inventory as vegetated wetlands, spring/seeps, or stream channels within the proposed project study area. Of these 15.45 acres, 4.8 acres were determined to be under the jurisdiction of the Corps. In addition, the review identified 8,340.43 acres of barren lake bed designated by the National Wetland Inventory as lacustrine wetlands. Pursuant to coordination with the CDFG, lacustrine wetlands were considered as likely CDFG jurisdictional areas subject to a final determination of jurisdiction by the CDFG.

Cartago Creek is the only named blue-line stream feeding into the proposed project area on the Olancha Quad.[34] Of the seven wetland areas characterized, two were associated with Cartago Creek and its tributaries. Another wetland area was associated with an unnamed spring that is commonly known as Sulfate Well, mapped on the Owens Lake Quad.[35] The remaining four unnamed drainages are adjacent to Cartago Creek, but located north of the Cartago Creek outflow.

Groundwater

The proposed project study area is located within the jurisdiction of the Regional Water Quality Control Board (RWQCB), Lahontan Region.[36] The hydrologic balance of the groundwater basin underlying the study area is characterized by the inflows from precipitation, surface flows, and subsurface flows; and outflows from evaporation, evapotranspiration, spring and seep flows, surface water diversion, and withdrawal from pumping.

Investigations performed by the USGS in Owens Valley north of Owens Lake have shown that the general trend of groundwater flow is toward the center of the valley and to the south.[23] Subsurface flows to the Owens Lake basin from the north are estimated to range between approximately 5,000 and 20,000 ac-ft/yr. Groundwater recharge occurs from either snowmelt or rain from the mountains and ephemeral streams. Estimates of groundwater recharge volumes from these components range from 5,400 to 13,000 acre-feet per year (ac-ft/yr).[24, 25, 26]

---

[34] U.S. Geological Survey. 1994. 7.5-Minute Series Olancha, CA, Topographic quadrangle. Denver, CO.

[35] U.S. Geological Survey. 1987. 7.5-Minute Series Owens Lake, CA, Topographic Quadrangle. Denver, CO.

[36] California Regional Water Quality Control Board, Lahontan Region. 1995. *Water Quality Control Plan for the Lahontan Region; North and South Basins*. South Lake Tahoe, CA.

[23] K. Hollett, W. Danskin, W. McCaffrey, and G. Walti. 1991. *Geology and Water Resources of Owens Valley, California*. United States Geological Survey Water Supply Paper 2370-B. Contact: U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225.

[24] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[25] B.W. Schultz. 1996. *Evaluation of Change in Wetlands at Owens Lake Playa between 1977 and 1992 Using MSS Satellite Imagery and Color Infrared Photography*. Desert Research Institute, Publication No. 41154. Draft Report Submitted to Great Basin Unified Air Pollution Control District. Contact: 2215 Raggio Parkway, Reno, NV 89512.

[26] M. Wirganowicz. 1997. *Numerical Simulation of the Owens Lake Groundwater Basin, California*. Unpublished Thesis. University of Nevada, Reno.

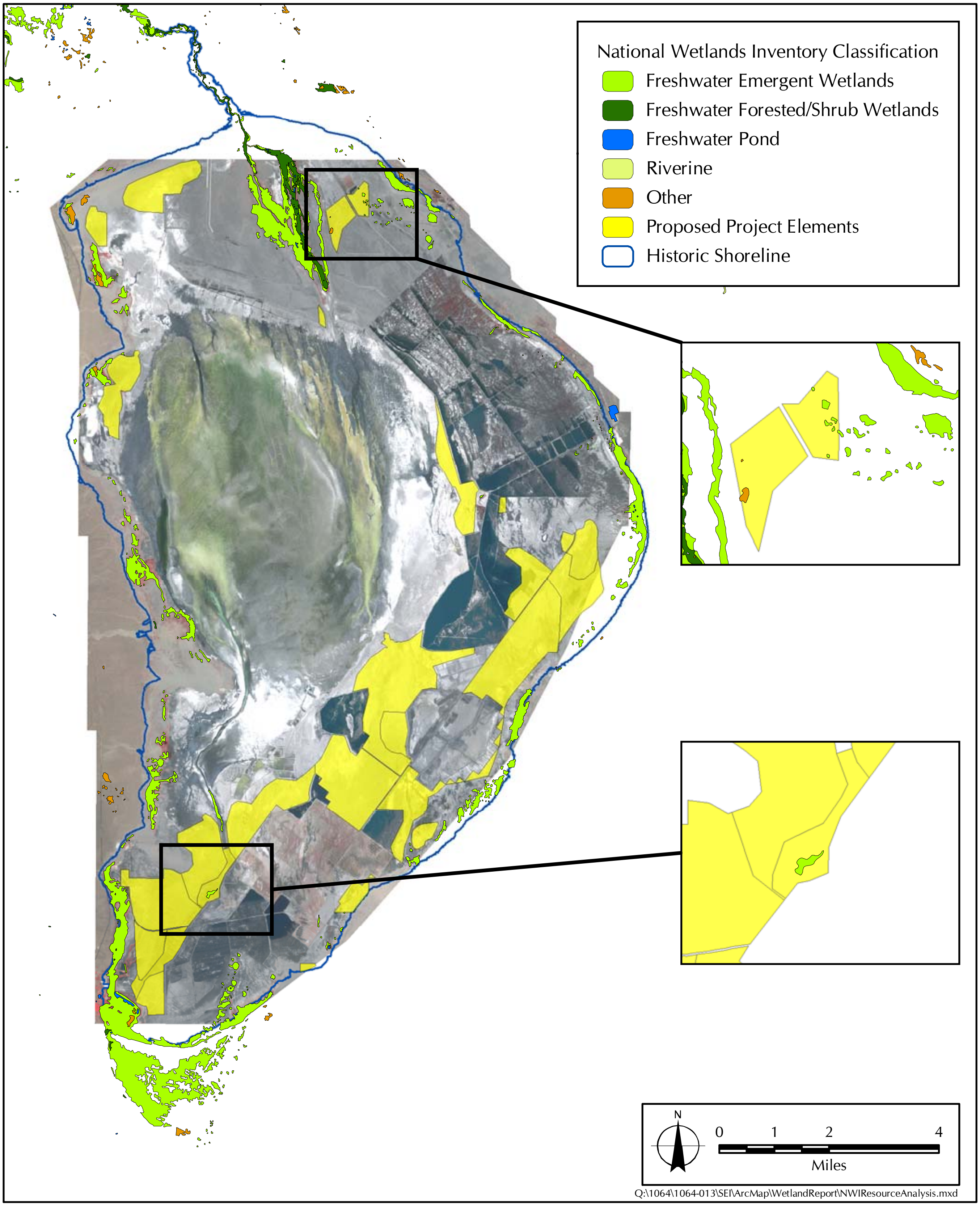


FIGURE 4

National Wetlands Inventory Resources

Groundwater pumping from the Owens Lake basin occurs to supply the potable water needs of nearby communities, as well as the exportation for commercial uses. The estimated average annual Owens Lake basin groundwater pumpage is approximately 5,173 ac-ft/yr.[27]

The general hydrologic gradient in the shallow groundwater is toward the brine pool. The gradients in the deeper aquifers are generally to the southern portion of the lake. However, due to the lack of data points available, the gradients present in the deep confined aquifers are not precisely known. Groundwater is stored in both confined and unconfined aquifer units. The deeper groundwater under the lake bed is confined, and has an upward hydrologic gradient. Four aquifer bodies have been mapped in the upper 1,000 feet below the lake bed.[28,29] The pressures in the confined aquifers range from approximately 2 to 22 pounds per square inch, depending on the aquifer and the elevation of the monitoring well measured.[30] The deep groundwater system along the west, east, and southeast edges of the Owens Lake basin are largely unconfined. The exact nature of how the unconfined system transitions to the confined units mapped under the lake bed is not known at this time. More information is needed to determine how these aquifers transition to those mapped under the lake bed itself.

Flood Threat

According to the Federal Emergency Management Agency (FEMA) flood maps,[34] Owens Lake and part of the proposed project site are within the 100-year flood hazard area. The majority of the Owens Lake bed is lays within a Zone A flood risk area. Such areas maintain a 1 percent annual chance of flooding and a 26 percent chance of flooding over the course of 30 years. The remainder of the area within the proposed project site and outside of the Owens Lake bed lies within a C Zone, an area of minimal flooding.

Field Delineation of USACOE and CDFG Jurisdictional Areas

Federal

Based on the characterization of seven wetland areas potentially subject to USACOE jurisdiction conducted June 19, 20, and 21, 2007, four areas were determined to be subject to USACOE jurisdiction pursuant to Section 404 of the Clean Water Act (Figure 1*)*.

Two of these USACOE jurisdictional areas consisted of connected surface and subsurface flows from Cartago Creek to the existing jurisdictional brine pool. One of the other USACOE jurisdictional areas consisted of a spring area, which connected surface and subsurface flows to the existing jurisdictional brine pool.

---

[27] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley* PM_{10} *Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[28] Great Basin Unified Air Pollution Control District. 1997. *Final Report, Phase 3-4 Seismic Program, Owens Lake, Inyo County, California*. Prepared by: Neponset Geophysical Corporation. Contact: 157 Short Street, Bishop, CA 93514.

[29] Great Basin Unified Air Pollution Control District. 1997. *Characterization of the Owens Lake Basin Hydrology System, Inyo County, California*. Prepared by: Neponset Geophysical Corporation. Contact: 157 Short Street, Bishop, CA 93514.

[30] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley* PM_{10} *Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[34] Federal Emergency Management Agency. 1986. Flood Insurance Rate Map, Inyo County, California; Map Number 0600731275C and 0600731475C, Effective 1986. Contact: 500 C Street, South, Washington, DC 20472.

The dominant wetland vegetation consists of Dry Alkali Meadow (DAM). Saltgrass (*Distichlis spicata*) dominates this habitat type. This plant community is a type of transmontane alkaline meadow (TAM). The most common co-occurring plant species occurring in DAM are alkali pink (*Nitrophila occidentalis*). Shadescale (*Atriplex confertifolia*) and Parry's saltbush (*Atriplex parryi*) occur on slight rises within the saltgrass clumps. On the western edge, particularly in the southwestern corner, are a number of additional species in low numbers, including common three-square (*Schoenoplectus pungens*), baltic rush (*Juncus balticus*), and many upland species listed in the floral compendium.[37] This plant community corresponds to Sawyer and Keeler-Wolf's Saltgrass series (CNDDB Code 41.200.00) and Holland's Transmontane Alkali Marsh (Element Code: 52320).[38,39]

State

Vegetated Wetlands, Springs/Seeps, or Stream Channels

As a result of a review of topographic maps, comprehensive literature review including past jurisdictional delineations, aerial photographs, field investigation, and coordination with the CDFG[40] of seven potential wetland areas comprised of vegetated wetlands, springs/seeps, or stream channels, six areas that support TAM vegetation were determined to be under the jurisdiction of the CDFG pursuant to Section 1600 of the State Fish and Game Code. These six areas correspond to areas where the proposed dust control areas intersect with CDFG jurisdictional areas containing a defined bed and bank and associated wetland vegetation. These areas include all of the USACOE jurisdictional areas.

The proposed project area contains 411.8 acres of emissive TAM areas that have been determined to be subject to the jurisdiction of the CDFG (Figure 2). Because these emissive wetlands are located in active emissive areas, they have been adversely impacted by blowing sand and dust and are in degraded condition. These alkaline meadows are considered wetlands subject to CDFG jurisdiction and are therefore sensitive vegetation communities. However, these TAM communities do not inhibit sand and dust movement across the Owens Lake bed, and therefore require dust control measures to bring them into compliance with the PM_{10} air quality standard.

The jurisdictional acreage of each wetland area and associated potential impacts are provided in Table 1, *Potential Wetland Areas and Associated Impacts*.

---

[37] Sapphos Environmental, Inc. August 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Biological Technical Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[38] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegeation*. Sacramento: California Native Plant Society.

[39] Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento: California Department of Fish and Game.

[40] Mendez, Irena, Sapphos Environmental, Inc., Pasadena, CA. 13 August 2007. Letter to Mr. Brad Henderson, Calfornia Department of Fish and Game, Bishop, CA. Subject: Determination of Jurisdictional Areas for the 2008 Supplemental Control Requirements for the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan.

TABLE 1
POTENTIAL VEGETATED WETLAND AREAS AND ASSOCIATED IMPACTS

Potential Wetland Area	Presence of Defined Bed and Bank	Presence of Riparian Vegetation	Presence of Hydrophytic Vegetation[1]	Presence of Hydric Soil[2]	Presence of Wetland Hydrology[3]	USACOE Jurisdiction (Acres)	CDFG Jurisdiction (Acres)
1	No	Yes	Yes	No	No	N/A	N/A
2	Yes	Yes	Yes	No	Yes	N/A	18.3
3	Yes	Yes	Yes	Yes	Yes	9.0	9.0
4	Yes	Yes	Yes	Yes	Yes	255.6	255.6
5	Yes	Yes	Yes	No	Yes	N/A	0.3
6	Yes	Yes	Yes	Yes	Yes	97.6	97.6
7	Yes	Yes	Yes	Yes	Yes	31.0	31.0
					Total	**393.2**	**411.8**

KEY:

[1] Hydrophytic vegetation is defined as more than half of the dominant plant species within a habitat are hydrophytic species (i.e., plants classified as facultative, facultative wetland, and obligate species as defined by the National Wetland Inventory of Plants.

[2] Hydric soil is soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in its upper part (i.e., within the shallow rooting zone of the herbaceous plants).

[3] Wetland hydrology is permanent or periodic inundation or prolonged soil saturation sufficient to create anaerobic conditions in the soil.

Barren Lake Bed

The proposed project area also contains 8,340.43 acres of emissive barren lake bed areas mapped as lacustrine wetlands by the National Wetlands Inventory that are likely CDFG jurisdictional areas subject to a final determination by the CDFG (Figure 4). Because these emissive wetlands are located in active emissive areas, they require dust control measures to bring them into compliance with the PM_{10} air quality standard.

DESCRIPTION OF AREAS OF POTENTIAL USACOE AND CDFG JURISDICTION

Wetland characterizations of areas potentially under the jurisdiction of the USACOE and the CDFG were based on delineations carried out from June 19, 21, and 22, 2007, in order to determine the extent of USACOE and CDFG jurisdictional areas at the seven wetland areas to be impacted as a result of project implementation. Data sheets for all proposed transects within the seven areas accompany this section (Attachment 1). In addition, photos and a large scale map of each crossing can be found in Figures 5 through 11.

Potential Wetland Area 1

This area is considered for use as a Shallow Flooding dust control measure and located in the south-western portion of the proposed project site (Figure 5, *Potential Wetland Area 1*). This area abuts a roadway and appears as an area where water pools occasionally due to the roadway. This area was surveyed and three transects established on June 19, 2007. This crossing contains saltgrass and consists of a DAM plant community, a type of TAM plant community. No defined bed and bank is located at the proposed area; saltgrass vegetation is present, but no clear wetland

PHOTO 1
Looking South Polygon 1 Transect 1

PHOTO 2
Looking South Polygon 1 Transect 3

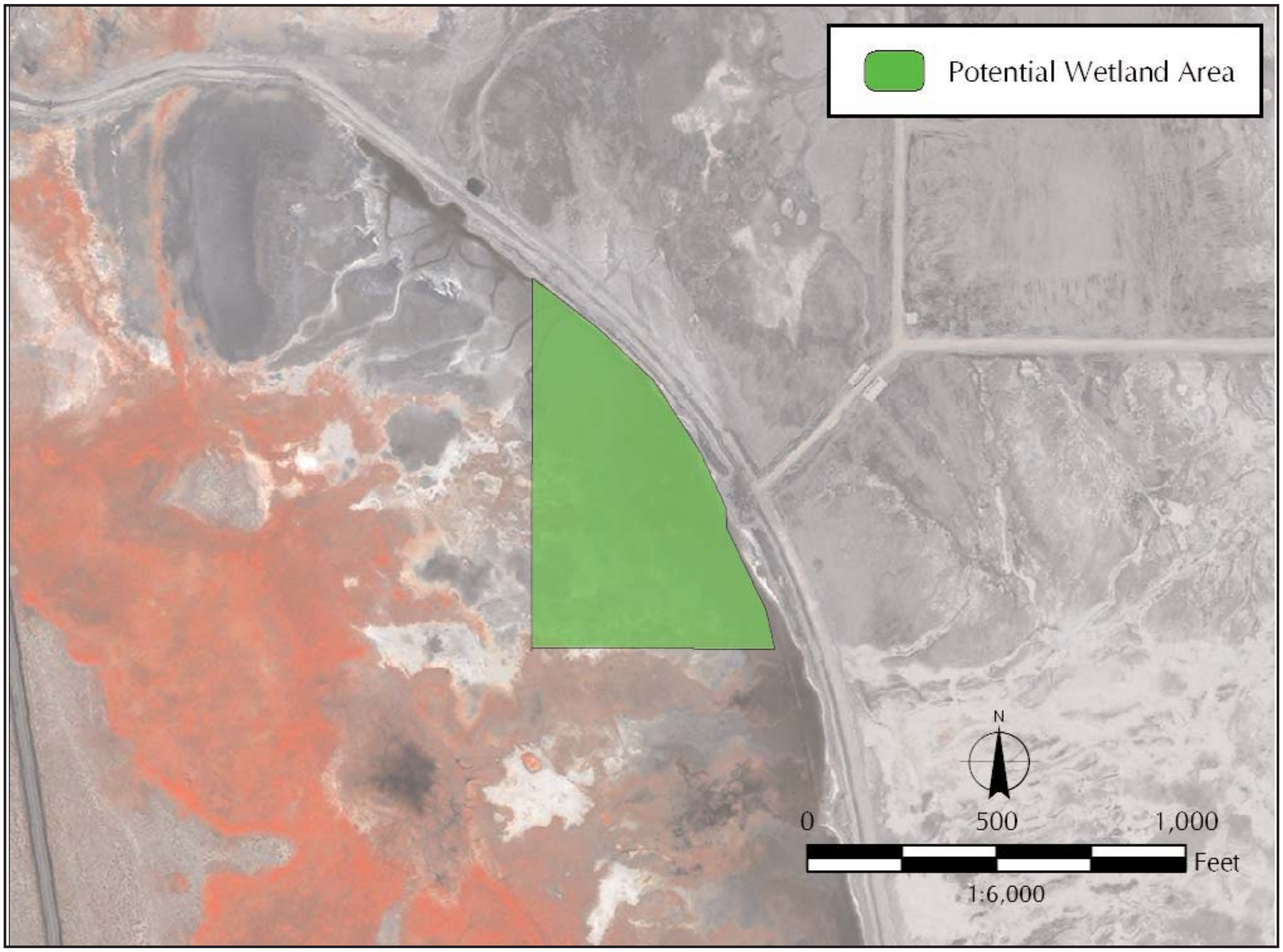


FIGURE 5
Potential Wetland Area 1

hydrology is present. Therefore, this area was considered not subject to USACOE or CDFG jurisdiction.

Potential Wetland Area 2

This area is proposed to consist of an area of Shallow Flooding and an area of Moat & Row, and is located in the southwestern portion of the proposed project site (Figure 6, *Potential Wetland Area 2*). As a result of the field characterization conducted on June 19, 2007, this wetland area was determined subject to USACOE and CDFG jurisdiction. A defined bed and bank is located within the area. Wetland vegetation and wetland hydrology are present, however hydric soils are absent. Wetland vegetation consists of saltgrass and alkali pink and is designated as TAM. This area appears to have flow events during heavy rains. This area is fed by sheet flow, as well as from runoff from the nearby ponds. As a result of the absence of hydric soils, the area was considered not subject the USACOE jurisdiction. Therefore, implementation of the dust control measure in Area 2 will result in impacts to 18.3 acres subject to CDFG jurisdiction.

Potential Wetland Area 3

This area is proposed to consist of an area of Moat & Row and is located in the southwestern portion of the proposed project site (Figure 7, *Potential Wetland Area 3*). As a result of the field characterization conducted on June 19 and 20, 2007, this wetland area was determined subject to USACOE and CDFG jurisdiction. A defined bed and bank is located within the area, wetland vegetation is present, and hydric soil and wetland hydrology exist. Wetland vegetation consists of saltgrass and is designated as TAM. This area appears to have flow events during heavy rains. This area is fed by sheet flow, as well as from runoff from the nearby ponds, and had portions of standing water. Implementation of dust control measures in Area 3 will result in impacts to 9 acres subject to USACOE jurisdiction and 9 acres subject to CDFG jurisdiction.

Potential Wetland Area 4

This area is proposed for future dust control measures such as Shallow Flooding, Moat & Row, Managed Vegetation, or Gravel Cover and is located in the southwestern portion of the proposed project site (Figure 8, *Potential Wetland Area 4*). As a result of the field characterization conducted on June 20, 2007, this wetland area was determined to be subject to USACOE and CDFG jurisdiction. A defined bed and bank is located within the area with multiple braided channels. Wetland vegetation is present, consisting of saltgrass and Baltic rush, and is designated as TAM. The area appears to have constant flow events and is heavily braided with small channels. Portions of the area presented standing water and evidence of larger flows. This area is fed by sheet flow from the Cartago Creek. Therefore, implementation of the dust control measures in Area 4 will result in impacts to 255.6 acres subject to USACOE jurisdiction and 255.6 acres subject to CDFG jurisdiction.

Potential Wetland Area 5

This area is proposed to consist of an area of Moat & Row and is located in the south-western portion of the proposed project site (Figure 9, *Potential Wetland Area 5*). As a result of the field characterization conducted on June 20, 2007, this wetland area was determined be subject to CDFG jurisdiction only. A defined bed and bank and wetland vegetation and wetland hydrology are present. However, hydric soils do not exist at Area 5. This area appears to have occasional flow

