APPENDIX E

Biological Resources Assessment

This page intentionally left blank.

NORTH HAIWEE DAM NO. 2 PROJECT

Biological Resources Assessment

June 2017

Prepared by Los Angeles Department of Water and Power

Watershed Resources Group

Los Angeles Department of Water & Power

TABLE OF CONTENTS

FIGURES

TABLES

Executive Summary

This Biological Resources Assessment has been prepared for the North Haiwee Dam No. 2 Project and identifies potential impacts to biological resources within the project area and the vicinity of the project area. This report presents the results of a literature review, describes the existing biological conditions for the project area, the identification of potential jurisdictional waters (if any), the project's potential impacts to sensitive plant and wildlife species, potential impacts to native resident and migratory wildlife, and suitable mitigation measures to address potential impacts. Focused surveys consisted of a general habitat assessment for plants and wildlife, rare plant surveys, raptor and general encounter bird surveys, visual and acoustical bat surveys, state and federal protocol level surveys for Desert tortoise, Mohave ground squirrel, and burrowing owl. For the purposes of this assessment, "project area" refers to the general survey area that was analyzed by biologists, which includes the proposed construction of the new North Haiwee Dam (NHD2) area and associated borrow sites.

For mapping purposes to depict vegetation alliances and to determine impacts to these alliances within the project vicinity, a 1,500-foot (500-meter) buffer was established around the borrow sites and a 750-foot (250-meter buffer) along the haul routes. Special status plant and wildlife surveys were conducted in October 2014 and again in March through July 2015. These surveys focused on 100% coverage via transects within the footprint of the NHD2 project area, the borrow sites, haul routes and an additional 50-foot buffer. Although no jurisdictional wetlands were present, a small stand of trees including riparian species such as tamarisk, willows, and cottonwoods may be impacted by project activities. An American kestrel nest was found in these trees, which is also used by many migratory birds and other wildlife. One special status plant species, sanicle cymopterus (*Cymopterus ripleyi var. saniculoides)* was observed during plant surveys. No special status wildlife species were found present during ground surveys; however, sign of the American badger was found in the NHD2 project area and special status bat species were recorded acoustically. Local native wildlife populations may potentially be adversely affected by the temporary disruption of foraging, burrowing, and nesting activities due to an increase of human activity, use of heavy equipment, and noise associated with construction activities. The majority of impacts to biological resources are expected to be temporary and implementation of recommended avoidance and minimization measures outlined in this report will reduce any potential impacts to less than significant levels.

1.0 Introduction

1.1 Purpose

The City of Los Angeles Department of Water and Power (LADWP), in cooperation with the U.S. Bureau of Land Management (BLM), proposes to replace or to improve the seismic reliability of the existing North Haiwee Dam (existing dam or NHD) located in the Owens Valley, California, approximately 150 miles north of Los Angeles (Figure 1). LADWP owns and operates the existing earthfill dam (constructed in 1913), an essential component of the Los Angeles Aqueduct (LAA) system which transports water from the Owens Valley through the North Haiwee Reservoir (NHR) to Southern California and the City of Los Angeles.

A seismic stability evaluation of the existing dam, conducted by LADWP, concluded that the existing Dam could experience structural failure in the event of a controlling Maximum Credible Earthquake (MCE) scenario. The MCE is the largest earthquake which could possibly occur at a fault, based on the characteristics of that particular earthquake fault. Based on this evaluation, the California Department of Water Resources, Division of Safety of Dams (DSOD), has directed LADWP to operate the NHR at a restricted maximum surface water elevation in order to prevent flooding in the event of an MCE.

In order to operate the NHR at the normal water level permitted prior to the restrictions put in place by DSOD, LADWP needs to comply with DSOD requirements including demonstration of continuous progress on seismic improvements and initiation of construction activities for such improvements by 2017. To that end, LADWP is proposing the North Haiwee Dam No. 2 Project (proposed Project). The proposed project would provide sufficient seismic reliability for the NHR, maintain the function of an essential water conveyance infrastructure component for the Los Angeles region, and protect local populations from a hazardous flooding event.

1.2 Project Location

The proposed Project would be located in the Owens Valley in unincorporated areas of Inyo County, California. The project site is located approximately 0.5 miles southeast of the community of Olancha, and approximately 0.75 miles north of the community of Haiwee (Inyo County, 2002). The project site is bordered on the south by the NHR, on the east by undeveloped, hilly City-owned property, on the north by the privately-owned Butterworth Ranch, and on the west by undeveloped BLM-owned land (Figure 1).

The existing dam is located at the north end of the NHR and South Haiwee Reservoir. Cactus Flats Road travels roughly west to east, north of the existing dam. The LAA approaches the NHR from the northwest, and enters the NHR approximately 0.25 miles south of the existing dam. The existing dam is approximately 0.7 miles east of the U. S. Highway 395 (US-395) and the project site is accessed via the partially paved North Haiwee Road from the west and via the partially paved Cactus Flats Road from the north and east.

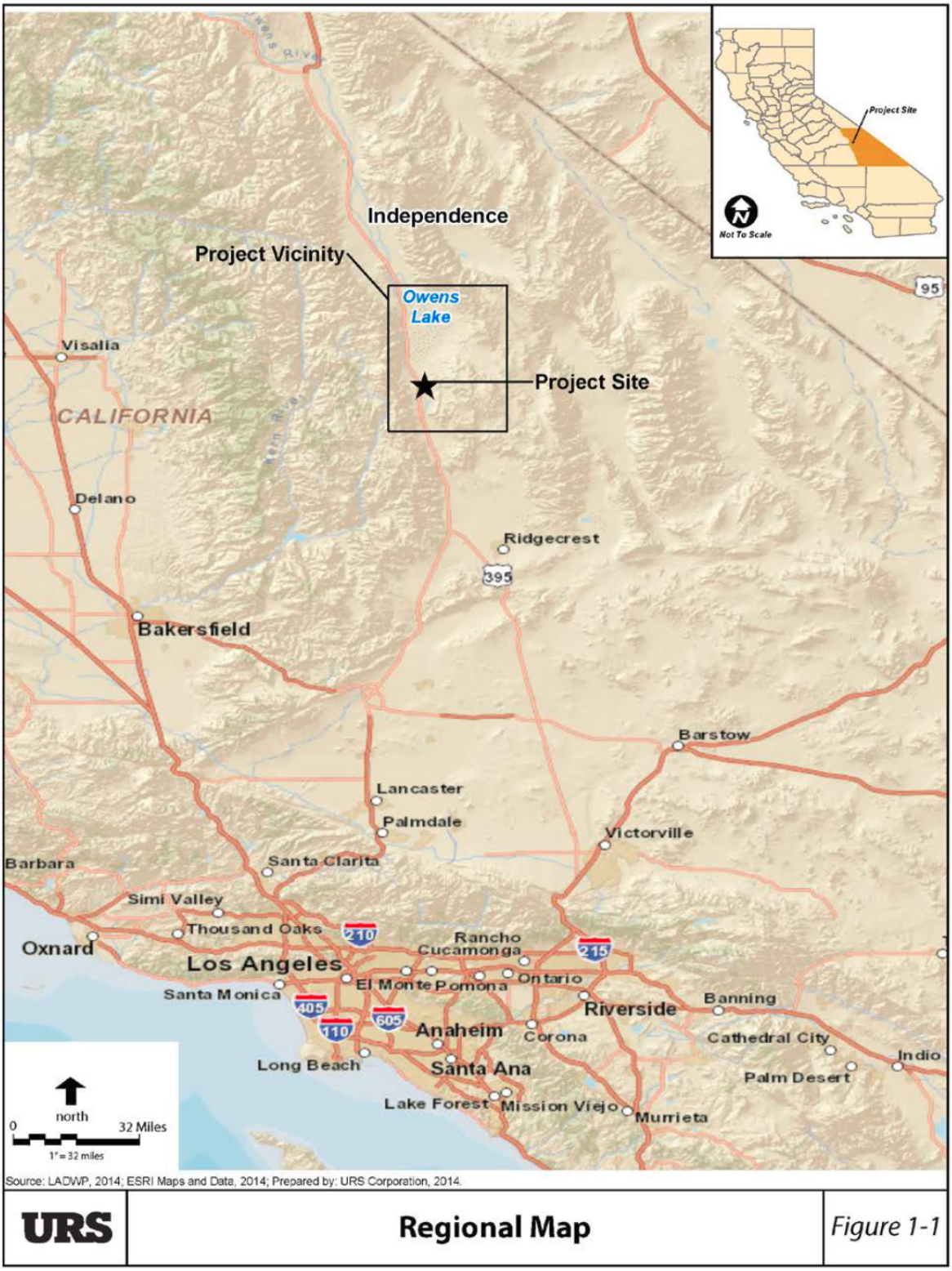


Figure 1. Regional map

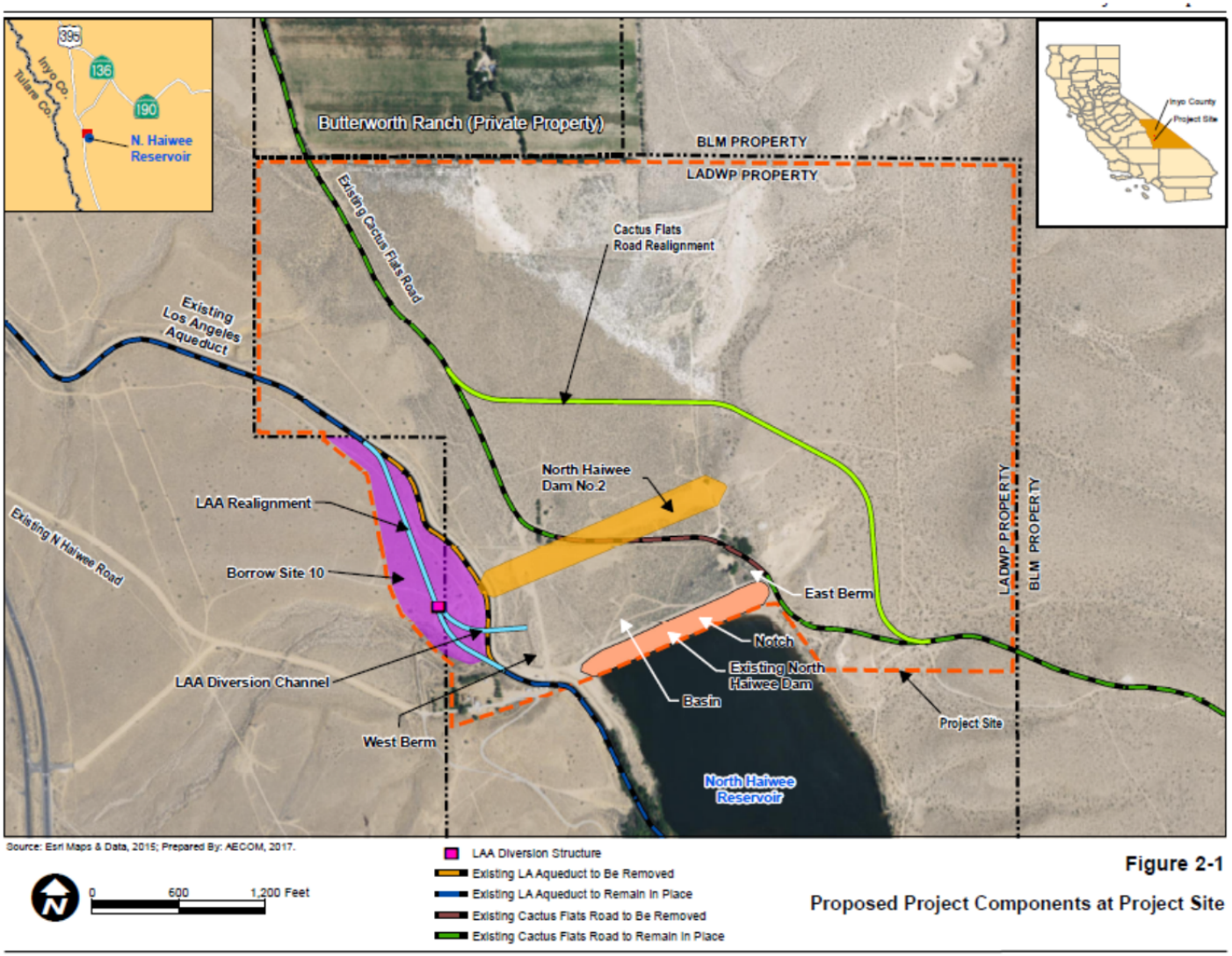
1.3 Project Overview

The proposed Project consists of the following components (Figure 2). These are:

1. Construction of NHD2 components, including construction of NHD2 and east and west berms, and grading the area between NHD and NHD2 for the basin;
2. Realignment of Cactus Flats Road;
3. Realignment of the LAA and construction of the diversion structure and temporary bridge;
4. Construction of the diversion channel and NHD modifications; and
5. Excavation of materials from the BLM distrubance area, and purchase of materials from Borrow Site 15.

1.3.1 North Haiwee Dam Number 2

North Haiwee Dam Number 2 (NHD2) will be constructed north of the existing dam. The NHD2 axis will be located approximately 800 feet north and roughly parallel to the existing dam axis (Figure 3). NHD2 will serve as a backup dam in the event the NHD is damaged by an earthquake event. NHD2 will be designed to retain water in the NHR in the event of failure of the NHD. The proposed NHD2 location provides a basin and a new accessible length of aqueduct channel between the existing dam and NHD2 that may be utilized for water quality and sediment management purposes or storage. The new dam would be an embankment dam and would either be homogeneous (non-clay core dam comprised of one primary material) or zoned (containing a clay core, and "zones" of different material types). Seepage control systems will be provided for the new dam and will be designed depending on the type of embankment dam selected (homogeneous or zoned).



2

Figure 2. Proposed project elements

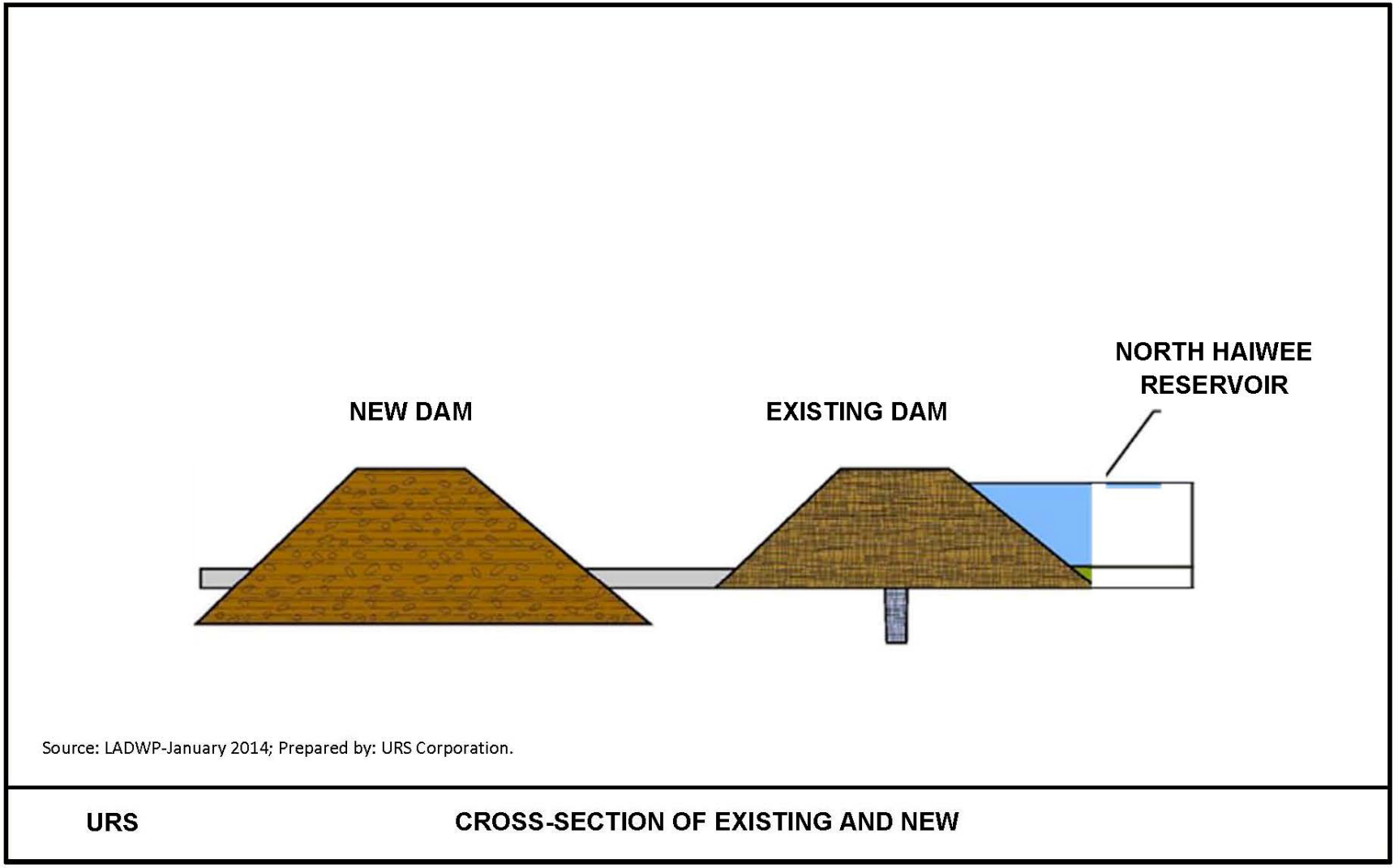


Figure 3. Cross-section of existing and new dams

NHD2 would be constructed per the design plans and specifications of DSOD guidelines and the operational requirements of the NHR.

1.3.2 Los Angeles Aqueduct Realignment

The LAA is an open flow channel that flows continuously. The westerly abutment of NHD2 would encroach upon a portion of the existing LAA. In order to construct NHD2 and maintain operations of the LAA, the proposed Project would realign a portion of the LAA. Once the realigned LAA is constructed, the flow of water through the existing LAA would be halted temporarily to connect the newly built segment to the existing LAA. After the LAA is reconnected, the obsolete existing LAA segment would be demolished and backfilled. Any excess soil from the excavation would be analyzed for potential use as material for the new dam. LADWP construction crews and/or a licensed and bonded contractor would construct the new section of the LAA. The realigned LAA would utilize the following design parameters:

- Trapezoidal Concrete Channel
- Approximately 1,900 feet in length
- Channel Width: 32 to 35 feet
- Channel Depth: 12 to 15 feet
- Channel Side Slopes: 1 Horizontal: 1 Vertical

Along both sides of the LAA Realignment, 20-foot wide unpaved access roads would be constructed. These roads would be connected to the existing access road across BLM land which connects the LAA to US-395. This road would be widened by up to five feet, and would be extended by up to 200 feet to connect with the new LAA Realignment access roads. In total, the US-395 access road for the LAA Realignment would be approximately 3,800 feet long, including the existing roadway and proposed extension

1.3.3 Cactus Flats Road Realignment

As with the existing LAA, construction of NHD2 would interrupt the existing Cactus Flats Road, directly blocking the roadway. Cactus Flats Road, which falls under the jurisdiction of Inyo County, is not a primary roadway, but is used by mining vehicles traveling to and from local mining sites, LADWP personnel, and other motorists. In order to maintain access to this public road, the existing Cactus Flats Road would need to be realigned to accommodate the new dam. Realignment of Cactus Flats Road would not require the acquisition of additional right of way (ROW) because the realignment would take place within City-owned land. For drainage purposes, a four-foot wide concrete ditch would be installed. LADWP would construct the new road.

The preliminary design parameters for the realigned portion of Cactus Flats Road are an approximate length of 7,000 feet and width of 20 feet. The realigned Cactus Flats Road would have a grade of up to eight percent (dependent on final design), and would incorporate compacted base material along the roadway and Arizona crossings drainage system.

1.4 Borrow Sites

The borrow material for the NHD2 construction may be obtained from four proposed borrow sites within a 21 mile radius of the project site. Borrow material will be hauled to the project site by trucks and stockpiled. Borrow material may include riprap, gravel, sand, and clay. Final selection of borrow material is dependent on practicality of excavation and transport, quantity and quality of materials, final NHD2 design, and potential for significant environmental impacts. There are four borrow sites proposed to be utilized for construction material of the NHD2. Two are located on LADWP-owned land, one is on privately-owned land and one is on LADWP and BLM-owned land.

2.0 Environmental Setting

2.1 Regional Setting

The proposed project area lies within the Owens Valley area of Inyo County. Inyo County is bounded by Mono County to the north, Nevada State to the east, San Bernardino County to the south, Kern County to the southeast, and Tulare and Fresno Counties to the west. Inyo County encompasses 10,140 square miles and is the second largest county in California; it is bounded by the Sierra Nevada Mountains on the west and on the east by the White Mountains and the Inyo Mountains. Inyo County is also characterized by its natural environment including the Badwater Basin, Death Valley National Park, Mount Whitney, and Owens Valley. Owens Valley is a small valley located between Indian Wells Valley and Owens Valley, and contains Little Lake, Red Hill, and Haiwee Reservoirs (Schweich 2012).

2.2 Local Setting

The proposed project is centered at the North Haiwee Dam, adjacent to and east of U.S. Highway 395, in an unincorporated part of the southern Owens Valley. Owens Valley is a long, narrow valley located on the eastern flank of the Sierra Nevada Mountains. The southern portion of this valley is located in the northern arid region of the Mojave Desert in Inyo County. The ground surface of the valley floor slopes gently to the south at a rate of 30 to 35 feet per mile. Owens Valley is topographically separated from the Rose Valley (south of Owens Valley) by Dunmovin Hill, a topographic high that is composed of a massive landslide or series of debris flow deposits that originated from the Sierra Nevada range to the west (Bauer 2002).

The average annual precipitation in southern Owens Valley ranges from 5 to 7 inches, while the area's open potential water evaporation rate has been estimated to be up to 65 to 80 inches per year (CWRCB 1993, Bauer 2002). Evapotranspiration rates for soil and plants in the area are likely lower, based on investigations conducted in Owens Valley (Steinwand et al. 2006). Surface water bodies in the southern Owens Valley area consist of perennial springs sustained by groundwater flow, ephemeral streams and washes that mainly flow in the winter, and manmade lakes and reservoirs.

2.3 Project Setting

The proposed project includes the NHD2 project area and up to four associated borrow sites (Figure 4). The NHD2 project area is approximately 392 acres, although only part of this acreage is slated for construction. The four borrow sites; 9, 15, 24 and the BLM disturbance area, range from zero to 21 miles away from the NHD2 project area and total an additional 82 acres. The NHD2 and four borrow sites range from 3,600 feet to 5,200 feet in elevation.

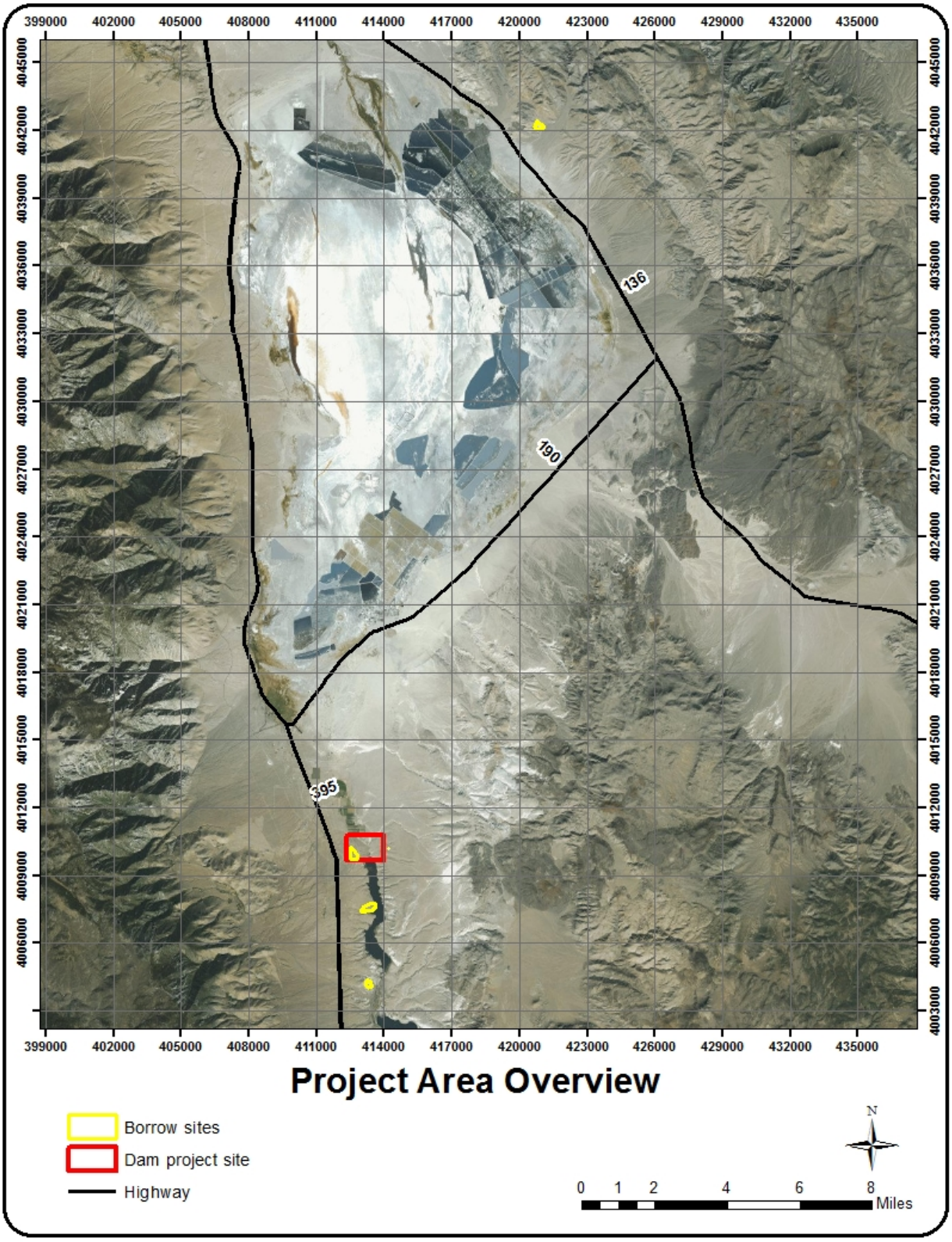


Figure 4. Project area overview including NHD2 project area and four associated borrow sites, 2015.

2.4 Natural Communities

The proposed project lies in the northwestern portion of the Mojave Desert, a subdivision of the Mojave Desert Biome that has a distinct flora and fauna (BLM 2003). The West Mojave Desert is generally flat and sparsely vegetated with creosote bush and saltbush plant communities dominating the landscape (BLM 2003). Most of the west Mojave lies between 2,500 and 4,000 feet and is considered high desert. Temperatures are often above 100°F in the summer and can drop below 32°F in the winter, bringing snow and frost. Annual precipitation is low and quite variable annually.

2.5 Expected Wildlife

Wildlife species typically associated with the Mojave Desert Biome and expected in the proposed project area include many common desert species: yellow-backed spiny lizard (*Sceloporus uniformis*), southern desert horned lizard (*Phrynosoma platyrhinos calidiarum*), western zebra-tailed lizard *(Callisaurus draconoides rhodostictus)*, western side-blotched lizard (*Uta stansburiana elegans*), Great Basin whiptail (*Aspidoscelis tigris tigris),* red racer (*Coluber flagellum piceus*), California kingsnake (*Lampropeltis californiae*), Great Basin gopher snake (*Pituophis catenifer deserticola*) Mohave desert sidewinder (*Crotalus cerastes cerastes*), Bell's sparrow (*Artemisiospiza belli canescens*), Black-throated sparrow (*Amphispiza bilineata*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris),* loggerhead shrike (*Lanius ludovicianus*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), several species of deer mice (*Peromyscus* spp.), kangaroo rats (*Dipodomys* spp.*)*, woodrats (*Neotoma* spp.), antelope ground squirrel (*Ammospermophilus leucurus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus auduboni*), several species of bats, and coyote (*Canis latrans*) (Trimble 1999).

3.0 Methods

3.1 Literature Review

Database queries were conducted to identify recorded and potential occurrences of special-status plant and wildlife species as well as natural communities in the project area, original eight borrow sites (of which four were removed for consideration throughout the 2015 biological field studies), and the surrounding vicinity. Queries and reviews included: a geographic information system review of the California Natural Diversity Database (CNDDB) Rarefind 5 (nine-quad search around NHD2 and each proposed borrow site); the California Department of Fish and Wildlife (CDFW) CNDDB 2015 Special Animals List; and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California. In addition, background information, including scientific papers and agency documents on plant and wildlife species was reviewed in order to identify species with the potential to occur in the project area and to obtain information about these species. These documents included, but were not limited to: biology reports and species habitat models; scientific reports and articles on species distribution and habitat; and species survey protocols. Biologists also consulted with CDFW, BLM, and U.S. Forest Service (USFWS)

regarding survey methods and requirements for special status species prior to implementing surveys for the proposed project.