PHOTO 1
Looking West Polygon 2 Transect 3

PHOTO 2
Looking Southeast Polygon 2 Transect 4

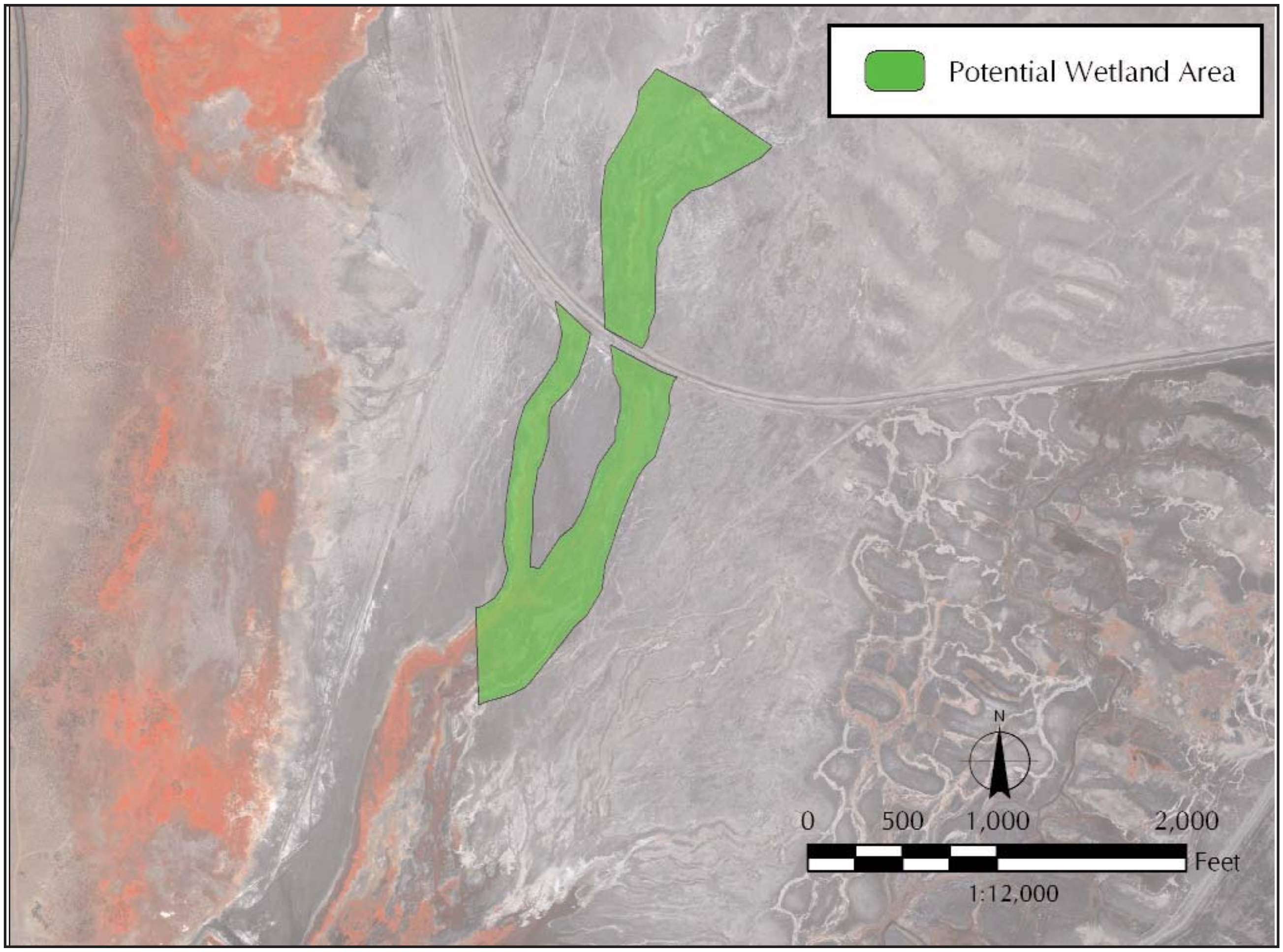


FIGURE 6
Potential Wetland Area 2

PHOTO 1
Looking Northwest Polygon 3 Transect 2

PHOTO 2
Looking Southeast Polygon 3 Transect 1

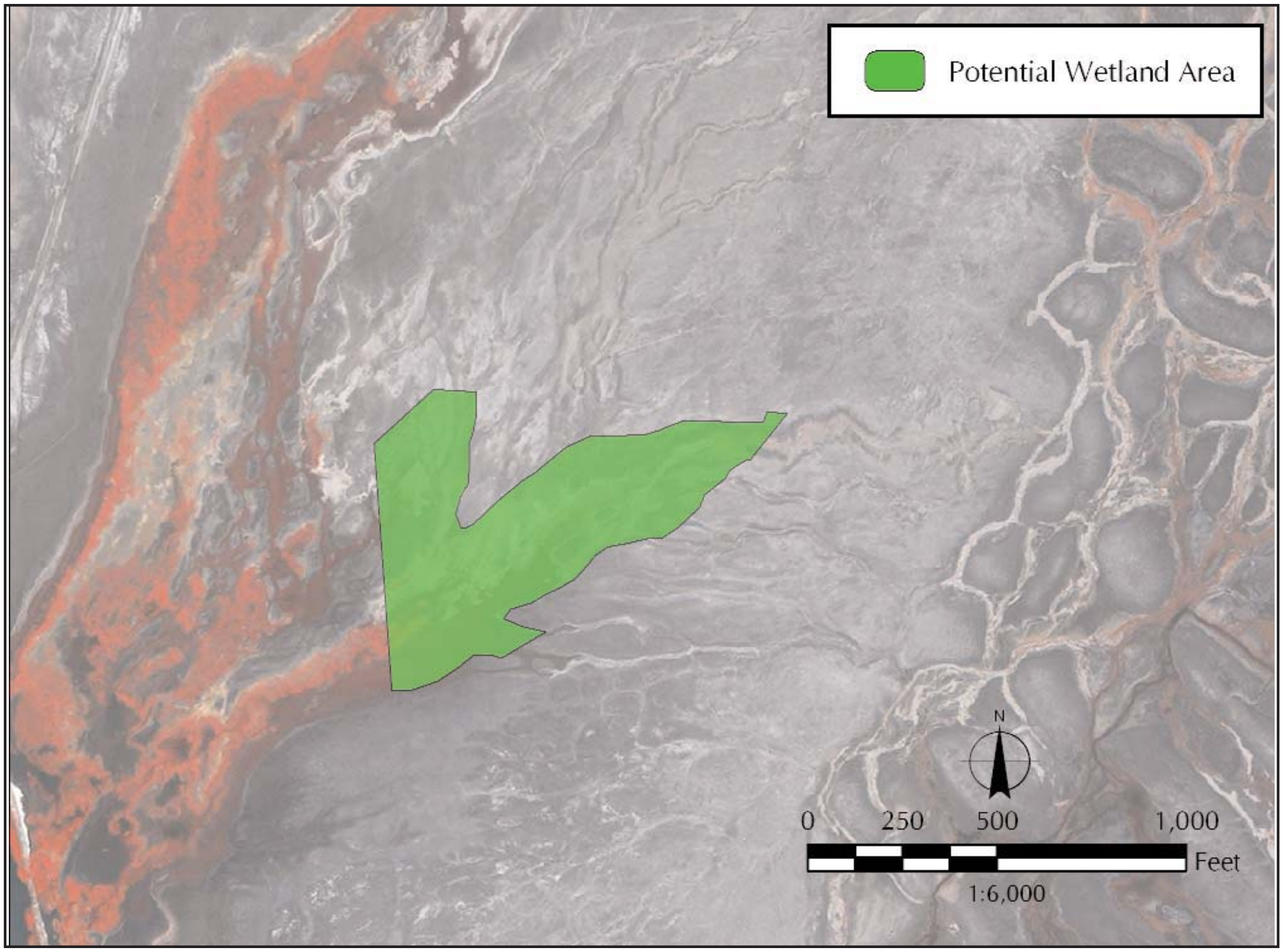


FIGURE 7
Potential Wetland Area 3

PHOTO 1
Looking East Polygon 4 Transect 1

PHOTO 2
Looking West Polygon 4 Transect 5

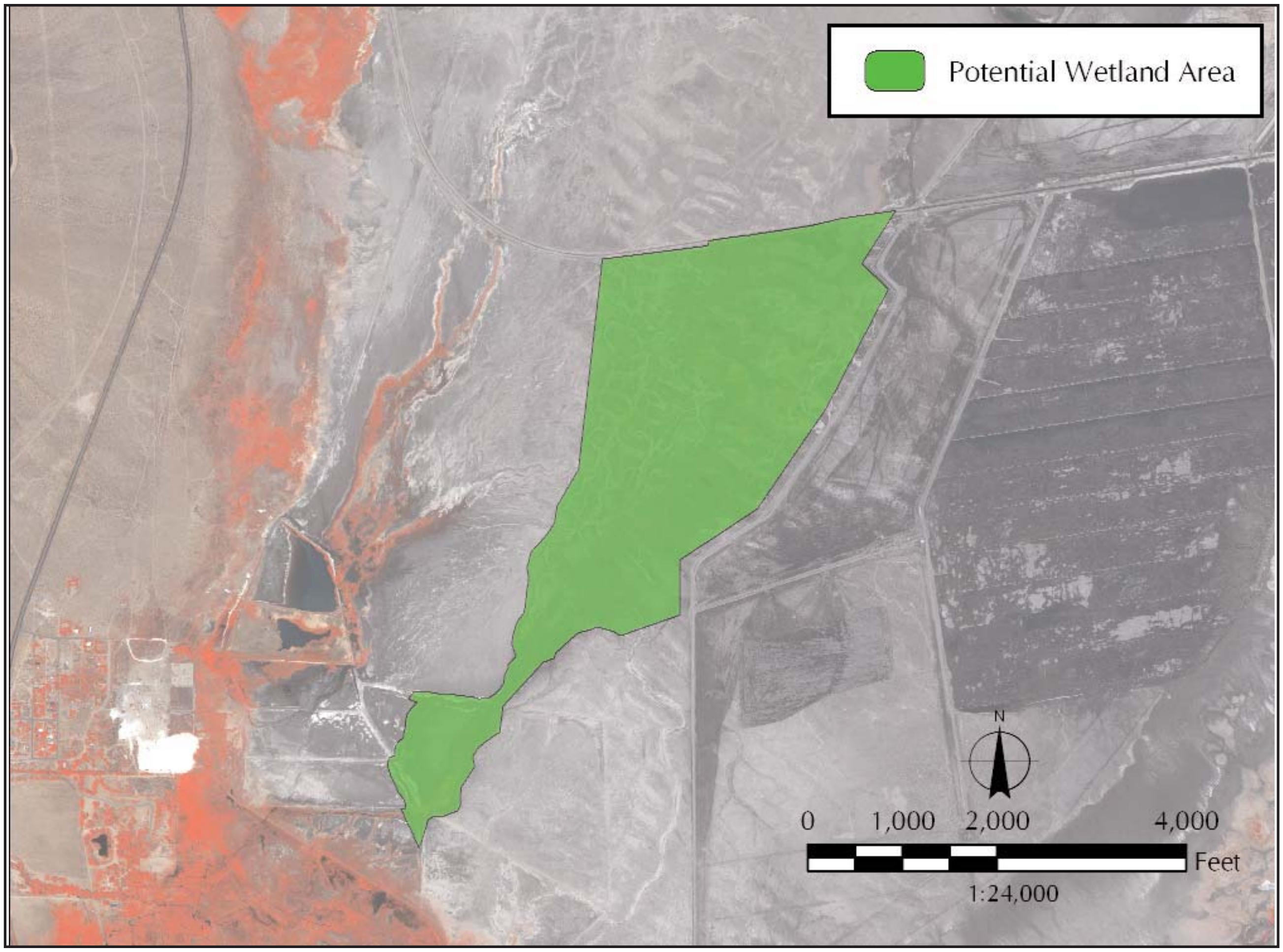


FIGURE 8
Potential Wetland Area 4

PHOTO 1
Looking South Polygon 5 Transect 1

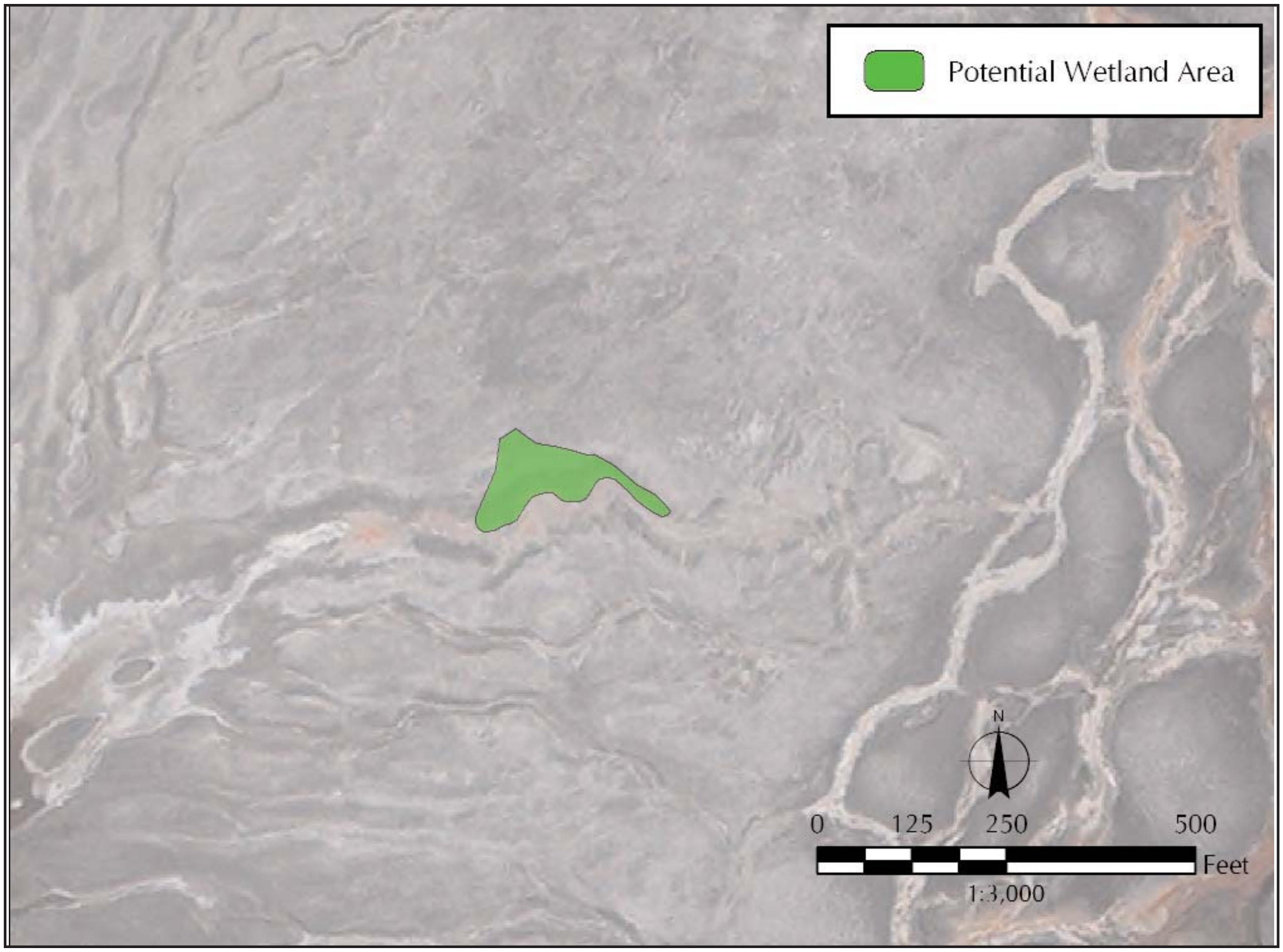


FIGURE 9
Potential Wetland Area 5

events during heavy rain seasons. Therefore, implementation of dust control measures at Area 5 will result in impacts to 0.3 acre subject to CDFG jurisdiction.

Potential Wetland Area 6

This area is proposed for future dust control measures such as Shallow Flooding, Moat & Row, Managed Vegetation, or Gravel Cover and is located in the southwestern portion of the proposed project site (Figure 10, *Potential Wetland Area 6*). As a result of the field characterization conducted on June 20, 2007, this wetland area was determined subject to USACOE and CDFG jurisdiction. A defined bed and bank is located within the area with multiple braided channels. Wetland vegetation is present, consisting of saltgrass and Baltic rush, and is designated as TAM. The area appears to have constant flow events and is heavily braided with small channels. The area had evidence of larger flows fed by sheet flow from the Cartago Creek. Therefore, implementation of the dust control measures will result in impacts to 97.6 acres subject to a USACOE jurisdiction and 97.6 acres subject to a CDFG jurisdiction.

Potential Wetland Area 7

This area is proposed for shallow flood dust control measures and is located in the center of the proposed project site near the terminus of Sulfate Road (Figure 11, *Potential Wetland Area 7*). As a result of the field characterization conducted on June 21, 2007, this wetland area was determined subject to USACOE and CDFG jurisdiction. A defined bed and bank is located within the area with multiple braided channels. Wetland vegetation is present, consisting of saltgrass, and is designated as TAM. The area appears to have constant flow events and heavy braiding as it channels toward the existing jurisdictional brine pool. The area is fed by Sulfate Well, a freshwater spring. Therefore, implementation of dust control measures will result in impacts to 31 acres subject to USACOE jurisdiction and 31 acres subject to CDFG jurisdiction.

PHOTO 1
Looking East Polygon 6 Transect 1

PHOTO 2
Looking East Polygon 6 Transect 3

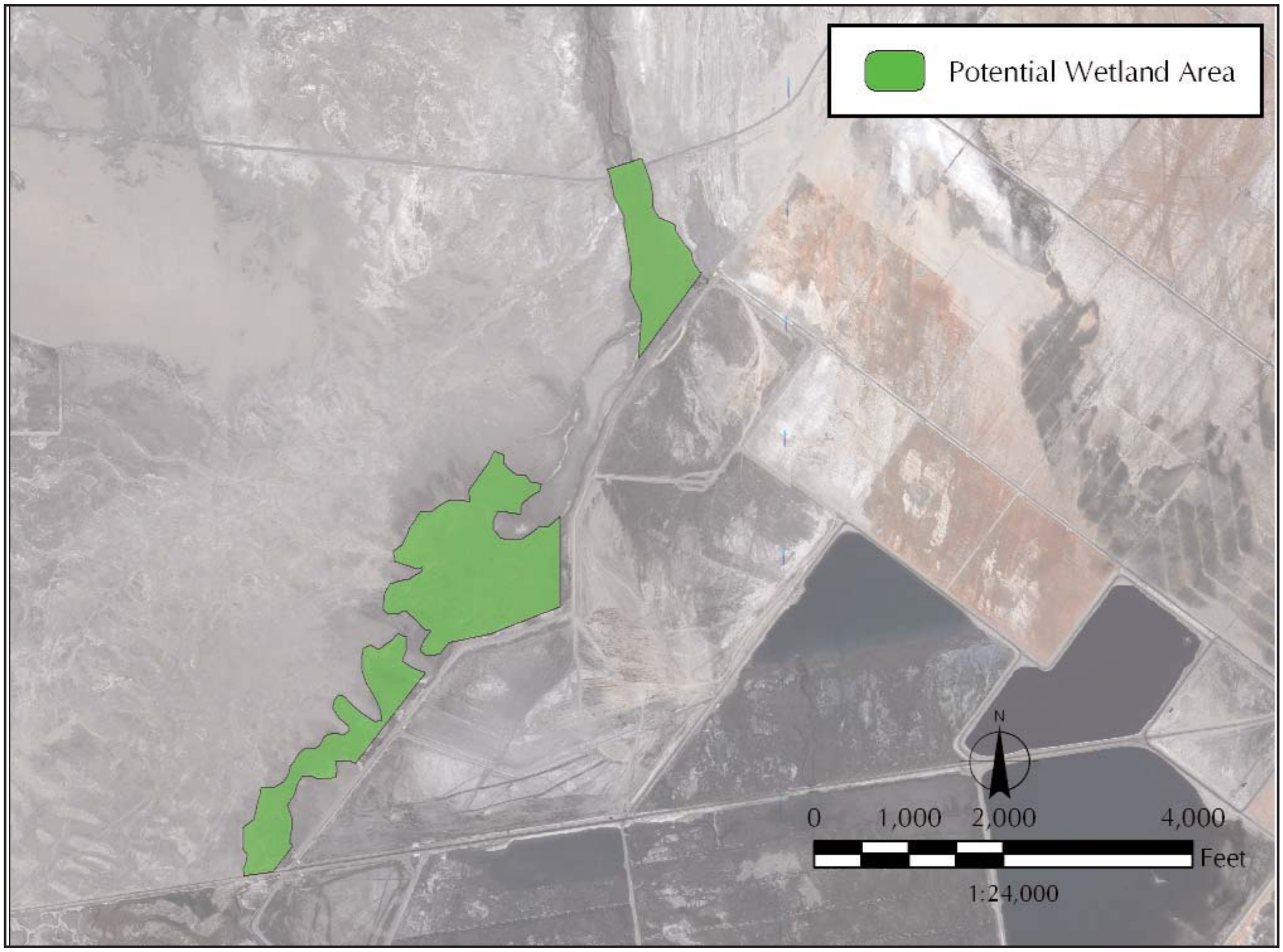


FIGURE 10
Potential Wetland Area 6

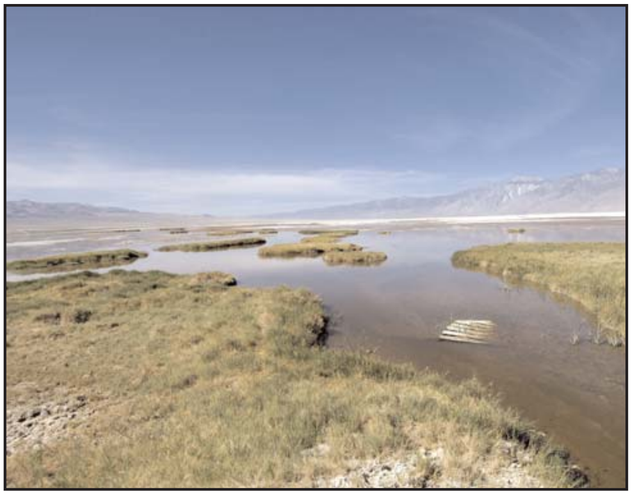


PHOTO 1
Looking South Polygon 7 Transect 1

PHOTO 2
Looking West Polygon 7 Transect 2

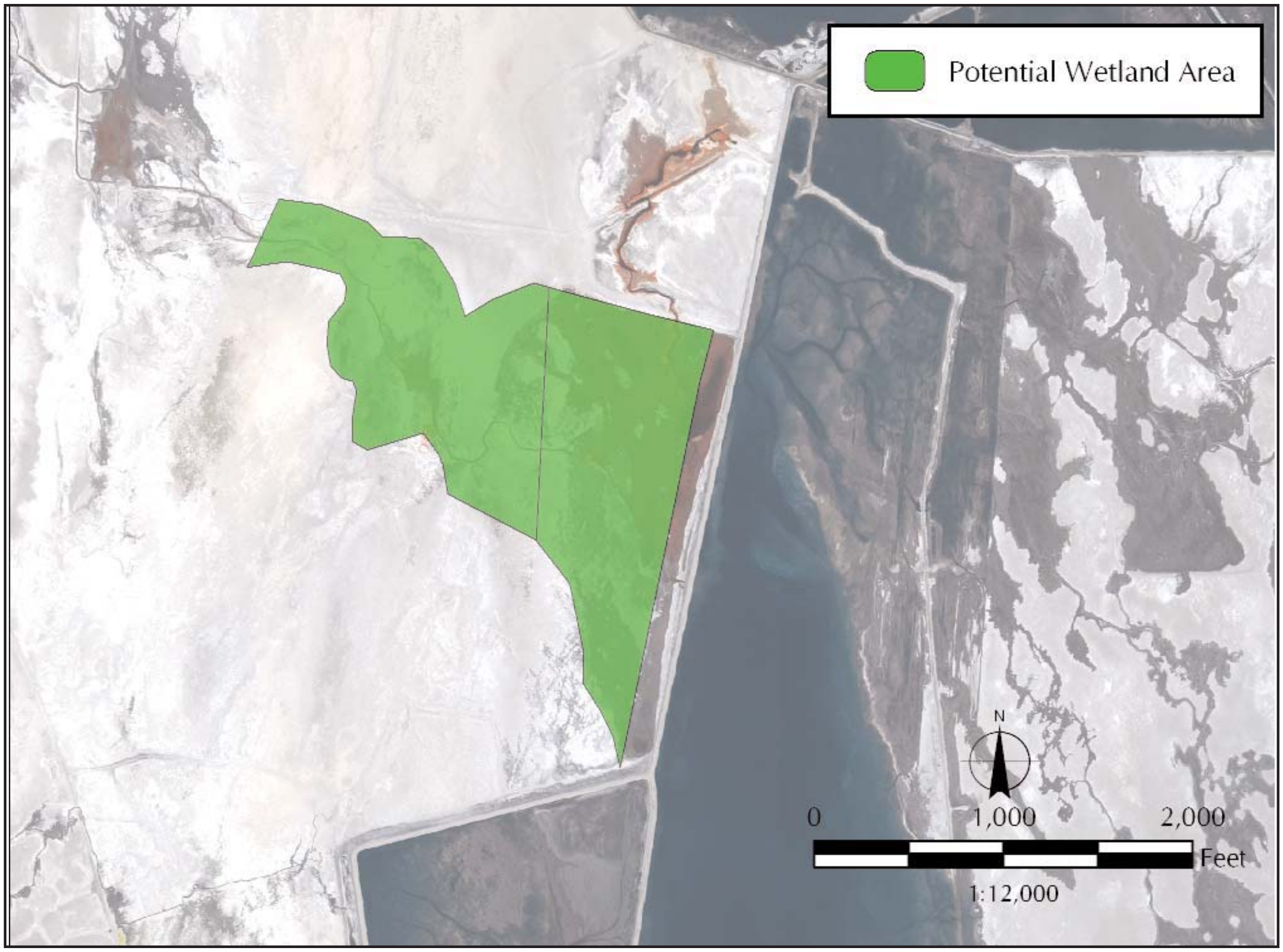


FIGURE 11
Potential Wetland Area 7

ATTACHMENT 1
DATA SHEETS

7.> 1064-013
Wetlands

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 1

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013; Polygon 1
Date: 6/19/07	Time start: 09:20 Transect 1

Surveyors: Irena Mendez, Jack GoldFarb

Photo data	Weather data
Photo No.: ~~1~~ OWN 3315	Air temperature: 85
Taken from (direction): N → S	Cloud cover (%) 0
Description of photo: N → S along transect 1 of Polygon 1	Precipitation: ☐ yes ☒ no Estimated wind speed: gusts up to 20mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space) Open Space

North: Open Space E. of Hwy 395 at O.L.	East: Open space East of 395 at Owens Lake
South:	West:
Slope %: 0	Soil description: Salt pan w/ emergent saltgrass
Aspect: 0	
GPS location: 11S 0408765/4023051	

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? ☐ yes (fill out section below) ☒ no elevated roadbed

Classify stream as follows: ☐ ephemeral ☐ intermittent ☐ perennial N/A

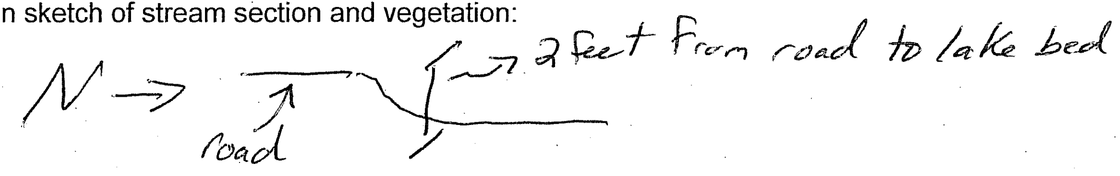
Presence of aquatic wildlife? ☐ yes ☒ no

Obvious wildlife movement corridor? ☐ yes ☒ no

Width of stream from top of streambed: Dry lake bed

Width of ~~riparian~~ saltgrass vegetation: per. waypoints

Cross-section sketch of stream section and vegetation:



Shelving: ☐ yes ☒ no	Sediment deposition: ☐ yes ☒ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☐ yes ☒ no
OHWM: ☐ yes ☒ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☐ yes ☒ no	Flowing or standing water: ☐ yes ☒ no

Notes: Saltgrass starts and stops were delineated with GPS waypoints.

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~0~~% 32.7%			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian
Deer	T	✓		

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake, Supplemental SIP
Applicant/Owner: District (Great Basin Unified Air Pollution Control District)
Investigator: Jacob Goldfarb (Irene Wender/

Date: 6/19/2007
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P1T1
Plot ID: Wetland Area 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 32.7% cover 100% dominance

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ☐ Inundated
  - ☐ Saturated in Upper 12 Inches
  - ☐ Water Marks
  - ☐ Drift Lines
  - ☐ Sediment Deposits
  - ☐ Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ☐ Oxidized Root Channels in Upper 12 Inches
  - ☐ Water-Stained Leaves
  - ☐ Local Soil Survey Data
  - ☐ FAC-Neutral Test
  - ☐ Other (Explain in Remarks)

Remarks: Adjacent to elevated road bed, does not exhibit wetland hydrology

SOILS

Map Unit Name
(Series and Phase): ____________________

Taxonomy (Subgroup): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Salt pan with emergent salt grass / No Positive hydric soil indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area # 1

Project Name and Site No.: Owens Lake Supplemental SIP EIR

Project No.: 1064-013 Polygon 1 Transect 2

Date: 6/19/07

Time start:

Surveyors: Irena Mendez, Jack Goldfarb

Photo data

Photo No.: OWN 3316

Taken from (direction): looking South

Description of photo:

Weather data

Air temperature: 89°F

Cloud cover (%) 0

Precipitation: [ ] yes [X] no

Estimated wind speed: gusts up to 20mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space) open space

North: Open Space East of SR395 at Owens Lake

East: Open Space East of SR395 at Owens Lake

South: "

West: "

Slope %: 0

Aspect: 0

GPS location:

Soil description: Salt pan w/ emergent saltgrass

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? [ ] yes (fill out section below) [X] no elevated roadbed

Classify stream as follows: [ ] ephemeral [ ] intermittent [ ] perennial N/A

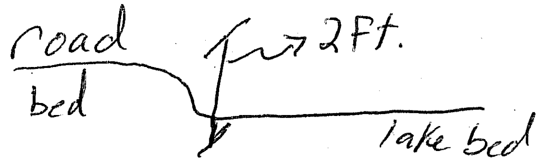
Presence of aquatic wildlife? [ ] yes [X] no

Obvious wildlife movement corridor? [ ] yes [X] no

Width of stream from top of streambed: Dry Lake bed

Width of riparian vegetation: width of saltgrass per waypoints collected along transect.

Cross-section sketch of stream section and vegetation:



Shelving: [ ] yes [X] no

Sediment deposition: [ ] yes [X] no

Debris lines: [ ] yes [X] no

Presence of defined bed and bank: [ ] yes [X] no

OHWM: [ ] yes [X] no

Riparian vegetation: [X] yes (note below) [ ] no

Water marks: [ ] yes [X] no

Flowing or standing water: [ ] yes [X] no

Notes: Saltgrass starts and stops were delineated with GPS waypoints

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
saltgrass	~~5~~ % 42.9%			

Wildlife

		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian
Deer	T	✓		

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jacob Goldfarb / Irena Mendez

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? ~~Yes~~ [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: PT2
Plot ID: Wetland Area 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 42.9% cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ___ Inundated
  - ___ Saturated in Upper 12 Inches
  - ___ Water Marks
  - ___ Drift Lines
  - ___ Sediment Deposits
  - ___ Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___ Oxidized Root Channels in Upper 12 Inches
  - ___ Water-Stained Leaves
  - ___ Local Soil Survey Data
  - ___ FAC-Neutral Test
  - ___ Other (Explain in Remarks)

Remarks: Adjacent to elevated roadbed; Does not exhibit wetland hydrology

SOILS

Map Unit Name
(Series and Phase): ____________________
Taxonomy (Subgroup): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltpan with emergent saltgrass / No Positive hydric soil indicators

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No.: Owens Lake Supplemental SIP

Project No.: 1064-013 Wetland 1, transect 3

Photo No.: OWN 3317

Taken from (e.g., looking north): Looking South

Description of photo: N->S along transect 3, wetland 1

General data	Weather data
Date: 6/19/07	Air temperature:
Time start:	Start / End
Surveyors: Irena Mendez Jack Goldfarb	Cloud cover (%) 0 Precipitation: ☐ yes ☒ no Estimated wind speed 0

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial) open space

North: open space, E of SR 395

East: open space East of SR 395

South: " "

West: ' '

Slope %: 0

Aspect: 0

GPS location: 11S 0408894/4022867

Soil description: Salt pan w/ emergent saltgrass

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

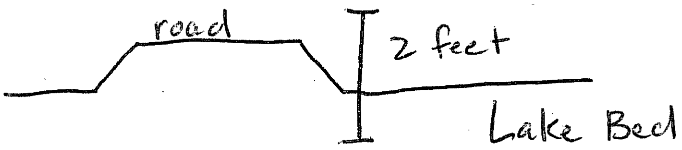
Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☐ yes (fill out section below) ☒ no road bed

Width of stream from top of streambed: Dry Lake bed

Width of riparian vegetation: Saltgrass waypoints

Cross-section sketch of stream section and vegetation:



Shelving: ☐ yes ☒ no	Sediment deposition: ☐ yes ☒ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☐ yes ☒ no
OHWM: ☐ yes ☒ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☐ yes ☒ no	Flowing or standing water: ☐ yes ☒ no

Notes: Saltgrass denoted on GPS w/ waypoints.

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~1%~~ 0%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake, Supplemental
Applicant/Owner: GBUAPC District
Investigator: Nora Mendez / Jack Goldfarb

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P1T3
Plot ID: Wetland Area 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks: Distichlis was observed immediately adjacent to P1T3 however cover was 0% on the transect

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ☒ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: –(in.)

Depth to Free Water in Pit: –(in.)

Depth to Saturated Soil: –(in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water-Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks: Adjacent to elevated roadbed; Does not exhibit wetland hydrology

SOILS

Map Unit Name
(Series and Phase): ______________________ Drainage Class: __________
Field Observations
Taxonomy (Subgroup): ______________________ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Encrusted salt pan, No evidence of hydric soil indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No.: Owens Lake Supplemental SIP

Project No.: 1064-013 Wetland 2, transect 1

Photo No.: Own 3318

Taken from (e.g., looking north): looking west

Description of photo: E->W along transect 1 of wetland 2

General data

Date: 6/19/07

Time start:

Surveyors:
Irena Mendez
Jack Goldfarb

Weather data

Air temperature:

Start

End

Cloud cover (%) 0

Precipitation: ☐ yes ☒ no

Estimated wind speed 0

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial) open space

North: Open Space E of SR 395

South: " "

East: open space

West: open space

Slope %: 0

Aspect: 0

GPS location: Back

Soil description: Clay, salt crusts

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no

Width of stream from top of streambed: waypoints

Width of riparian vegetation: waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no

Debris lines: ☐ yes ☒ no

OHWM: ☐ yes ☒ no

Water marks: ☐ yes ☒ no

Sediment deposition: ☐ yes ☒ no

Presence of defined bed and bank: ☒ yes ☐ no

Riparian vegetation: ☐ yes (note below) ☒ no

Flowing or standing water: ☐ yes ☒ no

Notes:

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~0~~% 5.9%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPC District
Investigator: Jacob Goldfarb | Irene Mendez

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P2T1
Plot ID: Wetland Area 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 6% cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water-Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks: Adjacent to road culvert, potential wetland area extends on both sides of road. Water flow appears intermittent; Outflow area from Cartago ~~creek~~ Spring

SOILS

Map Unit Name
(Series and Phase): ____________________

Taxonomy (Subgroup): ____________________

Drainage Class: ____________

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltgrass growing on encrusted lakebed. No hydric soils indicators

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 Wetland 2, transect 2
Photo No.: own 3331	Taken from (e.g., looking north): looking west

Description of photo:
E -> W along transect 2, wetland 2

General data	Weather data	
Date: 6/19/07	Air temperature:	
Time start:	Start	End
Surveyors: Irena Mendez Jack Goldfarb	Cloud cover (%) 0 Precipitation: [ ] yes [X] no Estimated wind speed 0	

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial) open space

North: open space E of SR 395	East: open space
South: " "	West: open space
Slope %: 0	Soil description: Clay, salt crust
Aspect: 0	
GPS location: Back	

Obvious wildlife movement corridor? [ ] yes [X] no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? [X] yes (fill out section below) [ ] no

Width of stream from top of streambed:
waypoints

Width of riparian vegetation:
waypoints

Cross-section sketch of stream section and vegetation:

Shelving: [ ] yes [X] no	Sediment deposition: [ ] yes [X] no
Debris lines: [ ] yes [X] no	Presence of defined bed and bank: [X] yes [ ] no
OHWM: [ ] yes [X] no	Riparian vegetation: [X] yes (note below) [ ] no
Water marks: [ ] yes [X] no	Flowing or standing water: [ ] yes [X] no

Notes:

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~1%~~ 17.0%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: ___
Investigator: ___

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: Pd12
Plot ID: Wetland Area 21

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 17.0% cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ☒ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water-Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ✓ Other (Explain in Remarks)

Remarks: Adjacent to road culvert; potential wetland area extends on both sides of road. Water flows appear intermittent: outflow from Cartago Spring

SOILS

Map Unit Name
(Series and Phase): ______________________________ Drainage Class: ______________

Field Observations

Taxonomy (Subgroup): ______________________________ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltgrass growing on encrusted lake bed. No hydric soil indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SID	Project No. 1064-013 Wetland 2, transect 3

Photo No.: Own 3322 Taken from (e.g., looking north): looking west

Description of photo:
E → W along transect 3, wetland 2

General data	Weather data
Date: 6/19/07	Air temperature:
Time start:	Start / End
Surveyors: Irena Mendez Jack Goldfarb	Cloud cover (%) 0
	Precipitation: [ ] yes [X] no
	Estimated wind speed 0

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial) open space

North: open space E of SR 395	East: open space
South: " "	West: open space
Slope %: 0	Soil description: Clay, salt crust
Aspect: 0	
GPS location: Back	

Obvious wildlife movement corridor? [ ] yes [X] no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry lake, recent tire tracks

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? [X] yes (fill out section below) [ ] no

Width of stream from top of streambed:
waypoints

Width of riparian vegetation:
waypoints

Cross-section sketch of stream section and vegetation:

Shelving: [ ] yes [X] no	Sediment deposition: [ ] yes [X] no
Debris lines: [ ] yes [X] no	Presence of defined bed and bank: [X] yes [ ] no
OHWM: [ ] yes [X] no	Riparian vegetation: [X] yes (note below) [ ] no
Water marks: [ ] yes [X] no	Flowing or standing water: [ ] yes [X] no

Notes:

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~2%~~ 17.3%			
Nitrophila occidentalis	1%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner:
Investigator:

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P2T3
Plot ID: Wetland Area 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2. Nitrophila occidentalis	herb	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 18% cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
  Primary Indicators:
    ___ Inundated
    ___ Saturated in Upper 12 Inches
    ___ Water Marks
    ___ Drift Lines
    ___ Sediment Deposits
    ___ Drainage Patterns in Wetlands
  Secondary Indicators (2 or more required):
    ___ Oxidized Root Channels in Upper 12 Inches
    ___ Water-Stained Leaves
    ___ Local Soil Survey Data
    ___ FAC-Neutral Test
    X Other (Explain in Remarks)

Remarks: Adjacent to road culvert, potential wetland area extends on both sides of road water flow appears intermittent; out-flow area from Cartago Spring

SOILS

Map Unit Name
(Series and Phase): ____________________

Taxonomy (Subgroup): ____________________

Drainage Class: ____________

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltgrass growing on encrusted lakebed, no hydric soil indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] ~~No~~
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 Wetland 2, transect 4
Photo No.: own 3324	Taken from (e.g., looking north): looking southeast

Description of photo:
NW → SE along transect 4, wetland 2

General data	Weather data	
Date: 6/19/07	Air temperature:	
Time start:	Start	End
Surveyors: Irena Mendez Jack Goldfarb	Cloud cover (%) 0	
	Precipitation: ☐ yes ☒ no	
	Estimated wind speed 0	

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial) open space

North: open space E of SR 395	East: open space
South: " "	West: open space
Slope %: 0	Soil description: Clay, saltcrust
Aspect: 0	
GPS location: Back	

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no

Width of stream from top of streambed:
Waypoints

Width of riparian vegetation:
Waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no	Sediment deposition: ☐ yes ☒ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☒ yes ☐ no
OHWM: ☐ yes ☒ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☐ yes ☒ no	Flowing or standing water: ☐ yes ☒ no

Notes:
Saltgrass denoted by GPS w/ waypoints
(Nitrophilia occidentalis)

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~10%~~ 30.1 %			
Nitrophila	~~5%~~ <0.1 %			
occidentalis	several individuals			
	observed			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD ("District")
Investigator: Vera Mendez / Jack Goldfarb

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P2T4
Plot ID: Wetland Area 2)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salt Grass: Distichlis spicata	herb	FACW	9.		
2. Nitrophila Occidentalis	herb	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). ~30% Cover 100% Dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)
Depth to Free Water in Pit: / (in.)
Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
✓ Other (Explain in Remarks)

Remarks: Adjacent to road culvert, potential wetland area extends on both sides of road. Water flow appears intermittent; outflow from Cartago Spring; currently dry

SOILS

Map Unit Name
(Series and Phase): ____________________

Taxonomy (Subgroup): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Saltgrass growing on encrusted lakebed. No hydric soil indicators

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] ~~[✓ No]~~
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 3

Project Name and Site No. Owens Lake Supplemental SIP

Project No. 1064-013 Polygon 3 Transect 1

Date: 6/19/07

Time start:

Surveyors: Irena Mendez / Jack Goldfarb

Photo data

Photo No.: OWN 3325

Taken from (direction): looking Southeast

Description of photo: NE → SE along Transect 1, polygon 3

Weather data

Air temperature:

Cloud cover (%) 0

Precipitation: ☐ yes ☒ no

Estimated wind speed: 0

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space) open space

North: Open space E of SR 395

East: "

South: "

West: "

Slope %: 0

Aspect: 0

GPS location: Back

Soil description: clay, salt crusts

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? ☒ yes (fill out section below) ☐ no

Classify stream as follows: ☐ ephemeral ☐ intermittent ☒ perennial

Presence of aquatic wildlife? ☒ yes ☐ no

Obvious wildlife movement corridor? ☐ yes ☒ no

Width of stream from top of streambed: waypoints

Width of riparian vegetation: Waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no

Debris lines: ☐ yes ☒ no

OHWM: ☐ yes ☒ no

Water marks: ☒ yes ☐ no

Sediment deposition: ☐ yes ☒ no

Presence of defined bed and bank: ☒ yes ☐ no

Riparian vegetation: ☒ yes (note below) ☐ no

Flowing or standing water: ☒ yes ☐ no

Notes: salt grass denoted by GPS w/ waypoints (& water)

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
saltgrass	~~70%~~ 100%			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Vera Mendez | Jack Goldfarb

Date: 6/19/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P3T1
Plot ID: Wetland Area 3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Common threesquare	herb	OBL	9.		
2. (Scirpus pungens)			10.		
3. Distichlis spicata	herb	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100% cover 100% dominance

Remarks: + sedges growing in shallow water, algae growing in water as well saltgrass

HYDROLOGY

___ Recorded Data (Describe in Remarks):
 ___ Stream, Lake, or Tide Gauge
 X Aerial Photographs
 ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1-3 (in.)

Depth to Free Water in Pit: ___ (in.)

Depth to Saturated Soil: ___ (in.)

Wetland Hydrology Indicators:
 Primary Indicators:
 X Inundated
 ___ Saturated in Upper 12 Inches
 X Water Marks
 ___ Drift Lines
 ___ Sediment Deposits
 X Drainage Patterns in Wetlands
 Secondary Indicators (2 or more required):
 ___ Oxidized Root Channels in Upper 12 Inches
 ___ Water-Stained Leaves
 ___ Local Soil Survey Data
 ___ FAC-Neutral Test
 ___ Other (Explain in Remarks)

Remarks: Visual inundation

SOILS

Map Unit Name
(Series and Phase): ____________________

Drainage Class: __________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ____________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: OBL and FACW species within clearly delineated wetland boundary inundated in June 2007; slippery gleyed soils when walking transect

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 3

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 Polygon 3 Transect 2
Date: 6/21/07	Time start: 08:45

Surveyors:
Jack Goldfarb, Edward Belden

Photo data	Weather data
Photo No.: OWN 3328	Air temperature: 80 F
Taken from (direction): looking Northwest	Cloud cover (%) 0
Description of photo: N.W. along transect 2 of Polygon 3	Precipitation: [ ] yes [X] no Estimated wind speed: 5 mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space) Open space - Dry lake

North: open space East of Hwy 395	East: Open space
South: " "	West: " "
Slope %: 0	Soil description: Salt & clay
Aspect: 0	
GPS location: Back	

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):
Cattle grazing; dry lake, standing water - shallow

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? [ ] yes (fill out section below) [X] no

Classify stream as follows: [ ] ephemeral [ ] intermittent [X] perennial → Wash

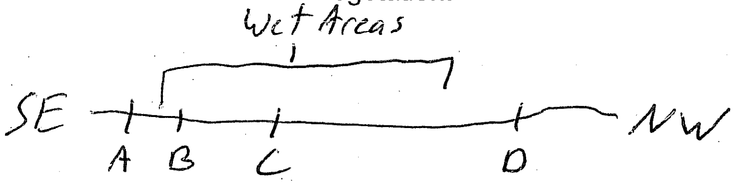
Presence of aquatic wildlife? [ ] yes [X] no

Obvious wildlife movement corridor? [ ] yes [X] no

Width of stream from top of streambed:
N/A waypoints denote wet areas

Width of riparian vegetation:
N/A

Cross-section sketch of stream section and vegetation:



Shelving: [ ] yes [X] no	Sediment deposition: [ ] yes [X] no
Debris lines: [ ] yes [X] no	Presence of defined bed and bank: [ ] yes [X] no
OHWM: [ ] yes [X] no	Riparian vegetation: [ ] yes (note below) [X] no
Water marks: [ ] yes [X] no	Flowing or [✓ standing] water: [X] yes [ ] no

Notes:

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
saltgrass	~~0%~~ 54.3%			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Crawford / Edward Belden

Date: 10/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAW
Transect ID: P3T2
Plot ID: Wetland Area 3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 54.3% cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ✓ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1-3 (in.)

Depth to Free Water in Pit: ____ (in.)

Depth to Saturated Soil: ____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ✓ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water-Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks: Visual inundation

SOILS

Map Unit Name
(Series and Phase): ____________________

Taxonomy (Subgroup): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: FACW species within clearly delineated wet land boundary inundated in 2007 (June); slippery gleyed soils when walking transect

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 4

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 Polygon 4 Transect 1
Date: 6/23/07	Time start:
Surveyors: Edward Belden / Jack Goldfarb	

Photo data	**Weather data**
Photo No.: OWN 3329	Air temperature: 75 F
Taken from (direction): looking East	Cloud cover (%) 0
Description of photo: Transect looking East	Precipitation: [ ] yes [X] no
	Estimated wind speed: 5 mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space)

North: Open space	East: Open Space
South:	West:
Slope %: 0	Soil description: Salt, clay
Aspect: 0	
GPS location: waypoints on back	

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

natural drainages, old roads associated w/ soda works worn & w/ old wood puncheons

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? [X] yes (fill out section below) [ ] no

Classify stream as follows: [ ] ephemeral [X] intermittent [ ] perennial

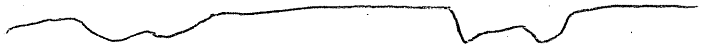
Presence of aquatic wildlife? [ ] yes [X] no

Obvious wildlife movement corridor? [X] yes [ ] no

Width of stream from top of streambed: waypoints on back

Width of riparian vegetation: waypoints on back

Cross-section sketch of stream section and vegetation: Saltgrass & other species collected



Shelving: [ ] yes [X] no	Sediment deposition: [ ] yes [X] no
Debris lines: [ ] yes [X] no	Presence of defined bed and bank: [X] yes [ ] no
OHWM: [X] yes [X] no	Riparian vegetation: [X] yes (note below) [ ] no
Water marks: [X] yes [ ] no	Flowing or standing water: [ ] yes [X] no

Notes: Saltgrass & other species in channel areas

no standing water

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~20%~~ 35.3%			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Gold Farb / Edward Belden

Date: 6/22/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DTM
Transect ID: P4T1
Plot ID: Wetland area 4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata 35.3%	Herb	FACW	9.		
2. sedge (Scirpus pungens) (15%)	herb	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50.3% total cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- [✓ Aerial Photographs]
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___(in.)

Depth to Free Water in Pit: ___(in.)

Depth to Saturated Soil: ___(in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ___ Inundated
  - ___ Saturated in Upper 12 Inches
  - ___ Water Marks
  - ___ Drift Lines
  - ___ Sediment Deposits
  - ___ Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___ Oxidized Root Channels in Upper 12 Inches
  - ___ Water-Stained Leaves
  - ___ Local Soil Survey Data
  - ___ FAC-Neutral Test
  - ___ Other (Explain in Remarks)

Remarks: Clearly defined channel currently dry with gleyed soils beneath crust

SOILS

Map Unit Name
(Series and Phase): ______________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: FACW and OBL species present in channel with crusts overlaying gleyed soils at approx 0.5 - 1 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP

Project No. 1064-013 wetland 4, transect 2

Photo No.: own 3331

Taken from (e.g., looking north): looking west

Description of photo: Dry Lake

General data

Date: 6/22/07

Time start:

Surveyors: Edward Belden
Jack Goldfarb

Weather data

Air temperature:

Start

End

Cloud cover (%) 0

Precipitation: ☐ yes ☒ no

Estimated wind speed 0

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: open space - channel

East: open space

South: " "

West: open space

Slope %: 0

Aspect: 0

GPS location: on back

Soil description: Salt crust

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

cattle grazing on saltgrass; historic roadways

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no

Width of stream from top of streambed: way points

Width of riparian vegetation: waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no

Debris lines: ☐ yes ☒ no

OHWM: ☒ yes ☐ no

Water marks: ☒ yes ☐ no

Sediment deposition: ☐ yes ☒ no

Presence of defined bed and bank: ☒ yes ☐ no

Riparian vegetation: ☒ yes (note below) ☐ no

Flowing or standing water: ☐ yes ☒ no

Notes:

Saltgrass

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~2%~~ 56.3%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack, Bird Fors / Edward Belden

Date: 6/22/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DPSM
Transect ID: P41D
Plot ID: Wetland Area 4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 56.3% Cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ☑ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___________(in.)

Depth to Free Water in Pit: ___________(in.)

Depth to Saturated Soil: ___________(in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water-Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks: Clearly defined channel currently dry with gleyed soils beneath crust

SOILS

Map Unit Name
(Series and Phase): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ____________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: FACW species present in clearly defined channel with crust overlaying gleyed soils at approximately 0.5-1 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 4

Project Name and Site No.: Owens Lake Supplemental SIP

Project No.: 1064-013 Polygon 4 Transect 3

Date: 6/21/07

Time start: 10:23

Surveyors: Edward Belden / Jack Goldfarb

Photo data

Photo No.: OWN 3334

Taken from (direction): E-SE

Description of photo: channel / dry lake

Weather data

Air temperature: 80F

Cloud cover (%): 0

Precipitation: [ ] yes [X] no

Estimated wind speed: 5 mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space)

North: Open Space

East: "

South: "

West: "

Slope %: 0

Aspect: 0

GPS location: Back

Soil description: Salt ~~Cuts~~ crusts

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? [X] yes (fill out section below) [ ] no

Classify stream as follows: [ ] ephemeral [X] intermittent [ ] perennial

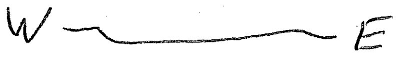
Presence of aquatic wildlife? [ ] yes [X] no

Obvious wildlife movement corridor? [ ] yes [X] no

Width of stream from top of streambed: Waypoints

Width of riparian vegetation: Waypoints

Cross-section sketch of stream section and vegetation: Dry channel



Shelving: [ ] yes [X] no

Sediment deposition: [ ] yes [X] no

Debris lines: [ ] yes [X] no

Presence of defined bed and bank: [X] yes [ ] no

OHWM: [ ] yes [X] no

Riparian vegetation: [ ] yes (note below) [X] no

Water marks: [X] yes [ ] no

Flowing or standing water: [ ] yes [X] no

Notes:

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
saltgrass	0 %			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Gold Farb / Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? ~~Yes~~ [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P4 T3
Plot ID: Wetland Area 4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: currently no vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
    ___ Stream, Lake, or Tide Gauge
    ___ Aerial Photographs
    ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ____________(in.)

Depth to Free Water in Pit: ____________(in.)

Depth to Saturated Soil: ____________(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Clearly defined channel (choke point); connects to braided channels on both sides

SOILS

Map Unit Name
(Series and Phase): ______

Drainage Class: ______
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Clearly defined channel boundary with crusts overlaying gleyed soils at approx. 0.5-1 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 wetland 4, transect 4
Photo No.: own3335	Taken from (e.g., looking north): West
Description of photo: West dry lake and channel	
General data	Weather data
Date: 6/21/07	Air temperature: 80°F
Time start: 10:45	Start End
Surveyors: Edward Belden Jack Goldfarb	Cloud cover (%) 0 Precipitation: ☐ yes ☒ no Estimated wind speed 5 mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: Open space	East: Open space
South: Open space	West: Open space
Slope %: 0	Soil description: Salt
Aspect: 0	
GPS location: Back	

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake - channel area, saltgrass

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no intermittent

Width of stream from top of streambed:
waypoints

Width of riparian vegetation:
Waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no	Sediment deposition: ☐ yes ☒ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☒ yes ☐ no
OHWM: ☐ yes ☒ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☒ yes ☐ no	Flowing or standing water: ☐ yes ☒ no

Notes:

Dry channel braided, saltgrass

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~1%~~ 58.1%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Goldfarb / Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P4T4
Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 58.1% Cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ✓ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ________(in.)
Depth to Free Water in Pit: ________(in.)
Depth to Saturated Soil: ________(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Clearly defined channel currently dry with gleyed soils beneath crust

SOILS

Map Unit Name
(Series and Phase): ______________________________
Drainage Class: ______________
Field Observations
Confirm Mapped Type? Yes No
Taxonomy (Subgroup): ______________________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: FACW species present on clearly defined channel with crust overlaying gleyed soils at approximately 0.5-1.0 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 4

Project Name and Site No. Owens Lake Supplemental SIP

Project No. 1064-013 P4 T5

Date: 6/21/07

Time start: 11:10am

Surveyors: Edward Belden / Jack Goldfarb

Photo data

Photo No.: OWN 3337

Taken from (direction): Looking West

Description of photo: Channel area & Dry Lake

Weather data

Air temperature: 80F

Cloud cover (%) 0

Precipitation: [ ] yes [X] no

Estimated wind speed: 5mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space)

North: Open Space

East: "

South: "

West: "

Slope %: 0

Aspect: 0

GPS location: Back

Soil description: clay, salt ~~crsts~~ crusts

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? [X] yes (fill out section below) [ ] no

Classify stream as follows: [ ] ephemeral [X] intermittent [ ] perennial

Presence of aquatic wildlife? [ ] yes [X] no

Obvious wildlife movement corridor? [ ] yes [X] no

Width of stream from top of streambed: Waypoints

Width of riparian vegetation: Waypoints

Cross-section sketch of stream section and vegetation: Braided Channel

Shelving: [ ] yes [X] no

Sediment deposition: [ ] yes [X] no

Debris lines: [ ] yes [X] no

Presence of defined bed and bank: [X] yes [ ] no

OHWM: [ ] yes [X] no

Riparian vegetation: [X] yes (note below) [ ] no

Water marks: [X] yes [ ] no

Flowing or standing water: [ ] yes [X] no

Notes:

Saltgrass, dry wash, braided

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~3%~~ 40.2%			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jackbird Toro | Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P4 T5
Plot ID: Wetland area 4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). cover: 40.2% 100% Dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___________(in.)

Depth to Free Water in Pit: ___________(in.)