3.2 General Habitat Assessment Surveys

The NHD2 project area and associated borrow sites were visited March 19-21, 2014 to conduct reconnaissance level surveys for wildlife, plants and habitat associations that are expected to occur in the project area. A complete compendium of wildlife and plant species was collected for the project through additional protocol-level biological surveys during the spring and summer of 2015 and will be referenced throughout this document. The results of the reconnaissance level surveys are discussed below in order to describe the existing habitats within the project area and establish a habitat baseline on which literature research could then be utilized to help determine the potential of species presence and special status species surveys to be conducted. As a result of the reconnaissance level surveys, four basic landtypes were established that are indicative of a distinctive evolutionary character, parent material and land-surface form that typically correlate with soil and vegetation types. These included dark residuum, white residuum, old alluvium and new alluvium. Dark residuum is dark colored, mostly mafic igneous parent material forming residual (formed in place) mountain/hills with topographic relief. It occurs in borrow site 15. White residuum is a light colored, ashy parent material forming residual (formed in place) mountains/hills with topographic relief. It occurs at borrow site 24. Old alluvium is a bouldery alluvium including outwash from the melting of Pleistocene glaciers and more contemporary mudflows. It occurs in all sites except borrow site 15 on the northeast of Owens Lake. New alluvium is gravelly or sandy contemporary alluvium typically inset to old alluvium and corresponding with existing drainage networks. It occurs throughout the entire project area.

3.2.1 New North Haiwee Dam (NHD2) Project Area and BLM Disturbance Area

The location of the NHD2 is proposed to be constructed east of the LAA, and north of the existing NHD. The BLM disturbance area is northwest of the existing NHD and east of the LAA and is located on BLM-owned land. Due to having the similar vegetation alliances and being connected to each other, the BLM disturbance area was analyzed in conjunction with the NHD2 project area (Figure 4, Photos 1-3). The 392.7-acre NHD2 project area and 13.7-acre BLM disturbance area are composed of old and new alluvium landtypes with dry sandy soils. There is an ephemeral wash that intersects the northeastern portion of the NHD2 project area and is dominated by the invasive prickly Russian thistle (*Salsola tragus*). An additional wash intersects the southern boundary of the BLM disturbance area and is composed of prickly Russian thistle and rubber rabbitbrush (*Ericameria nauseosa*). The NHD2 project area contains various American badger (*Taxidea taxus*) and canid (i.e. coyote (*Canis latrans*) or desert kit fox (*Vulpes macrotis*) burrows whereas there are fewer burrows scattered throughout BLM disturbance area. Wildlife observed during the initial March 2014 reconnaissance surveys included black-tailed jackrabbit (*Lepus californicus*,) side-blotched lizard (*Uta stansburiana*), desert woodrat (*Neotoma lepida*) middens, white-tailed kite (*Elanus leucurus*), rock wren (*Salpinctes obsoletus*) and a pair of golden eagles (*Aquila chrysaetos*).

In the lower elevation flats of the NHD2 project area the vegetation is composed of longspine horsebush (*Tetradymia axillaris*), fourwing saltbush (*Atriplex canescens*), shadscale saltbush (*Atriplex confertifolia*), cattle saltbush (*Atriplex polycarpa*), rubber rabbitbrush, and big sagebrush (*Artemisia tridentate*). The eastern bluff of the NHD2 project area is composed of Joshua tree, creosote bush (*Larrea tridentata*), spiny mendora (*Menodora spinescens*), Nevada jointfir (*Ephedra nevadensis*), burrobush (*Ambrosia dumosa*), Johnson's indigobush (*Psorothamnus arborescens*) and beavertail pricklypear. Within the BLM disturbance area, the vegetation is composed of creosote bush, burrobush, blackbush (*Coleogyne ramosissima*), water jacket (*Lycium andersonii*), peach thorn (*Lycium cooperi*), beavertail pricklypear (*Opuntia basilaris*), Joshua tree (*Yucca brevifolia*), desert prince's plume (*Stanleya pinnata*).

Photo 1. Looking West at NHD2 from South East Bluff

Photo 2. Looking Southeast at NHD2 from Northern Cactus Flats Road

Photo 3. Looking West Across the Southern End of the BLM Disturbance Area

Borrow site 9 is located mid-way between northern and southern Haiwee reservoirs near the western shoreline and is located on LADWP-owned land (Figure 4, Photos 4 and 5). This 37.8-acre borrow site is composed of old and new alluvium land types. There is a riparian area on the shoreline to the east of the access road adjacent to the borrow site and a wash at the southwestern section of the borrow site. A majority of the site is located on a bluff. Canid and badger burrows are scattered in low numbers throughout the site. Wildlife observed during the initial March 2014 reconnaissance surveys included coyote, western side-blotched lizard, Great Basin whiptail (*Aspidoscelis tigris*), common raven (*Corvus corax*) and woodrat middens. An American beaver skull was also observed up on the bluffs. The vegetation at this site is composed of Joshua tree, longspine horsebush, water jacket, peach thorn, burrobush (*Hymenoclea salsola*), cattle saltbush (*Atriplex polycarpa*), Nevada jointfir, fourwing saltbush), shadescale saltbush, big sagebrush (*Artemisia tridentata*), creosote bush (*Larrea tridentata*), beavertail pricklypear, desert trumpet (*Eriogonum inflatum*), antelope bitterbrush (*Purshia tridentate*), winterfat (*Krascheninnikovia lanata*), Johnson's indigobush, spiny mendora, Wiggin's cholla (*Cylindropuntia echinocarpa*), bluedicks (*Dichelostemma capitatum*), rockcress (*Arabis sp*.), Cooper's goldenbush (*Ericameria cooperi*), desert parsley (*Lomatium sp*.), desert princesplume, and freckled milkvetch (*Astragalus lentiginosus*) whiptail (*Aspidoscelis tigris*), common raven (*Corvus corax*) and woodrat middens. An American beaver skull was also observed up on the bluffs. The vegetation at this site is composed of Joshua tree, longspine horsebush, water jacket, peach thorn, burrobush (*Hymenoclea salsola*), cattle saltbush (*Atriplex polycarpa*), Nevada jointfir, fourwing saltbush), shadescale saltbush, big sagebrush (*Artemisia tridentata*), creosote bush (*Larrea tridentata*), beavertail pricklypear, desert trumpet (*Eriogonum inflatum*), antelope bitterbrush (*Purshia tridentate*), winterfat (*Krascheninnikovia lanata*), Johnson's indigobush, spiny mendora, Wiggin's cholla (*Cylindropuntia echinocarpa*), bluedicks (*Dichelostemma capitatum*), rockcress (*Arabis sp*.), Cooper's goldenbush (*Ericameria cooperi*), desert parsley (*Lomatium sp*.), desert princesplume, and freckled milkvetch (*Astragalus lentiginosus*).

Photo 4. Borrow Site 9 Looking South

Photo 5. Borrow Site 9 Looking West

3.2.2 Borrow Site 15

Borrow site 15 is located on privately-owned land, 1.3 miles east of State Route 136, near the northeastern boundary of Owens Lake, near the town of Keeler, California (Figure 4) and is composed of dark residuum and old alluvium landtypes. This borrow site is currently a permitted active mine with heavy equipment traffic and construction activity on a daily basis. Due to this construction activity, no reconnaissance surveys were conducted in March 2014, nor were any biological surveys completed for this site.

3.2.3 Borrow Site 24

Borrow site 24 is located on LADWP-owned land near the beginning of the southern Haiwee Reservoir near the western shoreline, 1.9 miles south of borrow site 9 and 0.7 miles west of Merritt Cut (Figure 4, Photos 6 & 7). This site is composed of old and new alluvium and white residuum land types. It is dominated by hills and slopes with white, chalky soils and low vegetation cover. Around the base of these hills out into surrounding flats, vegetation cover increases. The site may be suitable for bats, as potential roosting habitat is present, although the quality of habitat is low. Wildlife observed during the March 2014 reconnaissance site visit included yellow-backed spiny lizard (*Sceloporus uniformis)*, western side-blotched lizard, black-tailed jackrabbit, rock wren, and a nesting common raven in an adjacent transmission line tower. Desert woodrat middens were also observed. The vegetation around the base of the hills and edges of the borrow site are dominated by high cover cattle saltbush. The hill top slopes are composed of shadscale saltbush, desert princes plume, Nevada jointfir, creosote bush, desert pepperweed (*Lepidium fremontii*), longspine horsebush, Johnson's indigobush and spiny mendora.

Photo 6. Borrow Site 24 looking north

Photo 7. Borrow Site 24 looking east

3.3 Wetlands and Jurisdictional Areas

The National Wetlands Inventory (NWI) (USFWS 2015) has mapped approximately 1.55 acres of freshwater forested/shrub wetland on the shoreline of Haiwee reservoir, just southeast of borrow site 9. Because this area is outside of the borrow site footprint, direct impacts to this area are not expected to occur. With the exception of Haiwee Reservoir, there are no other water features in the project area, including wetlands, streams, seeps, or springs.

Approximately 400 feet to the northeast of Haiwee reservoir there is approximately 0.8 acres of a tamarisk thicket vegetation alliance with an understory composed of Torrey's saltbush. These trees include three Fremont cottonwood (*Populus fremontii*), eight Gooding's willow (*Salix gooddingii)* and eight tamarisk *(Tamarix ramosissima)* individuals. This area is not designated as wetland or riparian under the NWI. Additionally, a wetland delineation was conducted using the U.S. Army Corps of Engineers' *Arid West Region Supplemental Manual* (USACE 2008). The *Munsell Soil Colorbook* (Munsell 2009) was used to determine the soil profile from two soil pits dug on the site and the *2013 Pocket Guide to Hydric Soil Field Indicators* (Wetland Training Institute, 2013) was used to key out the soil.

There are three ephemeral washes within the project area located at the northeastern section of the NHD2 project area, the southern boundary of BLM disturbance area and the southwestern section of borrow site 9. The washes at the NHD2 project area and BLM disturbance area are composed of prickly Russian thistle and rubber rabbitbrush. The wash at borrow site 9 has a higher diversity of plant species compared to the NHD2 project area and BLM disturbance area.

3.4 Special-Status Natural Communities

Special-status natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status species or their habitat. The CDFW *List of California Terrestrial Natural Communities* indicates which natural communities are of special status given the current state of the California classification (CDFG 2009).

Active Desert Dunes and Big Tree Forest are distinctive native plant communities identified in the nine-quad search around the project area and associated borrow sites. These communities are classified with a State Rank of 2 (imperiled) and 3 (vulnerable) respectively, by the CNDDB (CDFW 2015). There is one CNDDB occurrence of Active Desert Dunes on the southeastern end of Owens Dry Lake, approximately 2.5 miles north of NHD2 project area. The closest CNDDB occurrence of Big Tree Forest is approximately 31 miles west of the project area, in the Sierra Nevada Mountains.

3.5 Natural Communities

Natural communities within the project area were mapped and defined in 2015 at the vegetation alliance level using keys and descriptions provided in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). Nine vegetation alliances were identified based on the dominant species and some non-dominant species. There were six additional non- or sparsely vegetated land cover types mapped (abandoned agriculture, aqueduct, borrow pit, dam, disturbed, reservoir) within the project area. Vegetation alliances were used to determine suitable habitat for potential species' occurrences and are described as follows:

3.5.1 Spiny Menodora Scrub

Menodora spinescens is dominant or co-dominant in the shrub canopy with *Ambrosia salsola*, *Atriplex confertifolia*, *Ephedra nevadensis*, *Krascheninnikovia lanata*, *Lepidium fremontii*, *Lycium andersonii*, *Picrothamnus desertorum*, *Sphaeralcea ambigua*, *Stanleya elata* and *Tetradymia axillaris*. Emergent trees may be present at low cover, including *Yucca brevifolia*. This alliance occurs in areas of old alluvium at borrow site 24.

3.5.2 Fourwing Saltbush Scrub

Atriplex canescens is dominant or co-dominant in the shrub canopy with *Ambrosia dumosa*, *Ambrosia salsola*, *Atriplex confertifolia*, *Atriplex polycarpa*, *Chrysothamnus viscidiflorus*, *Cleome isomeris*, *Ephedra viridis*, *Grayia spinosa*, *Larrea tridentata* and *Suaeda moquinii*. Emergent trees may be present at low cover, including *Prosopis glandulosa*. This alliance occurs in the washes at borrow sites 9, BLM disturbance area, and the NHD2 project area.

3.5.3 Joshua Tree Woodland

Yucca brevifolia is an emergent small tree over a shrub or grass layer with *Ambrosia dumosa*, *Ambrosia salsola*, *Artemisia tridentata*, *Chrysothamnus viscidiflorus*, *Coleogyne ramosissima*, *Cylindropuntia acanthocarpa*, *Ephedra nevadensis*, *Eriogonum fasciculatum*, *Gutierrezia microcephala*, *Krascheninnikovia lanata*, *Larrea tridentata*, *Lycium andersonii*, *Yucca baccata* and *Yucca schidigera*. Other trees may be present at low cover, including *Juniperus californica*, *Juniperus osteosperma* or *Pinus monophylla*. This alliance occurs on old alluvium east of NHD2.

3.5.4 Allscale Scrub

Atriplex polycarpa is dominant in the shrub canopy with *Ambrosia dumosa*, *Ambrosia salsola*, *Atriplex canescens*, *Bromus rubens*, *Chamaesyce polycarpa*, *Cleome isomeris*, *Isocoma acradenia* and *Larrea tridentata*. Emergent trees may be present at low cover, including *Prosopis glandulosa*. It occurs predominantly on new alluvium on borrow sites 9, 24, BLM disturbance area, and the NHD2 project area.

3.5.5 Creosote Bush-Burrobush Scrub

Ambrosia dumosa and *Larrea tridentata* are co-dominant in the shrub canopy with *Ambrosia salsola*, *Amphipappus fremontii*, *Atriplex confertifolia*, *Atriplex hymenelytra*, *Atriplex polycarpa*, *Bebbia juncea*, *Croton californicus*, *Cylindropuntia acanthocarpa*, *Cylindropuntia ramosissima*, *Dalea mollissima*, *Echinocactus polycephalus*, *Encelia farinosa*, *Encelia virginensis*, *Ephedra* spp., *Eriogonum fasciculatum*, *Krameria* spp., *Lepidium fremontii*, *Lycium andersonii*, *Psorothamnus* spp., *Salazaria mexicana*, *Senna armata*, *Viguiera parishii* and *Yucca schidigera*. Emergent trees or tall shrubs may be present at low cover, including *Fouquieria splendens* or *Yucca brevifolia*. This alliance occurs predominantly on old alluvium on borrow site 9 and the BLM disturbance area.

3.5.6 Tamarisk Thickets

Tamarix ramosissima or another *Tamarix* species is dominant in the shrub canopy. Emergent trees may be present at low cover, including *Populus fremontii* or *Salix* spp. This alliance occurs on the southeastern portion of the Haiwee reservoir in the NHD2 project area. There is an additional tamarisk thicket alliance in the southwest area of the NHD2.

3.5.7 Black Willow Thickets

Salix gooddingii is dominant or co-dominant in the tree canopy with *Alnus rhombifolia*, *Populus fremontii*, *Salix laevigata*, *Salix lasiolepis*, *Salix lucida* ssp. *lasiandra*, *Sambucus nigra* and *Washingtonia filifera*. Shrubs include *Baccharis pilularis*, *Baccharis salicifolia* or *Cornus sericea*. This alliance occurs in a riparian area just southeast of borrow site 9.

3.5.8 Shadscale Scrub

Atriplex confertifolia is dominant or co-dominant in the shrub canopy with *Ambrosia dumosa*, *Atriplex polycarpa*, *Atriplex spinifera*, *Chrysothamnus viscidiflorus*, *Coleogyne ramosissima*, *Encelia actoni*, *Encelia virginensis*, *Ephedra nevadensis*, *Eriogonum heermannii*, *Grayia spinosa*, *Gutierrezia microcephala*, *Krascheninnikovia lanata*, *Larrea tridentata*, *Lycium andersonii*, *Picrothamnus desertorum*, *Sarcobatus vermiculatus* and *Tetradymia axillaris*. Emergent, taller shrubs may be present at low cover. This alliance occurs primarily on white residuum at borrow site 24.

3.5.9 Hardstem Bulrush Marsh

Schoenoplectus acutus is dominant or co-dominant in the herbaceous layer with *Azolla filiculoides*, *Calystegia sepium*, *Eichhornia crassipes*, *Hibiscus lasiocarpos*, *Hoita macrostachya*, *Hydrocotyle ranunculoides*, *Leersia oryzoides*, *Ludwigia peploides*, *Lycopus americanus*, *Phragmites australis*, *Schoenoplectus californicus*, *Sparganium eurycarpum*, *Triglochin* spp., *Typha angustifolia*, *Typha latifolia* and *Urtica dioica*. Emergent trees and shrubs may be present at low cover, including the following trees, *Cephalanthus occidentalis*, *Rubus armeniacus*, *Salix exigua* or *Salix lasiolepis* and shrubs, *Alnus rhombifolia*, *Populus fremontii* and *Salix gooddingii*. This alliance occurs within the riparian area of the Haiwee reservoir to the east of borrow site 24.

3.6 Special Status Plants and Wildlife

Literature review, natural communities, aerial photos, and results of the March 2014 reconnaissance level surveys conducted for wildlife, plants and habitat associations within the NHD2 project area and borrow sites were used to determine what potentially suitable habitat is present for the special status plant and wildlife species generated in Tables 1 and 2. Species with no suitable habitat within the project area were designated as unlikely to occur and will not be addressed further in this document, except for the potential of a few migratory birds that do not have the potential to breed in the area. It is important to note that the likelihood of occurrence for all birds listed in Table 2 represents bird species that have the potential to breed in the project area or within the vicinity of the project area, particularly within the riparian habitats around Haiwee reservoir. For all plant species, one survey protocol was implemented and the results determining presence or absence of special status species is further discussed in the methods and results sections of this document. For wildlife species there are varying survey protocols that were implemented based on taxonomic classes. The wildlife species unlikely to occur include all fish: Wong's springsnail, Volcano Creek golden trout, Owens tui chub, Owens pupfish; all amphibians: Greenhorn Mountains slender salamander, Inyo Mountains slender salamander, Kern Plateau salamander, Mount Lyell salamander, Sierra Nevada yellow-legged frog, southern mountain yellow-legged frog; a few bird species: redhead, brant, common loon, American white pelican, bald eagle, Ferruginous hawk, snowy plover, mountain plover, black tern, Caspian tern, black swift, Le Conte's thrasher (San Joaquin Valley population), Virginia's warbler, Brewer's sparrow; and a few mammals: Argus Mountains kangaroo rat, Panamint kangaroo rat, Sierra martin, fisher and Nelson’s bighorn sheep. Species with a low, medium or high potential to occur are discussed below. Wildlife survey methods were then developed and conducted to determine species presence within the project area.

3.6.1 Special-Status Plants

Rare and Special-Status Plants are defined as:

- Federally listed endangered, threatened, or proposed species
- California listed endangered, threatened, and rare species
- BLM sensitive species, including species with California Rare Plant Rank of 1B

Other rare plants ranked by CNPS were included in vegetation surveys and are discussed in this document as rare plants. These rare plants are not considered special-status and are not protected under state or federal law. BLM and CDFW may have a policy regarding cactus and Joshua tree species; therefore the surveys may require a density analysis of these species in the project area.

Table 1 shows the federal and state regulatory status, preferred habitat, and probability of occurrence for each special-status plant species known to occur in the nine quadrangle maps surrounding the borrow sites and dam footprint. The “Potential for Occurrence” category provided in Table 1 is defined as follows:

• **Unlikely**: The study site and/or immediate vicinity do not support suitable habitat for a particular species, and therefore the project is unlikely to impact this species.

• **Low Potential**: The study site and/or immediate vicinity only provide limited habitat for a particular species. In addition, the known range for a particular species may be outside of the immediate project area.

• **Medium Potential**: The study site and/or immediate vicinity provide suitable habitat for a particular species, and proposed development may impact this species.

• **High Potential**: The study site and/or immediate vicinity provide ideal habitat conditions for a particular species and/or known populations occur in the immediate area.

Based on these factors, 43 special status plant species are unlikely to occur within the project area, 18 have a low probability to occur, 9 have a medium probability to occur, and 11 have a high probability of occurring within the project area or in the vicinity of the project area.

Table 1. Special-status Plant Species with Potential to Occur within the Project Area

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Allium atrorubens var. atrorubens	Great Basin onion	2B.3	High	rocky or sandy. • Great Basin scrub • Pinyon and juniper woodland
Astragalus atratus var. mensanus	Darwin Mesa milk-vetch	1B.1;BLM:S	High	volcanic clay, gravelly. • Great Basin scrub • Joshua tree woodland • Pinyon and juniper woodland
Astragalus cimae var. sufflatus	inflated Cima milk-vetch	1B.3;USFS:S	High	carbonate, rocky. • Great Basin scrub • Pinyon and juniper woodland
Astragalus ertterae	Walker Pass milk-vetch	1B.3;BLM:S	Unlikely	Pinyon and juniper woodland (sandy, granitic)
Astragalus mohavensis var. hemigyrus	curved-pod milk-vetch	1B.1;BLM:S	High	carbonate. • Joshua tree woodland • Mojavean desert scrub
Astragalus serenoi var. shockleyi	Shockley's milk-vetch	2B.2	Low	alkaline, granitic alluvium. • Chenopod scrub • Great Basin scrub • Pinyon and juniper woodland
Astragalus tidestromii	Tidestrom's milk-vetch	2B.2;USFS:S;SB	High	carbonate, sandy or gravelly. • Mojavean desert scrub
Blepharidachne kingii	King's eyelash grass	2B.3	Low	Great Basin scrub (usually carbonate)
Boechera dispar	pinyon rockcress	2B.3	Medium	granitic, gravelly. • Joshua tree woodland • Mojavean desert scrub • Pinyon and juniper woodland
Boechera lincolnensis	Lincoln rockcress	2B.3;BLM:S	High	carbonate. • Chenopod scrub • Mojavean desert scrub

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Boechera tularensis	Tulare rockcress	1B.3	Unlikley	Rocky slopes. • Subalpine coniferous forest • Upper montane coniferous forest
Botrychium ascendens	upswept moonwort	2B.3	Low	mesic. • Lower montane coniferous forest • Meadows and seeps
Botrychium lunaria	common moonwort	2B.3	Unlikley	• Meadows and seeps • Subalpine coniferous forest • Upper montane coniferous forest
Botrychium minganense	Mingan moonwort	2B.2	Low	Mesic. • Bogs and fens • Lower montane coniferous forest • Upper montane coniferous forest
Bouteloua trifida	three-awned grama	2B.3	Unlikely	• Mojavean desert scrub (carbonate, rocky)
Calochortus excavatus	Inyo County star-tulip	1B.1;BLM:S;USFS:S	Low	alkaline, mesic. • Chenopod scrub • Meadows and seeps
Calochortus palmeri var. palmeri	Palmer's mariposa lily	1B.2;BLM:S	Unlikely	mesic. • Chaparral • Lower montane coniferous forest • Meadows and seeps
Calochortus striatus	alkali mariposa lily	1B.2;BLM:S	Unlikely	alkaline, mesic. • Chaparral • Chenopod scrub • Mojavean desert scrub • Meadows and seeps

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Calyptridium pygmaeum	pygmy pussypaws	1B.2	Unlikely	sandy or gravelly. • Subalpine coniferous forest • Upper montane coniferous forest
Carlquistia muirii	Muir's raillardella	1B.3;BLM:S	Unlikely	granitic. • Chaparral (montane) • Lower montane coniferous forest • Upper montane coniferous forest
Clarkia xantiana ssp. parviflora	Kern Canyon clarkia	4.2;SB	Unlikely	often sandy, sometimes rocky, slopes, sometimes roadsides. • Chaparral • Cismontane woodland • Great Basin scrub • Valley and foothill grassland . CNDDB shows some occurrences south of Walker Creek at higher elevation. Probably does not exist at project site.
Cordylanthus eremicus ssp. kernensis	Kern Plateau bird's-beak	1B.3	Unlikely	• Great Basin scrub • Joshua tree woodland • Pinyon and juniper woodland • Upper montane coniferous forest
Cryptantha circumscissa var. rosulata	rosette cushion cryptantha	1B.2;BLM:S	Unlikely	gravelly (coarse), granitic. • Alpine boulder and rock field • Subalpine coniferous forest
Cryptantha clokeyi	Clokey's cryptantha	1B.2;BLM:S	Low	• Mojavean desert scrub
Cryptantha roosiorum	bristlecone cryptantha	1B.2;BLM:S	Unlikely	• Subalpine coniferous forest (carbonate, rocky)

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Cymopterus deserticola	desert cymopterus	1B.2;BLM:S	Medium	sandy. • Joshua tree woodland • Mojavean desert scrub
Cymopterus ripleyi var. saniculoides	sanicle cymopterus	1B.2;BLM:S	High	gravelly, sandy, carbonate. • Joshua tree woodland • Mojavean desert scrub
Dedeckera eurekensis	July gold	1B.3;BLM:S	Low	• Mojavean desert scrub (carbonate)
Deinandra arida	Red Rock tarplant	1B.2;BLM:S	Low	• Mojavean desert scrub (clay, volcanic tuff)
Deinandra mohavensis	Mojave tarplant	1B.3;BLM:S; USFS:S;SB	Unlikley	mesic. • Chaparral • Coastal scrub • Riparian scrub
Dudleya saxosa subsp. saxosa	Panamint dudleya	1B.3;BLM:S	Unlikely	granitic or carbonate, rocky. • Mojavean desert scrub • Pinyon and juniper woodland
Enceliopsis covillei	Panamint daisy	1B.2;BLM:S	Unlikely	• Mojavean desert scrub (subalkaline)
Eremothera boothii ssp. boothii	Booth's evening-primrose	2B.3	Medium	• Joshua tree woodland • Pinyon and juniper woodland
Ericameria gilmanii	Gilman's goldenbush	1B.3;BLM:S	Unlikely	carbonate or granitic, rocky. • Subalpine coniferous forest • Upper montane coniferous forest
Erigeron aequifolius	Hall's daisy	1B.3;BLM:S	Unlikely	rocky, granitic. • Broadleafed upland forest • Lower montane coniferous forest • Pinyon and juniper woodland • Upper montane coniferous forest

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Erigeron calvus	bald daisy	1B.1;BLM:S	Low	• Great Basin scrub
Eriogonum contiguum	Reveal's buckwheat	2B.3;BLM:S	Low	• Mojavean desert scrub (sandy)
Eriogonum eremicola	Wildrose Canyon buckwheat	1B.3;BLM:S	Unlikely	sandy or gravelly. • Pinyon and juniper woodland • Upper montane coniferous forest
Eriogonum hoffmannii var. hoffmannii	Hoffmann's buckwheat	1B.3;BLM:S	Low	rocky. • Mojavean desert scrub • Pinyon and juniper woodland
Eriogonum kennedyi var. pinicola	Kern buckwheat	1B.1;BLM:S	Unlikely	clay. • Chaparral • Pinyon and juniper woodland
Eriogonum mensicola	Pinyon Mesa buckwheat	1B.3;BLM:S	Unlikely	rocky or gravelly. • Great Basin scrub • Pinyon and juniper woodland • Upper montane coniferous forest
Eriogonum microthecum var. panamintense	Panamint Mountains buckwheat	1B.3;BLM:S	Unlikely	rocky. • Pinyon and juniper woodland • Subalpine coniferous forest
Eriogonum wrightii var. olanchense	Olancha Peak buckwheat	1B.3:BLM:S	Unlikely	• Alpine boulder and rock field • Subalpine coniferous forest (gravelly or rocky)
Eriophyllum mohavense	Barstow woolly-sunflower	1B.2;BLM:S	Low	• Chenopod scrub • Mojavean desert scrub • Playas
Erythranthe calcicola	limestone monkeyflower	1B.3;BLM:S	Low	usually carbonate, usually talus slopes. • Joshua tree woodland • Mojavean desert scrub • Pinyon and juniper woodland
Erythranthe rhodopetra	Red Rock Canyon monkeyflower	1B.1;BLM:S	Low	sandy, canyon washes. • Mojavean desert scrub

Scientific Name	**Common Name**	**Status**	**Probablity of Occurance**	**Habitat**
Eschscholzia minutiflora subsp. twisselmannii	Red Rock poppy	1B.1;BLM:S	Low	• Mojavean desert scrub (volcanic tuff)
Hackelia sharsmithii	Sharsmith's stickseed	2B.3:BLM:S	Unlikely	granitic, rocky. • Alpine boulder and rock field • Subalpine coniferous forest
Hesperidanthus jaegeri	Jaeger's hesperidanthus	1B.2;BLM:S	Unlikely	carbonate, rocky. • Great Basin scrub • Pinyon and juniper woodland • Subalpine coniferous forest
Hulsea vestita ssp. inyoensis	Inyo hulsea	2B.2	Unlikely	rocky. • Chenopod scrub • Great Basin scrub • Pinyon and juniper woodland
Ivesia campestris	field ivesia	1B.2	Unlikely	• Meadows and seeps (edges) • Subalpine coniferous forest • Upper montane coniferous forest
Lomatium shevockii	Owens Peak lomatium	1B.3;BLM:S	Unlikely	rocky. • Lower montane coniferous forest • Upper montane coniferous forest
Lupinus magnificus var. magnificus	Panamint Mountains lupine	1B.2;BLM:S	Low	• Great Basin scrub • Mojavean desert scrub • Pinyon and juniper woodland • Upper montane coniferous forest
Lupinus padre-crowleyi	Father Crowley's lupine	1B.2:BLM:S	Unlikely	decomposed granitic. • Great Basin scrub • Riparian forest • Riparian scrub • Upper montane coniferous forest