Depth to Saturated Soil: ___________(in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water-Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks: Clearly defined channel currently dry with gleyed soils beneath crust

SOILS

Map Unit Name
(Series and Phase): ______________________

Drainage Class: ______________

Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: FACW species present in channel with crusts overlaying gleyed soils at approximately 0.5 - 1 inch beneath crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No.: Owens Lake Supplemental SIP

Project No.: 1064-013 wetland 4, transect 6

Photo No.: Own 3330

Taken from (e.g., looking north): looking west

Description of photo: Dry lake, channel area

General data

Date: 6/21/07

Time start: 11:45

Surveyors: Edward Belden
Jack Goldfarb

Weather data

Air temperature: 85° F

Start

End

Cloud cover (%): 0

Precipitation: ☐ yes ☒ no

Estimated wind speed: 5 mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: Open space

South: Open space

East: Open space

West: open space

Slope %: 0

Aspect: 0

GPS location: Back

Soil description: Clay, salt crust

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no intermittent

Width of stream from top of streambed: waypoints

Width of riparian vegetation: waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no

Debris lines: ☐ yes ☒ no

OHWM: ☐ yes ☒ no

Water marks: ☒ yes ☐ no

Sediment deposition: ☐ yes ☒ no

Presence of defined bed and bank: ☒ yes ☐ no

Riparian vegetation: ☒ yes (note below) ☐ no

Flowing or standing water: ☐ yes ☒ no

Notes:

Saltgrass, dry

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~15%~~ 100%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Goldfarb / Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P4T6
Plot ID: Wetland area 4

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___________(in.)

Depth to Free Water in Pit: ___________(in.)

Depth to Saturated Soil: ___________(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Clearly defined channel currently dry with gleyed soils beneath crust.

SOILS

Map Unit Name
(Series and Phase): ____________________

Taxonomy (Subgroup): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: FACW species present in channel with crusts overlaying gleyed soils at approximately 0.5-1 inch beneath crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP

Project No. 1064-013 Wetland 5, transect 1

Photo No.: Own 3336

Taken from (e.g., looking north): looking South

Description of photo: Dry lake channel

General data	Weather data	
Date: 6/21/07	Air temperature: 80°F	
Time start: 11:00am	Start	End
Surveyors: Edward Belden Jack Goldfarb	Cloud cover (%) 0	
	Precipitation: ☐ yes ☒ no	
	Estimated wind speed 0	

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: Open space

East: open Space

South: Open Space

West: open space

Slope %: 0

Aspect: 0

GPS location:

Soil description: Saltcrust

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Dry Lake

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no intermittent

Width of stream from top of streambed: Waypoints

Width of riparian vegetation: Waypoints

Cross-section sketch of stream section and vegetation:

Shelving: ☒ yes ☐ no	Sediment deposition: ☐ yes ☒ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☒ yes ☐ no
OHWM: ☐ yes ☒ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☒ yes ☐ no	Flowing or standing water: ☐ yes ☒ no

Notes:

Saltgrass present, tiger beetle (not sensitive)

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~15%~~ 100%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Goldfarb / Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: PST1
Plot ID: Wetland Area 5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100% cover 100% dominance

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ☐ Inundated
  - ☐ Saturated in Upper 12 Inches
  - ☐ Water Marks
  - ☒ Drift Lines
  - ☐ Sediment Deposits
  - ☐ Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ☐ Oxidized Root Channels in Upper 12 Inches
  - ☐ Water-Stained Leaves
  - ☐ Local Soil Survey Data
  - ☐ FAC-Neutral Test
  - ☒ Other (Explain in Remarks)

Remarks: intermittent channel approximately 23.4 meters = 76.8 feet entire channel contained saltgrass —

SOILS

Map Unit Name
(Series and Phase): ______________________

Drainage Class: __________

Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltgrass growing on encrusted channel, No hydric soil indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] ~~No~~
Hydric Soils Present? Yes [✓ No]

(Circle)
Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Wetland Area 6

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 Polygon 6 Transect 1
Date: 6/21/07	Time start: 1251

Surveyors: Edward Belden / Jack Goldfarb

Photo data	Weather data
Photo No.: OWN 3339	Air temperature: 100F
Taken from (direction): Looking East	Cloud cover (%) 0
Description of photo: Dry Lake / channel	Precipitation: [ ] yes [X] no
	Estimated wind speed: 5mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space)

North: Open space	East: "
South: "	West: "
Slope %: 0	Soil description: Salt crusts, Clay sand
Aspect: 0	
GPS location: See back	

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined stream, bed, bank? [X] yes (fill out section below) [ ] no

Classify stream as follows: [ ] ephemeral [X] intermittent [ ] perennial

Presence of aquatic wildlife? [ ] yes [X] no

Obvious wildlife movement corridor? [ ] yes [X] no

Width of stream from top of streambed: Back

Width of riparian vegetation: Back

Cross-section sketch of stream section and vegetation:

Shelving: [ ] yes [X] no	Sediment deposition: [X] yes [X] no
Debris lines: [ ] yes [X] no	Presence of defined bed and bank: [✓] yes [ ] no
OHWM: [ ] yes [X] no	Riparian vegetation: [✓] yes (note below) [ ] no
Water marks: [X] yes [ ] no	Flowing or standing water: [ ] yes [✓] no

Notes:

Salt grass, dry channel

Vegetation Communities

Plant communities within and adjacent to crossings:

Species	% cover	Terrestrial upland	Aquatic	Riparian
saltgrass	~~15~~ % 100%			

Wildlife

Species	Sign*	Primary Habitat		
		Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Goldfarb/Edward Belden

Date: 6/21/2007
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: P6T1
Plot ID: Wetland Area 6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100% cover 100% dominance

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
  ☐ Stream, Lake, or Tide Gauge
  ☑ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ☐ Inundated
  ☐ Saturated in Upper 12 Inches
  ☐ Water Marks
  ☐ Drift Lines
  ☐ Sediment Deposits
  ☐ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ☐ Oxidized Root Channels in Upper 12 Inches
  ☐ Water-Stained Leaves
  ☐ Local Soil Survey Data
  ☐ FAC-Neutral Test
  ☐ Other (Explain in Remarks)

Remarks: Dry with gleyed soils under crust with a defined channel boundary

SOILS

Map Unit Name
(Series and Phase): ______________________________

Drainage Class: ______________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______________________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltgrass growin on channel gleyed soils approximately 0.5 - 1 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP	Project No. 1064-013 Wetland 6, transect 2
Photo No.: Own 3340	Taken from (e.g., looking north): looking west

Description of photo:
Dry lake / channel

General data	Weather data	
Date: 6/21/07	Air temperature: 100 °F	
Time start: 1:06 pm	Start	End
Surveyors: Edward Belden Jack Goldfarb	Cloud cover (%) 0	
	Precipitation: ☐ yes ☒ no	
	Estimated wind speed 5 mph	

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: Open Space	East: open Space
South: Open Space	West: open Space
Slope %: 0	Soil description: Clay, salt crust
Aspect: 0	
GPS location: Back	

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no intermittent

Width of stream from top of streambed:
Back

Width of riparian vegetation:
Back

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no	Sediment deposition: ☒ yes ☐ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☒ yes ☐ no
OHWM: ☐ yes ☒ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☒ yes ☐ no	Flowing or standing water: ☐ yes ☒ no

Notes:
Saltgrass, dry channel

Vegetation Communities				
Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)				
Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~15%~~ 100%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities				
		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Goldfarb / Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DAy
Transect ID: P6T2
Plot ID: Wetland Area 6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100% cover 100% dominance

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
    ___ Stream, Lake, or Tide Gauge
    ☒ Aerial Photographs
    ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: / (in.)

Depth to Free Water in Pit: / (in.)

Depth to Saturated Soil: / (in.)

Wetland Hydrology Indicators:
  Primary Indicators:
    ___ Inundated
    ___ Saturated in Upper 12 Inches
    ___ Water Marks
    ___ Drift Lines
    ___ Sediment Deposits
    ___ Drainage Patterns in Wetlands
  Secondary Indicators (2 or more required):
    ___ Oxidized Root Channels in Upper 12 Inches
    ___ Water-Stained Leaves
    ___ Local Soil Survey Data
    ___ FAC-Neutral Test
    ___ Other (Explain in Remarks)

Remarks: Dry with gleyed soils under crust / defined channel boundary

SOILS

Map Unit Name
(Series and Phase): ______________________
Drainage Class: ______________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saltgrass growing on channel, gleyed soils evident 0.5-1 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP

Project No. 1064-013 Wetland 6, transect3

Photo No.: OWN 334 1

Taken from (e.g., looking north): looking east

Description of photo: Dry lake; Saltgrass channel

General data	Weather data	
Date: 6/21/07	Air temperature: 100°F	
Time start: 1:20 pm	Start	End
Surveyors: Edward Belden Jack Goldfarb	Cloud cover (%) 0	
	Precipitation: ☐ yes ☒ no	
	Estimated wind speed 5 mph	

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: Open space	East: open space
South: Open space	West: open space
Slope %: 0	Soil description: Saltcrust
Aspect: 0	
GPS location: Back	

Obvious wildlife movement corridor? ☐ yes ☒ no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? ☒ yes (fill out section below) ☐ no intermittent

Width of stream from top of streambed: Back

Width of riparian vegetation: Back

Cross-section sketch of stream section and vegetation:

Shelving: ☐ yes ☒ no	Sediment deposition: ☐ yes ☒ no
Debris lines: ☐ yes ☒ no	Presence of defined bed and bank: ☒ yes ☐ no
OHWM: ☒ yes ☐ no	Riparian vegetation: ☒ yes (note below) ☐ no
Water marks: ☒ yes ☐ no	Flowing or standing water: ☐ yes ☒ no

Notes: Dry channel, Saltgrass

Vegetation Communities

Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)

Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	~~10%~~ 80%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities

		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Bolt Ford / Edward Belden

Date: 6/21/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: DIAM
Transect ID: P6T3
Plot ID: Wetland area 6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Distichlis spicata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 80% Cover 100% dominance

Remarks:

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
  ☐ Stream, Lake, or Tide Gauge
  ☑ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: — (in.)

Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
☐ Inundated
☐ Saturated in Upper 12 Inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (Explain in Remarks)

Remarks: Dry channel with gleyed soils under crust / defined channel boundary

SOILS

Map Unit Name
(Series and Phase): ____________________

Drainage Class: ____________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ____________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Salt grass growing in channel; gleyed soils evident 0.5-1 inch below crust

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

SECTION 1600 FISH AND GAME CODE FIELD ASSESSMENT SHEET

Project Name and Site No. Owens Lake Supplemental SIP

Project No. 1064-013 Wetland 7

Photo No.: own 3365, 3366

Taken from (e.g., looking north): 65: looking South, 66 looking West

Description of photo: Wetland + Spring area

General data

Date: 6/22/07

Time start:

Surveyors: Edward Belden
Jack Goldfarb

Weather data

Air temperature: 80° F

Start

End

Cloud cover (%) 0

Precipitation: [ ] yes [X] no

Estimated wind speed 5 mph

Physical Characteristics

Adjacent land uses (e.g., residential, commercial, open space; draw on aerial)

North: Open space

South: Open space

East: Open space

West: Open space

Slope %: 0

Aspect: 0

GPS location: Back

Soil description: Salt crust

Obvious wildlife movement corridor? [ ] yes [ ] no

Previous/existing disturbances, both natural and anthropogenic (describe and depict on aerial):

Evidence of Aquatic or Riparian Resources (take photo and depict on aerial)

Is there a well-defined streambed and stream bank? [X] yes (fill out section below) [ ] no perennial presence of aquatic life (migratory birds)

Width of stream from top of streambed: Delineated w/ GPS

Width of riparian vegetation: Delineated w/ GPS

Cross-section sketch of stream section and vegetation:

Shelving: [ ] yes [ ] no

Debris lines: [ ] yes [ ] no

OHWM: [X] yes [ ] no

Water marks: [X] yes [ ] no

Sediment deposition: [ ] yes [X] no

Presence of defined bed and bank: [X] yes [ ] no

Riparian vegetation: [X] yes (note below) [ ] no

Flowing or standing water: [X] yes [ ] no

Notes: Standing and flowing toward brine pool
Saltgrass present

Vegetation Communities				
Plant communities within and adjacent to crossings (add abbreviation and depict on aerial)				
Species	% cover*	Terrestrial upland	Aquatic	Riparian
Saltgrass	35%			

* 1 = individual; 2 = rare; 3 = frequent; 4 = common; 5 = abundant

Wildlife Communities				
		Primary Habitat		
Species	Sign*	Terrestrial upland	Aquatic	Riparian

* B = burrow; C = carcass; Fe = feathers; Fu = fur; N = nest; O = observed; S = scat; T = tracks; V = vocalization

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Owens Lake Supplemental SIP
Applicant/Owner: GBUAPCD (District)
Investigator: Jack Goldfarb | Edward Belden

Date: 6/12/07
County: Inyo
State: CA

Do Normal Circumstances exist on the site? Yes No
Is the site significantly disturbed (Atypical Situation)? Yes No
Is the area a potential Problem Area? Yes No
(If needed, explain on reverse.)

Community ID: DAM
Transect ID: PMT1
Plot ID: Wetland Area 7

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. distichlis spicata	herb	FACW
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100% dominance

Remarks: scattered saltgrass along margin of wetland area

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
  - ☐ Stream, Lake, or Tide Gauge
  - ☒ Aerial Photographs
  - ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2-3 feet (in.)

Depth to Free Water in Pit: ____ (in.)

Depth to Saturated Soil: ____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): ______________________

Drainage Class: ______________
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): ______________________

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: FACW species with clearly delineated boundary of wetland inundated 2-3 feet in June 2017.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

APPENDIX C
RESUMES

ANDREW C. KELLER
RESOURCE COORDINATOR

Mr. Andrew Keller is a wildlife biologist for Sapphos Environmental, Inc., recently joining the firm in April 2007. Mr. Keller's background encompasses environmental science, ecology, and conservation biology, with over 3 years of experience in these fields. His work history includes mammal trapping, wildlife surveys, radio telemetry, habitat analysis, and population biology. A specialist in reptiles and small mammals, Mr. Keller has extensive experience surveying for, trapping, identifying, and processing various species. In addition, he has extensive experience working in riparian zones, and his endeavors have aided in the protection and management of these habitat types in the desert southwest.

Mr. Keller has extensive experience in arid rangelands and riparian habitats, exploring the influence of multiple cattle grazing strategies on the productivity and diversity of Arizona rangelands. Specifically, he explored the response of arthropod and plant communities on varying levels of ungulate disturbance. Along with this research, a collaboration of different organizations was created, linking scientists, government, and cattle ranchers to reach common goals in terms of rangeland management. The culmination of this research resulted in the ongoing collaboration between specific interest groups and a continued monitoring program of grazing on the Colorado Plateau.

Mr. Keller's interests also involve modeling of endangered or threatened marine mammal populations to assess the status of these stocks according to the Endangered Species Act. His experience in this field includes a population viability analysis of the eastern North Pacific gray whale and the western Arctic bowhead whale as means of determining listing status under the ESA for these stocks. Mr. Keller has also spent time in the Gulf of California studying the California Sea Lion to define behavior parameters that may affect dispersal and abundance of this species. This data will be used to set modeling parameters to provide more accurate projections of growth rates and dispersal of sea lions.

Professional History

- Sapphos Environmental, Inc., resources coordinator, 2007–present
- Red Mountain College, adjunct faculty, Fall 2006
- Arizona State University, research technician, 2002–2005 (seasonal)
- Arizona State University, teaching assistant, 2002–2005
- Arizona State University, coordinator/behavioral biologist, 2002–2004 (seasonal)
- Northern Arizona University, research technician, 1996–1998

Education

- Master of Science, Biology, Arizona State University, 2006
- Bachelor of Science, Environmental Science, Northern Arizona University, 1998

Conferences/Workshops/Training

- 2005 Presentation, Society of Conservation Biology meeting. Topic: "Monitoring and the Endangered Species Act; revisiting the Eastern North Pacific Gray Whale."

Professional Affiliations

- Society for Conservation Biology
- Ecological Society of America

Publications

- Keller, A.C., and L. Gerber. 2004. Monitoring the Endangered Species Act: Revisiting the Eastern North Pacific Gray Whale. *Endangered Species Update*. *21* (3): 2–5.

- Sabo, J.L., C. Soykan, and A. Keller. 2005. Functional Roles of Leaf Litter Detritus in Terrestrial Food Webs. In *Multi-Species Assemblages, Ecosystem Development, and Environmental Change*, eds., P.C. de Ruiter, J.C. Moore, and U. Wolters. Academic Press, San Diego, CA.

- Keller, A. C., W. DeMaster, and L. Gerber. Ten-Thousand and Increasing: Is the Southern Arctic Bowhead Endangered? *Marine Mammal Science*. Accepted manuscript.

Publications in Review

- Sabo, J.L., C.U. Soykan, T.K. Harms, J. Roemer, and A. Keller. Giving Up Distance: Thermal, Structural, and Trophic Roles of Litter in a Desert Riparian Forest Food Web. *Ecological Monographs*. Unpublished manuscript.

- Keller, A.C., and J.L. Sabo. The Influence of Sampling Effort on Home Range Estimates: Revisiting the Eastern Fence Lizard (*Sceloporus undulatus*). *Ecology*. Unpublished manuscript.

- Sabo, J.L, B. Hagen, C.D. Soykan, A.C. Keller, and K.M. McClueny. The Role of Detritus as a Food Subsidy in Terrestrial and Marine Systems. Unpublished manuscript.

C.J. RANDEL
SENIOR WILDLIFE BIOLOGIST

Mr. Charles "C. J." Randel is a senior wildlife biologist at Sapphos Environmental, Inc. He has over 5 years of experience in the field of wildlife biology, including project design, trapping, radio-telemetry, habitat analysis, rangeland analysis, nest surveys, and publication of both scientific and nonscientific papers. Mr. Randel has been employed with Sapphos Environmental, Inc. for the past 2.5 years, in which time he has worked closely with the California Department of Transportation, District 8 (Caltrans) and successfully managed or assisted in the management of 70 Task Orders. Environmental documents for Caltrans included Biological Assessments, Natural Environment Studies, Natural Environment Studies Minimal Impact, and Biological Technical Reports. In addition to environmental documentation, Caltrans projects have included surveys for rare, threatened, and endangered species, including desert tortoise, Aguanga kangaroo rat, Los Angeles pocket mouse, Mohave ground squirrel, and Palm Springs round-tailed ground squirrel. Mr. Randel's efforts are supported by the California Department of Fish and Game scientific collecting permit No. 007706. In addition to environmental documentation and sensitive species surveys, Mr. Randel has experience with ArcGIS and has used this tool for multiple aspects from determination of likely species occupation for chukar to determination of habitat corridors for the lesser prairie chicken and urban bobcats and coyotes.

Mr. Randel has conducted and assisted with surveys in support of the various Wind Energy Development project in Kern County, California, including listed salamander surveys, endangered species surveys, and habitat analysis. Mr. Randel also has experience with Federal Endangered Species Recovery plans. He assisted with the mandatory 10-year update of the Federal Recovery Plan for the Attwater's prairie chicken and assisted in the implementation of the Riverside fairy shrimp recovery plan.

Mr. Randel's former employments as a wildlife biologist include Pheasants Forever, the Natural Resources Conservation Service, the Nebraska Game and Parks Commission, and the Wildlife and Fisheries Sciences Department, Texas A&M University.

Professional History

- Sapphos Environmental, Inc., Wildlife Biologist, August 2004–present
- Pheasants Forever, Inc., Regional Wildlife Biologist, April 2004–August 2004
- Texas A&M University, Department of Wildlife and Fisheries Sciences, Research Associate, January 2004–April 2004
- Texas A&M University, Department of Wildlife and Fisheries Sciences, Graduate Research Assistant, October 2001–December 2003

Education

- Master of Science, Wildlife and Fisheries Sciences, Texas A&M University, 2003
- Bachelor of Science, Biological Sciences, University of Nebraska, 2001

Conferences

- Using Remote Sensing Cameras to Individually Identify Bobcats, International Union of Game and Wildlife Biologists, 14 August 2007, Uppsala, Sweden

- Nesting Ecology of Rio Grande Wild Turkey in the Edwards Plateau of Texas, National Wild Turkey Symposium, 12 December 2005, Grand Rapids, Michigan
- Invertebrate Abundance at Nest and Brood Sites of Rio Grande Wild Turkey in the Edwards Plateau, Texas Chapter of the Wildlife Society Annual Meeting, February 2005, Amarillo, Texas
- Techniques for monitoring predator abundance and movement patterns, Carlsbad Field Office, U.S. Fish and Wildlife Service, December 2004
- Vegetation Characteristics, Invertebrate Abundance, Predation, and Survival: Rio Grande Wild Turkey Edwards Plateau, Texas, (State Turkey Meeting, TPWD), 18 February 2004, Kerrville, Texas

Workshops

- 13th Annual Surveying, Monitoring, and Handling Techniques Desert Tortoise Workshop, Desert Tortoise Council, 2004, Ridgecrest, California
- Mohave Ground Squirrel Workshop, Western Section of the Wildlife Society, 2005, Ridgecrest, California

Certifications

- ArcGIS Certified, 2003
- Independent Investigator, Mohave Ground Squirrel, 2007
- Southern Rubber Boa Certified, 2006

Professional Affiliations

- The Wildlife Society
- Society for Range Management
- American Society of Mammalogy

Publications

Collier, B.A., D.A. Jones, J.B. Schaap, C.J. Randel III, B.J. Willsey, R. Aguirre, T.W. Schwartner, N. J. Silvy, and M. J. Peterson. 2007. “Survival of Rio Grande Wild Turkeys on the Edwards Plateau of Texas.” *Journal of Wildlife Management*, *71*:82–86.

Lockwood, M.A., C.P. Griffin, M.E. Morrow, C.J. Randel, and N.J. Silvy. 2005. “Survival, Movements, and Reproduction of Released Captive-Reared Attwater’s Prairie-Chicken.” *Journal of Wildlife Management*, 69:1251–1258.

Randel, C.J., R. Aguirre, D.A. Jones, J.N. Schaap, B.J. Willsey, M.J. Peterson, and N.J. Silvy. In press. “Nesting Ecology of Rio Grande Wild Turkey in the Edwards Plateau of Texas.” Proceedings of the National Wild Turkey Symposium 9.

Randel, C.J., R.B. Aguirre, M.J. Peterson, and N.J. Silvy. 2006. "Comparison of 2 Techniques for Assessing Invertebrate Availability for Wild Turkeys in Texas." *Wildlife Society Bulletin*, *34*:853–855.

Randel, C.J., III, R.B. Aguirre, M.J. Peterson, and N.J. Silvy. In press. "Invertebrate Abundance at Rio Grande Wild Turkey Brood Sites." *Journal of Wildlife Management*.

Randel, C.J., J. Pestovic, and N.J. Silvy. 2003. *Ornithology Unit of the Texas Master Naturalist Program State Curriculum*. Texas Parks and Wildlife Department and Texas Cooperative Extension Publication.

DOUGLAS BRANCH MCNAIR
SENIOR WILDLIFE BIOLOGIST

Mr. Douglas McNair is a versatile ornithologist, vertebrate ecologist, and wildlife biologist. His work in the 1980s focused on the natural history of birds, especially studies on their distribution, abundance, and status in the southeastern United States. Topics included the occurrence of vagrants, the breeding biology of rare taxa and other sensitive species such as the lark sparrow (*Chondestes grammacus*) in North Carolina, and behavior such as heterospecific vocal mimicry of North American passerines. Mr. McNair also began analyses of egg set (and skin) data from museum collections during these years.

During the 1990s, Mr. McNair continued his focus in autecological studies but also concentrated on broader conceptual issues in field-intensive avenues of research, especially on landbird migration systems and fire ecology of avian communities. Migration system projects focused on the routes, habitat preferences, and stopover strategies of landbirds [(especially the blackpoll warbler (*Dendroica striata*)] at three sites in eastern North America (Magdalen Islands, Quebec; Charleston, South Carolina; Apalachicola National Forest, Florida) and one site in the West Indies (Barbados). At Tall Timbers Research Station, Mr. McNair examined the effects of season-of-fire on avian populations in longleaf pine-wiregrass forest in the Apalachicola National Forest. Mr. McNair worked on another project on autumnal grassland migrants in two savannas, with emphasis on Henslow's Sparrow *Ammodramus henslowii*. He also initiated another fire ecology research project in northern Florida on the breeding ecology of seaside sparrows (*A. maritimus*) in response to time since last dormant-season fire at St. Vincent National Wildlife Refuge. Other research projects initiated during the 1990s included the following: 1. breeding bird census in the commercial district of Rockingham, North Carolina (1994), which emphasized collection of nest-site information within the context of natural resource-based hypotheses of avian community use; 2. breeding distribution, nesting habitat, nest-site characteristics, and population size of the American oystercatcher (*Haematopus palliates*) (1995–1996) and least tern (*Sternula antillarum*) (1995–1998) in Franklin County, Florida; and 3. influence of weather (especially tropical cyclones) on the distribution and abundance of seabirds such as the magnificent frigatebird (*Fregata magnificens*), with emphasis on patterns of dispersal. Mr. McNair also discovered the gray-hooded gull (*Larus cirrocephalus*)—the first documented record in North America—and extended his research in historical ornithology to include Wyoming and the Caribbean.

Upon moving to the Caribbean in 2002, Mr. McNair's responsibilities with the Division of Fish and Wildlife (DFW) on St. Croix, U.S. Virgin Islands, included research, surveys, and monitoring, especially related to the distribution, abundance, and status of vertebrates; the natural history and reproductive ecology of rare and uncommon birds; and hurricane effects on birds. Mr. McNair's federal-aid grants funded the following projects: 1. population estimates, ecology, and translocation of the globally endangered St. Croix Ground Lizard (*Ameiva polops*); 2. reproductive ecology, predator control, and management of the Least Tern, a species of conservation concern; 3. historical and current breeding distribution of the territorially threatened White-Crowned Pigeon (*Patagioenas leucocephala*); 4. distribution and abundance of columbids using point-transect distance sampling, which has allowed DFW to obtain reliable population estimates for the Zenaida Dove (*Zenaida aurita*) (currently hunted) and Scaly-Naped Pigeon (*P. squamosa*) (hunt suspended in 1991); 5. waterbird surveys and monitoring in freshwater and saline habitats, especially of rare and uncommon breeding taxa; 6. historical and current status of the Cattle Egret *Bubulcus ibis* in the U.S. Virgin Islands, and management considerations; 7. review of the status of American (*Fulica*

Americana) and Caribbean coots (*F. caribaea*) in the U.S. Virgin Islands and their breeding ecology at Southgate Pond, St. Croix; 8. before-and-after comparison of bird species composition and abundance at the Sugar Bay mangrove forest following Hurricane Hugo, which has confirmed that winter populations of Nearctic-Neotropical migrants have remained depressed; and 9. archival of greater than 99 percent of all published literature on the birds of St. Croix at the DFW office. The St. Croix Ground Lizard and Least Tern projects involved recruitment of two graduate students to the Cooperative Fish and Wildlife Research Units at two universities, North Carolina State (Major advisor: Dr. Jaime Collazo) and Maryland at Eastern Shore (Major advisor: Dr. James Wiley), the first graduate student projects ever sponsored by DFW. Other work included coauthorship on "A Plan for Research, Management, and Conservation of Wildlife in the United States Virgin Islands," which included a new avifaunal list to replace the obsolete list in the VI Indigenous and Endangered Species Act of 1990. Mr. McNair also helped craft the Tree Conservation Act, a proposed amendment to the Act of 1990, and consulted with the Federal Aviation Administration (FAA), the local airport authority (VIPA), and the Department of Public Works on bird/aircraft strike issues at the airport and nearby landfill. Mr. McNair was elected to the Editorial Board of the *Caribbean Journal of Science* to serve as an ornithologist and to also serve on the Board of Advisors for the nongovernmental organization Environmental Protection in the Caribbean (EPIC).

Upon moving to Southern California in 2005, Mr. McNair began his work as an environmental consultant at Sapphos Environmental, Inc., with a focus on pragmatic conservation issues in an intensely developed area of the world. This work includes a variety of listed and sensitive species at any number of sites and avian migration systems (and other biological resources at proposed wind farms).

POSITIONS AND CONTRACTS

2005–2007	Senior Wildlife Biologist, Sapphos Environmental, Inc., Pasadena, California (December 2005 to present)
2002–2005	Wildlife Biologist III, Division of Fish and Wildlife, Department of Planning and Natural Resources, St. Croix, U.S. Virgin Islands (April 2002 to November 2005)
2000–2001	Ornithologist / Vertebrate Ecologist: U.S. Geological Survey (National Wetlands Ecology Lab) and U.S. Fish and Wildlife Service, Lafayette, Louisiana (March to September 2001); U.S. Forest Service, Apalachicola National Forest, Bristol, Florida (May 2000, May 2001)
1994–1999	Ornithologist / Vertebrate Ecologist: Tall Timbers Research Station, Tallahassee (December 1994 to December 1999)
1998	Ornithologist, Florida Wildlife Conservation Diversity Program, Tallahassee (September to October 1998)
1996–1997	Florida Heritage Program, Tallahassee (December 1996 to January 1997)
1995	Ornithologist, Florida Wildlife Conservation Diversity Program, Tallahassee (May to June 1995)
1990–1994	Ornithologist, Ornithology Department, Charleston Museum, Charleston (September 1990 to January 1991, November 1991 to April 1992, January to March 1993, September 1993 to February 1994)
1991	Ornithologist, U.S. Fish and Wildlife Service, Patuxent, Maryland (April to June 1991)
1990	Ornithologist, Florida Wildlife Conservation Diversity Program, Tallahassee (March to June 1990); Ornithologist, Richmond County. Contract with J. Carter (January to March 1990)
1985	Ornithologist, Charleston Museum, Charleston (May to July 1985)

1977–1978	Ornithologist, Berkshire County Museum, Pittsfield (September 1977 to September 1978)
1976	Naturalist, Wellfleet Bay Wildlife Sanctuary (Massachusetts Audubon Society) (June to August 1976)

COOPERATIVE EXPERIENCE

Research Associate

1984–1994	Charleston Museum, Charleston, SC

Bird Records Committee

1984–1994	Subchairman, South Carolina (Charleston Museum)

Bird Observatories / Migration Monitoring Stations

1997	Harrison Point, Barbados (Sep-Nov)
1995–1996	Apalachicola National Forest, Liberty County, Florida (October to November 1995, October to December 1996)
1991–1993	Pointe a Marichite, Magdalen Islands, Quebec (August to October 1991, May to October 1992, May to June 1993)
1990, 1993	Charleston Harbor, Charleston, South Carolina (September to December 1990, September to December 1993)
1978	Dungeness Bird Observatory, Kent, England, United Kingdom (November to December 1978)

Breeding Bird Atlas Projects

1990	Florida: Block Worker
1989	Tennessee and New Brunswick: Block Worker
1988	Nova Scotia: Block Worker
1978, 1980	Vermont: Block Worker
1977–1978	Massachusetts: Coordinator, Berkshire County
1974–1978	Massachusetts: Block Worker

EDITORIAL AND ADVISORY SERVICES TO PROFESSIONAL ORGANIZATIONS

Elected to the Editorial Board of the *Caribbean Journal of Science* (since 2002).

Serves as a guest editor for *Southeastern Naturalist* (since 2003).

Serves on the Board of Advisors (since 2004) for the non-governmental organization Environmental Protection in the Caribbean (EPIC).

MISCELLANEOUS SERVICES TO PROFESSIONAL ORGANIZATIONS

Contributor to many local, regional, or national ornithological societies and their Publications (e.g., *Chat, Florida Field Naturalist, North American Birds,* ISS/MSS, Color-marked Shorebird Studies, Hawk Migration Association of North America, Nongame conferences, etc.)

Compiled 1980 Index for *Journal of Field Ornithology*.

Prepared abstracts from several journals for the literature cited section of the *Auk*.

REVIEW SERVICES FOR SUBMITTED MANUSCRIPTS

Peer and technical reviewer for *Auk, Caribbean Journal of Science, Chat, Condor, Florida Field Naturalist, Journal of Caribbean Ornithology, Journal of Field Ornithology*, *Journal of Wildlife Management, Migrant, North American Birds, Oriole*, *Pitirre*, *Wilson Bulletin,* U.S. Fish and Wildlife Service (USFWS) Henslow's Sparrow status assessment, other USFWS publications, Tennessee Breeding Bird Atlas book, Studies in Trinidad and Tobago ornithology, etc.

POST-PUBLICATION REVIEWS

Inland Bird-Banding 52:65-67 (1980): (2 reviews)
Journal of Field Ornithology 53:287, 296 (1982): (3 reviews)
Journal of Field Ornithology 55:266-267, 279, 500, 515-516 (1984): (4 reviews)
Journal of Field Ornithology 56:198, 209 (1985): (2 reviews)

PUBLICATIONS—BIRDS

Mr. McNair has authored or co-authored 145 publications on birds in 19 journals and three other professional outlets since 1980 (41 papers in the 1980s, 72 in the 1990s, 32 in 2000s). This total excludes submitted manuscripts, abstracts, and birding papers. These journals are (in alphabetical order): *Alabama Birdlife*, *Blue Jay*, *Canadian Field-Naturalist*, *Caribbean Journal of Science*, *Chat*, *Condor* (and its sister publication *Studies in Avian Biology*), *Cotinga*, *Florida Field Naturalist*, *Inland Bird Banding* (defunct), *Journal of Field Ornithology*, *Kansas Ornithological Society Bulletin*, *Migrant*, *North American Birds*, *Oriole*, *Pitirre* (renamed *Journal of Caribbean Ornithology*), *Southwestern Naturalist*, *Transaction North American Wildlife*, *Western North American Naturalist*, and the *Wilson Bulletin* (renamed *Wilson Journal of Ornithology*). The other three professional outlets are (in descending chronological order): 1) Hayes, F.E., & S.A. Temple (Eds.). 2002. *Studies in Trinidad and Tobago Ornithology Honouring Richard ffrench*. *Occasional Paper No. 11*. St. Augustine, Trinidad: Department of Life Sciences, University of the West Indies. 209 pp., 2) Nicholson, C.P. 1997. *The Breeding Bird Atlas of Tennessee*. Knoxville, TN: University of Tennessee Press. 504 pp., and 3) McNair, D.B., & W. Post. 1993. *Supplement to Status and Distribution of SC Birds*. *Charleston Museum Ornithological Contribution No. 8*. Charleston, SC. 49 pp.

Subjects of papers follow the sequence, taxonomy, and English names of the 7th edition of the A.O.U. Check-list (1998) through the forty-seventh supplement (Banks et al. 2006).

McNair, D.B., F.E. Hayes, & L.D. Yntema. 2007. Status of the Least Grebe *Tachybaptus dominicus* in the United States Virgin Islands. *Caribbean Journal of Science* 43: *in press*.

McNair, D.B., & F.W. Sladen. 2007. Historical and current status of the Cattle Egret in the US Virgin Islands, and management considerations. *Journal of Caribbean Ornithology* 20: *in press*.

McNair, D.B., L.D. Yntema, C. Cramer-Burke, & S.L. Fromer. 2007. Recent confirmed breeding records of Ruddy Ducks at Southgate Pond, St. Croix, US Virgin Islands. *Journal of Caribbean Ornithology* 20: *in press*.

McNair, D.B. 2006a. “Historical breeding distribution and abundance of the White-crowned Pigeon (*Patagioenas leucocephala*) on St. Croix, US Virgin Islands.” *Journal of Caribbean Ornithology,* 19:1-7.

McNair, D.B. 2006b. “Review of the status of American Coot (*Fulica americana*) and Caribbean Coot (*Fulica caribaea*) in the United States Virgin Islands.” *North American Birds,* 59: 680-686.

McNair, D.B., & C. Cramer-Burke. 2006. “Breeding ecology of American and Caribbean coots at Southgate Pond, St. Croix: use of woody vegetation.” *Wilson Journal of Ornithology* 118: 208-217.

McNair, D.B., & C.D. Lombard. 2006. “Ground versus above-ground nesting of columbids on the satellite cays of St. Croix, US Virgin Islands.” *Journal of Caribbean Ornithology,* 19: 8-11.

McNair, D.B., L.D. Yntema, & C. Cramer-Burke. 2006. Use of waterbird abundance for saline wetland site prioritization on St. Croix, United States Virgin Islands. *Caribbean Journal of Science* 42:220-230.

McNair, D.B., L.D. Yntema, C.D. Lombard, C. Cramer-Burke, & F.W. Sladen. 2006. "Records of rare and uncommon birds from recent surveys on St. Croix, United States Virgin Islands." *North American Birds,* 59: 536-551.

McNair, D.B. 2003. "Further evaluation of some ornithological conundrums in Florida." *Florida Field Naturalist,* 31: 47-52.

McNair, D.B., & J.P. Dean. 2003. "Distributional information on birds from egg sets collected by Henry Rogers Durkee in 1870 in southwestern Wyoming." *Western North American Naturalist,* 63: 320-332.

Hayes, F.E., D.B. McNair, F.B. Lucas, C.L. Ramjohn, N.C. Johnson, S.T. Balah, L.W. Doodnath, & K.M. Garcia. 2003. "Noteworthy observations of birds, including two globally threatened species, in the eastern Paria Peninsula, Venezuela." *Cotinga,* 20: 101-102.

McNair, D.B., F.E. Hayes, & G.L. White. 2002. "First occurrences of Franklin's Gull (*Larus pipixcan*) for Trinidad." *Studies in Trinidad and Tobago ornithology honouring Richard ffrench* (F.E. Hayes & S.A. Temple, eds.). *Occasional Paper No. 11*. St. Augustine, Trinidad: Department of Life Sciences, University of the West Indies, 201-203.

McNair, D.B., E.B. Massiah, & M.D. Frost. 2002. "Ground-based autumn migration of Blackpoll Warblers at Harrison Point, Barbados." *Caribbean Journal of Science,* 38: 239-248.

McNair, D.B., F. Sibley, E.B. Massiah, & M.D. Frost. 2002. "Ground-based Nearctic-Neotropic landbird migration during autumn in the eastern Caribbean." *Studies in Trinidad and Tobago ornithology honouring Richard ffrench* (F.E. Hayes & S.A. Temple, eds.). *Occasional Paper No. 11*. St. Augustine, Trinidad: Department of Life Sciences, University of the West Indies, 86-103.

McNair, D.B., M.A. McMillian, & K.D. Meyer. 2001. "A review of the breeding status of the Short-tailed Hawk in the Lake Istokpoga region, Highlands County, Florida." *Florida Field Naturalist,* 29: 41-46.

McNair, D.B., & W. Post. 2001. "Review of the occurrence of vagrant Cave Swallows in the United States and Canada." *Journal of Field Ornithology,* 72: 485-503.

McNair, D.B. 2000a. "Assessment of occurrences of Magnificent Frigatebirds in northwest Florida: the influence of weather and roosts." *North American Birds,* 54: 339-344.

McNair, D.B. 2000b. "The status of three species of marine-estuarine birds in the interior of Florida: attraction to phosphate mines of the central peninsula." *North American Birds* 54: 137-145.

McNair, D.B. 2000c. "The status of Magnificent Frigatebirds in the interior of Florida: the influence of storms." *North American Birds,* 54: 11-15.

McNair, D.B. 2000d. "Five nesting attempts by an apparent pair of Eastern Kingbirds." *Florida Field Naturalist,* 28: 189-191.

McNair, D.B. 2000e. "Least Terns nest on the dry lakebed of Lake Jackson, Leon County, Florida." *Florida Field Naturalist,* 28: 111-114.

McNair, D.B. 2000f. "The status of Ross's Goose in Florida." *Florida Field Naturalist,* 28: 69-72.

McNair, D.B. 2000g. "Status of breeding Least Terns in the interior of central Florida from 1914-1962." *Florida Field Naturalist,* 28: 59-63.

McNair, D.B. 2000h. "First certain record of California Gull (*Larus californicus*) in Florida." *Florida Field Naturalist,* 28: 22-24.

McNair, D.B. 2000i. "The breeding status of Caspian Terns in the southeastern United States (Mississippi to Virginia)." *Florida Field Naturalist,* 28: 12-21.

McNair, D.B. 2000j. "Summary of historical breeding and breeding-season records of the Lark Sparrow in Tennessee." *Migrant,* 71:73-78.

McNair, D.B. 2000k. “Active nest of the Black-capped Chickadee from the Great Smoky Mountains: first report for North Carolina.” *Chat,* 64: 62-63.

McNair, D.B. 2000l. “Fish Crow predation on eggs being laid by a Florida Softshell Turtle.” *Oriole,* 65: 12-13.

McNair, D.B., & W.W. Baker. 2000. “Boat-tailed Grackles nest in Thomas County: first confirmed breeding records for interior Georgia.” *Oriole,* 65: 50-55.

McNair, D.B., & J.A. Gore. 2000. “Recent breeding of Caspian Terns in northwest Florida.” *Florida Field Naturalist,* 28: 30-32.

McNair, D.B., M.A. McMillian, and L.M. Rojas. 2000. “Attempted heterospecific kleptoparasitism by Crested Caracaras of Ospreys.” *Florida Field Naturalist,* 28: 196-197.

McNair, D.B., & W. Post. 2000. “Historical winter status of three upland *Ammodramus* sparrows in South Carolina.” *Studies in Avian Biology,* 21: 32-38.

Legare, M.L., D.B. McNair, W. C. Conway, & S. A. Legare. 2000. “Swamp Sparrow winter site fidelity records in Florida.” *Florida Field Naturalist,* 28: 73-74.

McNair, D.B. 1999a. “The Gray-hooded Gull in North America: first documented record.” *North American Birds,* 53: 337-339.

McNair, D.B. 1999b. “Red-winged Blackbirds at nocturnal roost sites in savannas.” *Florida Field Naturalist,* 27: 167-170.

McNair, D.B. 1999c. “Possible food-storing of a Green Anole by a Red-bellied Woodpecker.” *Oriole,* 64: 9-10.

McNair, D.B. 1999d. “Recent breeding range expansion of the Cedar Waxwing in south-central North Carolina: additional information.” *Chat,* 63: 45-47.

McNair, D.B., & J.A. Gore. 1999. “Recent breeding status of Royal and Sandwich terns in northwest Florida.” *Florida Field Naturalist,* 27: 117-120.

McNair, D.B., & T.E. Lewis. 1999. “Breeding status of Boat-tailed Grackles at St. Vincent Island, Franklin County, Florida.” *Florida Field Naturalist* 27:163-166.

McNair, D.B., E.B. Massiah, & M.D. Frost. 1999. “New and rare species of Nearctic landbird migrants during autumn for Barbados and the Lesser Antilles.” *Caribbean Journal of Science,* 35: 46-53.

McNair, D.B., & W. Post. 1999a. “Evaluation of breeding information obtained by J.E. Gould in Florida during the early 20th century.” *Florida Field Naturalist,* 27: 17-20.

McNair, D.B., & W. Post. 1999b. “First specimen record of the Cave Swallow *Petrochelidon fulva pelodoma* in eastern North America.” *Chat,* 63: 30-32.

McNair, D.B., & W. Post. 1999c. “Re-evaluation of the avian breeding records of J.E. Gould.” *Oriole,* 64: 47-52.

McNair, D.B. 1998a. “Sandwich Tern mortality by vehicle collision associated with Hurricane Erin.” *Florida Field Naturalist,* 26: 97-99.

McNair, D.B. 1998b. “Response of Henslow's Sparrows and Sedge Wrens to a dormant-season prescribed fire.” *Florida Field Naturalist,* 26: 46-47.

McNair, D.B. 1998c. “Sprague's Pipit overwinters at Apalachicola, Franklin County, and an assessment of their winter status in Florida and nearby states.” *Florida Field Naturalist* 26: 21-23.

McNair, D.B. 1998d. “Red-winged Blackbirds in longleaf pine forests during winter.” *Oriole,* 63: 61-66.

McNair, D.B. 1998e. “Indirect evidence on parasitism of the Lesser Antillean Bullfinch by the Shiny Cowbird.” *El Pitirre,* 11: 4-5.

McNair, D.B., & J.A. Gore. 1998. “Occurrences of flamingos in northwest Florida, including a recent record of the Greater Flamingo (*Phoenicopterus ruber*).” *Florida Field Naturalist,* 26: 40-43.

McNair, D.B., & T.E. Lewis. 1998a. “Fourth verified record of Vaux’s Swift (*Chaetura vauxi*) in

Florida." *Alabama Birdlife,* 44: 20-21.

McNair, D.B., & T.E. Lewis. 1998b. "Unusual prey of Sharp-shinned (*Accipiter striatus*) and Cooper's (*A. cooperii*) hawks in Florida." *Alabama Birdlife,* 44: 17-19.

Lewis, T.E., & D.B. McNair. 1998a. "Second breeding locality of Cliff Swallows in Florida." *Florida Field Naturalist,* 26: 117-121.

Lewis, T.E., & D.B. McNair. 1998b. "Second verified record of the Couch's / Tropical Kingbird complex (*Tyrannus couchii / T. melancholicus*) in northwest Florida." *Alabama Birdlife,* 44: 11-12.

McNair, D.B. 1997a. "Early winter breeding record of the Eurasian Collared-Dove in northern Florida." *Florida Field Naturalist,* 25: 22-23.

McNair, D.B. 1997b. "Opportunistic foraging on seeds in attached cones of longleaf pines by Northern Cardinals." *Oriole, 62:* 5-6.

McNair, D.B. 1997c. "Olive-sided Flycatcher." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 179-180.

McNair, D.B. 1997d. "Eastern Phoebe." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 189-191.

McNair, D.B. 1997e. "Fish Crow." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 213-215.

McNair, D.B. 1997f. "Brown-headed Nuthatch." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 227-229.

McNair, D.B. 1997g. "Painted Bunting." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 331-332.

McNair, D.B. 1997h. "Dickcissel." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 332-334.

McNair, D.B. 1997i. "Lark Sparrow." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 344-345.

McNair, D.B. 1997j. "Grasshopper Sparrow." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 346-349.

McNair, D.B. 1997k. "Red Crossbill." *The Breeding Bird Atlas of Tennessee*, ed. C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press, 366-368.

McNair, D.B. 1997l. "Pine Siskin." Page 385 in *The Breeding Bird Atlas of Tennessee*, C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press. 504 pp.

McNair, D.B., & T.E. Lewis. 1997. Vaux's Swifts overwinter at a roost in Apalachicola, Florida. *Florida Field Naturalist* 25:54-57.

McNair, D.B., & C.P. Nicholson. 1997. "Red-breasted Nuthatch." Pages 223-225 in *The Breeding Bird Atlas of Tennessee*, C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press. 504 pp.

Nicholson, C.P., & D.B. McNair. 1997. "Black-capped Chickadee." Pages 217-219 in *The Breeding Bird Atlas of Tennessee*, C.P. Nicholson. Knoxville, TN: Univ. Tennessee Press. 504 pp.

McNair, D.B. 1996. Late breeding records of a Red-headed Woodpecker and a Summer Tanager in Florida. *Florida Field Naturalist* 24:78-80.

McNair, D.B., W.J. Arendt, & E. Massiah. 1996. Sightings of the Blackpoll Warbler in the West Indies during winter. *Florida Field Naturalist* 24:81-82.

Engstrom, R.T., D.B. McNair, L.A. Brennan, C.L. Hardy, & L.W. Burger. 1996. Influence of dormant versus lightning season prescribed fire on birds in longleaf pine forests: experimental design and preliminary results. *Transactions of the 61st North American Wildlife Natural Resources Conference* (1996):200-207.

McNair, D.B. 1995. Refutation of purported historical breeding records of the Black-billed Cuckoo on the Georgia and South Carolina coasts. *Oriole* 60:42-44.

McNair, D.B., & W. Post. 1995. Verification of the first nest record of the Swainson's Warbler in

North Carolina. *Chat* 59:96-97.

Nisbet, I.C.T., D.B. McNair, W. Post, & T.C. Williams. 1995. Transoceanic migration of the Blackpoll Warbler: summary of scientific evidence and response to criticisms by Murray. *Journal of Field Ornithology* 66:612-622.

Post, W., & D.B. McNair. 1995. Evaluation of an historical egg set of the Passenger Pigeon in Kansas. *Kansas Ornithological Society Bulletin* 46:23-24.

McNair, D.B. 1994a. Caching by an irruptive Hawk-Owl. *Blue Jay* 52:216-217.

McNair, D.B. 1994b. Reexamination of pre-1970 nest records of the Caspian Tern from South Carolina and Georgia. *Chat* 58:16-18.

McNair, D.B. 1994c. Earliest verified breeding record of the Royal Tern in Georgia. *Oriole* 59:59-61.

McNair, D.B. 1994d. Verified historical breeding record of the Killdeer on the Georgia coast. *Oriole* 59:6-9.

McNair, D.B., & W. Post. 1994. Refutation of purported historical breeding records of the Bank Swallow on the Georgia coast. *Oriole* 59:85-88.

McNair, D.B. 1993a. First banded passerine recovered in the Magdalen Islands: Yellow-rumped Warbler, *Dendroica coronata*. *Canadian Field-Naturalist* 107:226.

McNair, D.B. 1993b. December sight record of Sooty Shearwater in South Carolina. *Chat* 57:35-36.

McNair, D.B., & J. Escobar. 1993. Verified winter record of Scarlet Tanager at Charleston, SC, and a review of the winter status of Scarlet Tanager in the southeast United States. *Chat* 57:25-31.

McNair, D.B., & W. Post. 1993a. Autumn migration route of Blackpoll Warblers: evidence from southeastern North America. *Journal of Field Ornithology* 64:417-425.

McNair, D.B., & W. Post. 1993b. Supplement to Status and Distribution of SC Birds. *Charleston Museum Ornithological Contribution No. 8*. Charleston Museum, SC. 49 pp.

Post, W., A. Cruz, & D.B. McNair. 1993. The North American invasion pattern of the Shiny Cowbird. *Journal of Field Ornithology* 64:32-41.

McNair, D.B. 1991a. Copulation in the Mangrove Cuckoo (*Coccyzus minor*). *Florida Field Naturalist* 19:84-85.

McNair, D.B. 1991b. Agonistic behavior of Ruddy Turnstones toward Short-billed Dowitchers foraging for Horseshoe Crab eggs. *Florida Field Naturalist* 19:83-84.

McNair, D.B. 1991c. Confirmed historical breeding record of the Painted Bunting from the Piedmont of Georgia. *Oriole* 56:77-78.

McNair, D.B. 1991d. Inland records of the Brant in the Carolinas and observations of kleptoparasitic behavior. *Chat* 55:32-34.

McNair, D.B., & B. Duyck. 1991. Interspecific feeding among some oscines. *Chat* 55:9-11.

McNair, D.B., & C.P. Nicholson. 1991. Historical breeding evidence of the Bachman's Sparrow in the North Carolina Mountains. *Migrant* 62:4-5.

Duyck, B., & D.B. McNair. 1991a. Notes on egg-laying, incubation, and nestling periods and of food brought to the nest by four species of cavity-nesting birds. *Chat* 55:21-29.

Duyck, B., & D.B. McNair. 1991b. Late-season high-elevation breeding record of Cedar Waxwing in the North Carolina Mountains. *Chat* 55:7-8.

Duyck, B., D.B. McNair, & C.P. Nicholson. 1991. Dirt-storing behavior by White-breasted Nuthatch. *Wilson Bulletin* 103:308-309.

McNair, D.B. 1990a. Review of proven, probable, and possible breeding records of the Dickcissel in Georgia and the Carolinas. *Oriole* 55:1-18.

McNair, D.B. 1990b. Eastern Phoebe breeds in the northeast Upper Coastal Plain, South Carolina. *Chat* 54:59-61.

McNair, D.B. 1990c. Dickcissels breed in Marlboro County, South Carolina. *Chat* 54:37-40.

McNair, D.B. 1990d. Dickcissels breed in Darlington County, South Carolina. *Chat* 54:36-37.

McNair, D.B. 1990e. Unusual nest site tenacity of a Carolina Wren. *Chat* 54:33-35.

McNair, D.B. 1990f. Lark Sparrows breed at Rhine-Luzon Drop Zone, Camp MacKall, Scotland County, North Carolina. *Chat* 54:16-20.

Duyck, B., & D.B. McNair. 1990a. Nest reuse in Blue Jays. *Chat* 54:81-82.