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Lupinus pusillus var. intermontanus	intermontane lupine	2B.3	High	• Great Basin scrub (sandy)
Mentzelia tridentata	creamy blazing star	1B.3;BLM:S	High	rocky, gravelly, sandy. • Mojavean desert scrub
Mimulus shevockii	Kelso Creek monkeyflower	1B.2;BLM:S	Medium	granitic or metamophic, sandy or gravelly. • Joshua tree woodland • Pinyon and juniper woodland
Monardella beneolens	sweet-smelling monardella	1B.3;BLM:S	Unlikely	granitic. • Alpine boulder and rock field • Subalpine coniferous forest • Upper montane coniferous forest
Monardella linoides subsp. oblonga	Tehachapi monardella	1B.3;BLM:S	Unlikely	• Lower montane coniferous forest • Pinyon and juniper woodland • Upper montane coniferous forest
Opuntia basilaris var. treleasei	Bakersfield cactus	1B.1;BLM:S;FE	Unlikley	sandy or gravelly. • Chenopod scrub • Cismontane woodland • Valley and foothill grassland
Oryctes nevadensis	Nevada oryctes	2B.1	Low	sandy. • Chenopod scrub • Mojavean desert scrub
Oxytheca watsonii	Watson's oxytheca	2B.2	Medium	sandy. • Joshua tree woodland • Mojavean desert scrub
Penstemon fruticiformis var. amargosae	Amargosa beardtongue	1B.3;BLM:S;SB	High	• Mojavean desert scrub
Perityle inyoensis	Inyo rock daisy	1B.2;BLM:S	Unlikely	rocky, carbonate. • Great Basin scrub • Pinyon and juniper woodland

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Perityle villosa	Hanaupah rock daisy	1B.3;BLM:S	Unlikely	rocky, carbonate. • Great Basin scrub • Pinyon and juniper woodland
Petalonyx thurberi ssp. gilmanii	Death Valley sandpaper-plant	1B.3;BLM:S	Medium	• Desert dunes • Mojavean desert scrub
Phacelia inyoensis	Inyo phacelia	1B.2;BLM:S; USFS:S	Unlikely	• Meadows and seeps (alkaline)
Phacelia mustelina	Death Valley round-leaved phacelia	1B.3;BLM:S	Medium	carbonate or volcanic, gravelly or rocky. • Mojavean desert scrub • Pinyon and juniper woodland
Phacelia nashiana	Charlotte's phacelia	1B.2;BLM:S;SB	Medium	usually granitic, sandy. • Joshua tree woodland • Mojavean desert scrub • Pinyon and juniper woodland
Phacelia novenmillensis	Nine Mile Canyon phacelia	1B.2;BLM:S	Unlikley	sandy or gravelly. • Broadleafed upland forest • Cismontane woodland • Pinyon and juniper woodland • Upper montane coniferous forest
Plagiobothrys parishii	Parish's popcornflower	1B.1;USFS:S	Low	alkaline, mesic. • Great Basin scrub • Joshua tree woodland
Saltugilia latimeri	Latimer's woodland-gilia	1B.2;BLM:S	Unlikely	rocky or sandy, often granitic, sometimes washes. • Chaparral • Mojavean desert scrub • Pinyon and juniper woodland
Sarcobatus baileyi	Bailey's greasewood	2B.3	Medium	Alkaline, dry lakes, washes, roadsides. • Chenopod scrub

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Sidalcea covillei	Owens Valley checkerbloom	1B.1;BLM:S	Unlikely	alkaline, mesic. • Chenopod scrub • Meadows and seeps
Sidalcea multifida	cut-leaf checkerbloom	2B.3	Unlikely	• Great Basin scrub • Lower montane coniferous forest • Meadows and seeps • Pinyon and juniper woodland
Stipa arida	Mormon needle grass	2B.3	High	carbonate. • Joshua tree woodland • Pinyon and juniper woodland
Streptanthus cordatus var. piutensis	Piute Mountains jewel-flower	1B.2;BLM:S	Unlikely	clay or metamorphic. • Broadleafed upland forest • Closed-cone coniferous forest • Pinyon and juniper woodland
Symphyotrichum defoliatum	San Bernardino aster	1B.2;BLM:S	Unlikely	near ditches, streams, springs. • Cismontane woodland • Coastal scrub • Lower montane coniferous forest • Meadows and seeps • Marshes and swamps • Valley and foothill grassland (vernally mesic)
Trifolium dedeckerae	DeDecker's clover	1B.3	Unlikely	granitic, rocky. • Lower montane coniferous forest • Pinyon and juniper woodland • Subalpine coniferous forest • Upper montane coniferous forest

Scientific Name	Common Name	Status	Probablity of Occurance	Habitat
Trifolium kingii subsp. dedeckerae	DeDecker's clover	1B.3;BLM:S	Unlikley	granitic, rocky. • Lower montane coniferous forest • Pinyon and juniper woodland • Subalpine coniferous forest • Upper montane coniferous forest
Viola pinetorum var. grisea	grey-leaved violet	1B.3	Unlikely	• Meadows and seeps • Subalpine coniferous forest • Upper montane coniferous forest

Definitions

1. Federal status:
FE= Listed as endangered under the federal Endangered Species Act (ESA)
USFS:S=United States Forest Service Sensitive
BLM:S= Bureau of Land Management Sensitive

2. CNPS Rare and Endangered
1B.1=Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in CA (over 80% of occurrences threatened/high degree and immediacy of threat)
1B.2= Plants rare, threatened, or endangered in CA and elsewhere; fairly threatened in CA (20-80% occurrences threatened/moderate degree and immediacy of threat)
1B.3=Plants rare, threatened, or endangered in CA and elsewhere; not very threatened in CA (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
2B.1= Plants rare, threatened, or endangered in CA, but more common elsewhere; seriously threatened in CA (over 80% of occurrences threatened/high degree and immediacy of threat)
2B.2=Plants rare, threatened, or endangered in CA, but more common elsewhere; fairly threatened in CA (20-80% of occurrences threatened/moderate degree and immediacy of threat)
2B.3= Plants rare, threatened, or endangered in CA, but more common elsewhere; not very threatened in CA (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

3.6.2 Special-Status Wildlife

Special-status wildlife are defined as those animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as under threat from human-associated developments. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as special-status on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. Special-status wildlife includes:

- Wildlife listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the federal Endangered Species Act or the California Endangered Species Act;
- Wildlife that meet the definitions of rare or endangered under *CEQA Guidelines* Section 15380.
- Wildlife covered under an adopted NCCP/HCP;
- Wildlife designated by CDFW as species of special concern;
- Wildlife "fully protected" in California (California Fish and Game Code Sections 3511, 4700, and 5050); and
- Wildlife protected by the Migratory Bird Treaty Act (MTBA).

A review was conducted of the most recent CNDDB records within a nine-quad search area around the proposed North Haiwee dam and associated borrow sites along with the CDFW January 2015 “Special Animals List,” which identifies “species at risk” or “special status species” that are considered by CDFW, Western Bat Working Group (WBWG), BLM, USFS, U.S. Fish and Wildlife Service (USFWS) and other agencies to be the taxa of species with the greatest conservation need (Table 2). This review was conducted for the original eight proposed borrow sites prior to removal of four borrow sites in 2015.

This review resulted in 67 special-status wildlife species. Forty-three of these species (Table 2) were previously recorded within the CNDDB nine-quad search areas conducted. The remaining 23 species (redhead, brant, common loon, American white pelican, least bittern, bald eagle, ferruginous hawk, peregrine falcon, long-billed curlew, black tern, yellow-billed cuckoo, long-eared owl, bank swallow, Nuttall's woodpecker, Virginia’s warbler, yellow-headed blackbird, western red bat, hoary bat, western small-footed myotis, long-eared myotis, fringed myotis, and western mastiff bat) have the potential to occur within the project area based on the CDFW Special Animal List. The potential for special-status wildlife species to occur in the project area is based on the proximity to these previously recorded occurrences, on-site vegetation and habitat quality, topography, elevation, soils, surrounding land uses, habitat preferences, and geographic ranges. It is important to note that the waterbird species listed in Table 2

have potential to occur in the lacustrine and riparian areas located outside of the project area along Haiwee reservoir but within the CNDDB 9-quad search but will not be directly impacted by the project. It is also important to note that the likelihood of occurrence for all birds listed in Table 2 represents bird species that have the potential to breed in the project area or within the vicinity of the project area, particularly within the riparian habitats around Haiwee reservoir. The remaining reptile, bird and mammal species have the potential to occur within upland habitats such as the borrow pit sites and NHD2 project area.

Table 2 below shows the federal and state regulatory status, preferred habitat, and probability of occurrence for each special-status wildlife species known to occur in the 9 quads surrounding the project area. The "Potential for Occurrence" category provided in Table 2 is defined as follows:

- **Unlikely:** The study site and/or immediate vicinity do not support suitable habitat for a particular species, and therefore the project is unlikely to impact this species.

- **Low Potential:** The study site and/or immediate vicinity only provide limited habitat for a particular species. In addition, the known range for a particular species may be outside of the immediate project area.

- **Medium Potential:** The study site and/or immediate vicinity provide suitable habitat for a particular species, and proposed development may impact this species.

- **High Potential:** The study site and/or immediate vicinity provide ideal habitat conditions for a particular species and/or known populations occur in the immediate area.

Based on these factors, 24 special-status wildlife species were determined to have a high potential, 12 have medium potential, 16 have a low potential and 15 are unlikely to occur on, or in the vicinity of the project area. For the purposes of this biological assessment, species that are unlikely to occur do not have suitable habitat within the project area, and will not be further discussed.

Table 2. Special-status Wildlife Species with Potential to Occur within the Project Area

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Insects & Fish				
Plebulina emigdionis	San Emigdio blue butterfly	USFS:S	Medium	Inhabits lower Sonoran zone desert canyons and riverbeds. Prefers dry rivercourses and intermittent streamsides as well as adjacent flats. Host plants are shrub species Atriplex canescens.
Pyrgulopsis wongi	Wong's springsnail	USFS:S	Unlikely	No suitable habitat present. Inhabits seeps and small to medium spring-fed streams. Common in watercress and on small pieces of travertine and stone.
Oncorhynchus mykiss aguabonita	Volcano Creek golden trout	USFS:S; SSC	Unlikely	No suitable habitat present. Found present at elevations from 6,890 feet to 10,000 feet above sea level, in California's southern Sierra Nevada mountains.
Siphateles bicolor snyderi	Owens tui chub	FE; SE	Unlikely	No suitable habitat present. Prefers water with low velocities such as portions of the Owens River, associated tributaries, springs, sloughs, drainage ditches, and irrigation canals with dense aquatic vegetation.
Cyprinodon radiosus	Owens pupfish	FE; SE; FP	Unlikely	No suitable habitat present. Prefers spring pools, sloughs, irrigation ditches, swamps, and flooded pastures in the Owens Valley from Fish Slough in Mono County to Lone Pine in Inyo County.
Amphibians				
Batrachoseps altasierrae	Greenhorn Mountains slender salamander	SSC	Unlikely	No suitable habitat present. Occurs only in the Greenhorn Mountains north to the tule river and Kern river highland drainages in Kern County.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Batrachoseps campi	Inyo Mountains slender salamander	BLM:S, USFS:S; SSC	Unlikely	No suitable habitat present. Inhabits very dry mountain ranges typically in the immediate vicinity of springs, seeps, and their associated riparian growth in rocky terrain at elevations of 4,700 to 8,000 feet in the Inyo Mountains
Batrachoseps robustus	Kern Plateau salamander	USFS:S	Unlikely	No suitable habitat present. Range occurs in Kern Plateau in southeastern Sierra Nevada mountains. Prefers moist habitats of pine and fir forests, as well as pinyon pine, sagebrush, and oaks in drier habitats.
Hydromantes platycephalus	Mount Lyell salamander	SSC	Unlikely	No suitable habitat present. Range occurs at higher elevations of the Sierra Nevada mountains. Prefers areas with associated water seepage in caves, granite boulders, rock fissures, rocky stream edges, and seepages from springs and melting snow.
Rana sierrae	Sierra Nevada yellow-legged frog	FE; ST; USFS:S	Unlikely	No suitable habitat present. Inhabits lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the southern Sierra Nevada Mountains.
Rana muscosa	southern mountain yellow-legged frog	FE; SE; USFS:S; BLM:S	Unlikely	No suitable habitat present. Prefers sloping banks with rocks or vegetation to the water's edge of ponds, lakes and streams in the southern Sierra Nevada Mountains.
Reptiles				
Gopherus agassizii	desert tortoise	FT; ST	High	Prefers alluvial fans, washes and canyons within Mojave desert scrub where suitable friable soils for den construction are present. Soils must be strong enough to allow for burrowing but must be soft enough for digging a burrow. Alternatively, rock formations are sometimes used as shelter.
Sceloporus graciosus graciosus	northern sagebrush lizard	BLM:S	Medium	Prefers open areas with scattered low bushes and lots of sun. Inhabits sagebrush and other types of shrublands.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Elgaria panamintina	Panamint alligator lizard	BLM:S, USFS:S; SSC	Low	Prefers rocky canyon bottoms near streams and springs, grown with creosote bush, sagebrush, and at the lower edge of the piñon-juniper zone. Found in dense vegetation near damp soil, and also in rocky talus outside of riparian areas.
Birds				
Aythya americana	redhead	SSC	Unlikely	Prefers open lakes and bays and often on salt water in winter.
Branta bernicla	brant	SSC	Unlikely	Prefers tundra and coastal islands in the Arctic and migrates to salt marshes and estuaries in winter.
Gavia immer	common loon	SSC	Unlikely	Prefer lakes with coves and islands as well as large reservoirs and slow-moving rivers.
Pelecanus erythrorhynchos	American white pelican	SSC	Unlikely	Observed on NHR in 2014. Prefer shallow water on inland marshes, lake or river edges, and wetlands. Forage on deeper lakes in late summer.
Ixobrychus exilis	least bittern	SSC	Low	Prefer freshwater or brackish marshes with tall emergent vegetation.
Haliaeetus leucocephalus	bald eagle	FD; BLM:S; SE; EA	Low	Frequent winter resident; Prefers rivers, large lakes, marshes or other large bodies of open water with an abundance of fish. Require mature stands of hard wood trees for perching, roosting and nesting.
Circus cyaneus	northern harrier	SSC	High	Prefers freshwater and brackish marshes, lightly grazed meadows, old fields, dry upland prairies, drained marshlands, high-desert shrubsteppe, and riverside woodlands.
Buteo swainsoni	Swainson's hawk	USFS:S; USFWS:BCC; ST	High	Locally, nests in small to medium-sized trees in the vicinity of alfalfa or other agricultural fields; nests have been found at ranch adjacent to project site.
Buteo regalis	Ferruginous hawk	USFWS:BCC	Unlikely	Prefers prairies, brushy scrub open country, and badlands.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Aquila chrysaetos	golden eagle	BLM:S; USFWS:BCC; FP; EA	High	Nest present at a borrow site. Prefers mountains up to 12,000 feet, canyonlands, rimrock terrain, and riverside cliffs and bluffs. Nest on cliffs and steep escarpments in grassland, chapparal, shrubland, forest, and other vegetated areas.
Falco peregrinus anatum	American peregrine falcon	USFWS: BCC; FP	Medium	Primarily occurs near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures.
Falco mexicanus	prairie falcon	USFWS:BCC	High	Prefers grasslands, shrub-steppe, desert scrubland and lakeshores.
Charadrius nivosus	snowy plover	USFWS:BCC; SSC	Unlikely	Prefers barren to sparsely vegetated flats and along shores of alkaline and saline lakes, ponds, reservoirs, braided river channels, and salt evaporation ponds.
Charadrius montanus	mountain plover	BLM:S; USFWS:BCC; SSC	Unlikely	Prefers arid plains, sandy deserts, short-grass prairies, and fields.
Numenius americanus	Long-billed Curlew	USFWS:BCC	Low	Breed in open, sparse grassland habitat ; during migration prefers lake and river shores, mudflats, salt marshes, and sandy beaches.
Childonias niger	black tern	SSC	Unlikely	Freshwater marshes and marshy lakes in summer; sandy coasts on migration and in winter.
Hydroprogne caspia	Caspian tern	USFWS:BCC	Unlikely	Prefers sandy or pebbly shores of lakes and large rivers.
Coccyzus americanus	yellow-billed cuckoo	USFWS:FC; BLM:S; USFS:S; SE	Low	Prefer wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes.
Athene cunicularia	burrowing owl	BLM:S; SSC	Low	Prefers open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Asio otus	long-eared owl	SSC	Medium	Nests and roosts in dense vegetation adjacent to open grasslands or shrublands used for foraging.
Cypseloides niger	black swift	USFWS:BCC; SSC	Unlikely	No suitable habitat present. Prefers forested areas near rivers. Nests are often located behind waterfalls or on damp cliffs, where the environment is dark, wet, and steep.
Picoides nuttallii	Nuttall's woodpecker	USFWS:BCC	Low	Prefers canyon scrub oaks, oak woodlands, and riparian woodlands.
Empidonax traillii extimus	southwestern willow flycatcher	FE; SE	Low	Prefers dense vegetation throughout all vegetation layers present in riparian areas.
Lanius ludovicianus	loggerhead shrike	USFWS:BCC; SSC	High	Prefers grasslands and open areas with scattered trees; open grassy woodlands; and desert scrublands, particularly those with spines or thorns.
Vireo bellii pusillus	least Bell's vireo	FE; SE	Low	Prefers dense, low, shrubby vegetation, generally within early successional stages in dominance of willows.
Riparia riparia	bank swallow	BLM:S; ST	Medium	Nest sites occur in friable soil in vertical cliffs, banks, and bluffs along rivers, creeks, lakes and reservoirs. Forage over a variety of habitats including wetlands, open water, and grassland.
Toxostoma lecontei macmilanorum	Le Conte's thrasher (San Joaquin Valley subspecies)	USFWS:BCC	Unlikely	Prefers deserts with scant vegetation (mostly cholla and creosote bush); in the Owens Valley is often found in association with dense stands of saltbush (Atriplex spp).
Oreothlypis virginiae	Virginia's warbler	USFWS: BCC	Unlikely	Prefers scrub oak and other chaparral, pinyon-juniper brushland, pine and oak woodlands.
Dendroica petechia brewsteri	yellow warbler	USFWS:BCC; SSC	Low	Prefers moist thickets, especially along streams and in swampy areas; gardens.
Icteria virens	yellow-breasted chat	SSC	Low	Prefers dense thickets and brush, often with thorns and streamside tangles.
Spizella breweri	Brewer's sparrow	USFWS:BCC	Unlikely	Preferred habitats include sagebrush and alpine meadows.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Xanthocephalus xanthocephalus	yellow-headed blackbird	SSC	Medium	Prefers wetlands in prairies, mountain meadows, quaking aspen parklands, and shallow areas of marshes, ponds, and rivers.
Bats				
Antrozous pallidus	pallid bat	BLM:S; USF:S; SSC; WBWG:H	High	Prefer arid regions with rocky outcroppings, to open, sparsely vegetated grasslands. Water must be available close by.
Corynorhinus townsendii	Townsend's big-eared bat	BLM:S; USF:S; Candidate ST; WBWG:H; SSC	High	Prefer arid western desert scrub and pine forest. Hibernate and roost in caves and abandoned mines. Maternity colonies are usually located within two miles of a water source.
Euderma maculatum	spotted bat	BLM:S; WBWG:H; SSC	High	Prefer open arid habitats dominated by juniper and sagebrush. Roosts high in cliff crevices and rocky outcrops.
Lasionycteris noctivagans	silver-haired bat	WBWG:M	Low	Prefers forested areas and hibernates in small tree hollows, beneath sections of tree bark, in buildings, rock crevices, in wood piles and on cliff faces.
Lasiurus blossevillii	western red bat	USFS:S; WBWG:H; SSC	Low	Roosts only in tree foliage. Prefer riparian areas dominated by walnuts, oaks, willows, cottonwoods, and sycamores where they roost in these broad-leafed trees.
Lasiurus cinereus	hoary bat	WBWG:M	Low	Prefers to roost in foliage of coniferous and deciduous trees at the edge of clearings; will sometimes roost in caves and under rock ledges.
Myotis ciliolabrum	western small-footed myotis	BLM:S; WBWG:M	Medium	Prefers cliff-face crevices, erosion cavities, and beneath rocks on the ground.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Myotis evotis	long-eared myotis	BLM:S; WBWG:M	Low	Prefer to roost in tree cavities and beneath exfoliating bark in both living trees and dead snags. Pregnant females often roost at ground level in rock crevices, fallen logs, and even in the crevices of sawed-off stumps.
Myotis thysanodes	fringed myotis	BLM:S; WBWG:H	Medium	Prefer woodlands at moderate elevation (5-8000 ft) in the mountains. Night and day roosts include caves, and abandoned mines, and buildings.
Myotis volans	long-legged myotis	WBWG:H	Medium	Prefers woodland and forest habitats above 1200 m (4000 ft). Also forages in chaparral, coastal scrub, Great Basin shrub habitats, and in early successional stages of woodlands and forests. Roosts in trees, rock crevices, fissures in stream banks, and buildings.
Myotis yumanensis	Yuma myotis	BLM:S	High	Occasionally roost in mines or caves, but most often prefer buildings or bridges. Tree cavities are probably the original sites for most nursery roosts.
Eumops perotis californicus	western mastiff	BLM:S; WBWG:H; SSC	Low	Prefers open, semi-arid to arid habitats including conifer and deciduous woodlands, coastal scrub, chaparral. Roosts in crevices in cliff faces, high buildings, trees and tunnels.
Mammals (excluding bats)				
Dipodomys panamintinus argusensis	Argus Mountains kangaroo rat	S1S3	Unlikely	Prefer creosote scrub, saltbush scrub, Joshua tree woodland and juniper woodland habitats. However, this subspecies only occupies a limited range in the Argus Mountains of Inyo County.
Dipodomys panamintinus panamintinus	Panamint kangaroo rat	S3	Unlikely	Prefer creosote scrub, saltbush scrub, Joshua tree woodland and juniper woodland habitats. However, this subspecies only occupies a limited range in the Panamint mountains of Inyo County.
Martes caurina sierrae	Sierra martin	USFS:S	Unlikely	No suitable habitat present. Prefers areas of high cover and structural complexity in large tracts of mature and old-growth forests.

Scientific Name	Common Name	Status	Probability of Occurrence	Preferred Habitat
Pekania pennanti	Fisher-West Coast Distinct population Segment	BLM:S; USFS:S; SSC	Unlikely	No suitable habitat present. Prefers dense coniferous or mixed forests, including early successional forest with dense overhead cover.
Xerospermophilus mohavensis	Mohave ground squirrel	ST	High	Inhabits open desert scrub, alkali scrub, and Joshua tree woodland with sandy or gravelly friable soils and an abundance of annual herbaceous vegetation. Avoids rocky areas.
Microtus californicus vallicola	Owens Valley vole	BLM:S; SSC	Low	Inhabits wetlands and lush grass-dominated sites, as well as alkali shrub-meadow habitats.
Taxidea taxus	American badger	SSC	High	Burrows present in project area. Prefers drier, open stages of most shrub, forest, and herbaceous habitats with friable soils. Requires open, uncultivated ground.
Vulpes macrotis	desert kit fox	CDFW: CA fur-bearing mammal	High	Occurs in multiple habitats including desert scrub, saltbush, chaparral, and grassland.
Ovis canadensis nelsoni	Nelson's bighorn sheep	BLM:S; USFS:S	Unlikely	Prefers open, steep, rocky, mountainous terrain above the desert floor

Definitions

1. Federal status: USFWS Listing, other non-CA specific listing

FE = Listed as endangered under the federal Endangered Species Act (ESA)
FT = Listed as threatened under ESA
FD = Delisted in accordance with the ESA
EA=Bald and Golden Eagle Protection Act
BLM:S= Bureau of Land Management Sensitive
USFS:S= US Forest Service Sensitive
USFWS:BCC=US Fish and Wildlife Birds of Conservation Concern
USFWS:FC=US Fish and Wildlife Serve Federal Candidate Species

2. State status: CDFG Listing

SE = Listed as endangered under the California Endangered Species Act (CESA)
ST = Listed as threatened under the CESA
SC = Candidate for listing (threatened or endangered) under CESA
SD = Delisted in accordance with the CESA
SSC = Species of Special Concern as identified by the CDFW
FP = Listed as fully protected under CDFW code

3. State Ranking
S-rank refers to the imperilment status only within California's state boundaries
S1=Critically Imperiled
S2=Imperiled
S3=Vulnerable
S4=Apparently Secure
S5=Secure
*Expressing the rank as a range of values (e.g. S1S3), means the rank is somewhere between S1 and S3
4. Other status:
WBWG = Listing by the Western Bat Working Group; L=Low Priority; M=Medium Priority; H=High Priority

3.6.3 Insects

San Emigdio Blue Butterfly

The San Emigdio blue butterfly is a USFS sensitive species and is found only in montane desert regions of Southern California from Inyo County southwest through the Mojave Desert and Southern Sierra Nevada to Los Angeles County. The host plant for this species' larval stage is four-winged saltbush (shadscale) (*Atriplex canescens*), which is found only in desert canyons. A single egg is laid on four-wing saltbush leaves. The larvae have formed a symbiotic relationship with at least one ant species, *Formica pilicomis*, which may account for the species' limited range (Ballmer and Pratt 1991). These ants presumably extract droplets of honeydew from the larvae and the ants offer the larvae protection from predators. Adult butterflies are active from late April to early September. They can have up to three broods per year (Emmel and Emmel 1973). Suitable habitat for this species is present in the project area. One CNDDB occurrence for this species was found in 2003 approximately 0.5 miles east of the proposed NHD2 on the west side of U.S. Highway 395.

3.6.4 Reptiles

Desert Tortoise

The Desert tortoise *(Gopherus agassizii)* is listed as a threatened species under the federal Endangered Species Act and the California Endangered Species Act. Mojave Desert tortoises are known to occur from below sea level to an elevation of 7,300 feet. Typical habitat for desert tortoise in the Mojave Desert has been characterized as creosote bush scrub below 5,500 feet (USFWS 2011). Desert tortoises occur most commonly on gently sloping terrain (bajadas) consisting of sand-and gravel-rich soils where there is sparse cover of low-growing shrubs. Soils normally must be friable enough for digging burrows, yet firm enough so that burrows do not collapse. Desert tortoises are known to occupy large home ranges. Females have long-term home ranges that may be as little as or less than half that of the average male, which can range to 200 or more acres (Berry 1986). Suitable habitat for this species is present in the project area. The CNDDB includes four record occurrences within the nine-quad database search around the proposed NHD2 in 2006.

Northern Sagebrush Lizard

The northern sagebrush lizard is a BLM sensitive species. In California, this species occurs in the Great Basin desert east of the Sierra Nevada and in the northeast corner of the state. They inhabit areas of desert floors, mountain slopes, forested slopes, and open flat lands. The species occurs in sagebrush habitat mainly on fine gravel soils, sandy soils, and rocky soils which are adjacent to water (Stebbins and McGinnis 2012). Essentially terrestrial, it seldom climbs, and usually remains close to rocks, crevices, and holes which it uses as shelter. The northern sagebrush lizard is active from late April to mid-September. They are easily disturbed and immediately seek refuge in crevices, rodent burrows, and under surface plants when alarmed (Smith 1946). Suitable habitat for this species is present in the project area. One CNDDB occurrence

for this species was found in 2003 approximately 0.5 miles east of the proposed NHD2 on the west side of U.S. Highway 395.

Panamint Alligator Lizard

The Panamint alligator lizard is a CDFW Species of Special Concern and a USFS and BLM sensitive species. This species inhabits limited riparian areas in the desert, mostly rocky canyon bottoms near streams and springs with riparian vegetation, near the edge of piñon-juniper or Joshua tree woodland zones. It can be found in dense vegetation near damp soil, and also in rocky talus outside of riparian areas (Stebbins and McGinnis 2012). They become crepuscular (dawn and dusk-active) and nocturnal during the hot summer months. During the cooler spring and fall they may be more diurnal (Zeiner et. al, 1988-1990). Suitable habitat within the project area is absent with the exception of a small area of riparian habitat to the east of borrow site 9. However, the only known CNDDB occurrence is 33 miles northeast of the proposed NHD2.

3.6.5 Birds

Redhead

Redhead is listed as a Species of Special Concern in the state of California. The species occurs throughout California at select open water bodies. They are abundant in northeast California, and declining in the central valley. They breed and winter in southern California. (Shuford, W.D., et al. 2008). The species does occur at the reservoir during migration, but Haiwee is outside of its breeding range. Redhead is expected to have an unlikely potential to breed in or around the project area.

Brant

Brant is listed as a Species of Special Concern in the state of California. The species breeds on tundra and coastal islands in the Arctic, and winters along the California coast. (Shuford, W.D., et al. 2008). Occasionally, Brant are encountered in the Owens Valley. The species is expected to have an unlikely potential to occur in or around the project area, because it is an uncommon migrant in the Eastern Sierra.

Common Loon

Common Loon is listed as a Species of Special Concern in state of California. In the past, Common Loons bred as far south as northern California, but currently, they breed in Canada, northwestern Montana, North Dakota, northern Minnesota, northern Wisconsin, northern Michigan, Vermont, New Hampshire and Maine. They are found throughout California during migration. Their diet consists of about 80% fish and 20% aquatic plants. Common Loons have nearly solid bones enabling them to dive deep while foraging. The species does occur in the reservoir during migration, but Haiwee is not within its breeding range, so it is expected to have an unlikely potential to breed in or around the project area.

American White Pelican

American White Pelican is listed as a Species of Special Concern in the state of California. It breeds in northeast California, and occurs throughout the rest of California in winter. (Shuford, W.D., et al. 2008). American White Pelican does occur in the reservoir during migration, but Haiwee is not within the species breeding range, so it is expected to have an unlikely potential to breed in or around the project area.

Least Bittern

Least Bittern is listed as a Species of Special Concern for the state of California. The species breeds throughout California in select marsh habitats (Shuford, W.D., et al. 2008). There are two CNDDB records of this species near the project area. One was at Cartago State Wildlife Area, and the other was at Cottonwood Marsh, on the west side of Owens Lake. It is expected to have a low potential to occur in or around the project area due to the lack of sufficient marsh habitat.