Duyck, B., & D.B. McNair. 1990b. Brown-headed Nuthatches nest again at Weaverville, Buncombe County, North Carolina. *Chat* 54:7-9.

Post, W., & D.B. McNair. 1990. Winter specimens of the Broad-winged Hawk in Georgia and South Carolina: some corrections. *Oriole* 55:21.

Schmalz, G., N.&B. Siebenheller, & D.B. McNair. 1990. Breeding evidence of the Mourning Warbler in the Great Smoky Mountains, North Carolina. *Chat* 55:79-80.

McNair, D.B. 1989a. Attempted interspecific food piracy by Fish Crows of an Osprey. *Chat* 53:66-68.

McNair, D.B. 1989b. Attempted nesting of Marsh Wren in Guilford County, North Carolina: a commentary. *Chat* 53:42.

McNair, D.B. 1988a. A review of breeding records of Pine Siskin and Red Crossbill in the southern Appalachian Mountains and adjacent regions. *Migrant* 59:105-113.

McNair, D.B. 1988b. Breeding attempt of Pine Siskin on Mt. Mitchell, North Carolina. *Migrant* 59:49-50.

McNair, D.B. 1988c. Red Crossbills breed at Highlands, North Carolina. *Migrant* 59:45-48.

McNair, D.B. 1988d. Second record of American Avocet from the mountain region of North Carolina. *Chat* 52:79-80.

McNair, D.B. 1988e. Common Raven breeds at Table Rock Mountain in South Carolina. *Chat* 52:59-62.

McNair, D.B. 1988f. Historic nest record on the Peregrine Falcon in Pickens County, South Carolina. *Chat* 52:57-58.

McNair, D.B. 1988g. Massive roost of Fish Crows at Drum Island, Charleston, South Carolina. *Chat* 52:12-13.

McNair, D.B. 1988h. Atypical nest-site of the American Oystercatcher in South Carolina. *Chat* 52:11-12.

McNair, D.B. 1988i. First modern record of White-winged Crossbill in Georgia: a commentary. *Oriole* 53:49-50.

McNair, D.B. 1987a. Egg-data slips: are they useful for information on egg-laying dates and clutch size? *Condor* 89:369-376.

McNair, D.B. 1987b. Recent breeding information on birds in a portion of the Southern Appalachian Mountains. *Migrant* 58:109-134.

McNair, D.B. 1987c. Massive flight of Tree Swallows during fall migration on the South Carolina coast. *Chat* 51:74-75.

McNair, D.B. 1987d. Status and distribution of the Fish Crow in the Carolinas and Georgia. *Oriole* 52:28-45.

McNair, D.B. 1986a. Clutch information for the Florida Grasshopper Sparrow from oological collections. *Florida Field Naturalist* 14:48-49.

McNair, D.B. 1986b. Past breeding distribution of eleven species in Georgia based on nest records from egg data slips. *Oriole* 51:28-31.

Post, W., D.B. McNair, & H.E. LeGrand, Jr. 1986. Status of the Lincoln's Sparrow in South Carolina. *Chat* 50:56-59.

McNair, D.B. 1985a. An auxiliary with a mated pair and food caching behavior in the Fish Crow. *Wilson Bulletin* 97:123-125.

McNair, D.B. 1985b. A comparison of oology and nest record card data in evaluating the reproductive biology of Lark Sparrows, *Chondestes grammacus*. *Southwestern Naturalist*

30:213-224.

McNair, D.B. 1985c. Second breeding locality of Dark-eyed Junco in South Carolina. *Chat* 49:100-101.

McNair, D.B. 1985d. Heterospecific vocal mimicry by Blue-gray Gnatcatchers. *Chat* 49:78-80.

McNair, D.B. 1985e. Status of three colonies of Red-cockaded Woodpecker at Pee Dee National Wildlife Refuge, Anson County, N.C. *Chat* 49:75-78.

McNair, D.B. 1985f. The breeding status of Blue-winged Warbler in South Carolina. *Chat* 49:47-48.

McNair, D.B. 1984a. Clutch-size and nest placement in the Brown-headed Nuthatch. *Wilson Bulletin* 96:296-301.

McNair, D.B. 1984b. Reuse of other species nests by Lark Sparrows. *Southwestern Naturalist* 29:506-509.

McNair, D.B. 1984c. Breeding status of the Grasshopper Sparrow in the coastal plain of the Carolinas, with notes on local behavior. *Chat* 48:1-4.

McNair, D.B. 1984d. Breeding biology of the Fish Crow. *Oriole* 49:21-32.

McNair, D.B. 1984e. Nest placement of the Eastern Phoebe under bridges in south-central North Carolina. *Oriole* 49:1-6.

McNair, D.B. 1984f. Winter prey of Northern Harrier in Mississippi. *Alabama Birdlife* 31:3-5.

McNair, D.B., & S.A. Gauthreaux, Jr. 1984. Cedar Waxwing breeds in South Carolina. *Chat* 48:17.

McNair, D.B. 1983a. The significance of breeding season records of Sedge Wrens in the Southeast States. *Oriole* 48:49-52.

McNair, D.B. 1983b. Additional information on a historical breeding record of the Lark Sparrow in North Carolina. *Chat* 47:73-75.

McNair, D.B. 1983c. Brown-headed Nuthatches store pine seeds. *Chat* 47:47-48.

McNair, D.B., & R.A. Forster. 1983. Heterospecific vocal mimicry by six oscines. *Canadian Field-Naturalist* 97:321-322.

McNair, D.B. 1982a. Lark Sparrows breed in Richmond County, North Carolina. *Chat* 46:1-8.

McNair, D.B. 1982b. Tufted Titmice store acorns. *Oriole* 47:12-13.

McNair, D.B. 1982c. Shorebirds at Lake Oktibbeha, Mississippi, in the fall of 1980. *Alabama Birdlife* 29:11-14.

McNair, D.B. 1982d. Grasshopper Sparrows breed in Lowndes County, Mississippi. *Alabama Birdlife* 29:9-11.

McNair, D.B. 1981. Common Eider plays "possum." *Wilson Bulletin* 93:559-560.

McNair, D.B. 1980. Green Heron perched on cow. *Inland Bird Banding* 52:62-63.

PUBLICATIONS—OTHER VERTEBRATES

Four publications since 2003 have been on the globally endangered St. Croix Ground Lizard (*Ameiva polops*), which are listed below.

McNair, D.B., & A. Mackay. 2005. Population estimates and management of *Ameiva polops* (Cope) at Ruth Island, United States Virgin Islands. *Caribbean Journal of Science* 41:352-357.

McNair, D.B., & C.D. Lombard. 2004. Population estimates, habitat associations, and management of *Ameiva polops* (Cope) at Green Cay, United States Virgin Islands. *Caribbean Journal of Science* 40:353-361.

McNair, D.B. 2003. Population estimate, habitat associations, and conservation of the St. Croix Ground Lizard *Ameiva polops* at Protestant Cay, United States Virgin Islands. *Caribbean Journal of Science* 39:94-99.

McNair, D.B., & W. Coles. 2003. Response of the St. Croix Ground Lizard *Ameiva polops* to severe local disturbance of critical habitat at Protestant Cay: before-and-after comparison. *Caribbean Journal of Science* 39:392-398.

Submitted Manuscripts–Birds
U.S. Virgin Islands

McNair, D.B. Conservation implications of the current breeding distribution and abundance of the White-crowned Pigeon *Patagioenas leucocephala* at St. Croix, US Virgin Islands. *Caribbean Journal of Science*.

McNair, D.B. Bird abundance and species richness in mangrove forest at Sugar Bay, St. Croix, US Virgin Islands: long-term comparison before-and-after Hurricane Hugo. *Journal of Caribbean Ornithology*.

McNair, D.B., L.D. Yntema, & C. Cramer-Burke. b. Conservation of man-made freshwater ponds on St. Croix, United States Virgin Islands: effects of pond area and location on indigenous waterbirds. *Wilson Journal of Ornithology*.

Florida

McNair, D.B. a. Least Tern populations and colony site characteristics in Franklin County, Florida. *Florida Field Naturalist*.

McNair, D.B. b. Pelagic birds in the interior of Florida: the influence of tropical cyclones. *Florida Field Naturalist*.

McNair, D.B. c. Breeding distribution, abundance, and aspects of the ecology of American Oystercatchers in Franklin County, Florida. *Florida Field Naturalist*.

McNair, D.B. d. The status of the Common Tern in the interior of Florida. *Florida Field Naturalist*.

Abstracts

Engstrom, R.T., & D.B. MCNAIR. 1998. Influence of season of prescribed fire on birds in longleaf pine forests. Abstract *in* 22th Proceedings of the I.O.U. Congress, Durban, South Africa.

Engstrom, R.T., & D.B. MCNAIR. 1995. Effects of season of fire on bird populations in Florida longleaf pine forests. Abstract *in* Conservation and ecology of grassland birds, Tulsa, Oklahoma.

Birding Papers

McNair, D.B. 1980a. Birding in the Hoosac Plateau, Berkshire County, Massachusetts. *In*: Where-to-watch-birds in Massachusetts Series, Birding Kit of the Massachusetts Audubon Society.

McNair, D.B. 1980b. Birding in the Fobes Hill Region, Berkshire County, Massachusetts. *Bird Observer Eastern Massachusetts* 8:49-54.

MEMBERSHIP IN SCIENTIFIC SOCIETIES

American Ornithologists' Union (AOU)
Caribbean Journal of Science (CJS)
Cooper Ornithological Society (COS)
Florida Ornithological Society (FOS)
Society of Canadian Ornithologists (SCO)
Society for the Conservation and Study of Caribbean Birds (SCSCB)
Western Foundation of Vertebrate Zoology (WFVZ)
Wilson Ornithological Society (WOS)

REFERENCES

Floyd E. Hayes, Ph.D.
Associate Professor
Department of Biology
Pacific Union College
1 Angwin Avenue
Angwin, CA 94508
Ph: (707) 965-4106
E-mail: floyd_hayes@yahoo.com, fhayes@puc.edu

Lloyd Kiff
Science Director
The Peregrine Fund
5668 West Flying Hawk Lane
Boise, ID 83709
Ph: (208)-362-3716
E-mail: lkiff@peregrinefund.org

Will Post, Ph.D.
Curator of Ornithology
Charleston Museum
360 Meeting Street
Charleston, SC 29403
Ph: (843) 722-2996
E-mail: grackler@aol.com

Wes Toller
Fisheries Biologist III
Division of Fish and Wildlife
45 Mars Hill
Frederiksted, USVI 00840
Ph: (340)-773-1082
E-mail: westoller@vipowernet.net

EDWARD BELDEN
SENIOR ENVIRONMENTAL ANALYST COORDINATOR

Mr. Edward Belden holds a master's degree in Environmental Science and Management, with an emphasis on conservation planning, environmental analysis, and green building. His knowledge and experience covers opportunity and constraint analyses, directed field surveys, mapping of plant communities, identification of native and invasive plants, development of restoration plans, and California Environmental Quality Act / National Environmental Policy Act (CEQA/NEPA) compliance documentation and Leadership in Energy and Environmental Design (LEED) consulting. Mr. Belden is knowledgeable of environmental impact assessment legislation, having completed many sections and peer reviews of CEQA documents.

At Sapphos Environmental, Inc., Mr. Belden has completed and managed numerous CEQA projects, including Initial Studies, Mitigated Negative Declarations (MNDs), and Environmental Impact Reports (EIRs). He has completed numerous feasibility analyses for projects prior to environmental documentation. Mr. Belden has recently worked on efforts for a 6-mile trail in the San Gabriel Mountains, including a feasibility report, initial study, public participation, and community plan update. In addition, he managed the production of the Los Angeles County Trails Manual. He has coordinated with numerous agencies including the California Department of Fish and Game for a Streambed Alteration Agreement and the Army Corps of Engineers for a Wetland Delineation. Mr. Belden has conducted directed surveys, biological inventories, and mitigation monitoring activities and preparation of Biological Technical Reports. Additional work efforts include assistance with green building activities and LEED certification as a LEED accredited professional.

Prior to joining Sapphos Environmental, Inc., Mr. Belden served as a biologist with the Louisiana Department of Wildlife and Fisheries to collect samples and manage data for federal projects. His field experience includes habitat construction monitoring, estimates of plant cover, mark-recapture, tree surveying, destructive root sampling, development of a data logger system, and integrated pest management within various communities, including Oak Woodlands, Coastal Sage Scrub, Eastern Hardwoods, and Wetlands. During his master's work, Mr. Belden took an active role in the restoration of the Arroyo Hondo Preserve riparian corridor along the Gaviota Coast of County of Santa Barbara. Mr. Belden's master's thesis evaluated the environmental impacts of rice production on the water resources within Tanzania for the United Nations Environment Program. Mr. Belden's graduate studies focused on conservation planning, including topics in landscape, community, population, and restoration ecology. In addition, courses covered economics, land-use planning, hydrology, and environmental law. Mr. Belden has also studied Marine Science, Environmental Policy, and Wind Power Polices abroad in Denmark.

Professional History

- Sapphos Environmental, Inc., Environmental Analyst, 2004–present
- University of California, Santa Barbara, Research Assistant, 2002–2004
- Louisiana Department of Wildlife and Fisheries, Biologist, 2001–2002

Education

- LEED 2.0 Accredited Professional, U.S. Green Building Council, Washington, DC, 2005
- Master of Environmental Science and Management, University of California, Santa Barbara, Emphasis in Conservation Planning, 2004
- Bachelor of Science, Biology, Minor in Public Policy, Hobart and William Smith Colleges, 2001

Conferences/Workshops/Training

- Association of Environmental Professionals Conference, 2004
- LEED Intermediate Workshop, 2004
- Association of Environmental Professionals Conference, 2005
- Greenbuild, U.S. Green Building Council National Conference, 2005
- California Trails and Greenways Conference, 2006
- Greenbuild, U.S. Green Building Council National Conference, 2006

Professional Affiliations

- U.S. Green Building Council, Los Angeles Chapter
- Association of Environmental Professionals, Los Angeles Chapter

Selected Publications

Hall, Andrew, and Edward Belden. 2006, winter. *Green Building and the LEED Rating System: The Next Logical Step for CEQA*. Environmental Monitor. Association of Environmental Professionals, Sacramento, CA.

FRANK LANDIS
SENIOR RECOURCES COORDINATIOR

Dr. Frank Landis is a habitat restoration specialist at Sapphos Environmental, Inc. He has more than 12 years of experience in the fields of plant ecology and botany, in the following areas: creation of monitoring plans, project design, directed surveys for rare plants, field surveys in a variety of habitats (including wetlands, oak savannas, and chaparral in California, Wisconsin, and Ohio), greenhouse research using native species from oak savannas and wetlands, greenhouse propagation of native plants and of arbuscular mycorrhizal fungi, and laboratory research on soil fungi and mycorrhizal fungi. His publication record includes a report for the National Park Service, scientific papers, nonscientific papers, an educational Web site, posters, and presentations for local groups, regional conferences, and international meetings. Former employers include the University of Akron, the University of Wisconsin–Madison, and Humboldt State University. He has received research funding from the National Science Foundation and the California Native Plant Society.

Dr. Landis started working for Sapphos Environmental, Inc. in June 2006. He is a certified wetland delineator and holds a sensitive plant collecting permit from California Department of Fish and Game. His work has included sensitive plant surveys, habitat restoration planning and implementation, plant community mapping, and oak tree reports.

Dr. Landis has participated in directed surveys for the federally listed Braunton's milk vetch. In addition, he has created a wetlands monitoring protocol for the Cuyahoga Valley National Park (Ohio). The protocol samples incorporates multiple tiers to accommodate varying budget restrictions, is designed to incorporate new science as it becomes available, and incorporates a methodology for creating indicators from collected data. He created a sampling strategy for soil fungal communities using DNA microarrays, a design that should be highly resistant to false positives. In his doctoral research, he studied the interaction between plant and mycorrhizal (fungal) communities in Wisconsin oak savannas, to improve restoration outcomes in these highly endangered communities. For his master's, he performed an extensive baseline survey of the chaparral on Santa Catalina Island, including a survey of the federally endangered Trash's mountain mahogany (*Cercocarpus traskiae*). Less formally, he has used most habitat and plant community survey protocols in a variety of habitats in northern, central, and southern California; the Alpine Sierras; Wisconsin; Ohio; and Smoky Mountains National Park, Tennessee.

Prior to graduate school, he worked for the San Francisco Estuary Project, helping to edit the Comprehensive Conservation and Management Plan. He also worked with the California Native Plant Society on the Significant Ecological Areas (SEA) project to create a habitat classification scheme for County of Los Angeles. This included developing a comprehensive database of faunal and floral species within the county.

Education

- PhD, Botany, University of Wisconsin–Madison, 2003
- MA, Botany, Humboldt State University, 1997
- BA, Environmental Sciences, University of California at Berkeley, 1990

Relevant Professional History

- Sapphos Environmental, Inc., Pasadena, California, Senior Resource Coordinator, 2006–present
- Elisabeth Landis, California Native Plant Society, Los Angeles, California, Volunteer Researcher, 2004–present
- University of Wisconsin–Madison, Department of Botany, Gargas Lab, Honorary Fellow, 2004–2006
- University of Akron, Department of Biology, Fraser Lab, Research Associate, 2004–2005
- University of Wisconsin–Madison, Department of Botany, Gargas Lab, Research Associate, 2004
- University of Wisconsin–Madison, Department of Botany, Givnish Lab, Doctoral Research, 1999–2003
- Humboldt State University, Department of Biology, Sawyer Lab, Master's Thesis Research, 1995–1997
- SEA Project, Los Angeles, California, Researcher, 1991–1994

Permits

- State of California Resources Agency, Department of Fish and Game Collecting Permit for State Designated Endangered, Threatened, and Rare Plants
- Certified wetland delineator

Professional Affiliations

- Ecology Society of America
- Botanical Society of America
- Mycological Society of America

Publications

Fraser, L.H., F.C. Landis, and K. Skerl. 2006. "Wetland Monitoring Protocol for the Cuyahoga Valley National Park, Ohio." Washington, DC, Department of the Interior, National Park Service. 114 pp.

Landis, F.C. 1994. "Surveying Santa Catalina Island Plant Communities." *Fremontia*, *22*(2): 24–27.

Landis, F.C. 2000. "Unburned and Grazed Chaparral: A Case Study." In *Second Interface between Ecology and Land Development in California*, eds. J.E. Keeley, M. Baer-Keeley, and C.J. Fotheringham. Sacramento, CA. USGS Open-File Report 00–62, 57–71.

Landis, F.C., and L.H. Fraser. Submitted. "A New Model of Carbon and Phosphorus Transfers in Arbuscular Mycorrhizae."

Landis, F.C., and A. Gargas. Accepted for publication. "Using ITS2 Secondary Structure to Create Species-Specific Probes for Fungi. *Mycologia*.

Landis, F.C., A. Gargas, and T.J. Givnish. 2004. Relationships among Arbuscular Mycorrhizal Fungi, Vascular Plants, and Environmental Conditions in Oak Savannas. *New Phytologist*, *164*:493–504.

Landis, F.C., A. Gargas, and T.J. Givnish. 2005. "The Influence of Arbuscular Mycorrhizae and Light on Midwestern Sand Savanna Understories I. Plant Community Composition." *Mycorrhiza*, *15*(*7*): 547–553.

Landis, F.C., A. Gargas, and T.J. Givnish. 2005. "The Influence of Arbuscular Mycorrhizae and Light on Midwestern Sand Savanna Understories II. Plant Competition." *Mycorrhiza*, *15*(*7*): 555–562.

IRENA MENDEZ
HABITAT RESTORATION SPECIALIST

Dr. Mendez is a habitat restoration ecologist with 13 years of experience in the field of native plant assemblages. Her expertise is the identification and restoration of habitats and communities that have been disrupted or degraded. Dr. Mendez has been involved with a number of restoration work efforts throughout southern California, including projects for Los Angeles World Airports, the Los Angeles County Department of Parks and Recreation, the Metropolitan Water District, and County of Los Angeles Sanitation District. These work efforts have been performed under the purview of the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, and the California Coastal Commission. Dr. Mendez is a specialist in the propagation and establishment of native plant materials and is interested in the interrelationships that exist between California's flora and fauna. Dr. Mendez directed a volunteer program at the Los Angeles/El Segundo Dunes for 5 years and lead walks at the Dunes for Los Angeles County Probation Crews, Juvenile Crews, Los Angeles World Airport Employees, and the Sierra Club.

Plant community mapping, directed surveys for state- and federally designated sensitive species, and identification of locally designated sensitive species have been undertaken by Dr. Mendez for a variety of projects. She prepared plant community maps and directed surveys for sensitive plants and a habitat restoration plan for riparian woodland in support of the Bosque del Rio Hondo Riverfront Park project, which was reviewed and approved by the U.S. Army Corps of Engineers, the Mountains Recreation and Conservation Authority, and the Los Angeles County Department of Parks and Recreation. The hydrology of the area has been changed dramatically since the construction of Whittier Narrows Dam just downstream from the project area. Analysis of baseline conditions indicated that much of the riparian areas on site were heavily degraded and dominated by giant reed (*Arundo donax*). An evaluation of vegetation remaining on site and nearby, as well as examination of historic aerial photographs, suggested that the site was once occupied by a mosaic of riparian communities, including southern cottonwood–willow riparian forest and southern willow scrub. The restoration plan developed for three remnant riparian corridors sought to restore structure and diversity to these degraded riparian habitats. The Rio Hondo Riverfront Park project was implemented between 1997 and 1998.

Dr. Mendez conducted plant community mapping and surveyed for state- and federally designated sensitive species at Frank G. Bonelli Regional County Park in support of the Final Environmental Impact Report (EIR) for the park. In addition, she provided input to the revisions and clarifications to the analysis of biological resources determined to be necessary for the successful completion of the final EIR by the Los Angeles County Department of Parks and Recreation. She is currently involved in finalizing a Habitat Conservation Plan for the park, which includes the formulation of conservation strategies for the many stemmed dudleya (*Dudleya multicaulis*), a locally important plant species.

Dr. Mendez served as the habitat restoration specialist for the Deane Dana Friendship Community Regional County Park Project and prepared the coastal sage scrub restoration plan for the park. The plant palette developed in support of restoration efforts included ocean locoweed (*Astragalus trichpodus* ssp. *lonchus*), the food plant for the endangered Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdensis*). The project will provide habitat for the endangered Palos Verdes blue butterfly and serve as the basis for a Conservation Agreement between the Los Angeles

County Department of Parks and Recreation and the U.S. Fish and Wildlife Service, ensuring long-term protection of the Palos Verdes blue butterfly.

Dr. Mendez performed the botanical surveys for the Los Angeles County Sanitation Districts proposed erosion protection facilities at the Valencia Water Reclamation Plant on the Santa Clara River. Subsequently, she performed environmental monitoring and reporting of activities relating to the construction of the erosion protection facility at the Valencia site, with the implementation of mitigation measures required by environmental permits obtained for the projects including a Clean Water Act Section 401 Water Quality Certification from the Regional Water Quality Control Board, authorization from the U.S. Army Corps under a Section 404 Nationwide Permit, with U.S. Fish and Wildlife Service consultation and opinion per Section 7 of the Endangered Species Act, and Streambed Alteration Agreement from the California Department of Fish and Game.

Dr. Mendez provided input to the Biological Resources Literature Review, done in support of Phase I of the LAX Master Plan Environmental Impact Statement (EIS)/EIR, prepared the analysis of floral resources in support of Phase II LAX master planning efforts, and prepared the biological resources input to the Draft EIS/EIR in support of Phase III master planning efforts. Dr. Mendez has supervised and conducted distribution surveys for the El Segundo blue butterfly (ESB; *Euphilotes battoides allyni*) annually from 1996 through 1999 pursuant to the special terms and conditions of the Sapphos Environmental, Inc. U.S. Fish and Wildlife Service Recovery Permit No. PRT 830990. In addition, Dr. Mendez also conducted habitat quality evaluation (HQE) surveys during the same time period within the ESB Habitat Restoration Area, in which plant size and flower numbers for coastal buckwheat were mapped for the site. Results of the HQE, coupled with results of these distribution surveys for ESB, and have provided the LAX Master Planning Team with a map of habitat quality as related to current distribution of the butterfly. Dr. Mendez is currently preparing biological resources input to the Administrative Draft Supplemental EIR/EIS and will also provide input to findings and overriding considerations and the mitigation monitoring plan. Dr. Mendez served as environmental monitor for the 4th year of implementation of the Long-Term Habitat Management Plan for the ESB Habitat Restoration Area.

During the early 1990s, Dr. Mendez served as the project scientist and head botanist for the El Segundo Dunes restoration project, which was conducted under the auspices of the City of Los Angeles Environmental Affairs Department, the Department of Airports, the California Department of Fish and Game, and the U.S. Fish and Wildlife Service pursuant to a permit from the California Coastal Commission. This 5-year work effort involved documentation of baseline conditions for plant resources. Density and diversity of existing plants was analyzed in remnant areas of relatively undisturbed coastal dunes habitat within the reserve. This information served as the basis for establishing a habitat restoration plan for 116 highly disturbed acres within the dunes preserve. Dr. Mendez developed an onsite nursery and collected seeds and plant materials from extant populations of target species for propagation and out planting on-site.

In 2000, Dr. Mendez performed a habitat assessment for the ESB within Phase I and Phase II Development Areas A, B, C, and D, in support of the Playa Vista development project, County of Los Angeles. The project site subject to habitat assessment surveys included an area located within the Ballona Recovery Unit of the El Segundo Blue Butterfly Recovery Plan and is considered by the U.S. Fish and Wildlife Service as a site known to contain habitat suitable to support the El Segundo blue butterfly.

Dr. Mendez is presently working closely with the Ahmanson Land Company, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game in the development of a conservation program for the previously presumed extinct San Fernando Valley spineflower (*Chorizanthe parryi* ssp. *fernandina*). Since the spineflower was rediscovered in May 1999, Dr. Mendez has designed and implemented a variety of field efforts at Ahmanson Ranch to increase the understanding of the San Fernando Valley spineflower. Detailed 2nd-year surveys utilizing established quantitative techniques are in the process of being completed for all areas where the San Fernando Valley spineflower occurs within the Ahmanson Ranch Specific Plan Area. The results of these quantitative surveys will serve as the basis for developing a conservation strategy that will ensure the continued existence of this taxon, while allowing the development project to fulfill its objectives.