Northern Harrier

Northern Harrier is listed as a Species of Special Concern in the state of California. This species occurs throughout the state of California. It prefers fresh water marshes, brackish and saltwater marshes, wet meadows, weedy borders of lakes, rivers and streams, annual and perennial grasslands (including those with vernal pools), weed fields, ungrazed or lightly grazed pastures, some croplands, sagebrush flats and desert sinks. They nest on the ground, mostly within patches of dense, often tall, vegetation in undisturbed areas. (Shuford, W.D., et al. 2008). Habitat for this species exists at the Haiwee Reservoir, but not within the project area. It is expected to have a high potential to occur in or around the project area.

Swainson's Hawk

Swainson's Hawk is listed as Threatened in the State of California. It is a USFS Sensitive Species. It is a USFWS Bird of Conservation Concern. It breeds in the western United States and Canada and winters in South America. Studies have documented that the California population winters in Central America and Mexico. It is a raptor adapted to the open grasslands, and has become increasingly dependent on agriculture, particularly alfalfa crops. In California they often nest peripheral to riparian systems. They will also use lone trees in agricultural fields or pastures and roadside trees. (CDFW 2015). There are CNDDB breeding records for this species at the Butterworth Ranch, north of the NHD2 site. It is expected to have a high potential to occur in or around the project area.

Ferruginous Hawk

Ferruginous Hawk is listed as a USFWS Bird of Conservation Concern. This species occupies arid and open grassland, shrubsteppe, and desert in the western half of North America. It is the largest hawk in North America. The breeding range is from Alberta, Manitoba, and Saskatchewan south to New Mexico and Arizona, west to eastern California and Oregon, and east into the Dakotas, Nebraska and Kansas

(Travsky et. al. 2005). The species does not breed in Inyo County, but is a somewhat common migrant and winter visitor in the Eastern Sierra. It is expected to have an unlikely potential to occur in or around the project area.

Golden Eagle

Golden Eagle has full protection under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. It is a BLM Sensitive Species. It is a USFWS Bird of Conservation Concern. Golden Eagles nest in high densities in open and semi-open habitat, but also may nest at lower densities in coniferous habitat when open space is unavailable. They can be found from the tundra, through grasslands, woodland-brushlands, and forested habitat, south to arid deserts, including Death Valley (Pagel, J.E., Ph.D. 2010). Locally, Golden Eagles nest throughout the Inyo Mountains adjacent to, and within the project area. Two nests have been documented within the 9 quad CNDDB search. One of the nests is located within the perimeter of borrow site 7, and the other is north, but outside the project boundary. This species is expected to have a high potential to occur in or around the project area.

Bald Eagle

Bald Eagle has full protection under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. It is a BLM Sensitive Species. It was delisted under the Federal Endangered Species Act, but is still listed as Endangered in the state of California. In winter, the species can be found throughout most of California at lakes, reservoirs and rivers. The state's breeding habitats are mainly in mountain and foothill forests and woodlands near reservoirs, lakes and rivers. Most breeding territories are in northern California, but the eagles also nest in scattered locations in the central and southern Sierra Nevada Mountains and foothills. (CDFW 2015). Locally, the closest Bald Eagles have been documented as nesting to the project area was at Tinemaha Reservoir, but it was abandoned in 1997 (CDFW 2015). Bald Eagle does occur at the reservoir during migration and as a wintering species, but it is expected to have a low potential to breed in or around the project area.

American Peregrine Falcon

Peregrine Falcon is a USFWS Bird of Conservation Concern, and is Fully Protected in the state of California. It was federally Delisted in 1999 and State Delisted in 2009. Currently the species occurs throughout the state of California. American Peregrine Falcon can be expected to occur wherever there are large concentrations of shorebirds, often near rivers or lakes. It requires cliffs or suitable surrogates for breeding that are close to preferred foraging areas (DRECP 2012). The species forages at Owens Lake. It is expected to have a medium potential to occur in or around the project area due to the lack of an abundant shorebird/waterfowl prey base.

Prairie Falcon.

Prairie Falcon is a USFWS Bird of Conservation Concern. Prairie Falcons breed from south-central British Colombia, Alberta, Saskatchewan, and western North Dakota

south to Baja California, southern Arizona, New Mexico, and western and northern Texas. In California, Prairie Falcons occur over the length of the state except the humid northwest coastal belt. The breeding range of the Prairie Falcon includes open habitats at all elevations up to 11,000 ft. They inhabit shrub-steppe desert, open desert scrub, grassland, mixed shrub-grasslands, and alpine tundra. Nest scrapes are typically on sheltered ledges or in potholes of a cliff overlooking a large, open area (Yolo 2009). The species has been seen at the Haiwee Reservoir. Nesting and foraging habitat exists in the area. It is expected to have a high potential to occur in or around the project area.

Snowy Plover

Snowy Plover (Interior population) is listed as a Species of Special Concern in the state of California. It is also a USFWS Species of Conservation Concern. In California, the interior population is concentrated at a few alkali lakes in northeastern California and the southern deserts and at agricultural evaporation ponds or remnant alkali playas in the San Joaquin Valley. In winter, the birds retreat from higher elevations and, in the interior, concentrate in the Tulare Basin and at the Salton Sea. In the interior of California, Snowy Plovers breed on barren to sparsely vegetated flats and along shores of alkaline and saline lakes, reservoirs, ponds, braided river channels, agricultural wastewater ponds, and salt evaporation ponds. (Shuford, W.D., et al. 2008). Snowy Plovers breed at Owens Lake, to the north of the Haiwee Reservoir. This species is expected to have an unlikely potential to occur in or around the project area because suitable habitat is minimal and of low quality at Haiwee Reservoir.

Mountain Plover

Mountain Plover is listed as a Species of Special Concern in the state of California. It is also a USFWS Bird of Conservation Concern. Mountain Plover is a grassland species that only occurs in the Central Valley, Antelope Valley, the Colorado River Valley, and Imperial Valley. (Shuford, W.D., et al. 2008). There have been several reports of Mountain Plover occurrence at Owens Lake, but the species is a rare visitor in the Owens Valley during migration. It is expected to have an unlikely potential to occur in or around the project area. Haiwee is not within the breeding range.

Long-billed Curlew

Long-billed Curlew is a USFWS Bird of Conservation Concern. Long-billed Curlews breed from south-central British Columbia, southern Alberta, southern Saskatchewan, and southern Manitoba south to east-central California (Siskiyou, Modoc, Lassen counties), irregularly south to the vicinity of Big Pine in Inyo County, central Nevada, central Utah, central New Mexico, northern Texas, and east to southwestern North Dakota, northwestern South Dakota, north-central Nebraska, and southwestern Kansas (McGaugh,1998). The winter range in California includes the San Joaquin Valley, the Imperial Valley, portions of the West Mojave, and coastal estuaries. Long-billed Curlews are birds of open habitats: upland short grass prairies, wet meadows, grasslands, and in winter, agricultural fields, and saltwater marshes with

tidal channels, intertidal mudflats, and coastal estuaries. (McGaugh, 1998). Breeding habitat for this species does not exist in the project area, but it might use the reservoir shoreline during migration. It is expected to have a low potential to occur in or around the project area.

Black Tern

Black Tern is listed as a Species of Special Concern in the state of California. The species is extirpated from the Sacramento-San Joaquin River Delta, and in the San Joaquin Valley, formally a center of abundance. Now Black terns breed in two small rice fields in the San Joaquin Basin. The species is quasi-extirpated from the Tulare Basin, where it nests irregularly and locally in ephemeral habitats mainly in extremely wet years. Black Terns formally bred in rice fields as far south as Kern County. In northeastern California, breeding has been documented as far south as Sierra County where breeding is irregular, particularly at Kyburz (Shuford, W.D., et al. 2008). The species may occur at the reservoir in migration, but it is expected to have an unlikely potential to occur in or around the project area because Haiwee is not within its breeding range.

Caspian Tern

Caspian Tern is a USFWS Bird of Conservation Concern. It is common to very common along the California coast and at scattered locations inland, from April through early August. It nests in dense colonies on sandy estuarine shores, on levees in salt ponds, and on islands in alkali and freshwater Lakes. Nesting colonies are located at the south end of San Francisco Bay, San Diego Bay, and several lakes in Modoc and Lassen Counties. Small colonies have been reported on Humboldt Bay, San Pablo Bay, and Elkhorn Slough. It feeds primarily on small fish in freshwater lakes, estuaries, salt ponds, and sometimes over ocean (Zeiner, D.C., et al. 1988-1990). The species does occur at the reservoir during migration, but it is expected to have an unlikely potential to breed in or around the project area because Haiwee is not within its breeding range.

Yellow-billed Cuckoo

Yellow-billed Cuckoo is listed as Threatened under the Federal Endangered Species Act, and Endangered in the state of California. It is also a USFS Sensitive Species and a USFWS Bird of Conservation Concern. The Yellow-billed Cuckoo prefers riparian woodlands consisting of cottonwood and willow, with dense understory. Historically the species was common in riparian habitat throughout much of lowland California. Presently, Yellow-billed Cuckoos are limited to the Sacramento River from Red Bluff to Colusa, and the South Fork Kern River. Smaller populations exist sporadically in other riparian systems throughout the state. The species has been documented in Inyo County, near Lone Pine and Big Pine (Laymon, S. A. 1998). The species is expected to have a low potential to occur in or around the project area. Marginal habitat exists in the Merritt Cut riparian zone, but Yellow-billed Cuckoo is rare in Inyo County.

Long-eared Owl

Long-eared Owl is listed as a Species of Special Concern in the state of California. This species breeds throughout the entire state of California, excluding higher elevations in the Sierra Nevada. Long-eared Owls nest in conifer, oak, riparian, pinyon-juniper, and desert woodlands that are either open or are adjacent to grasslands, meadows, or shrublands. They nest mainly in old corvid or hawk nests, mistletoe brooms, and natural platforms or debris piles in trees. They prefer dense cover (Shuford, W.D., et al. 2008). Long-eared Owls often use willow thickets for nesting, and salt cedar stands for winter roosting. There are two tamarisk stands at the NHD2 site, so roosting habitat exists in the project area. Due to the lack of willow thickets, nesting habitat does not exist in the project area. The eBird data base reported seven Long-eared Owl sightings within the nine quad CNDDB search parameters. One was at NHD2 site, two were along Sage Flat Road (west of the reservoir), two were at Ash Creek on the west shore of Owens Lake, and two more were at Owens Lake (no specific location). It is expected to have a medium potential to occur in or around the project area.

Burrowing Owl

Burrowing Owl is listed as a Species of Special Concern in the State of California. It is also a BLM Sensitive Species. The species occurs throughout the state of California with the exception of the coastal and interior mountain ranges. It is primarily a grassland species, but persists and even thrives in some landscapes highly altered by human activity. Preferred habitat includes burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation (Shuford, W.D., et al. 2008). Locally, Burrowing Owls are scarce in the Owens Valley. The CNDDB reported eight Burrowing Owl locations within the 9 quad search area, all of which were along Coso Junction Road to China Lake, and in China Lake, approximately 4 miles south of borrow site 7. A search of the eBird data base revealed two Burrowing Owl locations within the 9 quad search area, one on the west side of Owens Lake, approximately 1.7 miles east of borrow site 14, and one on Cactus Flat Road, just north of the NHD2 site. Burrowing Owl surveys were conducted in 2015 and no Burrowing Owls or sign were found. It is expected to have a low potential to occur in or around the project area because it is rare in Inyo County.

Black Swift

Black Swift is listed as a Species of Special Concern in the state of California. It is also a USFWS Bird of Conservation Concern. It nests exclusively in mountains behind or adjacent to waterfalls. The highest nesting population occurs in the Yosemite Valley. The species relies almost entirely on one type of food supply, flying ant swarms. (Shuford, W.D., et al. 2008). This species may occur as a rare transient in the project area. The species is expected to have an unlikely potential to occur in or around the project area because breeding habitat does not exist.

Nuttall's Woodpecker

Nuttall's Woodpecker is a USFWS Bird of Conservation Concern. In California, the species is a common, permanent resident of low-elevation riparian deciduous and oak habitats. It occurs in the Central Valley, in the Transverse and Peninsular Ranges, in the Coast Ranges north to Sonoma County, and in lower portions of the Cascade Range and Sierra Nevada. It occurs as a vagrant in the Owens Valley (Zeiner, D.C., et al. 1988-1990). The species is expected to have a low potential to occur in or around the project area.

Southwestern Willow Flycatcher

Southwestern Willow Flycatcher is listed as Endangered under the Federal Endangered Species Act, and it is also listed as Endangered in the state of California. There are three subspecies of Willow Flycatcher that breed in California. *Empidonax traillii extimus* breeds from the Mexican border north to Pleasant Valley in the Owens Valley. *Empidonax traillii brewsteri* breeds from Tulare County north, along the western side of the Sierra Nevada and Cascades, extending to the coast in northern California. The Great Basin Willow Flycatcher, *Empidonax traillii adastus* breeds east of the Sierra/Cascade axis, from the Oregon border into Modoc County and possibly into northern Inyo County. Southwestern Willow Flycatcher is a riparian obligate species restricted to dense stream-side vegetation. (Craig, D., and P.L. Williams 1998). The species does occur at the reservoir during migration, but it is expected to have a low potential to breed in or around the project area due to lack of breeding habitat.

Loggerhead Shrike

Loggerhead Shrike is listed as a Species of Special Concern in the State of California. In California, Loggerhead shrikes breed mainly in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground. They require tall shrubs or trees, as well as fences and power lines for hunting perches, territorial advertisement, and pair maintenance. They use large shrubs or trees for nest placement. They also need impaling sites for prey manipulation and storage, which can include sharp, thorny or multi-stemmed plants and barbed wire fences (Yosef 1996). They breed from as early as January to July (Grinnell and Miller 1944, Yosef 1996). Locally, the Loggerhead Shrike is present throughout the Owens Valley in desert scrub and riparian habitats. The 2015 bird surveys revealed that Loggerhead Shrikes are nesting at the NHD2 site. It is expected to have a high potential to occur in or around the project area.

Least Bell's Vireo

Least Bell's Vireo is listed as Endangered under the Federal Endangered Species Act. It is also listed as Endangered in the state of California. Historically, Least Bell's Vireo was a common breeder in the Owens Valley. It was extirpated from the Owens Valley and most of its historic range in California, and by the time of its listing in 1986, there were only 300 pairs statewide. They were confined to eight counties south of Santa Barbara. By 1998 the population size had increased to 2,000 pairs, and the species began to expand back into its historic range. It is still a rare occurrence in the

Owens Valley (Kus B. 2002). The CNDDB reported 1 occurrence in Olancha, approximately 3.5 miles north of the project site, within the 9 quad search parameters. There was no date associated with the sighting. Least Bell's Vireo is a riparian obligate species that prefers dense first successional vegetation. Habitat for this species does not occur in the project area, and since it is rare in Inyo County, it is expected to have a low potential to occur in or around the project area.

Bank Swallow

Bank Swallow is a BLM Sensitive Species, and listed as Threatened under the CESA. The species is extirpated from Southern California, and the majority of the California population is centered along the Sacramento and Feather rivers. Bank Swallows are colonial breeders. They excavate their own burrows for nesting in vertical river banks (CDFG. 1992). Just north of the Owens Valley in Mono County there is a substantial colony at Crowley Lake. Significant numbers forage over the Owens Valley flyway during migration. It is expected to have a medium potential to occur in or around the project area. Breeding habitat exists at Haiwee, but the species was not found during the 2015 bird surveys.

Le Conte's Thrasher (San Joaquin Valley Population)

Le Conte's Thrasher (San Joaquin Valley Population) is listed as a Species of Special Concern in the state of California. It is also a USFWS Bird of Conservation Concern. The range of this population does not extend into Inyo County (Shuford, W.D., et al. 2008). It is expected to have an unlikely potential to occur in or around the project area. Le Conte's Thrasher is fairly common in the Owens Valley, but the Owens Valley population does not have a Special Status Species listing.

Virginia's Warbler

Virginia's Warbler is a USFWS Bird of Conservation Concern. The species is a rare to uncommon, summer resident along the eastern slope of the southern Sierra Nevada and in several desert ranges, including the Inyo Mountains. It breeds in arid, shrubby, mixed conifer, pinyon-juniper, montane chaparral from about 7000 to 9000 ft. (Zeiner, D.C., et al. 1988-1990). It is expected to have an unlikely potential to occur in or around the project area due to the low elevation and lack of habitat.

Yellow Warbler

Yellow Warbler is listed as a Species of Special Concern in the state of California, and it is also a USFWS Bird of Conservation Concern. Yellow Warbler is considered one of the most abundant warblers North America. The breeding range covers most of North America. Historically, Yellow Warbler was a common to locally abundant breeder throughout California, except for most of the Mojave Desert and all of the Colorado Desert and higher elevations of the Sierra Nevada. Currently, Yellow Warblers occupy much of their former breeding range, except for the Central Valley, where they are close to extirpation. Locally, Yellow Warblers occur in low densities on the Owens Valley floor. Yellow Warblers generally occupy riparian vegetation in close proximity to water along streams and in wet meadows. Throughout, they are

found in willows and cottonwoods, and in California they are found in numerous other species of riparian shrubs or trees, varying by biogeographic region. (Shuford, W.D., et al. 2008). The species occurs at the reservoir during migration, but it is expected to have a low potential to nest at Haiwee due to the lack of dense riparian thickets.

Yellow-breasted Chat

Yellow-breasted Chat is listed as a Species of Special Concern in the state of California. The species has a patchy distribution in the state of California. It is most abundant in the northwest, in Humboldt, Shasta, and Siskiyou counties. It is mostly absent from the Central Valley, and fairly common in select riparian systems in eastern California. Yellow-breasted Chats occupy early successional riparian habitats with a well-developed shrub layer and an open canopy. Nesting habitat is usually restricted to the narrow border of streams, creeks, sloughs, and rivers and seldom forms extensive tracts. Blackberry (*Rubus* spp.), wild grape (*Vitis* spp.), willow, and other plants that form dense thickets and tangles are frequently selected as nesting strata (Shuford, W.D., et al. 2008). The species is expected to have a low potential to occur in or around the project area. It is possible that a Yellow-breasted Chat might use Haiwee Reservoir during migration, but they are seldom seen during migration.

Brewer's Sparrow

Brewer's Sparrow is a USFWS Bird of Conservation Concern. The breeding range for this species is primarily in the Great Basin, ranging from eastern California, Oregon, and Washington to the Rocky Mountains. The wintering range extends from southeastern California to southeast Texas, and into the northern regions of Central America. Breeding habitat for Brewer's Sparrow in composed of shrublands and is closely associated with sagebrush dominated landscapes. The preferred habitat for Brewer's Sparrow in the winter range is composed of sagebrush shrublands, and desert dominated by saltbrush vegetation and creosote. (USFWS, ECOS). The species does occur at the reservoir during migration, but it is expected to have an unlikely potential to breed in or around the project area because suitable breeding habitat does not exist.

Yellow-headed Blackbird

Yellow-headed Blackbird is listed as a Species of Special Concern in the State of California. It breeds widely and abundantly across western Canada and the United States, but is patchily distributed in the southwestern portion of its breeding range. It migrates broadly across western and central North America, to wintering grounds largely in western and northern Mexico. The greatest breeding densities are found in regions with large and productive marshes. Yellow-headed Blackbird breeds throughout California, with high densities in the northeast. It breeds almost exclusively in marshes with tall emergent vegetation, such as tules (*Scirpus* spp.) or cattails (*Typha* spp,), generally in open areas and edges over relatively deep water. Water is an important component. If it is too shallow, they will not use the habitat. (Shuford, W.D., et al. 2008). The species is expected to have a medium potential to occur along the reservoir shoreline, but not in the project area.

3.6.6 Mammals-Bats

Pallid Bat

Pallid bat is designated by CDFW as a Species of Special Concern. It is also a BLM and USFS sensitive species and is designated high priority under the WBWG. This species roosts alone, in small groups (2 to 20 bats), or gregariously, up to jhundreds of individuals. Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees, and various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings. Pallid bats are opportunistic generalists that glean a variety of arthropod prey from surfaces, but also capture insects on the wing (Brown and Berry 1997). There is one CNDDB occurrence approximately 6.3 miles north of NHD2 foraging along the alkali meadows below Dirty Socks Spring. Potential roosting habitat is present in the project area at borrow site 24. This species is expected to have a high potential to occur.

Townsend's Big-eared Bat

Townsend's big-eared bat is designated by CDFW as a Species of Special Concern and is a candidate for being listed as threatened under the California Endangered Species Act (CESA). It is also a BLM and USFS sensitive species and is designated high priority under the WBWG. This species is associated with desert scrub, mixed coniferous forest, and pinyon-juniper forests. They are often found roosting in caverns, such as caves or mines, and prefer to forage through riparian areas and along water. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines. Summer maternity colonies range in size from a few individuals to several hundred individuals. Roosts are highly site fidelic (Sherwin et. al. 2000). The primary threat to this species is almost certainly related to disturbance and/or destruction of roost sites. Foraging habitat includes: edge habitats along streams, adjacent to and within a variety of wooded habitats. These bats often travel large distances while foraging, including movements of over 150 kilometers during a single evening (Brown et. al. 1994). They feed primarily on moths. There is an occurrence in the CNDDB approximately 1,350 feet south of borrow site 24. This record identifies a maternity colony at the Pumice mine, which is property owned by LADWP.

Potential roosting habitat for Townsend's big-eared bat is present in the project area at borrow site 24. This species is expected to have a high potential to occur.

Spotted Bat

Spotted bat is designated by CDFW as a Species of Special Concern. It is also a BLM sensitive species and is designated high priority under the WBWG. Limited information is available on this species' life history and population trends. They can be found in different areas from low deserts to high-elevation coniferous forests. They appear to be solitary animals but occasionally roost or hibernate in small groups. Roost sites include cracks, crevices, and caves, usually high in fractured rock cliffs (Wai-ping and Fenton 1989). They show high roost fidelity, using the same roosts nightly and forage primarily on moths. They forage high, at or above treetops, and have a loud high pitched echolocation call clearly audible by humans (Harvey et. al 1999). There is one CNDDB occurrence foraging along the wetland meadow shoreline on the western side of Owens dry lake. There is another CNDDB occurrence of this species on the southern end of Owens Lake, east of Cartago, approximately 6.3 miles north of the NHD2. This species is expected to have a high potential to occur and potential roosting habitat is present in the project area at borrow site 24.

Silver-haired Bat

Silver-haired bat is designated a medium priority under the Western Bat Working Group (WBWG). This species is primarily a forest bat and has been found hibernating in hollow trees, under sloughing bark, in rock crevices, cliff faces, and occasionally under wood piles, in leaf litter, under foundations, and in buildings (Harvey et. al 1999). They forage over woodland ponds and streams. Maternity roosts appear to be almost exclusively in trees, inside natural hollows and bird excavated cavities, or under loose bark of large diameter snags. Roosting sites are generally at least 15m above the ground. Both males and females change roosts frequently, and use multiple roosts within a limited area throughout the summer, indicating that clusters of large trees are a necessary habitat requirement (WBWG 2012). The closest recorded CNDDB occurrence to the project area is over 65 miles northeast of the project area. This species is expected to have low potential to occur in or around the project area; however a small patch of roosting habitat is present in the small area with trees north of the existing Haiwee Dam. Additionally, this species may roost in riparian areas along the Haiwee reservoir within the project vicinity.

.

Western Red Bat

Western red bat is designated by CDFW as a Species of Special Concern. It is also a USFS sensitive species and is designated high priority under the WBWG. This species is typically solitary, roosting primarily in the foliage of trees or shrubs. It is a highly migratory species and often hibernates in leaf litter (Pierson et al. 2000, WBWG 2012). They prefer riparian areas dominated by walnuts, oaks, willows, cottonwoods, and sycamores where they roost in these broad-leafed trees. Rarely are they found in desert habitats (Harvey et. al 1999). There are no CNDDB records for this species. This species is expected to have low potential to occur in or around the project area;

however a small patch of roosting habitat is present in the small area with trees north of the existing Haiwee Dam. Additionally, this species may roost in riparian areas along the Haiwee reservoir within the project vicinity.

Hoary Bat

Hoary bat is designated a medium priority under the WBWG. Hoary bats are solitary and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches, 3-12 m above the ground. Roosts are usually at the edge of a clearing, although a few instances of roosting have been reported in caves or beneath rock ledges (WBWG 2012). There are no CNDDB records for this species. This species is expected to have low potential to occur in or around the project area; however a small patch of roosting habitat is present in the small area with trees north of the existing Haiwee Dam. Additionally, this species may roost in riparian areas along the Haiwee reservoir within the project vicinity.

Western Small-footed Myotis

Western small-footed myotis is a BLM sensitive species and is designated a medium priority under the WBWG. This species occurs in deserts, chaparral, riparian zones, and western coniferous forest; it is most common above piñyon-juniper forest. Individuals are known to roost alone or in small groups in cliff and rock crevices, buildings, concrete overpasses, caves, and mines (Bogan 1974, WBWG 2012). They typically forage over and near water (Harvey et. al. 1999). There are no CNDDB records for this species. However, there is a medium potential for occurrence within the project area, as potential roosting habitat is present at borrow site 24.

Long-eared Myotis

Long-eared myotis is a BLM sensitive species and is designated a medium priority under the WBWG. This species has been known to occur in semiarid shrublands, sage, chaparral, and agricultural areas, but is usually associated with coniferous forests (WBWG 2012). Individuals prefer to roost in tree cavities and beneath exfoliating bark in both living trees and dead snags. Pregnant females often roost at ground level in rock crevices, fallen logs, and even in the crevices of sawed-off stumps (Manning and Jones 1989). There are no CNDDB records for this species. This species is expected to have low potential to occur in or around the project area; however a small patch of roosting habitat is present in the small area with trees north of the existing Haiwee Dam. Additionally, this species may roost in riparian areas along the Haiwee reservoir within the project vicinity.

Fringed Myotis

Fringed myotis is a BLM sensitive species and is designated a high priority under the WBWG. This species is most common in drier woodlands (oak, pinyon-juniper, ponderosa pine) at moderate elevation (5-8000ft) in the mountains but is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe (O'Farrell and Studier 1980). They roost in crevices in buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and

snags, particularly large ones, is also common throughout its range in western U. S. (WBWG 2012). There are no CNDDB records for this species. However, there is a medium potential for occurrence within the project area, as potential roosting habitat is present at borrow site 24.

Long-legged Myotis

Long-legged myotis is designated a high priority under the WBWG. This species forages in chaparral, coastal scrub, Great Basin shrub habitats, and in early successional stages of woodlands and forests (Warner and Czaplewski. 1984). They roost in abandoned buildings, cracks in the ground, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts. They prefer caves and mine tunnels as hibernacula (WBWG 2012) and are able to fly at cooler temperatures than many other bat species, enabling them to extend their prehibernation period of activity (Harvey et. al. 1999). The closest recorded CNDDB occurrence to the project area is 35 miles northwest of the NHD2 in the Sierra Nevada Mountains. However, there is potentially suitable roosting habitat in the project area and the species may occur while in transit to foraging areas.

Yuma Myotis

Yuma myotis is a BLM sensitive species. This species is usually associated with permanent sources of water, typically rivers and streams, but may also use tinajas (depressions formed in bedrock that store pockets of water) in the arid West (Harris 1974). They forage just above the surface of streams and ponds and occur in a variety of habitats including riparian, arid scrublands and deserts, and forests. The species roosts in bridges, buildings, cliff crevices, caves, mines, and trees. Maternity colonies may range in size up to several thousand and nursery roosts are quickly abandoned if disturbed (Harvey et. al. 1999). There is one CNDDB occurrence 6.3 miles north of NHD2 foraging along the alkali meadows below Dirty Socks Spring. Potentially suitable roosting habitat for this species is present in the project area at borrow site 24.

Western Mastiff

Western mastiff is designated by CDFW as a Species of Special Concern. It is also a BLM sensitive species and is designated high priority under the WBWG. It is primarily cliff-dwelling, where maternity colonies of 30 to several hundred (typically fewer than 100) roost generally under exfoliating rock slabs (WBWG 2012). This species is found in a variety of habitats, from desert scrub to chaparral to oak woodland and into the ponderosa pine belt and high elevation meadows of mixed conifer forests. Individuals have been estimated to forage as much as 2,000 feet above the ground and may forage in flocks. They have been heard in open desert, at least 15 miles from the nearest possible roosting site (Vaughan, 1959). There are no CNDDB records for this species and although the probability of occurrence is expected to be low within the project area, potentially suitable roosting habitat is present at borrow site 24.

3.6.7 Other Mammals

Mohave Ground Squirrel

Mohave ground squirrel (MGS) is small, grayish, diurnal squirrel that is currently listed under the California Endangered Species Act as a threatened species. MGS occur in the western half of the Mojave Desert. This species' historical range encompasses an area between Antelope Valley and Lucerne Valley, in the south. However, MGS occurrences in the southern portion of its range are very rare. The northern limits of the range are near Owens Dry Lake, in the north, and through China Lake Naval Weapons Station and Fort Irwin Military base, in the east. The eastern limits extend to Barstow and south along the Mojave River. The western limits loosely follow Highway 14 and the foothills of the southern Sierra Nevada escarpment. MGS are dormant in the fall and winter months. They emerge from hibernation in February and begin pair bonding and mating during March. If rainfall is adequate, MGS will reproduce. If rainfall levels do not provide sufficient rainfall to support significant annual plant growth then MGS will merely forage on herbaceous perennials and shrubs in order to gain enough body mass to survive another prolonged period of dormancy and will not reproduce in that year. The adult males can enter dormancy as early as late May. Juveniles will remain above-ground until August in order to gain sufficient fat reserves prior to entering dormancy. There are six CNDDB occurrence records in the vicinity of the project area and suitable habitat (based upon the presence of required annuals and shrubs for this species) is present in the project area.

Owens Valley Vole

Owens Valley vole is designated by CDFW as a Species of Special Concern and is BLM sensitive. Little is known about this subspecies of California vole but its habitat requirements are presumably similar to the California vole, which inhabits wetlands and lush grass-dominated sites, as well as alkali shrub-meadow habitats. Voles breed throughout the year, and reach population peaks if food and cover are abundant. They forage on the ground feeding on leafy parts of grasses, sedges, and herbs. They clip grasses and forbs at the base, which forms a network of runways around their burrows. This species is known to be a nocturnal short-tailed vole and makes its home in groundwater-dependent meadows on the Owens valley floor (CDFG 1986). There are two CNDDB occurrences of this species within three to five miles northwest of the proposed NHD2. One occurrence was located at Cabin Bar Ranch in 1989 and the second was in Olancha in 1981. Suitable habitat within the project area is very limited with a small amount of riparian habitat to the east of borrow site 9.

American Badger

The American badger is designated by CDFW as a Species of Special Concern. This species inhabits level, open areas in grasslands, agricultural areas, and open shrub habitats. They dig large burrows in dry, friable soils and feeds mainly on fossorial mammals such as ground squirrels, gophers, rats, and mice. This species is primarily active during the day, but may become somewhat nocturnal when occurring in close proximity to humans. During summer and fall, they range more frequently, with the mating season generally occurring in November. One to three burrows may be dug

from foraged out prey holes in a day, used for a day to a week, and then abandoned, with possible returns later, and other small wildlife utilize abandoned burrows in the interim. Natal dens are dug by the female and are used for extended periods, but litters may be moved, probably to allow the mother to forage in new areas close to the nursery (Messick and Maurice 1981). Three to five young are born from late March to early April. The average home range of badgers has been estimated to be 667 to 1,550 acres (Lindzey 1978). Suitable habitat for this species is present in the project area.

Desert Kit Fox

The desert subspecies of the kit fox is a protected furbearing mammal. A trapping permit for the take of this furbearer cannot be issued by CDFW. Because of this and recent outbreaks of canine distemper which has taken a heavy toll on the species' population, a decision by CDFW extended the protection of this fox to include development projects. Suitable habitat for this species consists of arid open areas, shrub grassland, and desert ecosystems. Its diet consists mostly of small rodents, especially kangaroo rats, but it will also prey upon rabbits, lizards, insects, and berries. Dens have multiple entrances, which are up to 8 inches wide and often keyhole-shaped. Litters of three to five young are born in February or March (Egoscue 1962; McGrew 1979). Suitable habitat for this species is present in the project area.

Field Survey Methods for Special Status Plants

Focused rare and special-status plant surveys were conducted by botanists during floristic blooming periods in the spring and summer of 2015 (March, April, May) in the NHD2 project area, associated borrow sites and haul routes. These surveys were conducted for all plant species with the potential to occur in the project area in accordance with guidelines issued by the USFWS (USFWS 1996), BLM (2009), CDFW (CDFW 2009), and CNPS (CNPS 2001), with guidance from the Ridgecrest BLM Field Office and CDFW.

Nearby reference populations were visited prior to initiating focused rare and special-status plant surveys. Reference populations were visited to observe germination rates and phenological states of the various rare and special-status species with the potential to occur in the project area (CDFW 2009). The focused surveys were conducted by botanists walking parallel transects spaced at approximately 30 feet (9 meters) throughout the NHD2 project area and associated borrow sites. Each rare or special-status plant observed was documented with a sub-meter accuracy Trimble Geo XT global positioning system (GPS) and CNDDB data sheets were filled out to document each special-status plant population (CESA 2012). Plant nomenclature followed the Jepson Manual 2nd Edition (Baldwin, ed. 2012). Rare and special-status plant surveys included documentation of all plants observed in the survey area (CESA 2012), including exotic species. The locations of exotic species during surveys were not mapped, although general locations and abundance of weed species were noted.

3.7 Field Survey Methods for Special Status Wildlife

Focused USFWS and CDFW protocol level surveys were conducted for special-status wildlife generated from the 9-quad CNDDB search and state and federal special animals lists and are discussed below. These surveys were conducted for the species identified having potentially suitable habitat within the NHD2 project area, borrow sites and associated haul routes.

3.7.1 Insects

San Emigdio blue butterfly

Visual surveys were conducted for the San Emigdio blue butterfly in four-wing saltbush scrub during Mohave ground squirrel and rare plant surveys. All butterfly species observed were recorded.

3.7.2 Reptiles

Desert tortoise

The Desert tortoise *(Gopherus agassizii)* is listed as a threatened species under the federal Endangered Species Act and the California Endangered Species Act. Mojave desert tortoises are known to occur from below sea level to an elevation of 7,300 feet. Typical habitat for desert tortoise in the Mojave Desert has been characterized as creosote bush scrub below 5,500 feet (USFWS 2011). Desert tortoises occur most commonly on gently sloping terrain (bajadas) consisting of sand- and gravel-rich soils where there is sparse cover of low-growing shrubs. Soils normally must be friable enough for digging burrows, yet firm enough so that burrows do not collapse. Tortoises generally cannot construct burrows in rocky soils or shallow bedrock (USFWS 2011). Typical habitat for the Desert tortoise in the Mojave Desert has been characterized as creosote bush scrub between 1,970 feet (600 meters) and 5,900 feet (1,800 meters) in elevation where precipitation ranges from 2 to 8 inches and vegetation diversity and production is high (Nussear et al. 2009). Desert tortoises are known to occupy large home ranges. Females have long-term home ranges that may be as little as or less than half that of the average male, which can range to 200 or more acres (Berry 1986).

Threats to desert tortoise populations identified in the 2011 US Fish and Wildlife Service (USFWS) Desert Tortoise Recovery Plan are numerous and include:

- Human contact and mortality, including vehicle collisions and collection of tortoises
- Predation, primarily from raven, but also from feral dogs, coyotes, mountain lions, and kit fox
- Disease
- Habitat destruction, degradation, and fragmentation resulting from grazing, land

- Development, solar development, OHVs, wildfire, landfills, and road construction
- Climate change and drought

The 2014 desert tortoise (*Gopherua agassizii)* field surveys were conducted and adhered to the USFWS protocol, *Preparing for any Action that May Occur within the Range of the Mojave Desert Tortoise* (USFWS 2010). From March 19-21, 2014, a baseline environmental site assessment was conducted within the project area. The assessment included the new proposed dam site, borrow sites and haul routes. Potentially suitable desert tortoise habitat was identified and plant and wildlife observed communities were recorded.

Protocol-level field surveys were conducted within the project area between October 17-30, 2014 by a team of six biologists. Approximately 460 acres of belt transect surveys were conducted within the proposed New Haiwee Dam site boundary, each approximately one mile in length (NHD2). Another 82 acres of belt transects were surveyed within the proposed borrow sites. Borrow site belt transects varied in length, due to the various shapes of each site. Approximately, 11 miles of haul routes going to three of the four proposed borrow sites were also surveyed. Borrow site 15 was not surveyed as it is currently an actively mined borrow site. Additionally, a 50-foot buffer was established around the proposed NHD2 boundary, the borrow sites and haul routes. General weather conditions and temperatures were recorded at the start and end of each survey day and location. Transects were spaced at 30-foot wide (10-meter) intervals within the NHD2 project borrow sites. Each biologist used a Trimble GeoXM or Garmin Etrex20 GPS unit with UTM's in NAD 83 following a bearing coordinate to maintain proper orientation and spacing of each individual transect. At the end of each transect, the starting point was shifted 30-feet from the last transect using UTM coordinates and bearings. Using this method, the survey area was systematically walked until 100 percent of the survey area was visually inspected. All points of interest were recorded with a GPS using UTMs in NAD83.

The biological team focused on a search area that included 15 feet on either side of them. Biologists remained close to one another without leading or lagging in order to increase the precision of the search for desert tortoise and associated sign. When one member of the team stopped to investigate an observation, all members of the team stopped. Team members were instructed to search within rock ledges, beneath every shrub and periodically look behind them to ensure every angle of habitat was surveyed.

USFWS (2010) desert tortoise pre-project survey data sheets were used to record tortoise sign (tortoise burrows or large mammal burrows, scat, carcasses, tracks, shell fragments, disarticulated carcasses, drinking scrapes, mating rings, etc…) or live tortoises. Large to midsize burrows ≥ four inches in diameter that could accommodate adult or subadult tortoises were recorded and evaluated using the USFWS descriptions for the five types of burrows (see following table). All midsized to large burrows were visually inspected with mirrors or flashlights.

Burrow Class Based on USFWS Descriptions	
1.	Currently active, with desert tortoise or recent desert tortoise sign
2.	Good condition, definitely desert tortoise; no evidence of recent use
3.	Deteriorated condition; this includes collapsed burrows; definitely desert tortoise (describe)
4.	Good condition; possibly desert tortoise
5.	Deteriorated condition; this includes collapsed burrows; possibly desert tortoise

Following the 100% coverage transect surveys, Zone of Influence (ZOI) surveys were also conducted around the three borrow sites and haul routes (as identified for any project site that is linear or less than or equal to 200 acres in the USFWS 2010 protocol) to further validate a presence/absence determination. Transects were implemented at 200 meters (650 feet), 400 meters (1,310 feet), and 600 meter (1,970 feet) spacing around the 50-foot boundary of each borrow site and haul route perimeter (Figure 5). Transects were generated using ArcMap prior to leaving to the project area. As with the belt transect surveys, proper orientation and spacing was maintained using either Trimble GeoXM or Garmin GPS units. Because the NHD2 site was over the 200-acre ZOI trigger and most likely will not overlap a desert tortoises' home range (USFWS 2010), ZOI surveys were not conducted.

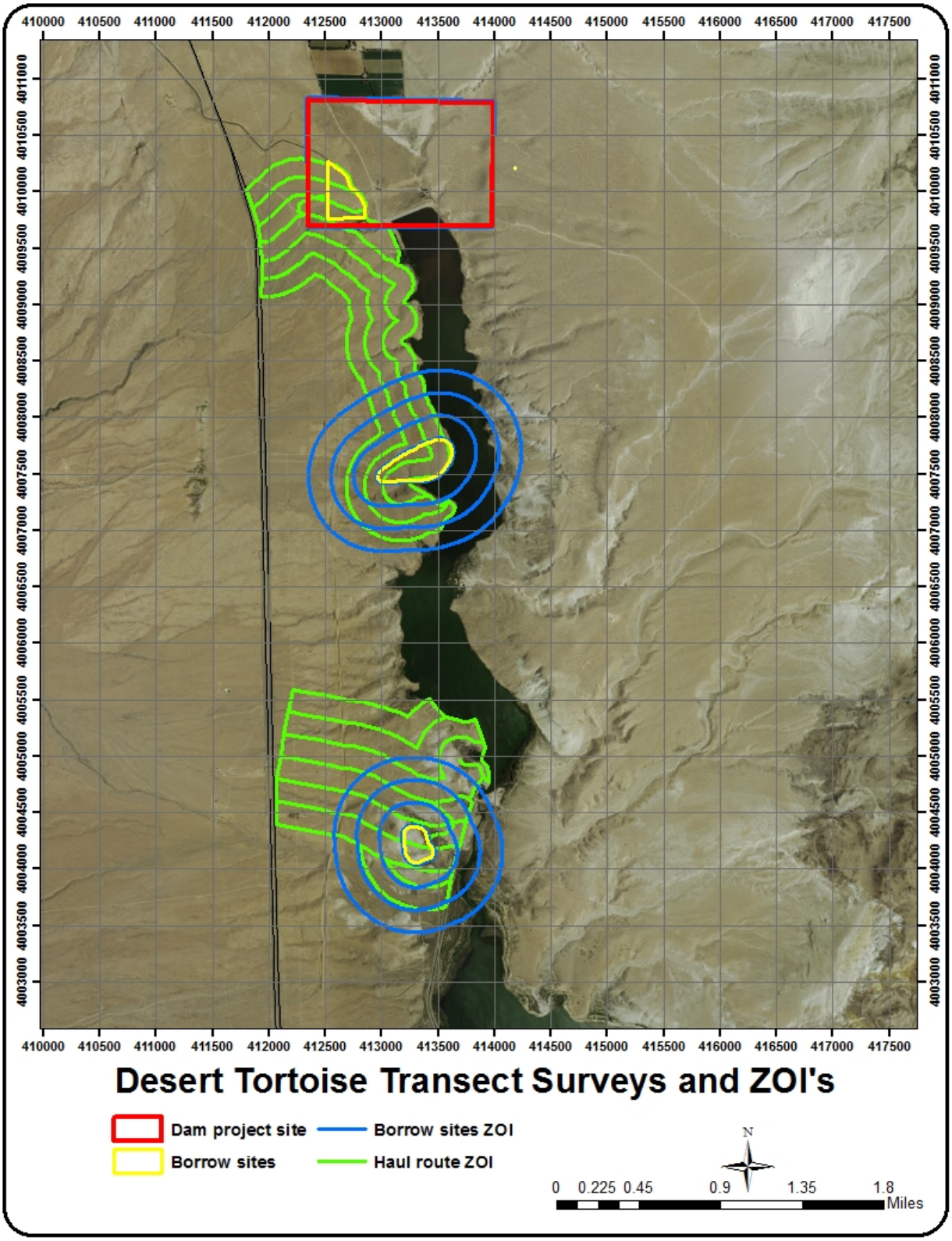


Figure 5. Desert tortoise transect survey area including ZOI's around the NHD2 (project area, borrow sites, and haul routes).

Northern Sagebrush Lizard

Opportunistic visual surveys were conducted for northern sagebrush lizards during desert tortoise transect surveys, nesting bird and raptor surveys as well as Mohave ground squirrel trapping surveys.

Panamint Alligator Lizard

Opportunistic visual surveys were conducted for Panamint alligator lizard. However, as borrow sites were removed from the current proposed project area, there is now no suitable habitat present. Small pockets of suitable habitat may be present along the riparian shoreline of Haiwee Reservoir, outside of the project area but within the 9-quad CNDDB search.

3.7.3 Birds

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is primarily a grassland species, but also inhabits landscapes highly altered by human activity (Tomsen 1971, Haug et al. 1993, Millsap 2002, Gervais et al. 2003, Rosenberg and Haley 2004). Suitable habitat characteristics include the presence of burrows for roosting and nesting and relatively open landscapes. They prefer short grass to completely barren substrates. Some shrubs or small trees are preferable for perching. They are rarely found in tall grass, dense scrub, or woodland habitats. They prefer low elevation, less than 4,000 feet. In California, they are closely associated with agricultural or rural settings that have been invaded by California Ground Squirrel (*Otospermophillus beecheyi*). California Ground Squirrel burrows provide ideal nest sites. They will also occupy culverts and man-made berms.

Historically, the species range covered most of the State of California, but was absent from the counties north of Marin and from mountainous areas. Populations increased in the Imperial Valley following the development of agriculture and in the Central Valley after the draining of wetlands. Recent population statistics show that Burrowing Owls have declined along the central and southern coastal regions due to rapid urbanization (Desante et al. 2007). Large breeding populations remain in agricultural areas in the Central and Imperial Valleys (Coulombe 1971, Rosenberg and Haley 2004). Locally, burrowing owls are scarce from Inyo County south through the eastern Mojave Desert (Garrett and Dunn 1981).

The burrowing owl is currently considered a Bird Species of Special Concern (breeding), priority 2. Burrowing owl is included on both prior special concern lists (Remsen 1978, 2nd priority; CDFG 1992). Habitat loss and degradation from rapid urbanization of farmland in core areas of the Central and Imperial valleys is the greatest threat to burrowing owls in California. Ongoing urbanization in coastal regions, changes in agricultural practices, and continuing eradication of ground squirrels are also serious threats. In addition to loss of nesting burrows from extermination of ground squirrels, developed environments pose a substantial risk to Burrowing Owls from mortality caused by traffic (Klute et al. 2003, D. K. Rosenberg et al. unpubl. data).

A burrowing owl habitat assessment was conducted on February 11, 2015, in accordance with the Department of Fish and Game 2012 Staff Report on Burrowing Owl Mitigation to determine if burrowing owl habitat is present in the project area and if occupancy surveys were required. Prior to a field analysis, a preliminary evaluation of the NHD2 project area and borrow sites was completed. Current imagery in an ArcMap GIS project was utilized to locate areas on each site that appeared to be open enough to contain potential burrowing owl habitat. Areas covered in rock outcrops or dense vegetation were excluded. A GIS layer of burrows that was generated from the recent Desert Tortoise survey results was overlaid in order to determine if burrows were present. A recent land form analysis was also utilized to further determine the potential for burrowing owl habitat at each site. Both, the CNDDB and eBird databases were utilized to locate burrowing owl sightings in the vicinity of the project area. Once the locations for a field habitat assessment were selected, two biologists conducted the field habitat assessment.

In accordance with the Department of Fish and Wildlife 2012 Staff Report on Burrowing Owl Mitigation, four burrowing owl occupancy surveys were scheduled to take place at the NHD2 and the BLM disturbance area. The first survey was conducted on March 26, 2015, the second on April 15, 2015, the third on May 12, 2015, and the fourth on June 6, 2015. These four burrowing owl surveys were conducted during the breeding season. They took place during daylight hours when the owls were most likely to be present near their burrows (Haug and Diduik 1993, CBOC 1997, Thompson 1971, Conway and Simon 2003, Conway et al. 2008). Each survey period was conducted three weeks apart. Prior to each survey, the time and weather conditions were reported on a data sheet. During the surveys all other wildlife observations were recorded. Two biologists with previous burrowing owl survey experience conducted the surveys. The biologists walked transects that were anywhere from 10 to 30 meters apart, dependent on site conditions, such as shrub density or berms. When surveying the edge of a project site, or a haul route, the survey area included a 150 meter buffer zone. The surveyors consistently scanned ahead in order to detect flushing owls. More time was spent investigating berms and mounds, where owls were likely to occur. All burrows were identified and examined for the presence of Burrowing Owl sign. Burrowing Owl sign consisted of prey parts, owl pellets, or feathers.

Raptor Surveys

Raptor surveys were conducted throughout the entire Haiwee Reservoir in order to determine where raptors were nesting in or around the project area. Since most raptors have a large range for potential impacts to occur, all raptors nesting in the vicinity of the Haiwee Reservoir were considered to have the potential to be impacted by the project. Raptors that may use the Haiwee Reservoir either for breeding or migration are listed in Table 2, “Special-status Wildlife Species with potential to occur in the project area.”

Four raptor surveys were conducted during the year 2015. One survey was conducted in the winter and the remaining three were conducted during the breeding season. Two biologists with previous raptor survey experience drove along the perimeter of the entire Haiwee reservoir searching for raptors. The reservoir was scoped for raptors and raptor

nests using spotting scopes and binoculars. Cliff faces were scoped for golden eagle, great horned owl and falcon nests. Trees were scoped for osprey, bald eagle, great horned owl, buteo, accipiter and falcon nests. All raptor and raptor nests encountered were recorded with GPS devices. Some areas where previous observations have been reported were examined for nesting raptors. During each successive survey, all nests were revisited and nesting stages were recorded. Raptor sightings were also recorded during opportunistic surveys and sightings that took place during other biological investigations. The Butterworth Ranch, just north of the NHD2 project area, is a documented breeding location for Swainson's hawk, a special status species, so this ranch was surveyed for Swainson's hawks.

General Bird Surveys

The purpose of general bird surveys was to document bird species that use the project site either for breeding or migration. Nesting birds, protected under the federal Migratory Bird Treaty Act and CDFW Fish & Game Code Sections 3503, 3503.5 and 3513, have the potential to be impacted by the project. All birds were recorded during other scheduled surveys, such as the raptor survey, burrowing owl survey, and Mohave ground squirrel trapping survey. Bird behavior was recorded, along with the habitat type and location that they were associated with. Singing birds that were observed in the site during every survey were considered to be potentially breeding, if occurring in appropriate breeding habitat. Birds were assigned breeding status if an active nest or fledgling were found. Other birds were considered to be migratory. Breeding range for most birds is documented in literature, and that information was incorporated to determine if the birds encountered were migratory or potentially breeding.

3.7.4 Mammals-Bats

Bats have large home ranges, varying from approximately 10 – 100 km2, depending on the species, colony size, and time period (AFWD 2006). Bats rely on vocalizations for communication (Fenton 1985) and orientation when commuting or foraging (Altringham 1996). They emit ultrasonic signals in order to echolocate. By emitting a series of discrete calls and listening for returning echoes, bats are able to locate objects, including prey items (Griffin 1958). Echolocation signals have frequency, duration, and intensity components associated with them (Simmons et al. 1979). Bats spend over half of each day in their roost, and thus suitable roost sites are of extreme importance to bats for thermoregulation and escaping predators (Kunz 1982). Roost sites may be night roosts (sites used temporarily between feeding bouts during the evening), day roosts (sites used during the day), hibernacula (sites where hibernation occurs during the winter) or maternity roosts (sites where females give birth and take care of flightless young). Maternity roosts are particularly important overall for bat life histories, as they are often site fidelic and are extremely sensitive to disturbance, which may cause abandonment of young or failed reproduction. In contrast, there are solitary species that roost in foliage and do not seem to be as dependent on the characteristics of the roost-site to provide them with protection from the elements (AFWD 2006).

The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate; physical closures of old mine shafts, which eliminates roosting habitat; elimination of riparian or desert wash microphyll vegetation which is often productive foraging habitat; more general habitat loss or land use conversion; and agricultural pesticide use which may poison bats or eliminate their prey-base (Gannon 2003). All special status regional bats are insectivorous, catching their prey either on the wing or on the ground (BLM 2011). Some species feed mainly over open water where insect production is especially high, but others forage over open desert scrub (WBWG 2012) such as that found within the project area.

Identifying potential roost sites and then observing them (visually and with acoustic detectors) can provide valuable information on the presence of bats in an area as well as the habitat features that can readily limit their populations. Visual surveys at roost sites can provide an index of abundance at broad scales for some species, such as Townsend's big-eared bat, which is not easily detected or identified with mist nets or acoustic surveys but roosts in large numbers in caves and mines (Thomas and LaVal 1988).

Because bats vocalize at different intensities visual surveys should be coupled with acoustic surveys to capture the magnitude of high and low range frequencies different species emit (Kunz et al. 2007). Acoustic surveys are conducted by using an ultrasound or echolocation bat detector. Bat detectors are effective at detecting free-flying bats from over 50 meters. For species with unique calls, detectors are an effective means of obtaining species detections, and serve as a valuable complement to visual surveys or mist netting to obtain a more comprehensive species list for a site (O'Farrell and Gannon 1999). Acoustic detectors can detect the presence of bats, assess whether a bat is foraging or commuting, and potentially identify the species emitting the call. It is also important to note that bat detectors record the number of bat calls rather than an actual number of bats recorded. Multiple calls may represent a single bat calling multiple times or multiple bats each calling a single time. Thus, the data collected can provide presence of a species in the area and population indices of relative activity or abundance, but cannot provide a direct estimate of population densities. Acoustic data can then be analyzed using software such as SonoBat, which provides a comprehensive tool for analyzing and comparing high-resolution full-spectrum sonograms of bat echolocation calls recorded. SonoBat can record, process, display, and analyze calls collected from an acoustic detector. This software performs a number of signal quality checks to reject poorly formed calls, overloaded calls, or those with distorted signals or too much noise to optimize faithful call parameter extraction and classification.

An environmental baseline site assessment was conducted within the project area during March and October 2014. Potentially suitable roosting structures were identified including large trees, rocky outcrops, caves and cliffs with cracks, crevices and holes. Initial structures were surveyed which included visual inspection for bats and bat sign (e.g. guano, staining), scent surveys for guano, and auditory surveys for bat sound

(e.g., squeaking, clicking, fluttering). Presence of potential roosting habitat was identified at the southern end of NHD2 as well as borrow site 24.

Bat surveys were conducted at the end of May through early June 2015 via roost counts with night vision goggles and acoustic monitoring with a Pettersson D500x bat detector and Sonobat 3.2.1 software to identify the presence and species of bats within the area, as well as the frequencies of echolocation calls. The presence of precipitation, a full moon, strong winds, or temperatures below 10 degrees Celsius all tend to cause a decrease in levels of bat activity (USFS 2006). Therefore, surveys were not conducted within these conditions. Visual counts of the number of bats exiting a roost was conducted to provide a useful and accurate census of the total number of bats using a roost site, provided that all roost exits are monitored and any bats that re-enter the roost are accounted for (Thomas and LaVal 1988). Roost emergence by bats occurs shortly after dusk. To conduct a visual roost count, infrared lights were set up at a potential roost site (i.e. the cave entrance, mine adit, cliff or rocky outcrop) in order to light up the habitat using night vision goggles. A Pettersson D500x audio recorder was used to record bat calls flying overhead to determine presence of bats at a site. Roost counts were recorded by using night vision goggles and hand clickers to tally numbers with for 1.5 hours (from 45 minutes before sunset to 45 minutes after sunset). The numbers of bats exiting a roost were tallied separately from the number of bats entering a roost in order to quantify a total number of bats utilizing the roost site. The UTM coordinates for each site was taken with a Garmin GPS unit and data was recorded on paper datasheets. Wind speed and temperature was also recorded using a handheld Kestrel weather-recording device at the beginning and end of each survey. These visual bat activity surveys allowed maximum bat detections in the project area by adjusting the location of acoustic detection equipment based on results of observed bat activity.

Acoustic monitoring was recorded using a time expansion system, the D500x Pettersson detector. The D500X is a full spectrum "direct recording" ultrasound recording unit capable of long-term, unattended recording of high frequency bat calls. This device detects full-spectrum ultrasound and records in real time using the highest quality, highest signal-to-noise ratio microphone presently available on any passive bat detector today. The D500x recorder was placed in a weather proof box within different habitat types at the NHD2, over the Los Angeles Aqueduct (LAA) inlet just to the south of the NHD2, at borrow sites 9, 24, and the BLM disturbance area. The recorder was operated under good weather conditions for maximum detections from the end of May to early June 2015 to detect as many different species as possible at each site. Echolocations were recorded to the internal memory of the D500x which were then transferred to a laptop. A microphone was placed in a protective PVC capsule made especially for the device to record high frequency calls without disruption or damage. The D500x receiver was attached to the end of a 2x4 and directed toward a potential roost site where high bat activity may occur and positioned in a way that would achieve the highest quality recording (i.e. 1–2 meters above ground to avoid call distortion from ground heat, and facing away from a large solid structure that could potentially distort bat sounds through reflection). Potential foraging and roosting features were recorded, as well as the UTM coordinates where the receiver was placed.

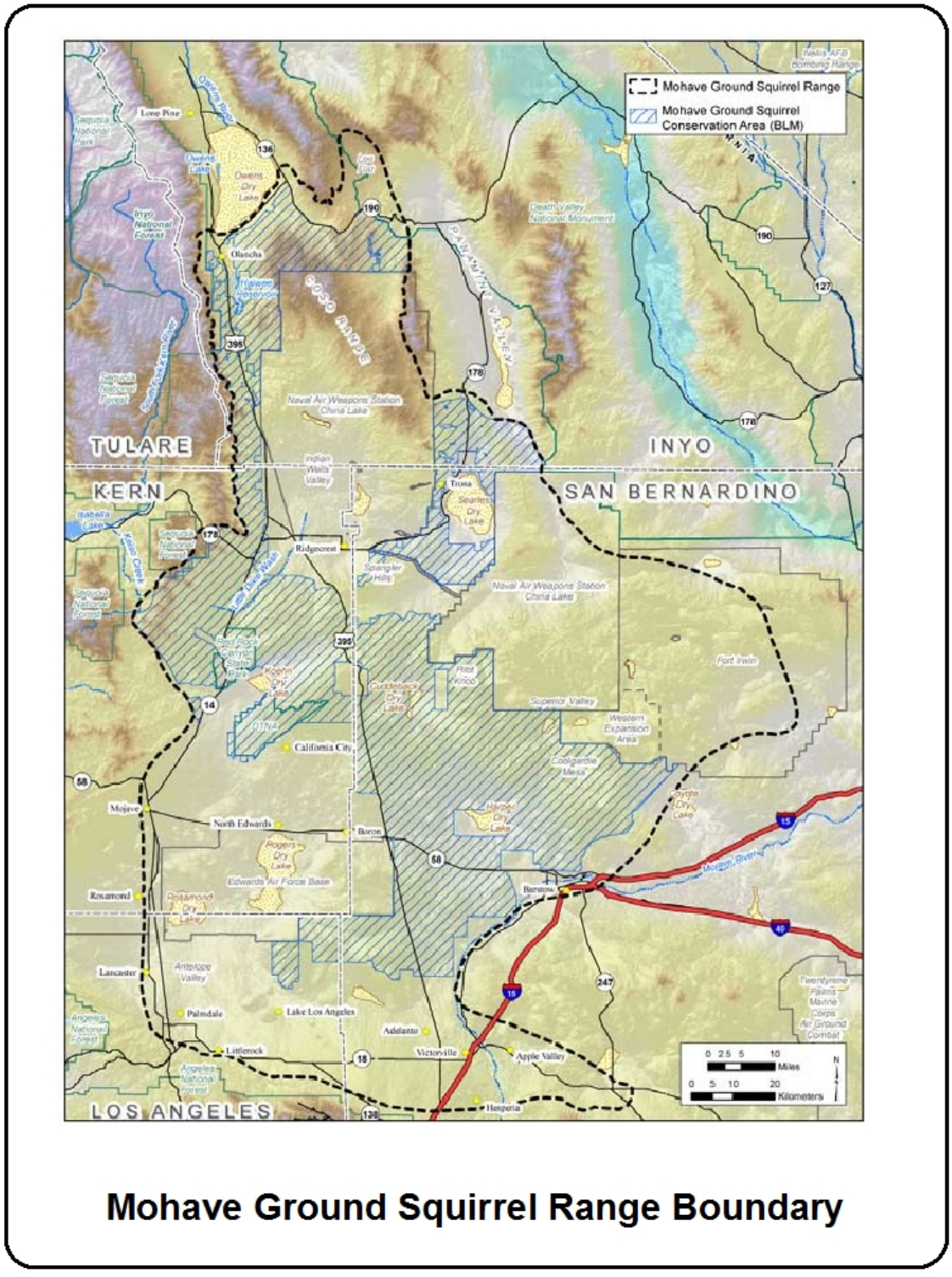
The D500x detector was programmed to record calls between 5 kilohertz (kHZ) and 20 kHZ for a minimum of 3-second duration. It was programmed to record during two periods: approximately 1 hour before sunset to sunrise. Following collection of the D500x Pettersson detector monitoring, all bat "wav" files were downloaded into a laptop ready for analysis. Time, date and coordinates metadata were stamped on all sound files. Acoustical data recorded at each site was analyzed using the Sonobat® software (version 3.2.1). The automated analysis function of the software was used, with default settings selected to initially identify calls to genus or species. Each echolocation call was visually compared to reference calls and descriptions of individual species call structure. Calls were identified to genus or species based on association with these and with a minimum standard of 90-percent confidence. Before call analysis, all noise files (i.e., nonbat calls) were extracted using the batch scrubber feature of Sonobat. The batch scrubber was set to the "medium scrubber" setting, which removed only those files that did not contain strong calls and/or call patterns that may be representative of a bat. A minimum of 10 percent of the scrubbed files was reviewed for the acoustic sessions to ensure the accuracy of the scrubbing procedure.