Additional Professional Experience

- El Segundo Dunes Restoration Project, Agresearch, Project Scientist, 1992–1994. Duties as project scientist included baseline population census prior to planting, plant monitoring of all revegetated sites (116 acres), plant surveys within foredune habitat (40 acres) proximal to the VOR (navigational aid), operation of plant nurser, supervision of all planting of native stock, seed collection, and training of technicians and volunteers.

- University of California, Los Angeles, Department of Chemistry and Biochemistry, Postdoctoral Scholar, 1988–1990. Work conducted on the synthesis of radio-labeled substrate (tritium labeled geranylgeranyl-pyrophosphate) for use in the quantification of kaurene made by Kaurene Synthetase *in vitro* in rice and wild cucumber and casbene made by Casbene Synthetase in castor bean; synthesis of radio-labeled affinity ligand to be used in the purification of Kaurene Synthetase from wild cucumber, *Marah macrocarpus*; and covalent coupling of affinity ligand to solid supports to determine which one gives the best resolution via high performance liquid chromatography.

- University of California, Los Angeles, Department of Biology, Postdoctoral Scholar 1986–1988. Responsibilities included laboratory setup and organization. Work conducted on the synthesis of phytyl pyrophosphate, a possible inhibitor of Kaurene synthetase to be used as an affinity ligand in the purification of Kaurene synthase from wild cucumber (*Marah macrocarpus*).

- University of California, Riverside, Division of Toxicology and Physiology, Research Assistant, 1981–1986. Work included the design and synthesis of new Dichloro-Diphenyl-Trichloroethane (DDT) analogs, the determination of insecticidal activity in houseflies using probit analysis, and linear regression analyses to correlate activity with structure.

- Instituto Venezolano de Investigaciones Cientificas, Caracas, Venezuela, Research Assistant, 1976–1980. Work consisted of natural products chemistry, specifically the chemical study of the constituents of the fruits of the soap plant, also known as *Phytolacca icosandra L.* under the direction of Dr. T. Nakano.

Professional History

- Sapphos Environmental, Inc., Habitat Restoration Specialist, 1995–present
- Agresearch, Project Scientist for the Los Angeles/El Segundo Dunes Restoration Project, 1992–1994
- University of California, Los Angeles, Postdoctoral Scholar, 1986–1990
- University of California Riverside, Research Assistant, 1981–1986
- Instituto Venezolano de Investigaciones Cientificas, Research Assistant, 1976–1980

Education

- Postdoctoral Scholar, University of California, Los Angeles, Department of Biochemistry, 1988–1990
- Postdoctoral Scholar, University of California, Los Angeles, Department of Biology, 1986–1988
- Doctorate, Chemistry, University of California, Riverside, 1986
- Master of Science, Chemistry, University of California, Riverside, 1982
- Bachelor of Science, Chemistry, Universidad Simon Bolivar, Caracas, Venezuela, 1980

Educational Awards

- Women at Work Medal of Excellence Award, 2001
- Postdoctoral Scholar, University of California, Los Angeles, 1986–1990
- Dissertation Research Award, 1985
- Chancellor's Patent Fund, 1983–1984
- Gran Mariscal de Ayacucho (GMA) Foundation Scholarship, 1981–1982

Professional Affiliations

- Society for Ecological Restoration, California Chapter, 1996–present
- California Native Plant Society, Los Angeles/Santa Monica Mountains Chapter, Board Member, 1992–present
- California Exotic Pest Plant Council

Permits

- U.S. Fish and Wildlife Service Recovery Permit (PRT 8300990) to monitor the El Segundo Blue Butterfly at Los Angeles International Airport

Publications

Mendez, I. In preparation. *Field Guide to the Flora of the El Segundo Dunes*.

Mendez, I., and F. Heath. 1994. “The Buckwheat Blues.” *American Butterflies*, *2*: 4–9.

Mohan, R.S., N.K.N. Yee, R.M. Coates, Y. Ren, P. Stamenkovic, I. Mendez, and C.A. West. 1996. “Biosynthesis of Cyclic Diterpene Hydrocarbons in Rice Cell Suspensions: Conversion of 9,10-sys-Labda-8(17), 13-dienyl Disphosphate to 9B-Pimara-7, 15-diene and Stemar-13-ene.” *Archives of Biochemistry and Biophysics*, *330*(1): 33–47.

JACK GOLDFARB
WILDLIFE BIOLOGIST

Jack Goldfarb is a wildlife biologist at Sapphos Environmental, Inc. He has over 7 years of experience in the field of wildlife biology, including project design and implementation, radio-telemetry, trapping, sensitive species surveys, wetland delineation, and habitat analysis. Mr. Goldfarb started working with Sapphos Environmental, Inc. in May 2007. Prior to his employment with Sapphos Environmental, Inc., he worked 2.5 years in the Natural Resources department at Texas Tech University as an assistant project leader on the Texas horned lizard (*Phrynosoma cornutum*) project, located on four Texas Army National Guard bases throughout Texas. Additional herpetological inventory activities were conducted at all Texas Army National Guard bases to provide a complete list of herpetological fauna present at each location. He has also conducted surveys for several other rare, threatened, and endangered species, including the Virgin Islands rock iguana, *Cyclura pinguis*, bog turtle, *Glyptemys muhlenbergi*, timber rattlesnake, *Crotalus horridus*, northern pine snake, *Pituophis melanoleucus*, northern redbelly turtle, *Pseudemys rubiventris*, Pine Barrens tree frog, *Hyla andersoni*, and the hawksbill sea turtle, *Eretmochelys imbricata*.

In addition, Mr. Goldfarb has conducted several projects in Costa Rica, including a radio-telemetry study of two lizard species to determine their spatial and temporal movement patterns using ArcGIS software. While in Costa Rica and the tropics, he conducted and assisted with several projects including leaf litter plot surveys, terrestrial and aquatic macro-invertebrates collections, and a faunal diversity survey of logged and un-logged rainforest stands.

In addition to his time with Texas Tech University, Mr. Goldfarb has been employed with the Wildlife Conservation Society, A.M.T., Inc. environmental consulting firm, and East Stroudsburg University. During his tenure with A.M.T., Inc., Mr. Goldfarb participated in rare, threatened, and endangered species surveys with a focus on the federally threatened bog turtle. In support of these work efforts, Mr. Goldfarb conducted presence/absence surveys, clearance and translocation surveys, as well as construction monitoring activities. He is also a professional photographer and has published photos in the Natural History Museum in New York, the Philadelphia Zoo, and several environmental education books.

Professional History

- Sapphos Environmental, Inc., Wildlife Biologist, 2007–present
- Texas Tech University, Assistant Project Leader, September 2004-January 2007
- East Stroudsburg University, Graduate Research Assistant, September 2001-May 2004
- A.M.T., Inc. Environmental Consulting Firm, Wildlife Biologist, March 2004-September 2004
- Wildlife Conservation Society, Herpetology Team Member, May 2002-September 2003
- Wildlife Photographer, 1999-present

Education

- Master of Science, Biological Sciences, East Stroudsburg University, 2004
- Bachelor of Science, Biological Sciences, 2000

Conferences/Workshops/Training

- Texas Wildlife Society meeting, 2005
- Texas horned lizard research group workshop, June 2005
- Horned lizard Conservation Society meeting and workshop, 2005
- Museum Preservation Workshop, University of Texas at Austin, 2005
- Pennsylvania Academy of Sciences meeting, 2003
- West Texas Herpetological Society meetings, 2004-2006

Professional Affiliations

Tri-Beta Biological Honor Society
Society for the Study of Amphibians and Reptiles
Herpetologist's League
American Society of Ichthyologists and Herpetologists
Ecological Society of America
Horned Lizard Conservation Society

KARA DONOHUE
WILDLIFE BIOLOGIST

Ms. Kara Donohue is a wildlife biologist at Sapphos Environmental, Inc. She has more than 5 years of experience in the field of wildlife biology, including conducting avian, nest, and vegetation surveys; avian trapping and banding; small mammal trapping; biological monitoring; insect sampling; and site supervision.

While working for Sapphos Environmental, Inc., Ms. Donohue has been the project manager for a variety of projects, including a wind energy project and a habitat restoration project. She has been involved in the preparation of several biological technical reports. Ms. Donohue has participated in creating a plant communities map and conducting biological surveys and has assisted in the writing of a trails manual for the County of Los Angeles. In addition, Ms. Donohue worked extensively on the annotated bibliography for the Port of San Diego, summarizing various historical documents and reviewed journal articles as well as environmental consultant documents.

As a raptor bander and site supervisor for HawkWatch International, at the fall migration monitoring site of Goshute Mountains, Nevada, Ms. Donohue led a crew of 12 volunteers; provided frontline information to the public; and counted, trapped, and banded hawks. Ms. Donohue trapped and banded migrating raptors and trained new banders, as well as coordinated with the main office in Salt Lake City, Utah.

Ms. Donohue worked as a raptor biologist for the Institute for Wildlife Studies on the San Clemente Island loggerhead shrike project. The San Clemente loggerhead shrike subspecies is a federally listed endangered species and endemic to an island actively used by the U.S. Navy for bombing exercises. Ms. Donohue worked on the nonlethal predator control of raptors and ravens in conflict with breeding shrikes. This position required coordination with various groups, including the U.S. Navy and Point Reyes Bird Observatory. She conducted surveys in rough terrain for raptors and ravens in shrike nesting areas and determined potential conflicts.

Ms. Donohue worked for the Virginia Polytechnic Institute as a plover biologist for the federally listed piping plover. Her responsibilities included conducting nest searches and monitoring plovers, assessing habitat and insect sampling, and erecting exclosures and fencing. In addition, Ms. Donohue monitored U.S. Army Corps of Engineers activities in close proximity to plover nesting areas and communicated with private homeowners on plover and least tern activity.

During her graduate studies, Ms. Donohue worked as a field technician in southwestern Idaho, studying burrowing owls. She was involved in the trapping, banding, and bleeding of adult and juvenile owls; nest monitoring; and recording responses to playback surveys and predator presence surveys.

Ms. Donohue's master's thesis at Boise State University will examine, with the use of stable isotope technology, the origins of migrating red-tailed hawks. In addition, she used the DNA-determined sex and morphometrics of individual red-tailed hawks to develop equations for in-hand sex determination of adult and immature birds. An article resulting from the DNA work has been published in a peer-reviewed scientific journal.

Professional History

- Sapphos Environmental, Inc., Wildlife Biologist, 2005–present
- United States Geological Survey, Technician, 2005
- Utah Division of Wildlife Resources, Wildlife Technician, 2004
- HawkWatch, International, Site Supervisor/Raptor Bander, 2001–2003
- United States Forest Service, Field Technician, 2003
- Boise State University, Field Technician, 2002
- Blanton and Associates, Biological Monitor, 2001
- Coastal Virginia Wildlife Observatory, Raptor Bander, 2000
- Institute for Wildlife Studies, Raptor Biologist, 2000
- Kalamazoo Nature Center, Field Biologist/Wildlife Rehabilitation Intern, 1998–2000
- Cape May Raptor Banding Project, Raptor Bander, 1996–1998
- Whitefish Point Bird Observatory, Owl Bander, 1998
- Virginia Polytechnic Institute, Plover Biologist, 1997
- Natural Resource Research Institute, Field Assistant, 1996
- University of Michigan, Field Assistant, 1995

Education

- Master of Science, Raptor Biology, Boise State University, In progress
- Bachelor of Science, Anthropology and Zoology, University of Michigan, 1996

Conferences/Workshops/Training

- 2007 Bat of the Southwestern Deserts workshop
- 2007 Continuing Legal Education (CLE) Endangered Species workshop
- 2006 and 2007 American Wind Energy Association Conference
- 2005 CEQA training

Professional Affiliations

- Society for Conservation Biology

Publications

- Donohue, K.C., and A.M. Dufty. 2006. "Sex Determination of Red-tailed Hawks (Buteo jamaicensis calurus) Using DNA Analysis and Morphometrics." *Journal of Field Ornithology*, *77*:74–79.

APPENDIX D

RESULTS OF SURVEYS FOR NESTING SNOWY PLOVERS IN SUPPLEMENTAL DUST CONTROL MEASURE AREAS AT OWENS LAKE IN 2007

Results of Surveys for Nesting Snowy Plovers in Supplemental Dust Control Measure Areas at Owens Lake in 2007

Prepared by:

Gary W. Page
PRBO Conservation Science
3820 Cypress Drive # 11
Petaluma, CA 94954

July 2007

Introduction

Snowy Plovers are small shorebirds that nest on dry playa and shallow-flood dust control areas of Owens Lake (Ruhlen et al. 2006). They depend on the seeps, surface water flows, and shallowly-flooded dust control areas as their primary foraging habitat. The Snowy Plovers that nest at Owens Lake are part of an interior population considered a "Species of Special Concern" by the California Department of Fish and Game. In May and June 2007, PRBO Conservation Science (PRBO) examined Supplemental Dust Control Measure (DCM) Areas D1-D23, Channel Areas C1-C2, and Study Areas S1-S4 at Owens Lake to document use by nesting Snowy Plovers prior to construction or other activities in the areas (Fig 1).

Methods

One to three biologists surveyed DCM, Channel, and Study areas between 8 May and 16 June 2007. They used binoculars and 20-60 power zoom spotting scopes to look for adult Snowy Plovers, and their nests and broods. Area searches, rather than transects, were used for all areas to allow observers flexibility in moving toward locations they suspected might be suitable for nesting Snowy Plovers. Dave Shuford, Phil Henderson and Gary Page, the three observers who conducted the surveys, all had prior experience with Snowy Plovers at Owens Lake. They scanned for plovers with binoculars and spotting scopes from enough stationary points to cover the entire area selected for coverage each survey day. It was not possible to cover all portions of some DCM areas in a single day requiring observers to return to survey another part of the area on a subsequent day.

If a plover was located, it was watched carefully it to see if it would return to a nest. Data collected on each observation of a plover, group of plovers, nest, or brood, included date, latitude, and longitude. Latitude and longitude (UTM/NAD83) were taken using a Garmin GPS unit. Sapphos Environmental, Inc. kindly provided data on the size of each study area.

We summarized the following information from the surveys for each area: number of days the area was surveyed, total survey hours, survey hours per acre, and the total number of nests, broods and adult plovers (by sex) that were found (Table 1). From these data we calculated the nests plus broods per acre per hour of search and total adults per acre per hour of search (Table 1). Abbreviations used in tables are: M = male, F = female, U = adult of uncertain sex. The number of eggs in nests is also reported in Tables 2 to 14; under Broods, the number of chicks (c) and their approximate size (%) relative to an adult are included.

Considerable data on use of Owens Lake by breeding Snowy Plovers have been summarized for the past 14 years (Ruhlen et al. 2006). They include annual counts of the numbers of plovers in different parts of the lake and surveys of Dust Control Measure areas prior construction. Annually, since 1994 a lake-wide survey for Snowy Plovers has been conducted in late May or early June to provide an index of the number of Snowy Plovers at Owens Lake. The 2007 survey was conducted from 21-26 May. These data were also examined to form an opinion on whether nesting might occur in some study areas for which we found no concrete evidence in 2007.

Results

All Study Areas Combined

For all survey areas combined, we detected 22 nests, 5 broods, and 81 adult Snowy Plovers in 2007 (Table 1). Adult plovers, nests and broods were found in both Channel Areas. Adult plovers and nests were found in 2 of the 4 Study Areas (Figs. 1 & 2). The others held no adults, nests, or broods. Eleven of 23 DCM Areas had adult plovers, 7 had nests, and 3 had broods. No evidence of plovers was detected in 12 DCM Areas (Table 1).

Table 1. Numbers of Snowy Plovers on surveys of supplemental dust control measure areas in 2007.

Area	Area Size in Acres	Survey Days	Total Survey Hours	Survey Hours per Acre	Total Nests & Broods		Total Adults			Nests & Broods per Acre per Hour	Total Adults per Acre per Hour
					Nests	Broods	F	M	U		
C1	189.09	2	12.50	0.07	1	2	1	3	1	**0.198**	**0.331**
C2	133.02	2	12.67	0.10	2	0	3	1	1	**0.190**	**0.476**
D1	101.11	1	2.50	0.02	0	0	0	0	0	0.000	0.000
D2	137.35	1	4.50	0.03	0	0	0	0	0	0.000	0.000
D3	20.80	2	2.16	0.10	0	0	0	0	0	0.000	0.000
D4	377.84	2	20.50	0.05	0	0	0	0	0	0.000	0.000
D5	366.23	2	21.99	0.06	0	1	0	1	0	**0.060**	**0.060**
D6	21.53	1	1.83	0.08	0	0	1	1	0	0.000	**0.170**
D7	273.63	3	24.59	0.09	2	0	3	3	2	**0.180**	**0.719**
D8	39.62	1	2.58	0.07	1	0	1	1	0	**0.065**	**0.130**
D9	337.67	2	12.16	0.04	0	0	1	2	0	0.000	**0.108**
D10	1120.14	2	25.86	0.02	3	0	4	1	0	**0.069**	**0.115**
D11	1271.93	2	32.32	0.03	0	0	0	3	0	0.000	**0.076**
D12	9.81	1	0.75	0.08	0	0	0	0	0	0.000	0.000
D13	9.97	1	0.33	0.03	0	0	0	0	0	0.000	0.000
D14	954.25	3	26.59	0.03	0	0	0	0	0	0.000	0.000
D15	50.39	1	1.58	0.03	0	0	0	0	0	0.000	0.000
D16	446.78	3	31.25	0.07	1	0	2	0	0	**0.070**	**0.140**
D17	4.97	1	0.50	0.10	0	0	0	0	0	0.000	0.000
D18	4.86	1	0.42	0.09	0	0	0	0	0	0.000	0.000
D19	690.25	3	38.76	0.06	4	1	5	7	1	**0.281**	**0.730**
D20	137.38	1	3.67	0.03	0	0	0	0	0	0.000	0.000
D21	247.26	3	19.66	0.08	2	0	4	2	0	**0.159**	**0.477**
D22	19.81	1	0.50	0.03	0	0	0	0	0	0.000	0.000
D23	185.62	3	11.50	0.06	2	1	5	6	1	**0.186**	**0.743**
S1	456.69	1	9.00	0.02	0	0	0	0	0	0.000	0.000
S2	174.65	2	8.50	0.05	1	0	3	1	0	**0.049**	**0.195**
S3	460.63	3	36.33	0.08	3	0	5	5	0	**0.237**	**0.789**
S4	95.21	1	3.50	0.04	0	0	0	0	0	0.000	0.000
	287.534	52	369	0.06	22	5	38	37	6	0.060	0.181

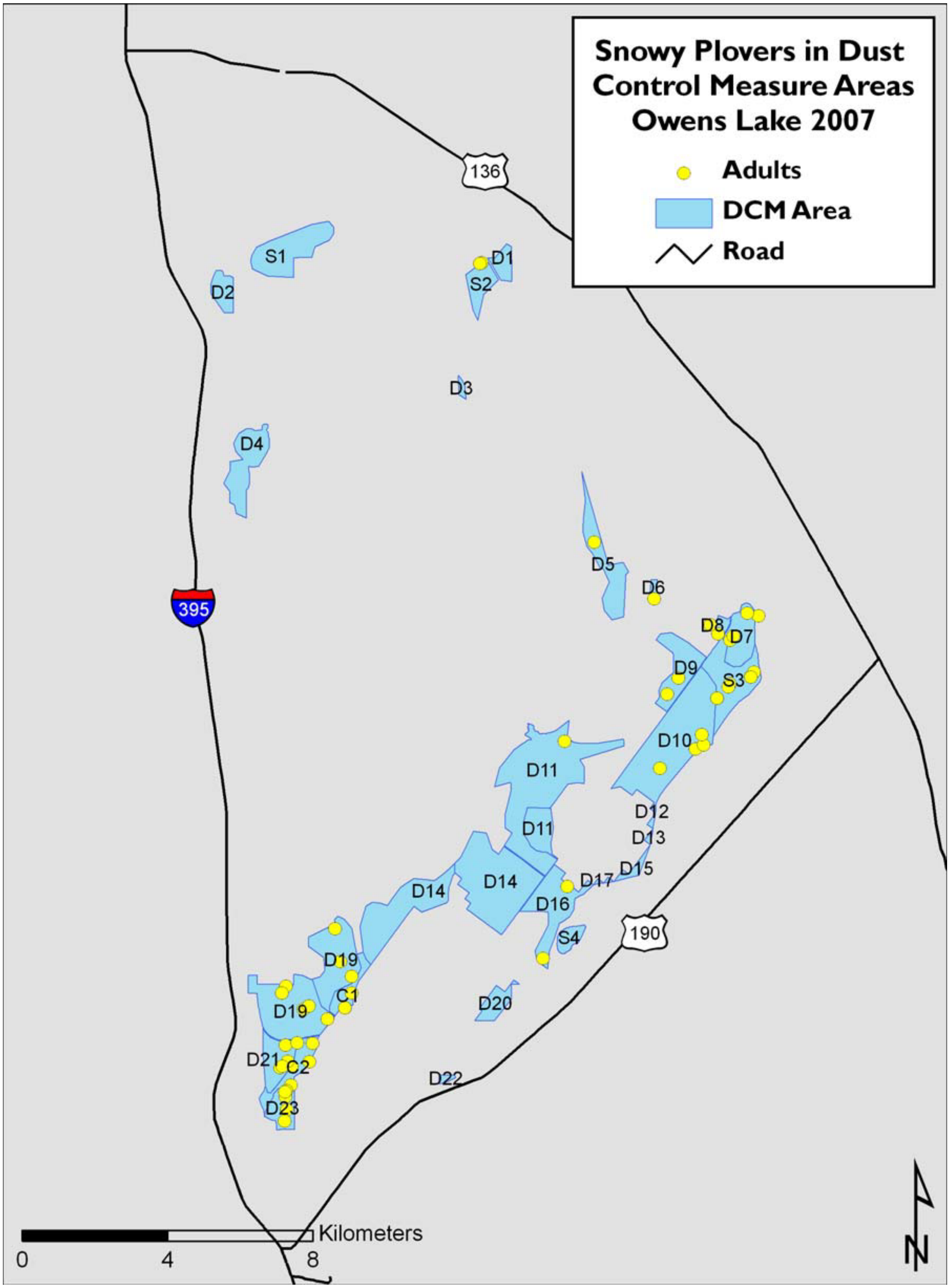


Figure 1. Map of supplemental dust control measure areas showing locations of adult Snowy Plovers on May-June surveys in 2007.

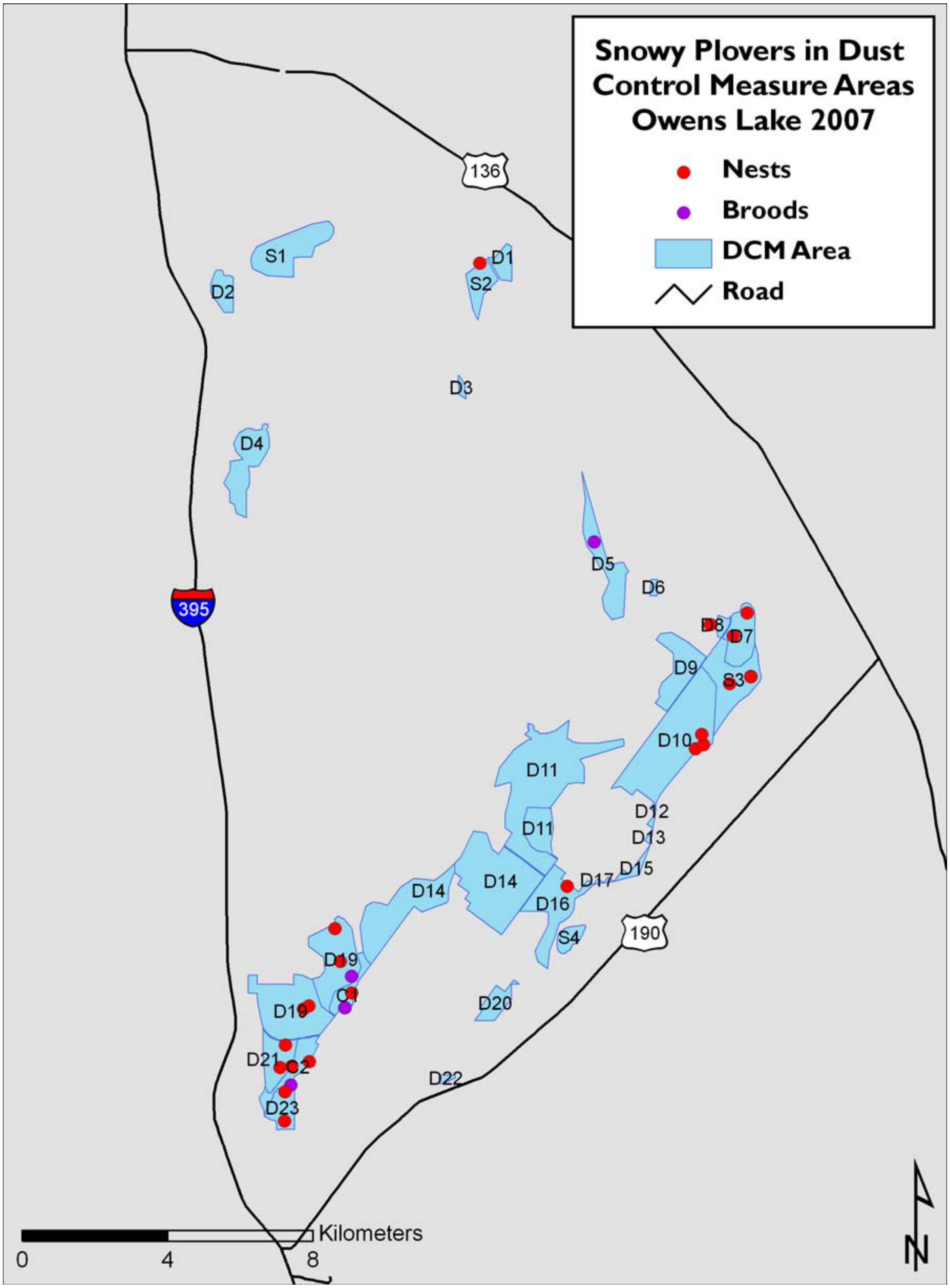


Figure 2. Map of supplemental dust control measure areas showing locations of Snowy Plover nests and broods on May-June surveys in 2007.