3.7.5 Mammals (excluding Bats)

Mohave Ground Squirrel

The Mohave ground squirrel is listed under the California Endangered Species Act as a threatened species. This species is present throughout the western half of the Mojave Desert. The NHD2 project area and borrow sites are located within the range boundary of Mohave ground squirrel, as established in the BLM's 2005 West Mojave Plan (Figure 6). MGS are dormant in the fall and winter months. They emerge from estivation in February and begin pair bonding and mating during March. If rainfall is adequate, MGS will reproduce. If rainfall levels do not provide sufficient rainfall to support significant annual plant growth then MGS will merely forage on herbaceous perennials and shrubs in order to gain enough body mass to survive another prolonged period of estivation and will not reproduce in that year. The adult males can enter dormancy as early as late May. Juveniles will remain above-ground until August in order to gain sufficient fat reserves prior to entering dormancy (Leitner and Leitner 1998).

Several other common squirrels occur within the range of MGS; antelope ground squirrel (AGS; Ammospermophilus leucurus), round-tailed ground squirrel (RTGS; Xerospermophilus tereticaudus) and the California ground squirrel (CGS; Spermophilus beecheyi). RTGS and CGS do not occur within the proposed project area. AGS occur throughout the range of the MGS and within the project area but are easily distinguished by a lateral white stripe on each side of their bodies, whereas MGS do not have a lateral white stripe (Jameson and Peeters 2004).



Mohave Ground Squirrel Range Boundary

Figure 6. The historic range of the MGS as established in the West Mojave Plan.

Due to its sensitive status, presence/absence pre-project surveys are required to determine if MGS are present within the project area. Initial field surveys were conducted between March 16 and March 20, 2015 within the NHD2 project area and associated borrow sites. Based on this initial survey it was determined that suitable habitat with focal vegetative species were present and due to the quality of habitat and the proximity of CNDDB occurrences adjacent to these sites, further investigations were warranted. Therefore, protocol trapping, using the CDFW January 2010 Mohave Ground Squirrel Survey Guidelines (CDFG 2010) under a Memorandum of Understanding issued by CDFW, was implemented at borrow sites 9 and 24 as well as the NHD2 project area on the upper bluff of the Cactus Flat Road re-alignment area (Figures 7-9).

The trapping schedule consisted of three grids (one at the NHD2 project area and one each at borrow sites 9 and 24) with three trapping sessions per grid, and took place during the months of April to June. Within each grid, one hundred ventilated, aluminum 12-inch Sherman box traps were deployed at 35-meter spacing over suitable MGS habitat. The grids consisted of a two trap line configuration, each 2x25 traps long at borrow sites 24 and Cactus Road re-alignment (at the NHD2) and a 10x10 trap line configuration at borrow site 9. All three MGS grids each covered approximately 25 acres within the NHD2 and borrow sites. Typically, a grid is required for every 80 acres of habitat within a project area. Grid placement was determined by suitable vegetation cover, proximity to surrounding habitat and availability of access roads. Cardboard boxes were used as shade covers for each trap. Traps and shade covers were placed on the northeast side of the nearest bush on a north-south axis to provide the greatest shade cover possible. The shade covers were covered with dirt on both sides and on the roof to provide better temperature insulation and to prevent the boxes from blowing away in the wind.

Each of three trapping sessions (April 4-11, May 5-9 and June 23-27, 2015) was conducted over a five consecutive day period plus one initial day to set up the trapping grid. During setup each trap was kept closed and pre-baited with a four-way horse feed mixed with peanut butter and rolled oats to lure potential squirrels to the traps and bait. Traps were opened and baited within one hour of sunrise and closed within one hour of sunset. Traps were also closed when air temperature reached 90°F one foot above ground in the shade, when temperature fell below 40°F or during periods of rainy weather. Temperature readings were taken and recorded every hour at one foot above ground level in the shade of a bush. Wind and sky conditions were recorded prior to each trap check. Traps were checked every two to four hours depending on temperature and other influential factors that may have been present on each grid, such as potential pregnant or lactating females in traps, dogs on grids, ravens, cold weather, expected juveniles, etc. All animals captured were identified to species, aged (juvenile or adult), weighed, sexed, and given a unique identifier such as a line or X, with a non-toxic marker to identify the individuals trapped over each trapping session. Each animal's reproductive status was also noted.

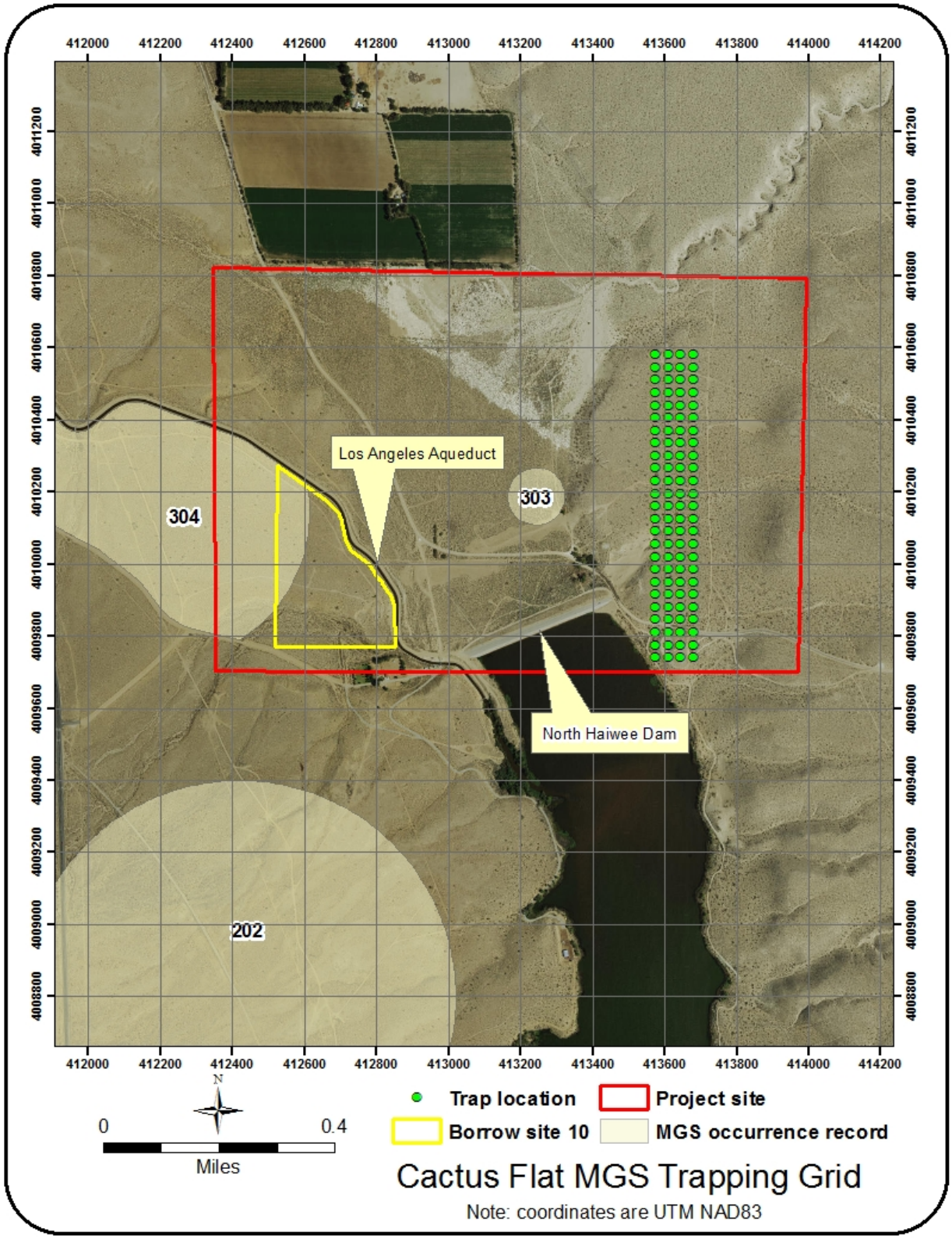


Figure 7. MGS CNDDB occurrence records and trapping grid on Cactus Flat Road within the NHD2 project area, spring 2015.

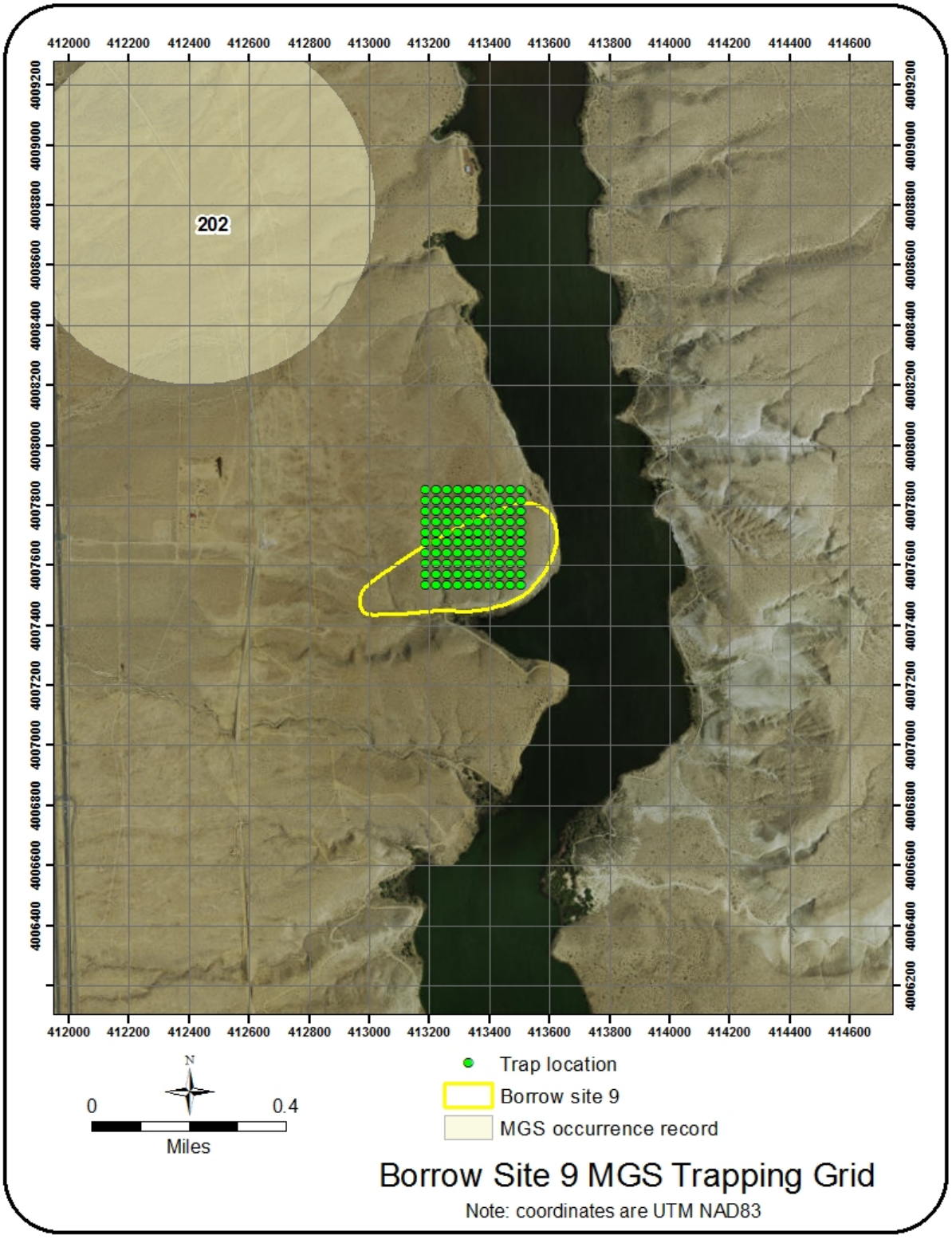


Figure 8. MGS CNDDB occurrence records and trapping grid on borrow site 9, spring 2015.

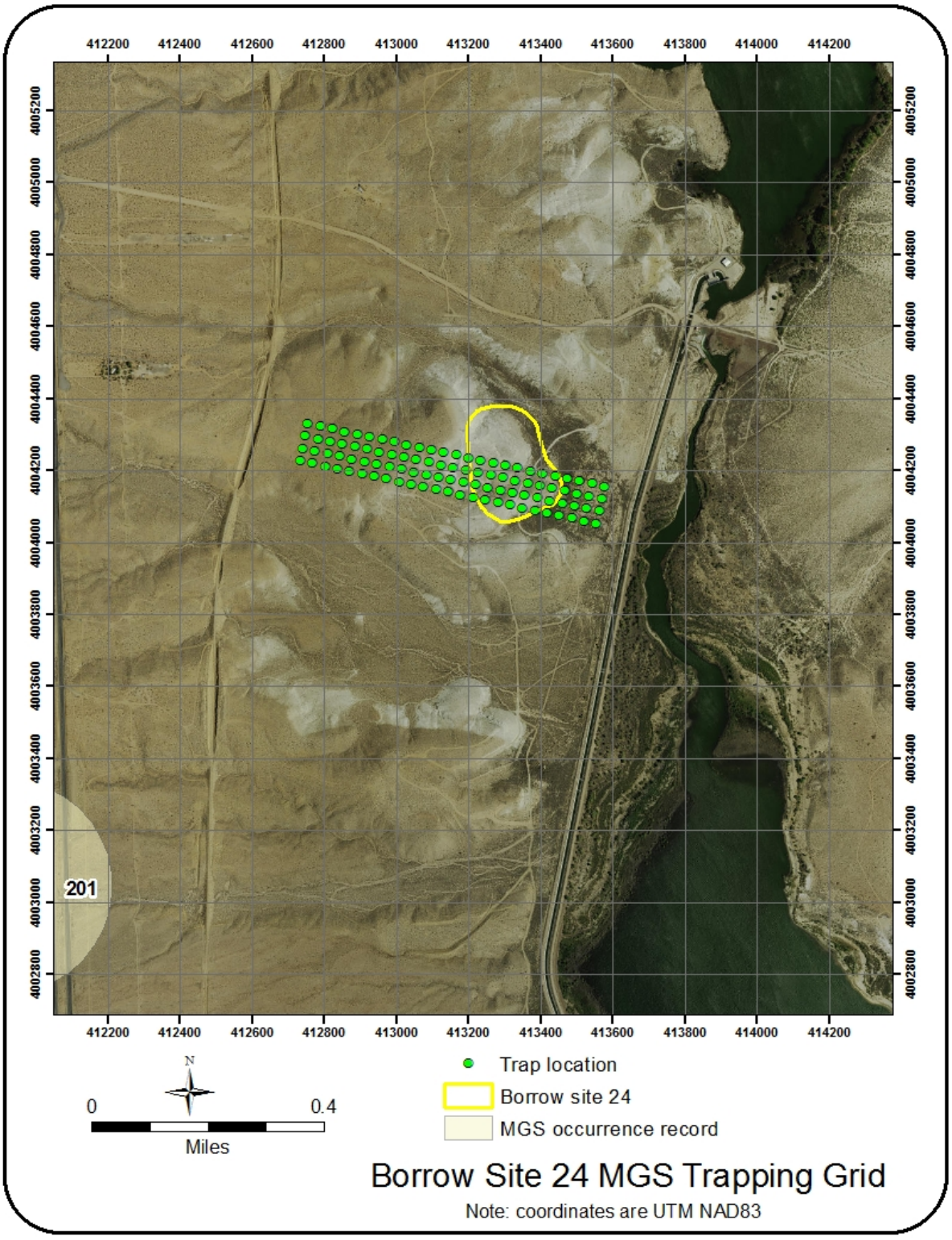


Figure 9. MGS CNDDB Occurrence Records and Trapping Grid on Borrow Site 24, Spring 2015.

Owens Valley Vole

On the Haiwee reservoir shoreline bordering the eastern edge of Site 9 outside of the actual proposed borrow site there is marginal suitable habitat for Owens Valley vole; however, no vole surveys were conducted as there is no suitable habitat present in the currently proposed project area. Small pockets of suitable alkaline-meadow habitat may be present along the riparian shoreline of Haiwee Reservoir, outside of the project area but within the 9-quad CNDDB search.

American Badger and Desert Kit Fox

Surveys for American badger and desert kit fox were conducted during protocol level desert tortoise transect and ZOI surveys. These surveys included visual searches for tracks, scat and burrows. All potential badger/kit fox burrows or other sign were recorded with a GPS unit and mapped using GIS ArcMap. This information will be used to implement a badger/kit fox exclusion plan prior to ground disturbing construction activities.

3.8 Native Resident and Migratory Wildlife

This section addresses 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.

The extent, distribution, and accessibility of suitable habitat affect the long-term viability of native resident and migratory wildlife populations. Fragmentation and isolation of natural habitat ultimately results in the loss of native species within those areas. Accessibility between habitat areas, (i.e., connectivity), is important to long-term genetic diversity and demography of wildlife populations. In the short term, connectivity may also be important to individual animals' ability to occupy their home ranges and utilize nursery sites, if their ranges extend across a potential movement barrier. These considerations apply to all plants and animals. Plant populations "move" over the course of generations via pollen and seed dispersal; most birds and insects travel and disperse via flight; terrestrial species such as small mammals and reptiles disperse across land. Therefore, landscape barriers and impediments are more important considerations for movement of these terrestrial species (Crooks and Sanjayan 2006).

In areas where native habitats exist as partially isolated patches surrounded by other land uses, planning for wildlife movement generally focuses on "wildlife corridors" to provide animals with access routes among habitat patches. In largely undeveloped areas, including southern Owens Valley, wildlife habitat is available in extensive open space areas throughout much of the region, but specific barriers may impede or prevent movement. Opportunity for wildlife movement throughout Owens Valley is impeded by U.S. Highway 395, the LAA and scattered abandoned agricultural lands. Other impediments to wildlife movement within the vicinity of the proposed project include residential land uses such as the Pumice Mine quarry to the east of the project area,

Haiwee reservoir to the south and east of the project area, and active agriculture land at Butterworth Ranch north of the project area. In these landscapes, wildlife movement focuses on specific sites where animals can cross linear barriers (e.g., culverts underneath U.S. Highway 395 or overheads and bridges across the LAA). A few existing linear features, including a network of unpaved roads and transmission line access roads parallel to the highway, provide opportunity and dispersal for wildlife movement. Movement opportunity varies for each species, depending on motility and behavioral constraints, as well as landscape impediments. Some species, such as coyote, may learn to cross the highway safely. But for most terrestrial species the highway presents an impassable or high-risk barrier to east-west movement. Some lizard and mice species may utilize the overheads to cross the LAA but most other terrestrial species will not navigate through these structures. Within the NHD2 project area and associated borrow sites there are a few scattered ephemeral drainages that terrestrial wildlife may utilize. If these drainages are altered by construction activities terrestrial wildlife may have to navigate to other nearby drainages for dispersal and utilization of nursery sites. They may also use thick saltbush scrub as cover outside of these drainages for dispersal pathways.

4.0 Results

This section of the Biological Resources assessment characterizes the environmental baseline conditions for biological resources, within the 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.

4.1 Wetlands and Jurisdictional Areas

A wetland delineation was conducted using the U.S. Army Corps of Engineers' *Arid West Region Supplemental Manual* (USACE 2008) to determine whether the 0.8 acres of tamarisk thicket vegetation alliance approximately 400 feet to the northeast of Haiwee reservoir is a wetland. This tamarisk thicket includes three Fremont cottonwoods (*Populus fremontii*), eight Gooding's willows (*Salix gooddingii)* and eight tamarisk *(Tamarix ramosissima)* and the understory is composed of Torrey's saltbush. Although the dominance test passed indicating the presence of hydrophytic vegetation (i.e. cottonwoods and willows) no primary or secondary indicators were present for hydric soils or wetland hydrology. Because only one of three indicators was identified the area is not a designated wetland. However, this area is designated by the USACE as a riparian tree area and will be impacted by the project as the proposal includes the removal of these trees. Additionally, there are 10 tamarisks and two small Fremont cottonwoods in another tamarisk thicket that are proposed to be removed approximately 1,100 feet west of the riparian tree area (refer to Photos 8 and 9 below). Tamarisk is an invasive species that takes over and out-competes native species. LADWP implements tamarisk eradication programs throughout the Owens Valley to attempt to control the spread of this prolific species. Removal of tamarisk from the project area would benefit this eradication program. Prior to any tree disturbance, nesting bird surveys will be conducted via guidelines of mitigation measure (MM) BIO-4 "Preconstruction Nesting

Surveys" described in this report. If any nesting birds are found, the area will not be disturbed for 300 feet in all directions (500 feet for raptors) until all young have fledged.

There is potential for three ephemeral washes to be impacted by construction activities. The washes at the NHD2 project area and BLM disturbance area are composed of prickly Russian thistle and rubber rabbitbrush. These washes have considerable riverine erosion and deposition from past flash flood events, which explain low species diversity and high propagation by invasive not-native Russian thistle. The ephemeral wash at the BLM disturbance area terminates in the LAA and the wash at theNHD2 fans out and terminates in the site. The wash at borrow site 9 has a higher diversity of plant species compared to the NHD2 project area and BLM disturbance area. However this wash did not appear to have evidence of recent riverine erosion or deposition, which could explain the higher plant diversity. This wash terminates at the Haiwee Reservoir. There is potential for these washes to be impacted by construction activities. Mitigation measures described in this report (MM BIO-1 "Biological Monitor" and MM BIO-11 "Minimize Construction-Related Impacts") will be implemented to ensure that potentially significant impacts to these washes are minimized and avoided.

Photo 8. View looking west at the tamarisk thicket riparian tree area proposed for removal of approximately 0.8 acres of the NHD2, July 2015

Photo 9. View looking west at a tamarisk and two small cottonwoods, in approximately 1,110 feet from the riparian tree area, 2015

4.2 Special Status Natural Communities

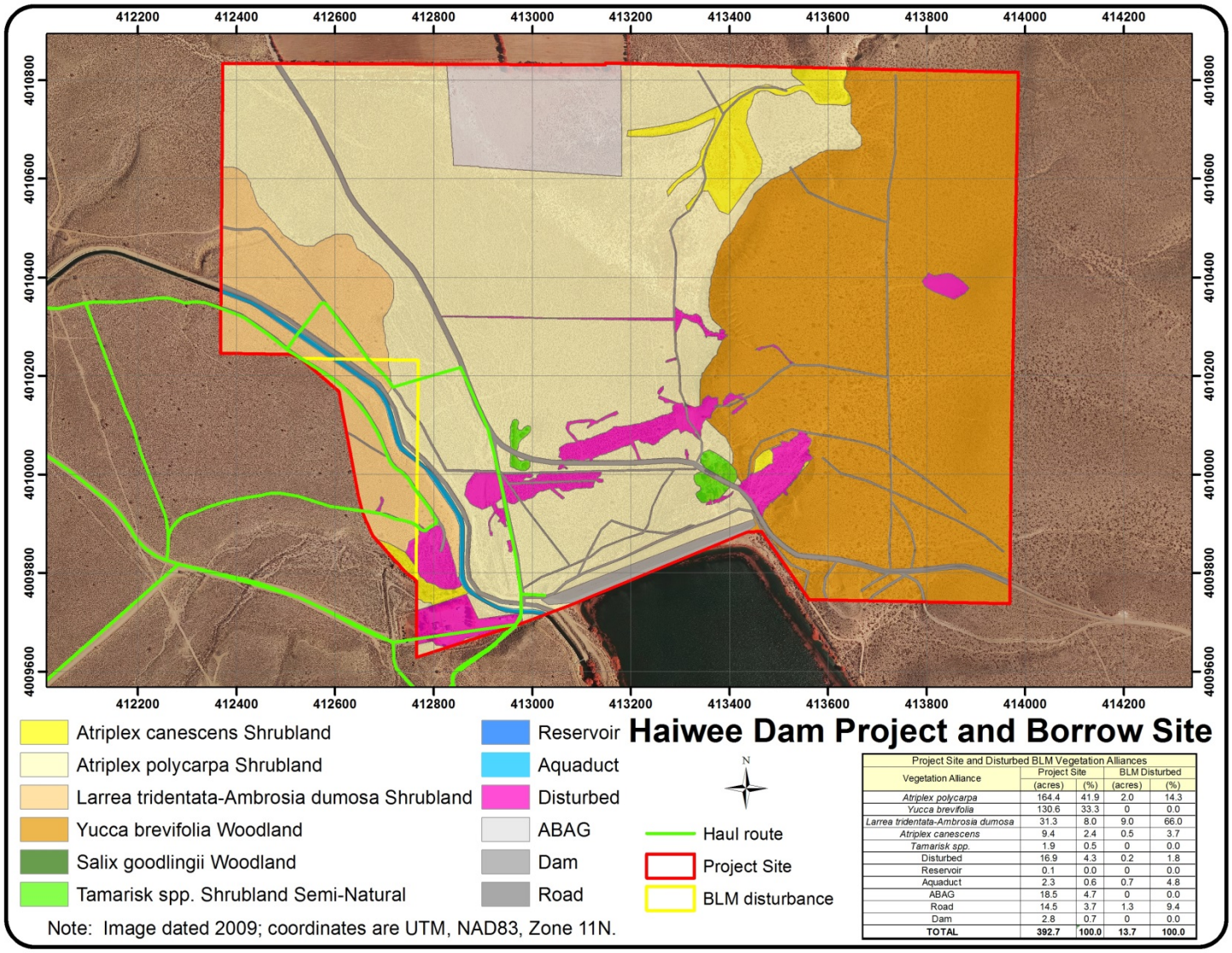
Active Desert Dunes and Big Tree Forest are distinctive native plant communities identified in the nine-quad search around the project area and associated borrow sites. These communities are classified with a State Rank of 2 (imperiled) and 3 (vulnerable) respectively, by the CNDDB (CDFW 2015). No Active Desert Dunes, Big Tree Forest or other special-status natural communities were observed in the project area during field surveys conducted by biologists in 2014-2015. No impacts to these natural communities will occur from the proposed project.

4.3 Natural Communities and Special Status Plants

Plant transect surveys resulted in a compendium of all plant species observed, including special status species, and adhered to the guidelines issued by the USFWS (USFWS 1996), BLM (2009), CDFW (CDFW 2009), and CNPS (CNPS 2001). These surveys focused on the footprint of the NHD2 project area, the borrow sites, and a 50-foot buffer around the project area and along the haul routes. For mapping purposes to depict vegetation alliances and to determine impacts to these alliances in the vicinity of the project area a 1,500 foot (500 meter) buffer was established around the borrow sites and a 750 foot (250 meter) buffer along the haul routes. Acreages from nine vegetation alliances in the NHD2 Project area reported in Table 3 and within the Project area proposed disturbance on BLM property. Figure 10 depicts the vegetation alliances within the NHD2 project area and the BLM disturbance area, along with associated alliance acreages. Figures 11 and 12 show the actual borrow site in yellow and the surrounding vegetation in the buffer designated as various colors. These acreages depict the maximum area that could be potentially impacted by the proposed project, including buffers. Actual project impacts are expected to be less when these large buffers are excluded from consideration. Because the borrow sites are fairly disturbed but have intact margins of good habitat, a buffer was surveyed to include any potential habitat for rare and special-status species that abut the borrow site. The NHD2 project area boundary was used for the complete plant survey area. No buffer was generated around the NHD2 project area.