Summary by Area

Channel Areas C1 and C2

C1 and C2 appear to be regularly used by nesting Snowy Plovers. Both Channel Areas had relatively high concentrations of Snowy Plover nests/broods relative to other survey areas in 2007 (Table 1). Two of the 5 broods and 3 of the 22 nests that were found on the surveys were in these areas. The two broods found in C1 were in almost exactly the same location on surveys that were 1 month apart (Table 2). The C1 and C2 Channel Areas and adjoining DCM Areas D19, D21 and D23 are associated with the Cartago Creek drainage system which has an extensive history of plover surveys dating back to 1978 (Ruhlen et al. 2006). On annual lake-wide summer surveys, the number of adult plovers counted in the Cartago Creek area varied from 4 to 55 individuals from 2001-2006 (Page and Ruhlen 2005, 2006, Ruhlen et al 2006). The 2007 lake-wide survey yielded 16 adults in the Cartago area (PRBO unpublished data). Past preconstruction surveys in the Cartago Creek drainage area documented substantial evidence of nesting in 2001 (Figs 1 & 2 in Ruhlen and Page 2001).

Table 2. Summary of data on Snowy Plover adults, nests and broods in areas C1 and C2 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
C1	10-May	1	1			1 2-egg	11S 0411606	4022757
C1	10-May	1			1 3c-25%		11S 0411423	4022348
C1	11-June	1		1	1 3c-25%		11S 0411417	4022348
C2	11-May		1			1 3-egg	11S 0409956	4020736
C2	11-May			1			11S 0410527	4021373
C2	11-May		1			1 3-egg	11S 0410443	4020869
C2	11-May	1	1				11S 0410109	4021382

Study Areas S1-S4

S1. There was no evidence that S1 was a nesting area for Snowy Plovers. No Snowy Plovers were found on the 28 May survey of S1. Observers reported that survey conditions were excellent and that the area was totally covered. S1 is adjacent to shallow flood area T35-1. On the 2007 lake-wide survey for Snowy Plovers the 21 May count at T35-1 yielded no plovers.

S2. S2 was documented as a nesting area for Snowy Plovers. One nest (on the border of the area) and 4 adults were recorded on surveys of S2 (Table 3). On the 3 June survey the observer who spotted the pair of plovers noted that they may have a nest. The female seen on 4 June was on the nest found on 3 June. S2 is adjacent to shallow flood areas T29-1 and T29-2. Three adult Snowy Plovers were recorded in these shallow flood areas on 22 May during the lake-wide survey.

S3. The surveys demonstrated S3 is a Snowy Plover nesting area. Ten adults and 3 nests were recorded for this area (Table 3). The number of adults and nests recorded per acre per hour of survey were high (Table 1). S3 is sandwiched between DCM Areas D7 and D10 which also had nesting plovers.

Table 3. Summary of data on Snowy Plover adults, nests and broods in areas S1-S4 in 2007.

		Adults						
Area	**Date**	**M**	**F**	**U**	**Broods**	**Nests**	**Longitude**	**Latitude**
S2	3-June		1			1 3-egg	11S 0415126	4042843
S2	3-June	1	1				11S 0415187	4042864
S2	4 June		1				11S 0415126	4042843
S3	15-May	2	1				11S 0421655	4030885
S3	15-May		1			1 3-egg	11S 0422004	4031274
S3	16-May	1					11S 0421971	4031191
S3	16-May		1			1 3-egg	11S 0422588	4031472
S3	16-May	1	1				11S 0422678	4031596
S3	16-May	1					11S 0421655	4030885
S3	15-June		1			1 2-egg	11S 0422585	4031467

S4. Although we did not record nesting plovers during one survey on 30 May 2007, it is likely S4 is a nesting area for Snowy Plovers. One of the two observers conducting the 30 May survey heard a plover and noted the habitat looked satisfactory for nesting. S4 is adjacent to DMC Area D16 which had nesting plovers and not far from shallow flood area T9 which held 13 adult plovers and 1 brood on 23 May during the lake-wide Snowy Plover survey. In addition, past surveys in 2001 suggest this region of the lake bed is used by nesting plovers (Ruhlen and Page 2001).

Dust Control Management Areas D1-D23

D1. D1 may be used by nesting Snowy Plovers but we failed to document it on our surveys. No Snowy Plovers were located on the 3 June survey of this area. The surveyors noted much backhoe work had been conducted there recently. D1 is adjacent to Study Area S2 which had nesting plovers and shallow flood areas T30-2 and T30-3 where no Snowy Plovers were recorded on 22 May during the lake-wide plover survey.

D2. Although we were not able to document use of this area for nesting in 2007, it can't be ruled out as a nesting area because plovers are consistently found nearby. No plovers were documented on the 2 June survey of D2. D2 lies north east of seeps (Northwest Seeps) that have been surveyed for plovers in the past. On lake-wide surveys between 2001 and 2006 plovers have been consistently documented in the vicinity of the seeps and broods have often been encountered; numbers of adults ranged from 2-12 during this period (Page and Ruhlen 2005, 2006, Ruhlen et al 2006) but only 1 adult was found on 24 May during the 2007 lake-wide survey (PRBO unpubl. data).

D3. Although we were not able to document use of this area for nesting in 2007, it shouldn't be ruled out as a nesting area. No plover activity was documented during 28 May and 3 June surveys of this area. The adjacent T36-3 shallow flood area held no plovers on the 21 May lake-wide survey. Prior to the construction of the T36 shallow flood areas Ruhlen and Page (2001) recorded plover nesting on the playa in the vicinity of D3.

D4. Despite the lack of plovers on surveys in 2007, D4 should be considered a Snowy Plover nesting area based on past records and the occurrence of a nest just outside the area in 2007. Although surveys on 31 May and 1 June failed to locate any plovers in this area, on 31 May a female was located on a nest of 3 eggs just outside the area (coordinates = 11S 0408923 & 4037118). Seeps on the eastern border of this area (Bartlett/Carroll Creek) have consistently held plovers from 2001-2006 when numbers of adults varied from 1-14 on lake-wide surveys (Page and Ruhlen 2005, 2006, Ruhlen et al 2006). No plovers were found in the Bartlett/Carroll Creek area on 25 May during the 2007 lake-wide survey. Broods have also been located on some past surveys of the Bartlett/Carroll Creek area (PRBO unpublished data).

D5. The detection of a male plover with a brood on a 5 June survey documented D5 as a Snowy Plover nesting area (Table 4). D5 is adjacent to shallow flood area T25S which held 15 plovers on the 21 May 2007 lake-wide survey.

Table 4. Summary of data on Snowy Plover adults, nests and broods in area D5 in 2007.

		Adults						
Area	**Date**	**M**	**F**	**U**	**Broods**	**Nests**	**Longitude**	**Latitude**
D5	5-June	1			1 1c-90%		11S 0418276	4035162

D6. Although no nests or broods were located in this small area on the 14 May survey, the 2 adults that were present within 100 m of the area on 5 June suggested it may be used for nesting. It is bordered by shallow flood areas T18N with no Snowy Plovers on 23 May and T23SW with no Snowy Plovers on 21 May during the 2007 lake-wide survey.

Table 5. Summary of data on Snowy Plover adults, nests and broods in area D6 in 2007.

		Adults						
Area	**Date**	**M**	**F**	**U**	**Broods**	**Nests**	**Longitude**	**Latitude**
D6	14-May	1		1			11S 0419920	4033609

D7. Our surveys documented relatively high use of D7 by nesting Snowy Plovers (Table 1). Although 8 adults (the 2 adults of unknown sex were about 100 m outside the area) and 2 nests were located on the 19 May survey, two observers failed to locate any birds on a follow-up survey on 13 June. D7 is adjacent to Study Area S3 for which we also documented relatively heavy use by nesting Snowy Plovers.

Table 6. Summary of data on Snowy Plover adults, nests and broods in area D7 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D7	19-May	1	1				11S 0422015	4032467
D7	19-May	1	1			1 3-egg	11S 0422100	4032583
D7	19-May			2			11S 0422801	4033134
D7	19-May	1	1			1 3-egg	11S 0422489	4033206

D8. D8 should be considered a nesting area even though the GPS point of the female with a nest on 19 May indicated the nest was about 150 m outside the area. D8 borders D7, another area for which we also documented use by nesting plovers in 2007.

Table 7. Summary of data on Snowy Plover adults, nests and broods in area D8 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D8	19-May	1					11S 0421676	4032634
D8	19-May		1			1 3-egg	11S 0421467	4032885

D9. D9 is likely a Snowy Plover nesting area. Three adults, but no nest or broods, were found in this area on a 13 May survey. On the 13 May survey, one observer noted a pair exhibited territorial defense and was engaged in extensive nest scraping suggesting D9 is a nesting area. No evidence of Snowy Plovers was found on a 16 June survey. D9 is adjacent to T18N which had no Snowy Plovers on 23 May during the 2007 lake-wide survey. D9 is bordered by D10 which was a documented nesting area in 2007 (Table 1).

Table 8. Summary of data on Snowy Plover adults, nests and broods in area D9 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D9	13-May	1					11S 0420284	4030990
D9	13-May	1	1				11S 0420592	4031442

D10. This location was well established as a breeding area in 2007. We recorded 5 adults and 3 nests here over 2 days of surveys in June (Table 9). By 22 May biologists working for Bio Environmental Associates (BEA) had located 7 nests in the southeastern portion of this area. D10 is adjacent to shallow flood areas T13-1 and T13-2 where 72 Snowy Plovers were recorded on 23 May during the 2007 lake-wide survey. It also borders T18S which had 5 plovers on 23 May during the 2007 lake-wide survey.

Table 9. Summary of data on Snowy Plover adults, nests and broods in area D10 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D10	8-June	1	1				11S 0420082	4028945
D10	8-June		1			1 3-egg	11S 0421060	4029478
D10	9-June		1			1 3-egg	11S 0421288	4029596
D10	9-June		1			1 3-egg	11S 0421239	4029883

D11. We failed to document D11 as a breeding area as no nests or broods were located. Three males seen on one of two survey dates in this area may not have been nesting there (Table 10). D11 borders shallow flood areas T18S, T13-3, and T11. On the 2007 lake-wide survey these shallow flood areas accounted for 15 adult plovers. Transects in the region of D11 in 2001 and 2002 did not indicate use by nesting plovers (Ruhlen and Page 2001, 2002).

Table 10. Summary of data on Snowy Plover adults, nests and broods in area D11 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D11	9-May	3					11S 0417455	4029693

D12, D13, D15, D17, and D18. Although we failed to find plovers in these areas during a survey on 2 June 2007, they should be considered potential breeding areas based on data collected in the past. The observer conducting the 2 June 2007 survey noted that a nest had been found by BEA east of the intersection of D13 and D15 but it appeared to be inactive on 2 June. These small DMC Areas abut shallow flood area T13-1 where 48 Snowy Plovers were recorded on 23 May during the 2007 lake-wide Snowy Plover survey. They also are in a region where past surveys have documented Snowy Plover nests (Ruhlen and Page 2001, 2002).

D14. All evidence collected to date suggests D14 receives little use by nesting Snowy Plovers. No plovers were recorded in D14 on surveys made on three dates between 9 May and 7 June (Table 1). D14 abuts shallow flood area T8W where no Snowy Plovers were seen on 23 May during the 2007 lake-wide survey. Past surveys of this region have also failed to detect much evidence of nesting by the Snowy Plover (Ruhlen and Page 2001, 2002).

D16. Snowy Plovers were found nesting in this area (Table 1). Two adult plovers and a nest were located in D16 on an 8 May survey. On the same day biologists from BEA located another Snowy Plover nest in this area. Follow up surveys by PRBO on 2 June and 10 June produced no additional plover sightings. D16 is bordered by shallow flood areas T9, T13-1, and T13-2. These shallow flood areas accounted for 85 Snowy Plovers on the 2007 lake-wide survey which was conducted in those areas on 23 May.

Table 11. Summary of data on Snowy Plover adults, nests and broods in area D16 in 2007.

		Adults						
Area	**Date**	**M**	**F**	**U**	**Broods**	**Nests**	**Longitude**	**Latitude**
D16	8-May		1			1 3-egg	11S 0417535	4025687
D16	8-May		1				11S 0416862	4033706

D19. This is a well documented nesting area of the Snowy Plover. We recorded 13 adults, 4 nests and 1 brood here (Table 12). The number of adults and the number of nests and broods per acre per survey hour were relatively high (Table 1). D19 and the abutting areas, C1 and C2, are associated with the Cartago Creek drainage system which has an extensive history of plover surveys dating back to 1978 (Ruhlen et al. 2006). On regular summer surveys the number of adult plovers counted in the Cartago Creek area varied from 4 to 55 individuals from 2001-2006 (Page and Ruhlen 2005, 2006, Ruhlen et al 2006). The 2007 summer survey yielded 16 adults (PRBO unpublished data). Past preconstruction surveys in the Cartago Creek drainage area documented substantial evidence of nesting in 2001 (Figs 1 & 2 in Ruhlen and Page 2001).

Table 12. Summary of data on Snowy Plover adults, nests and broods in area D19 in 2007.

		Adults						
Area	**Date**	**M**	**F**	**U**	**Broods**	**Nests**	**Longitude**	**Latitude**
D19	10-May	1	1				11S 0410940	4022037
D19	10-May	1					11S 0409795	4022941
D19	10-May	2					11S 0409679	4022754
D19	10-May	1	1			1 3-egg	11S 0410281	4022316
D19	10-May	1	1			1 3-egg	11S 0410422	4022399
D19	10-May			1	1 2c-50%		11S 0411597	4023212
D19	20-May	1	1			1 3-egg	11S 0411141	4024526
D19	12-June		1			1 3-egg	11S 0411287	4023625

D20. Plovers may use this area for nesting but surveyors found no nests or adults on a 30 May survey of this area. The surveyors commented that there was potential nesting habitat. D20 is bordered by shallow flood area T5-3 which was covered on 23 May during the lake-wide survey; it accounted for 9 adults and 1 brood on the survey. .

D21. This is a well documented nesting area of the Snowy Plover. We recorded 6 adults and 2 nests here (Table 13). D1 is associated with the Cartago Creek drainage system which has an extensive history of plover surveys dating back to 1978 (Ruhlen et al. 2006). On regular summer surveys the number of adult plovers counted in the Cartago Creek area varied from 4 to 55 individuals from 2001-2006 (Page and Ruhlen 2005, 2006, Ruhlen et al 2006). The 2007 summer survey yielded 16 adults (PRBO unpublished data). Past preconstruction surveys in the Cartago Creek drainage area documented evidence of nesting in 2001 (Figs 1 & 2 in Ruhlen and Page 2001).

Table 13. Summary of data on Snowy Plover adults, nests and broods in area D21 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D21	11-May		1			1 3-egg	11S 0409781	4021316
D21	11-May	1	1				11S 0409843	4020880
D21	11-May		1			1 3-egg	11S 0409636	4020706
D21	11-June	1	1				11S 0409697	4020742

D22. The observers who covered this small area commented that it held no potential breeding or feeding habitat. No plovers were seen on the 30 May survey of this area.

D23. This is a well documented nesting area of the Snowy Plover. We recorded 12 adults, 2 nests and 1 brood here (Table 14). D23 and the abutting channel area, C2, are associated with the Cartago Creek drainage system which has an extensive history of plover surveys dating back to 1978 (Ruhlen et al. 2006). On regular summer surveys the number of adult plovers counted in the Cartago Creek area varied from 4 to 55 individuals from 2001-2006 (Page and Ruhlen 2005, 2006, Ruhlen et al 2006). The 2007 summer survey yielded 16 adults (PRBO unpublished data). Past preconstruction surveys in the Cartago Creek drainage area documented evidence of nesting in 2001 (Figs 1 & 2 in Ruhlen and Page 2001).

Table 14. Summary of data on Snowy Plover adults, nests and broods found in DMC area D23 in 2007.

		Adults						
Area	Date	M	F	U	Broods	Nests	Longitude	Latitude
D23	11-May	1			1 3c-25%		11S 0409934	4020223
D23	11-May	3					11S 0409779	4019900
D23	4-June	1	2				11S 0409808	4020067
D23	4-June	1	1	1		1 3-egg	11S 0409773	4020034
D23	4-June		1				11S 0409825	4019533
D23	4-June		1			1 1-egg	11S 0409756	4019227

Discussion

The 2007 survey at Owens Lake followed a very dry winter and the amount of surface water at seeps along the shore of the lake was reduced over other years. This may have affected the distribution of the plovers and resulted in our surveys failing to detect plovers in the D2 and D4 area.

The 421 adult plovers detected on the lake-wide survey in 2007 were down substantially from the 602 recorded in 2005. There were 505 and 658, respectively, on the 2005 and 2004 lake-wide surveys. Lower plover numbers also appears to have occurred on the California coast in 2007. Lower than average over-winter survival from cold weather may have affected both groups of birds. Regardless, the lower number of birds at Owens Lake in 2007 probably reduced the numbers we could expect on our surveys and caused us to underestimate the use of some areas.

Acknowledgements

W. David Shuford and R. Phillip Henderson conducted the majority of the surveys for PRBO. Chris Rintoul prepared the maps showing the locations of nests and broods. Sapphos Environmental, Inc. provided the base maps for the figures and the acreage of the study sites. We thank Ray Ramirez, Dan Hack, Russell Kochs, John Gilbert and Scot Ferguson who shared information on the locations of plover nests that they found.

Literature Cited

Page, G. W. and T. D. Ruhlen 2005. Results of the 2005 breeding season surveys for Snowy Plovers and Common Ravens at Owens Lake. PRBO Conservation Science Report.

Page, G. W. and T. D. Ruhlen 2006. Results of the 2006 breeding season surveys for Snowy Plovers and Common Ravens at Owens Lake. PRBO Conservation Science Report.

Ruhlen T. D. and G. W. Page. 2001. Summary of surveys for Snowy Plovers at Owens Lake in 2001. PRBO Conservation Science Report.

Ruhlen T. D. and G. W. Page. 2002. Summary of surveys for breeding Snowy Plovers and American Avocets at Owens Lake in 2002. PRBO Conservation Science Report.

Ruhlen T. D., G. W. Page, and L. E. Stenzel. 2006. Effect of a changing environment on nesting Snowy Plovers at Owens Lake, California. Western Birds 37:126-138.

Appendix 1a. Results of the May-June 2007 lake-wide Snowy Plover Survey at Owens Lake.

		Adults						
West Shore	**Date**	**Total**	**Males**	**Females**	**Unk. Sex**	**Unk. Age**	**Juveniles**	**Broods**
Olancha Pond	NS							
Cartago Creek	24-May	16	5	7	4	0	2	0
T 1	23-May	4	4	0	0	0	0	0
Permanente/Ash Creek	24-May	0	0	0	0	0	0	0
South Cottonwood	26-May	5	0	1	4	0	0	2
North Cottonwood	26-May	45	7	4	34	0	1	2
Bartlett/Carroll Creek	25-May	0	0	0	0	0	0	0
Northwest Seep	24-May	1	1	0	0	0	0	1
Subtotal		71	17	12	42	0	3	5

		Adults						
Zone 1 and Delta	**Date**	**Total**	**Males**	**Females**	**Unk. Sex**	**Unk. Age**	**Juveniles**	**Broods**
T 35-1	21-May	0	0	0	0	0	0	0
T 35-2	21-May	1	0	1	0	0	0	0
T 36-1	21-May	0	0	0	0	0	0	0
T 36-2	21-May	5	3	2	0	0	0	2
T 36-3	21-May	0	0	0	0	0	0	0
Owens River Delta	24-May	0	0	0	0	0	0	0
Subtotal		6	3	3	0	0	0	2

		Adults						
Zone 2	**Date**	**Total**	**Males**	**Females**	**Unk. Sex**	**Unk. Age**	**Juveniles**	**Broods**
T 30-1	22-May	0	0	0	0	0	0	0
T 30-2	22-May	0	0	0	0	0	0	0
T 30-3	22-May	0	0	0	0	0	0	0
T 29-1	22-May	2	1	1	0	0	0	1
T 29-2	22-May	1	0	1	0	0	0	0
T 29-3	22-May	0	0	0	0	0	0	0
T 29-4	22-May	0	0	0	0	0	0	0
T 28 N	22-May	0	0	0	0	0	0	0
T 28 S	22-May	0	0	0	0	0	0	0
T 27 N	22-May	63	28	7	28	0	0	2
T 27 S	22-May	11	3	2	6	0	0	0
T 26	22-May	2	0	0	2	0	0	0
T 25 N	21-May	0	0	0	0	0	0	0
T 25 S	21-May	15	7	6	2	0	1	0
T 24	21-May	27	15	3	9	0	0	0
T 23 NE	21-May	0	0	0	0	0	0	0
T 23 NW	21-May	0	0	0	0	0	0	0
T 23 SE	21-May	12	7	1	4	0	0	1
T 23 SW	21-May	0	0	0	0	0	0	0
Subtotal		133	61	21	51	0	1	4

	Adults						
	Total	**Males**	**Females**	**Unk. Sex**	**Unk. Age**	**Juveniles**	**Broods**
Subtotal West Shore & Zones 1-2	210	81	36	93	0	4	11

Appendix 2b. Numbers of avocets, stilts, gulls and ravens on the 2007 Owens Lake plover survey.

		Avocets		Stilts		Gulls	Ravens	
Zones 3 & 4	**Date**	**Adults**	**Broods**	**Adults**	**Broods**	**Ad & Imm**	**Total**	**Behavior**
Sulfate Well East & West	24-May	12	0	0	0	1	10	10 roost
Swede's Pasture Springs	24-May	0	0	0	0	0	14	14 forage
T 18 N	23-May	174	0	0	0	1212	9	1 forage, 8 roost berm
T 18 S	23-May	53	0	0	0	1794	2	1 forage, 1 fly
North Tubman Seep	24-May	0	0	0	0	0	0	
Tubman Springs	24-May	0	0	0	0	0	1	1 forage
T 13-1	23-May	142	6	2	0	0	2	2 chased by avocets
T 13-2	23-May	637	29	0	0	0	0	
T 13-3	23-May	676	11	0	0	0	0	
T 11	24-May	208	2	0	0	124	0	
Whiskey Creek	25-May	0	0	0	0	0	0	
T 9	23-May	41	0	0	0	32	0	
T 8 W	23-May	0	0	0	0	0	0	
T 5-1	23-May	0	0	0	0	0	0	
T 5-1 Addition	23-May	0	0	0	0	0	0	
T 5-2	23-May	14	0	0	0	0	1	1 stand playa
T 5-3	23-May	0	0	0	0	0	0	
T 5-4	23-May	240	4	11	0	0	0	
Dirty Socks	23-May	0	0	2	0	0	2	2 forage
Managed Vegetation	23-May	0	0	0	0	0	0	
T 4-3	23-May	4	0	0	0	241	8	8 forage
T 4-3 Addition	23-May	0	0	0	0	0	0	
T 4-4	23-May	50	0	10	0	0	0	
T 4-5	23-May	0	0	0	0	0	0	
T 3 NE	23-May	4	0	0	0	0	0	
T 3 SE	23-May	0	0	0	0	0	0	
T 3 SE Addition	23-May	0	0	0	0	0	0	
T 3 SW	23-May	40	0	0	0	0	0	
Southwest Seep	24-May	0	0	0	0	0	0	
Duck Ponds	25-May	49	0	17	0	0	1	1 forage
T 2-1	23-May	0	0	0	0	119	0	
T 2-2	23-May	5	0	0	0	1	0	
T 2-3	23-May	12	0	0	0	0	1	1 fly
T 2-4	23-May	32	0	0	0	3	5	4 forage, 1 perched pipe
T 2-5	23-May	0	0	0	0	0	0	
Subtotal		2393	52	42	0	3527	56	

	Avocets		Stilts		Gulls	Ravens	
	Adults	**Broods**	**Adults**	**Broods**	**Ad & Imm**	**Total**	**Behavior**
Total All Areas	3067	52	61	0	8407	205	

Appendix 3a. Common Ravens tabulated in Snowy Plover areas on the 25 May 2007 raven survey.

West Shore	Total	Adult-sized	Fledglings	Behavior
Olancha Pond	2	2	0	2 forage
Cartago Creek	2	2	0	2 forage
T 1	0	0	0	
Permanente/Ash Creek	1	1	0	1 fly
South Cottonwood	3	3	0	1 fly, 2 perch on telephone poles
North Cottonwood	6	6	0	2 fly, 1 forage & 1 stand playa, 2 perch in trees
Bartlett/Carroll Creek	2	2	0	2 flying near nest
Northwest Seep	2	2	0	2 forage in marsh
Subtotal	18	18	0	

Zone 1 and Delta	Total	Adult-sized	Fledglings	Behavior
T 35-1	0	0	0	
T 35-2	2	2	0	2 forage
T 36-1	0	0	0	
T 36-2	0	0	0	
T 36-3	0	0	0	
Owens River Delta	0	0	0	
Subtotal	2	2	0	

Zone 2	Total	Adult-sized	Fledglings	Behavior
T 30-1	8	8	0	1 fly, 5 forage, 1 stand, 1 perch on post
T 30-2	1	1	0	1 fly
T 30-3	0	0	0	
T 29-1	9	9	0	1 fly, 7 forage, 1 perch on post
T 29-2	4	4	0	1 fly, 3 stand
T 29-3	1	1	0	1 stand
T 29-4	0	0	0	
T 28 N	17	17	0	2 fly, 15 forage
T 28 S	16	16	0	1 fly, 2 stand, 13 forage
T 27 N	4	4	0	1 fly, 3 forage
T 27 S	4	4	0	1 fly, 3 forage
T 26	20	20	0	11 forage, 9 stand
T 25 N	4	4	0	1 fly, 3 forage
T 25 S	0	0	0	
T 24	0	0	0	
T 23 NE	0	0	0	
T 23 NW	0	0	0	
T 23 SE	3	3	0	3 forage
T 23 SW	1	1	0	1 fly
Subtotal	28	28	0	

	Total	Adult-sized	Fledglings
Subtotal West Shore & Zones 1-2	48		