Table 3. Vegetation Alliance Acreage within the Project Site, Spring 2015

Vegetation Alliances on the Project Site and Proposed Disturbance Area on BLM property				
Vegetation Alliance	Project Site		BLM Disturbed	
	(acres)	(%)	(acres)	(%)
Atriplex polycarpa	164.4	41.9	2.0	14.3
Yucca brevifolia	130.6	33.3	0	0.0
Larrea tridentata-Ambrosia dumosa	31.3	8.0	9.0	66.0
Atriplex canescens	9.4	2.4	0.5	3.7
Tamarisk spp.	1.9	0.5	0	0.0
Disturbed	16.9	4.3	0.2	1.8
Reservoir	0.1	0.0	0	0.0
Aquaduct	2.3	0.6	0.7	4.8
ABAG	18.5	4.7	0	0.0
Road	14.5	3.7	1.3	9.4
Dam	2.8	0.7	0	0.0
TOTAL	**392.7**	**100.0**	**13.7**	**100.0**



Project Site and Disturbed BLM Vegetation Alliances

Vegetation Alliance	Project Site		BLM Disturbed	
	(acres)	(%)	(acres)	(%)
Atriplex polycarpa	164.4	41.9	2.0	14.3
Yucca brevifolia	130.6	33.3	0	0.0
Larrea tridentata-Ambrosia dumosa	31.3	8.0	9.0	66.0
Atriplex canescens	9.4	2.4	0.5	3.7
Tamarisk spp.	1.9	0.5	0	0.0
Disturbed	16.9	4.3	0.2	1.8
Reservoir	0.1	0.0	0	0.0
Aquaduct	2.3	0.6	0.7	4.8
ABAG	18.5	4.7	0	0.0
Road	14.5	3.7	1.3	9.4
Dam	2.8	0.7	0	0.0
TOTAL	**392.7**	**100.0**	**13.7**	**100.0**

Figure 10. Vegetation alliances within the NHD2 project site and BLM Disturbance Area, spring 2015.

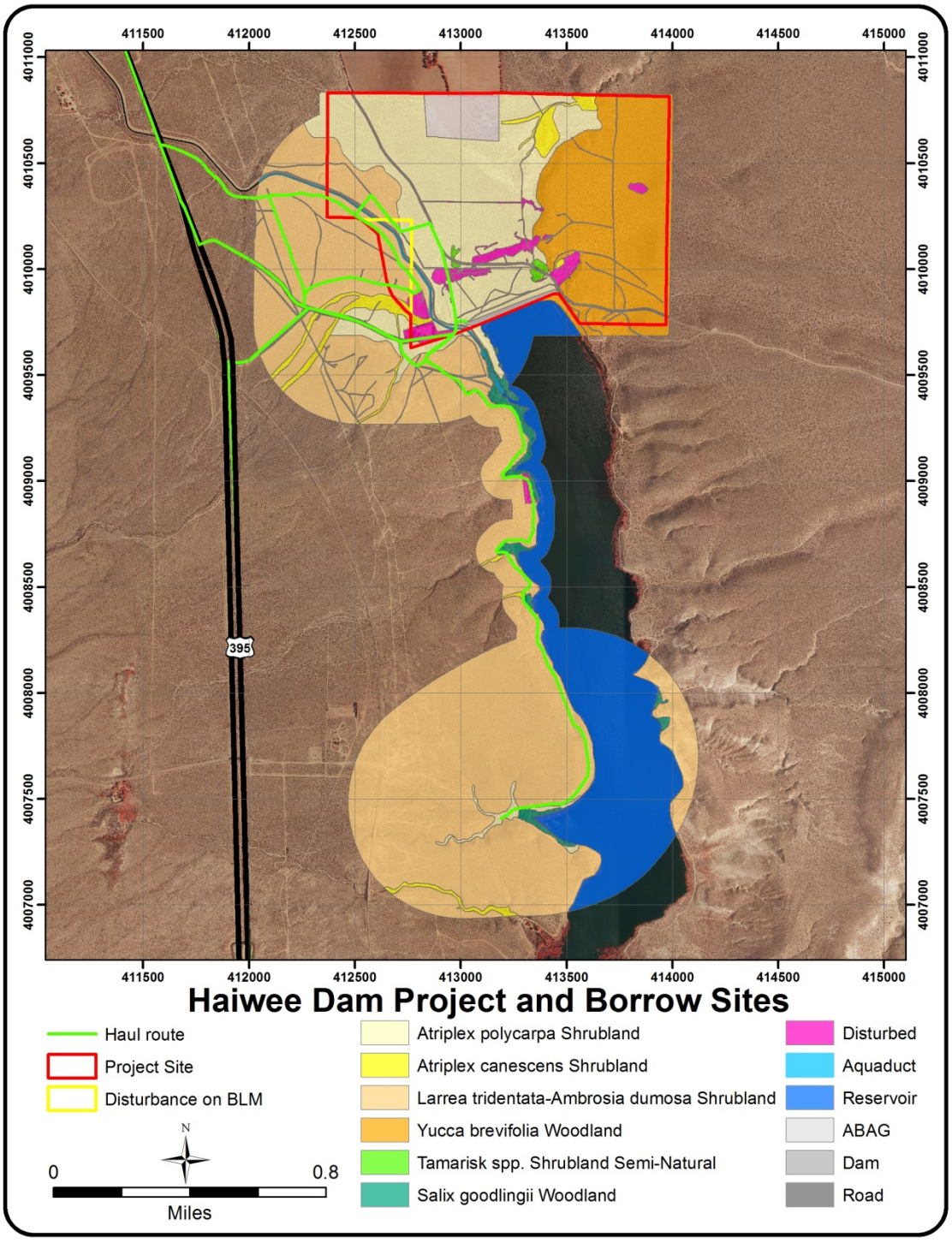


Figure 11. Vegetation alliances within the vicinity of the project area with a 1,500-foot (500 meter) buffer established around the borrow sites and a 750 foot (250-meter) buffer along the haul routes, spring 2015.

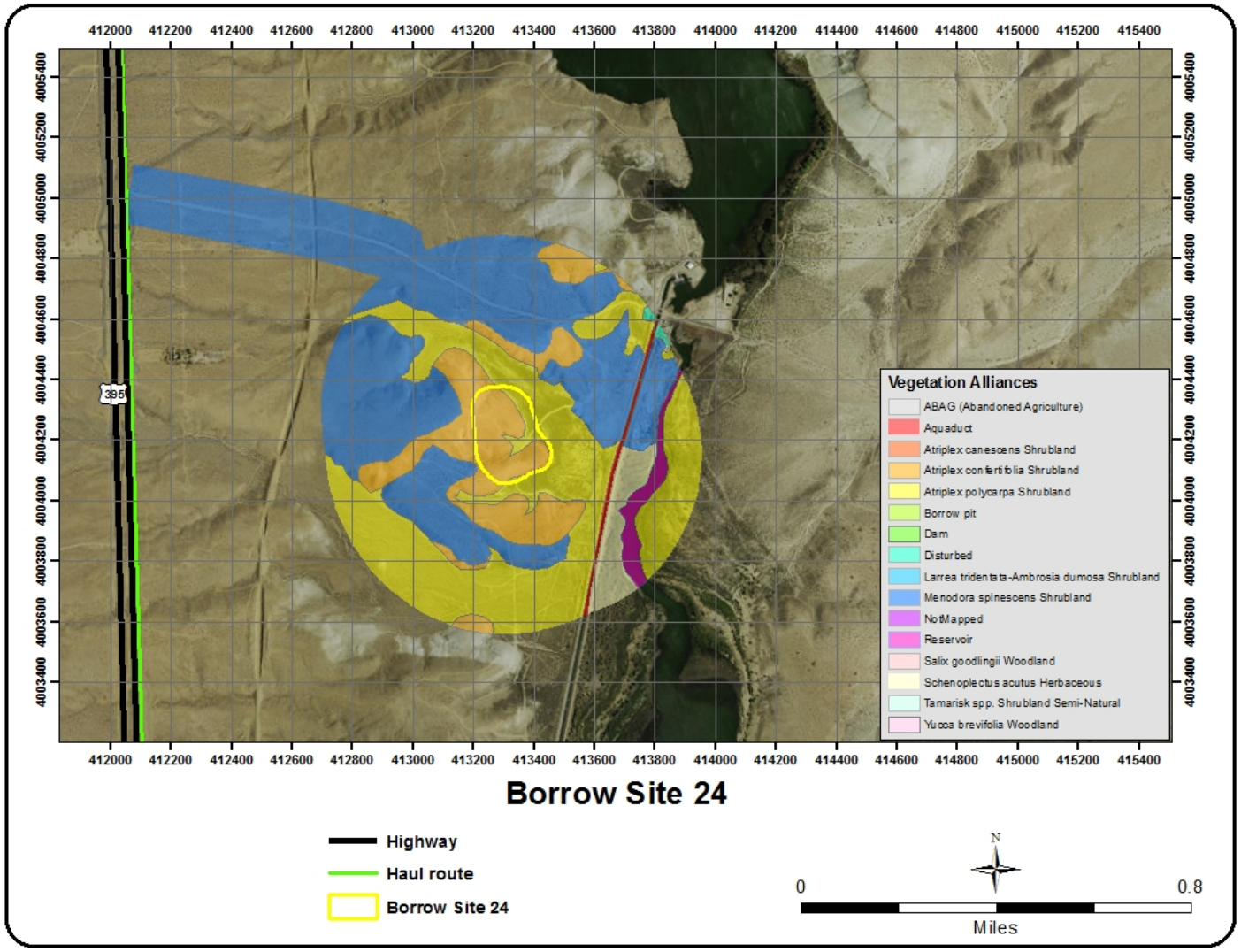


Figure 12. Vegetation alliances within the vicinity of the project area with a 1,500 foot (500 meter) buffer established around borrow site 24 and a 750 foot (250 meter) buffer along the haul route, spring 2015.

A comprehensive species list was generated for all species identified during three plant transect surveys conducted on March 16-18, April 20-21, and May 18, 2015, which resulted in 131 plant species (Table 4). Only one special status species, sanicle cymopterus (*Cymopterus ripleyi var. saniculoides*), was identified within the project area. This species has a CNPS 1B.2 status and is also a BLM sensitive species. The plant was found during the second survey, on April 20, 2015, in two locations. Seven plants were recorded on the eastern edge of the NHD2 project area in the flats and one plant was found along the Cactus Flat Road re-alignment, on the bench along the existing road. There is potential for this species to be impacted by project construction; however implementation of MM BIO-7 "Special-Status Plant Species Surveys" will reduce and avoid significant impacts to this plant.

Even though the three plant survey windows followed the fourth consecutive year of drought in the area, spring temperatures and rain provided favorable conditions to conduct surveys. Plant transect surveys resulted in 131 species, including annuals and perennials, and one special status species, sanicle cymopterus. However, due to the below average winter rainfall and high early spring temperatures, annual and perennial species became stressed. Some perennial shrubs did not exhibit new growth. The three survey periods conducted captured the range of phenology and species present within the project area. The first survey quickly generated a large species list. The second survey was important to identify species that were then in flower or fruit making keying possible. These species were unidentifiable during the first survey window. In the third survey window no new species were identified. Even though this is the fourth year of drought, surveys identified both annual and perennial species present within the project area.

Table 4. Plant Species List generated from three plant transect surveys conducted within the project area, 2015

Site	Common Name	Species
NHD2	Mojave sand verbena	*Abronia pogonantha*
9	rayless goldenhead	*Acamptopappus sphaerocephalus*
NHD2	Indian ricegrass	*Achnatherum hymenoides*
NHD2	desert needlegrass	*Achnatherum speciosum*
NHD2	dainty gilia	*Aliciella micromeria*
9	fringed onion	*Allium fimbriatum*
NHD2/BLM Disturbance	onion	*Allium sp.*
24	flatspine bur ragweed	*Ambrosia acanthicarpa*
NHD2	burrobush	*Ambrosia dumosa*
NHD2	bristly fiddleneck	*Amsinckia tessellata*
NHD2	wolly easterbonnets	*Antheropeas wallacei*
NHD2	rockcress	*Arabis sp.*
NHD2	big sagebrush	*Artemisia tridentata*
NHD2	freckled milkvetch	*Astragalus lentiginosus*

Site	Common Name	Species
NHD2/BLM Disturbance	Fremont's milkvetch	*Astragalus lentiginosus* var *fremontii*
NHD2	milkvetch	*Astragalus sp.*
24	milkvetch	*Astragalus sp.*
NHD2	fourwing saltbush	*Atriplex canescens*
NHD2	shadescale saltbush	*Atriplex confertifolia*
NHD2	cattle salbush	*Atriplex polycarpa*
NHD2	Torrey's saltbush	*Atriplex torreyi*
NHD2	woolly desert marigold	*Baileya pleniradiata*
NHD2	mustard	*Brassica sp.*
NHD2	cheatgrass	*Bromus tectorum*
NHD2	desert mariposa lily	*Calochortus kennedyi*
NHD2	Booth's evening primroses	*Camissonia boothii*
BLM Disturbance	Mojave suncup	*Camissonia campestris*
NHD2	browneyes	*Camissonia claviformis*
NHD2	suncup	*Camissonia sp.*
9	exserted Indian paintbrush	*Castilleja exserta*
9	Indian paintbrush	*Castilleja sp.*
NHD2	Cooper's wild cabbage	*Caulanthus cooperi*
BLM Disturbance	red triangles	*Centrostegia thurberi*
NHD2	pincushion flower	*Chaenactis fremontii*
24	bighead dustymaiden	*Chaenactis macrantha*
9	brittle spineflower	*Chorizanthe brevicornu*
NHD2/BLM Disturbance	wrinkled spineflower	*Chorizanthe corrugata*
NHD2	Mojave spineflower	*Chorizanthe spinosa*
9	common pussypaws	*Cistanthe monandra*
9	blackbrush	*Coleogyne ramosissima*
BLM Disturbance	birds-beak	*Cordylanthus sp.*
NHD2/BLM Disturbance	Bigelow's tickseed	*Coreopsis bigelovii*
NHD2	cushion cryptantha	*Cryptantha circumscissa*
NHD2	redroot cryptantha	*Cryptantha micrantha*
NHD2	scented cryptantha	*Cryptantha utahensis*
NHD2/BLM Disturbance	desert dodder	*Cuscuta denticulata*
NHD2	Wiggin's cholla	*Cylindropuntia echinocarpa*
NHD2	desert springparsley	*Cymopterus deserticola*
NHD2	Ripley's springparsley	*Cymopterus ripleyi*
9	desert larkspur	*Delphinium parishii*

Site	Common Name	Species
NHD2	western tansymustard	*Descurainia pinnata*
NHD2	bluedicks	*Dichelostemma capitatum*
NHD2	saltgrass	*Distichlis spicata*
9	brittle spineflower	*Chorizanthe brevicornu*
NHD2/BLM Disturbance	wrinkled spineflower	*Chorizanthe corrugata*
9	desert larkspur	*Delphinium parishii*
NHD2	western tansymustard	*Descurainia pinnata*
NHD2	bluedicks	*Dichelostemma capitatum*
NHD2	saltgrass	*Distichlis spicata*
NHD2	California shieldpod	*Dithyrea californica*
24	squirreltail	*Elymus elymoides*
NHD2	Acton's brittlebush	*Encelia actonii*
NHD2	Nevada jointfir	*Ephedra nevadensis*
NHD2	mormon tea	*Ephedra virdis*
NHD2	white mallow	*Eremalche exlilis*
NHD2	miniature woollystar	*Eriastrum diffusium*
NHD2	Cooper's goldenbush	*Ericameria cooperi*
NHD2	narrowleaf goldenbush	*Ericameria linearifolia*
NHD2	rubber rabbitbrush	*Ericameria nauseosa*
9	Eastern Mojave buckwheat	*Eriogonum fasciculatum*
24	Heermann's buckwheat	*Eriogonum heermannii*
9	desert trumpet	*Eriogonum inflatum*
NHD2	buckwheat	*Eriogonum sp.*
BLM Disturbance	Pringle's woolly sunflower	*Eriophyllum pringlei*
9	redstem stork's bill	*Erodium cicutarium*
NHD2	pygmy poppy	*Escholzia minutiflora*
NHD2	showy gilia	*Gilia cana*
NHD2	carveseed	*Glyptopleura marginata*
NHD2	spiny hopsage	*Grayia spinosa*
NHD2	broom snakeweed	*Gutierrezia sarothrae*
NHD2	burrobush	*Hymenoclea salsola*
NHD2	winterfat	*Krascheninnikovia lanata*
NHD2	creosote bush	*Larrea tridentata*
NHD2/BLM Disturbance	whitedaisy tidytips	*Layia glandulosa*
NHD2	yellow pepperweed	*Lepidium flavum*
NHD2	desert pepperweed	*Lepidium fremontii*
NHD2	golden linanthus	*Leptosiphon aureus*
NHD2	desert calico	*Loeseliastrum matthewesii*
NHD2/BLM	Mojave desertparsley	*Lomatium mohavense*

Site	Common Name	Species
Disturbance		
9	Nevada biscuitroot	*Lomatium nevadense*
NHD2	desertparsley	*Lomatium sp.*
NHD2	Mojave lupine	*Lupinis odoratus*
NHD2	lupine	*Lupinus sp.*
NHD2	water jacket	*Lycium andersonii*
NHD2	peach thorn	*Lycium cooperi*
9	snake's head	*Malacothrix coulteri*
NHD2	smooth desertdandelion	*Malacothrix glabrata*
NHD2	alkali mallow	*Malvella leprosa*
NHD2	spiny mendora	*Menodora spinescens*
NHD2	shining blazingstar	*Mentzelia nitens*
24	blazingstar	*Mentzelia sp.*
NHD2	wishbone-bush	*Mirabilis leavis var. villosa*
NHD2	four o'clock	*Mirabilis sp.*
NHD2	Mojave desertstar	*Monoptilon bellioides*
BLM Disturbance	purplemat	*Nama demissum*
NHD2	beavertail pricklypear	*Opuntia basilaris*
9	roundleaf oxytheca	*Oxytheca perfoliata*
24	beardtongue	*Penstemon sp.*
9	twocolor phacelia	*Phacelia bicolor*
NHD2	Fremonts phacelia	*Phacelia fremontii*
NHD2	bud sagebrush	*Picrothamnus desertorum*
NHD2	Freemont cottonwood	*Populus fremontii*
24	desert peach	*Prunus andersonii*
NHD2	Johnson's indigobush	*Psorothamnus arborescens var. minutifolius*
NHD2	Nevada dalea	*Psorothamnus polydenius*
NHD2	antelope bitterbrush	*Purshia tridentata*
NHD2	New Mexica plumeseed	*Rafinesquia neomexicana*
BLM Disturbance	Datura wrightii	*sacred thorn-apple*
NHD2	red willow	*Salix laevigata*
NHD2	prickly Russian thistle	*Salsola tragus*
NHD2	chia	*Salvia columbariae*
NHD2	Arabian schismus	*Schismus arabicus*
NHD2	desert globemallow	*Sphaeralcea ambigua*
24	desert princesplume	*Stanleya pinnata*
NHD2	small wirelettuce	*Stephanomeria exigua*
NHD2	brownplume wirelettuce	*Stephanomeria pauciflora*
24	desert snowberry	*Symphoricarpus longiflorus*

Site	Common Name	Species
NHD2	tamarisk	*Tamarix ramosissima*
NHD2	longspine horsebush	*Tetradymia axillaris*
9	Mojave cottonthorn	*Tetradymia stenolepis*
NHD2	fanleaf crinklemat	*Tiquilia plicata*
24	threehearts	*Tricardia watsonii*
9	Mojave woodyaster	*Xylorhiza tortifolia*
NHD2	Joshua tree	*Yucca brevifolia*

The proposed disturbance area on BLM property is dominated by creosote-burrobush shrubland. However, there are some Joshua trees scattered within this disturbance area. All Joshua trees within the BLM disturbance area were identified using high resolution aerial imagery. The canopy of each Joshua tree was delineated using heads up digitizing to create a shapefile in ArcGIS. Depending on the size of the canopy, a buffer was applied to the shapefile to encompass the entire canopy of each Joshua tree. The buffer was then used to calculate area of canopy cover within the BLM disturbance area. The area of canopy was then divided by the total area of the proposed disturbance area on BLM property and then multiplied by 100 to calculate percent cover of Joshua tree canopy cover. The total Joshua tree canopy cover within the proposed disturbance area on BLM property was calculated to be 0.5%.

In accordance with the California Desert Native Plants Act, Joshua trees will be salvaged as identified in MM Bio-15. Salvage procedures will be further specified per BLM guidance in a separate salvage and revegetation plan document.

Special Status Wildlife

This section describes the results of focused surveys conducted in fall 2014 and spring/summer 2015 for special status wildlife and includes a determination of their potential to occur in the project area.

4.3.1 Insects

San Emigdio blue butterfly

During opportunistic surveys conducted during Mohave ground squirrel trapping and rare plant surveys, no San Emigdio blue butterflies were found in the project area; however, cabbage white butterflies (*Pieris rapae)* and painted lady butterflies (*Vanessa cardui)* were observed in abundance from March-April 2015.

4.3.2 Reptiles

Desert Tortoise

Weather conditions during desert tortoise surveys varied from clear and calm to partly cloudy and breezy. Temperatures ranged from 46-84 degrees Fahrenheit. No

precipitation occurred during the field surveys. Elevation within the project area ranged from 3,400 feet to 5,200 feet.

No live desert tortoises were observed during focused protocol level belt transect surveys in the proposed project NHD2 site, borrow sites, haul routes or ZOI's. Additionally, no positive desert tortoise sign was observed, which includes class 1-3 burrows, scat, tracks, shells or disarticulated shell fragments. Approximately four class 4 (good condition; possibly desert tortoise) and 13 class 5 (deteriorated condition; this includes collapsed burrows; possibly desert tortoise) were observed during belt transect surveys (Table 5, Figures 12-14). Class 4 and class 5 burrows are identified as unknown burrows. Some of these burrows had the appropriate crescent shape and size, but no other definitive desert tortoise sign was found. For this reason, these burrows can only be considered to be of possible tortoise origin. Due to lack of any associated sign (i.e. scat, tracks, shell fragments, etc) around these burrows or within their surrounding habitat, it is presumed that they were either inactive or occupied by wildlife species other than desert tortoise. There were hundreds of old and abandoned American badger and canid burrows scattered throughout the NHD2 project area. Sign such as scat, was found for these species; however a majority of the burrows were either inactive or being utilized by woodrats and rabbits.

Table 5. Unknown Burrows Identified as Classes 4 and 5 Burrows during October 2014 Belt-Transect Surveys

Project Site	Class 4	Class 5
NHD2	2	9
9	0	0
BLM Disturbance	0	0
24	1	3
24 haul route	1	1
Total	**4**	**13**

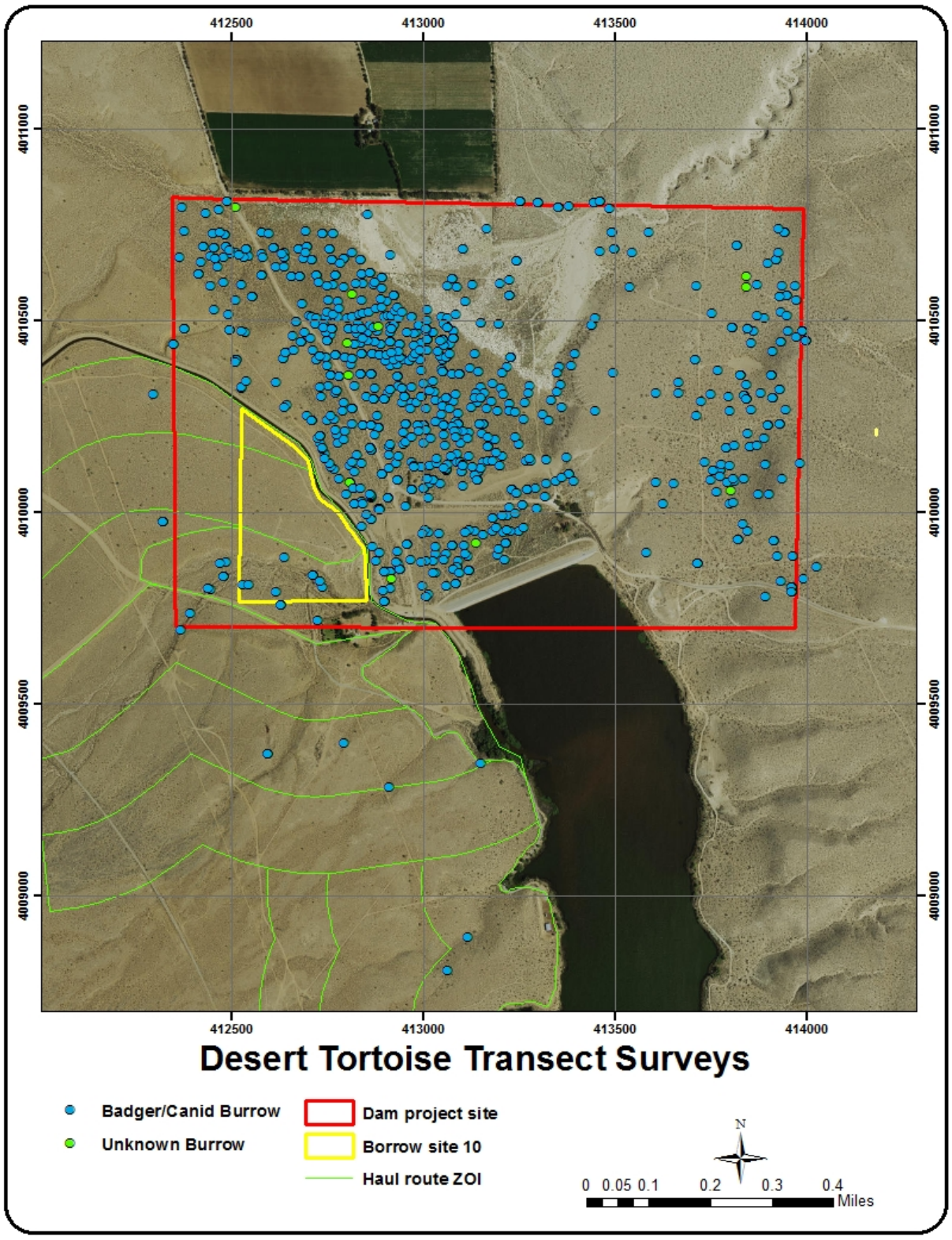


Figure 13. Desert tortoise transect surveys - NHD2 project area and haul route, October 2014.

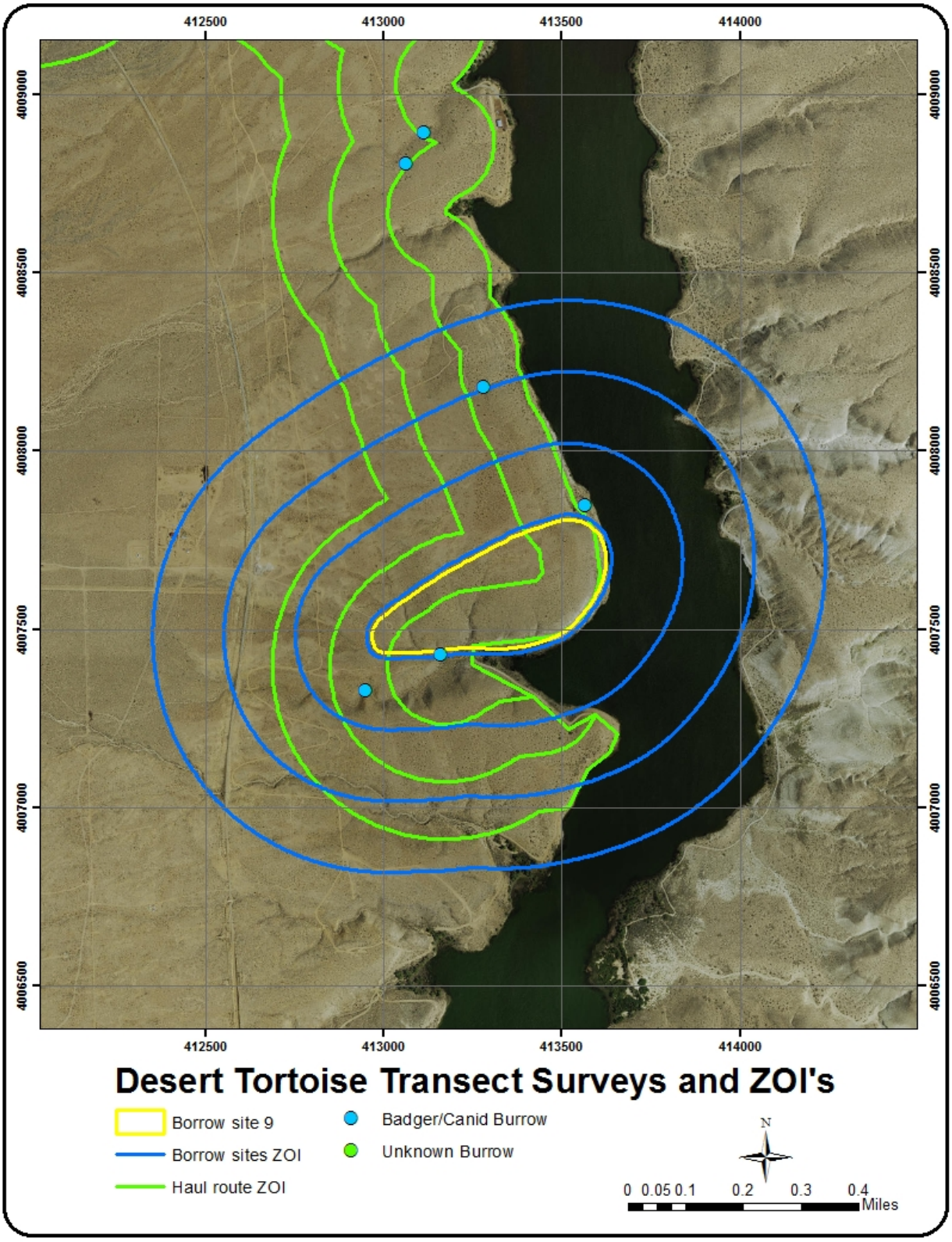


Figure 14. Results of desert tortoise transect surveys at borrow site 9, October 2014. The few burrows found present were that of American badger or canid.

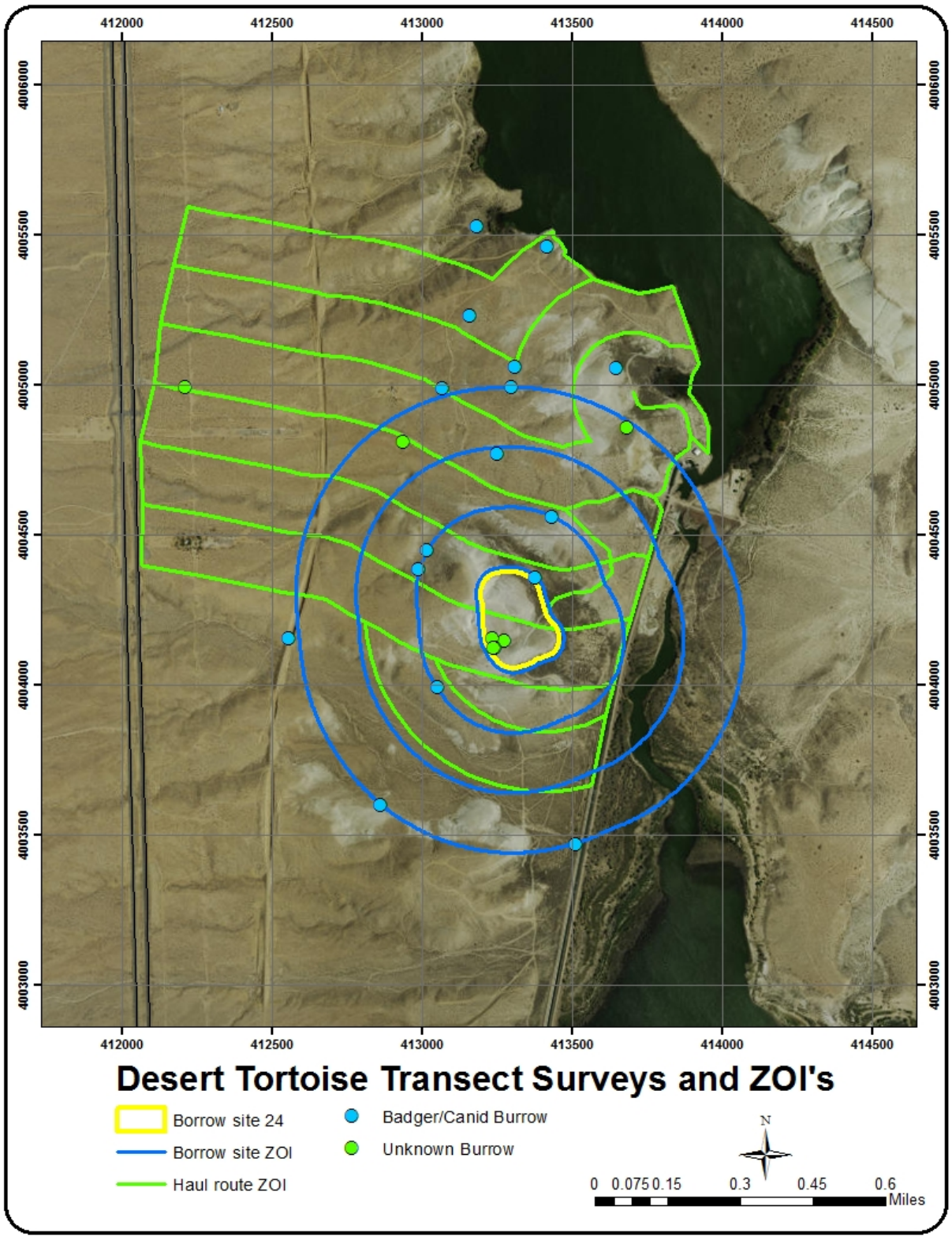


Figure 15. Results of desert tortoise transect surveys at borrow site 24, October 2014. The few burrows found in the borrow site were unknown burrows in deteriorated condition.

The absence of Desert tortoise sign, combined with no identification of live tortoises in any of the project area surveys, indicate that the probability of desert tortoises inhabiting the project area is low. However, due to presence of suitable habitat and prior CNDDB records indicating presence of tortoise in the project area, the probability of occurrence is not unlikely. The CNDDB includes four records within the nine-quad database search around the proposed NHD2 in 2006. These records indicate that at least six individuals (five adults and one juvenile) were observed at four sites including occurrence #252, #253, #254 and #255 just north of Haiwee reservoir road, at the south end of south Haiwee reservoir. Additionally, one individual desert tortoise was observed in 2009 along the Los Angeles Aqueduct, about 2.2 miles north-northwest of Cartago between the Owens Lake and the Golden Trout Wilderness (CDFW 2015).

The presence of U.S. Highway 395 has possibly reduced habitat suitability and increased habitat fragmentation adjacent to the highway relative to natural conditions, though it likely does not preclude movement of tortoise that may be present within the project area away from the highway. Past desert tortoise occurrence records may be indicative that a small population of desert tortoise existed in the project area. However, individuals would most likely have experienced increased mortality from vehicles along the highway and from attempts to cross the highway. Studies of tortoise presence along highways reveal that tortoise densities (and sign) increase farther from the highway and high-volume highways can result in decreases in tortoise sign up to 13,000 feet (4,000 meters) from highways (Hoff and Marlow 2002). The entire project area is located within 2,000 to 5,000 feet of the U.S. Highway 395, which experiences near-continuous traffic.

There is no designated critical habitat for desert tortoise in the project area. However, the Mojave population of desert tortoise is divided into five recovery units in the Desert Tortoise Revised Recovery Plan (USFWS 2011). Recovery units were defined on the basis of geographic barriers that coincide with observed variation among tortoise populations. The project area is located on the northern boundary of the Western Mojave recovery unit (USFWS 2011, WEMO 2005). The recovery objectives identified in the Revised Recovery Plan revolve around the concept of the recovery unit. These objectives include: maintain self-sustaining populations of desert tortoises within each recovery unit into the future; maintain well-distributed populations of desert tortoise throughout each recovery unit; ensure that habitat within each recovery unit is protected and managed to support long-term viability of desert tortoise populations. The project will not significantly impact the objectives of the recovery plan as desert tortoise and/or sign have not been observed within the project area. Furthermore, the implementation of minimization and avoidance measures described in this report such as MM BIO-1 “Biological Monitor,” MM BIO-2 “Worker Education Training” and MM BIO-3 “Special Status Wildlife Surveys” will ensure that no impacts occur to desert tortoise if incidentally observed walking through the project area.

Northern Sagebrush Lizard

During opportunistic visual surveys conducted for desert tortoise transect surveys, nesting bird and raptor surveys as well as Mohave ground squirrel trapping surveys, no northern sagebrush lizards were found present in the project area. Common lizard species observed included Great Basin whiptails, western side-blotched lizards, yellow-backed spiny lizards and southern desert horned lizards.

Panamint Alligator Lizard

During opportunistic visual surveys conducted for desert tortoise transect surveys, nesting bird and raptor surveys as well as Mohave ground squirrel trapping surveys, no Panamint alligator lizards were found present in the project area. Although there is potentially suitable habitat within the vicinity of the project area along the Haiwee reservoir shoreline, there is no suitable habitat present in the project area.

4.3.3 Birds

Burrowing Owl

Even though the highest density of burrows was at the NHD2 project area, it was predominantly covered in mature dense, *Atriplex* spp. Since burrowing owls require open habitat, it was determined that surveys would not be needed in most of this project area. Some areas within the NHD2 that were more open were selected for occupancy surveys. Those areas included the eastern slope, the bluff on the west side, the edges of the aqueduct and Cactus Flats Road. There was a prior record of a burrowing owl sighting on Cactus Flats Road, near the northern boundary of the project area. Occupancy surveys were conducted at this site along Cactus Flats Road, the edge of the aqueduct, and the slope on the east side and the western bluff.

Most of borrow site 9 consists of rock outcrop, with the exception of a dense stand of *Ericameria* spp. growing along the entrance road. A field assessment was conducted at this site due to the CNDDB record of 8 burrowing owl sightings along Coso Junction Road, 4 miles to the south. This site consists of dense *Ericameria* spp. and *Atriplex* spp., and very few burrows were found. It was determined no habitat is present therefore no field assessment was required at this site. Borrow Site 24 is comprised of steep hills with dense shrub cover at the slope bottoms and flats and the landscape is barren on the hill tops. Very few burrows were found at these sites and the soil on the barren hilltops, which was classified as white residuum, is not conducive to burrowing owl habitat.

Burrowing owl occupancy surveys were only conducted at the NHD2 project area because suitable habitat was not present within the borrow sites. Although four occupancy surveys were conducted, no burrowing owls or sign were found. Burrowing owl is not as prevalent in the Owens Valley as it is in the Central Valley. Sightings are often inconsistent, meaning that an owl sighted one year may not be there the following year. Some of the areas covered during the survey were similar to burrowing owl habitat in the Central Valley, but no owls were present. No burrowing owl sign was

found, indicating that the owls have not occupied the area for years. However, individuals could migrate to the area in later years. Occupancy surveys will take place again prior to project construction via MM BIO-3 "Special Status Wildlife Surveys." If any burrowing owls are found avoidance measures will be implemented in accordance with the Department of Fish and Game 2012 Staff Report on Burrowing Owl Mitigation to reduce any potential impacts to burrowing owl to less than significant levels.

Raptor Surveys

The first raptor survey was conducted on February 11, 2015. A golden eagle was present at the southern end of the Haiwee reservoir where they nested in 2014. This appears to be an established nesting location as there were approximately seven old nests scattered across the cliff face. No eagles were nesting during this survey. Because this nesting location is south of the dam at south Haiwee reservoir, no impacts are anticipated and disturbance to nesting eagles should be minimal. No other raptors were observed during this survey.

The second raptor survey was conducted on April 16, 2015. Species encountered during this survey included bald eagle, golden eagle, osprey, ferruginous hawk, red-tailed hawk, sharp-shinned hawk, prairie falcon, American kestrel, barn owl, and great horned owl. Several raptor nests were found as well. The pair of golden eagles that nested south of the dam at south Haiwee Reservoir in 2014 were found nesting but were using a different nest farther up the cliff face. The nest was in the incubation stage. Another pair of golden eagles was observed soaring near the Butterworth Ranch, north of the NHD2 site. Two second year bald eagles were observed foraging over the north and south reservoirs. An adult osprey was observed foraging over the north reservoir and a male northern harrier was observed foraging over a wet meadow south of the south Haiwee dam. An adult ferruginous hawk was also seen at the south reservoir. Additionally, five red-tailed hawks were observed and two nests were found during the survey. One nest was at the Butterworth Ranch and the other was at the south Haiwee reservoir. Both nests were in the incubation stage. No Swainson's hawks were present at the Butterworth Ranch. An immature sharp-shinned hawk was found in the tamarisk stand in the southeast corner of the NHD2 project area. A pair of American kestrels was seen copulating in the riparian tree stand in the southeast corner of the NHD2 and a prairie falcon was observed flying near the north reservoir. A great horned owl was seen below the south Haiwee dam in a cottonwood, and it is probable that it was nesting in the cliffs nearby. Two great horned owl nests were found in cottonwoods on the west shore of the north Haiwee reservoir. One had two nestlings, and the other had 3 nestlings. A barn owl flushed from a cavity in the bank at the LAA1 inlet, just south of the NHD2 project area. This owl was seen on several occasions throughout the spring and early summer and was probably nesting nearby.

The third raptor survey was conducted on May 13, 2015. Species encountered during the survey included osprey, northern harrier, bald eagle, golden eagle, red-tailed hawk, American kestrel, Cooper's hawk, and great horned owl. Additionally, two new red-tailed hawk nests were found. A small downy chick was seen in the golden eagle nest south of the dam at south Haiwee reservoir. A first year bald eagle was seen at the

north reservoir. The osprey found during the first survey was still present at the north reservoir. A male northern harrier was observed foraging within the south Haiwee reservoir. Seven red-tailed hawks were seen and three nests were found during the survey. Two nests were found at Merritt Cut, and one nest was found south of the south Haiwee dam. The nest at the Butterworth Ranch did not appear to have anything in it. A pair of red-tailed hawks was exhibiting courtship display nearby. The other red-tailed hawk nest found during the previous survey had small white downy chicks, possibly 3 weeks old. Three immature Swainson's hawks were found at the Butterworth Ranch. Three recently fledged great horned owls were encountered in the Merritt Cut riparian zone under a large nest in a cottonwood. A Cooper's hawk flew out of a group of cottonwoods in the same riparian zone, making alarm calls, but the nest was not found. A pair of American kestrels in the same area appeared to be nesting, as they were displaying alarm calls. An American kestrel nest was found in the riparian tree stand at the NHD2 project area.

The fourth raptor survey was conducted on July 1, 2015. No additional raptors were observed at this time. The osprey was still present, perched near the south Haiwee Dam. Four barn owl fledglings were encountered in the LAA1 inlet riparian zone. They apparently fledged from the nest cavity that was discovered during the second survey. All of the red-tailed hawk nests were empty. Adult and juvenile red-tailed hawks were encountered throughout the north and south reservoirs. Most were perched in the riparian zones along the shore. Some juveniles were observed begging for food. They must have fledged in June. American kestrel fledglings were encountered at the NHD2 project area, the Merritt Cut, and south of the south Haiwee dam. This is evidence that there were three active nests where Kestrels were seen during previous surveys. Great horned owls were encountered in almost every riparian zone. There were four at the Merritt Cut riparian zone. It is assumed that they fledged in April, since all nests were empty during the April survey. The golden eagle nest at the southern Haiwee reservoir was empty. No eagles were present in this area. Perhaps the nestling fledged in June and dispersed. A prairie falcon was seen perched on an outcrop northwest of the eagles nest. A Cooper's hawk flew out of the same group of cottonwoods in the Merritt Cut riparian zone making alarm calls. Again, no nest was found, but due to the alarm calls a nest or fledglings may have been present. An immature golden eagle was seen on the north shore of the north Haiwee reservoir. Raptor survey results are consolidated in Table 6 and raptor nest locations are depicted in Figure 15.

Table 6. Raptor survey results from four surveys conducted during spring and summer, 2015 at the Haiwee reservoir and project area.

Species	Total	Nests
Northern Harrier	1	Potentially nesting
Cooper's Hawk	1	Potentially nesting
Sharp-shinned Hawk	1	No evidence of nesting
Swainson's Hawk	3	No evidence of nesting
Red-tailed Hawk	9	5
Ferruginous Hawk	1	No evidence of nesting
Golden Eagle	5	1
Bald Eagle	3	No evidence of nesting
Osprey	1	No evidence of nesting
American Kestrel	6	3 (1 within project footprint)
Prairie Falcon	1	No evidence of nesting
Barn Owl	4	1
Great Horned Owl	7	4

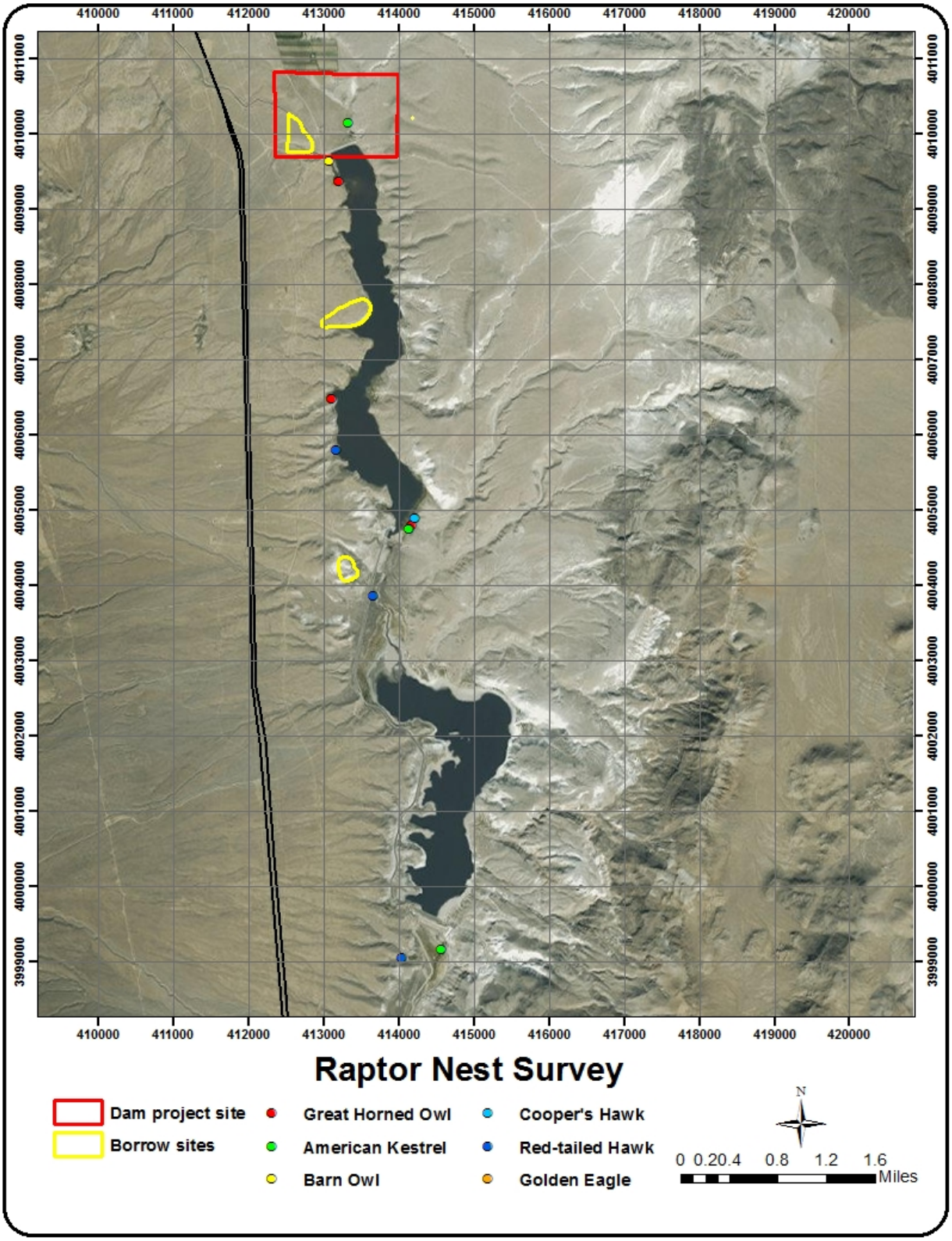


Figure 16. Raptor nest survey results from four surveys conducted during spring and summer, 2015.

The majority of raptors encountered were nesting in areas that are outside of the project area and will not be disturbed. The Merritt Cut riparian zone is probably the most productive raptor nesting area at the Haiwee reservoir. That area will not be impacted by the proposed project, as it is 3.5 miles south of the NHD2 project area. Two raptor nesting sites, however, have the potential to be affected by the project. These include the LAA Inlet (just south of the NHD2 project area) and the riparian tree stand in the southeast corner of the NHD2 project area. The extent of impacts to the LAA riparian zone has yet to be determined within the LAA. Construction in the area may prevent barn owls previously utilizing the area from using that site. The small riparian tree stand in the southeast corner of the NHD2 project area will be removed. Such an action will remove nesting habitat for American kestrels, greater roadrunners, blue-gray gnatcatchers and red-tailed hawks. It will also remove habitat for migratory birds that use the area as a roosting site. However, there is abundant riparian habitat outside of the project area throughout the Haiwee reservoir and MM BIO-1 "Biological Monitor," MM BIO-3 "Special Status Wildlife Surveys" and MM BIO-4 "Preconstruction Nesting Surveys" will be implemented to reduce potential impacts to less than significant levels.

General Bird Surveys

General bird surveys conducted within the project area and vicinity resulted in 2,239 observations of 126 species (Table 7). The majority of bird species observed occurred as migrants utilizing the reservoir and shoreline as a stopover and the upland scrub vegetation alliances for food resources. Those birds that used the reservoir and shoreline riparian habitat either for migration or breeding are not expected to be impacted by project construction. There will not be any construction activity along the shoreline of Haiwee reservoir. The original dam separates the reservoir from the NHD2 project area and the shoreline road will not be used as a haul route. Many birds found in the reservoir have previously been classified as having an unlikely or low potential to occur in or around the project area. This is because those birds only use the reservoir during migration. The potential to occur categories are based on breeding, not migration.

The majority of the NHD2 project area consisted of a dense monoculture of large *Atriplex* spp. shrubs. Very few birds were observed in this habitat type, and no breeding birds were detected. There was a small stand of riparian trees (cottonwood, willow, tamarisk) in the southeast corner of the site that was heavily used by migrants in the spring (predominantly flycatchers and warblers). Three active nests were found in the tree stand, American kestrel, common raven, and greater roadrunner. It was suspected that blue gray gnatcatchers were nesting there as well. During the summer of 2015 the tree stand was used by loggerhead shrike, ash-throated flycatcher, and Bullock's oriole family groups. The American kestrels fledged and dispersed in June. An active roadrunner nest was found in the tree stand in 2006, and evidence of one was detected in 2013, but none were found during the 2015 bird surveys. The east end of the new dam site consisted of upland Joshua Tree woodland. This habitat type was heavily used by lesser nighthawk, common poorwill, ash-throated flycatcher, and black-throated

sparrow. During the months of June and July, evidence of nesting ash-throated flycatcher, loggerhead shrike and black-throated sparrow was documented in this area.

Butterworth Ranch, a large alfalfa horse ranch, exists on the northern border of the NHD2 project area. The tree lined alfalfa fields at this ranch attracted a variety of birds that may be indirectly affected by project construction. Two rare species were found during spring migration, including merlin and vermillion flycatcher. The trees along the haul route were heavily used by migrating flycatchers. The ranch is a documented breeding location for Swainson's hawk, a special status species. Several Swainson's hawks were observed at the ranch in the spring, but none appeared to be breeding. However, an active red-tailed hawk nest was found present.

Cliffs adjacent to South Haiwee Reservoir, although outside of the project area, contains an active golden eagle nest. Golden eagle is a special status species that requires an extensive buffer zone for protection during the breeding season. The nest was active during surveys in 2014 and 2015 from March through July.

Borrow Site 9, an upland site on the west shore of the north Haiwee reservoir, is comprised of Joshua Tree woodland and a variety of desert shrub species. Breeding birds at this site included black-throated sparrow, mourning dove, and house finch. Borrow Site 24 contains both upland and lowland habitat types. Black-throated and Bell's sparrows were breeding throughout these sites. The BLM disturbance area is primarily a lowland habitat type comprised of the creosote/burrowbush alliance and is intersected by an ephemeral drainage. Black-throated and Bell's sparrows were common breeders at this site. Barn owls nested in the bank at the north end of the LAA1 inlet. The nestlings fledged in June. The inlet is a large riparian zone dominated by willow and tamarisk. It was used extensively by migrating warblers. Wood ducks and green herons were observed multiple occasions during the summer of 2015. The area contains sufficient nesting habitat for both species. An active great horned owl nest was found at this location. The nestlings fledged in April 2015.

There is a large riparian zone at the Merritt Cut that is not expected to be impacted by project construction, as it is located approximately 3.5 miles south of the NHD2 project area but is included in the 9-quad CNDDB search for borrow site 24. Nesting birds at this location included American kestrel, great horned owl, western kingbird, mourning dove, house finch, ladder-backed woodpecker, northern flicker, house wren, and Bullocks oriole. It was suspected that a Cooper's hawk had a nest in that location, but the nest was not found. A yellow-billed cuckoo (a special status species) was observed at this site on July 1, 2015, but nesting was not confirmed.

Several species of waterfowl were consistently observed in the north and south Haiwee reservoirs, but no broods were found. Breeding habitat exists, but it is expected that these species would not be impacted by project construction. Two species of shorebirds were observed foraging in the north Haiwee reservoir, but the water level was extremely low due to drought conditions, exposing sandbars that offer habitat that is typically not present. Great horned owls and red-tailed hawks were nesting in the

willow/cottonwood riparian zones along the reservoir shoreline. The owls fledged in April and the hawks fledged in June. An osprey (a special status species) was observed in the north and south reservoirs during all surveys, but this species did not appear to be nesting.

Overall, project construction is not expected to significantly impact breeding birds and raptors, as most of these species were observed either nesting along the Haiwee reservoir outside of the project area or migrating through the project area. There is a potential for impacts to occur to nesting birds utilizing the small area of riparian trees on the southeast corner of the NHD2 that is proposed for removal. Implementation of minimization measures MM BIO-3 “Special Status Wildlife Surveys” and MM BIO-4 “Preconstruction Nesting Surveys” will be implemented prior to project construction to reduce potential impacts to less than significant levels.

Table 7. Bird species encountered including the location of the encounter and breeding status

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Wood Duck					X		X			PB	No
Gadwall					X					PB	No
Mallard					X	X				PB	No
Cinnamon Teal					X	X				PB	No
Northern Shoveler					X					M	No
Green-winged Teal					X					M	No
Canvasback					X					M	No
Redhead					X					M	Yes
Lesser Scaup					X	X				M	No
Ring-necked Duck					X	X				M	
Bufflehead					X					M	No
Common Merganser					X					M	No
Ruddy Duck					X	X				M	No
Common Loon					X					M	Yes
Pied-billed Grebe					X	X				PB	No
Eared Grebe					X	X				M	No
Western Grebe					X	X				PB	No
Clark's Grebe					X	X				PB	No
Double-crested Cormorant					X	X				M	No
American White Pelican					X	X				M	Yes
Great Blue Heron					X	X	X			M	No

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Great Egret					X		X			M	No
Green Heron							X			PB	No
White-faced Ibis					X					M	No
Turkey Vulture					X					M	No
Osprey					X	X				PB	Yes
Bald Eagle					X	X				PB	Yes
Northern Harrier						X				PB	Yes
Sharp-shinned Hawk					X					M	No
Cooper's Hawk								X		PB	No
Swainson's Hawk	X								X	PB	Yes
Red-tailed Hawk										B	No
Ferruginous Hawk						X				M	Yes
Golden Eagle					X	X				B	Yes
American Coot					X	X	X			PB	No
Killdeer					X					PB	No
American Avocet					X					PB	No
Black-necked Stilt					X					PB	No
Spotted Sandpiper					X					M	No
California Gull					X					M	Yes
Caspian Tern					X	X				M	Yes
Eurasian Collared-Dove						X		X		PB	No
Mourning Dove	X	X		X	X	X		X	X	B	No

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Greater Roadrunner	X									B	No
Yellow-billed Cuckoo								X		PB	Yes
Barn Owl							X			B	No
Great Horned Owl					X	X	X	X		B	No
Common Nighthawk	X									PB	No
Lesser Nighthawk	X									PB	
Common Poorwill	X		X							PB	No
Vaux's Swift	X	X			X					M	No
White-throated Swift	X	X			X					M	No
Costa's Hummingbird					X					PB	No
Rufous Hummingbird	X X					X				M	Yes
Belted Kingfisher								X		PB	No
Ladder-backed Woodpecker	X				X	X				B	No
American Kestrel	X				X	X		X		B	No
Merlin									X	M	No
Prairie Falcon				X					X	PB	No
Olive-sided Flycatcher						X		X		M	Yes
Western Wood-	X				X	X			X	PB	No

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Pewee											

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Willow Flycatcher	X				X				X	M	Yes
Gray Flycatcher	X		X		X				X	M	No
Dusky Flycatcher			X							M	No
Western Flycatcher	X				X	X			X	M	No
Black Phoebe	X				X	X				PB	No
Say's Phoebe			X			X				PB	No
Vermilion Flycatcher									X	M	No
Ash-throated Flycatcher			X		X			X	X	B	No
Western Kingbird	X		X			X				B	No
Loggerhead Shrike					X	X				B	Yes
Cassin's Vireo	X							X		M	No
Warbling Vireo	X				X					M	No
Common Raven	X	X	X	X	X	X	X	X	X	B	No
Horned Lark		X	X							M	No
Tree Swallow	X	X			X				X	M	No
Violet-green Swallow	X				X				X	M	No
Northern Rough-winged	X		X		X		X			PB	No

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Swallow											
Cliff Swallow	X				X	X			X	B	No
Barn Swallow	X		X		X				X	B	No
Verdin		X			X	X				PB	No
Rock Wren	X		X		X					B	No
House Wren	X				X			X		B	No
Blue-gray Gnatcatcher	X	X	X		X	X		X		PB	No
Ruby-crowned Kinglet						X				M	No
Swainson's Thrush	X					X				M	No
Northern Mockingbird						X				PB	No
Sage Thrasher						X			X	M	No
Le Conte's Thrasher										PB	No
European Starling	X				X	X				B	No
Phainopepla	X					X				M	No
Common Yellowthroat						X		X		PB	No
Orange-crowned Warbler	X		X		X	X			X	M	No
MacGillivray's Warbler	X									PB	No
Yellow Warbler	X				X	X			X	PB	No
Myrtle Warbler	X									M	No
Audubon's Warbler	X									M	No

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Black-throated Gray Warbler					X					M	No
Townsend's Warbler	X				X			X		M	No
Chipping Sparrow			X							M	No
Brewer's Sparrow			X							M	No
Black-throated Sparrow	X X	X	X			X				B	No

Common Name	NHD2	Site 9	BLM Disturbance	Site 24	North Haiwee	South Haiwee	LAA1 Inlet	Merritt Cut	Ranch	Breeding Status	Special Status Species
Bells Sparrow	X	X	X		X				X	B	No
Savannah Sparrow									X	PB	No
Fox Sparrow						X				M	No
White-crowned Sparrow										M	No
Western Tanager	X				X					M	No
Black-headed Grosbeak	X					X				M	No
Red-winged Blackbird					X	X				PB	No
Bullock's Oriole	X		X		X	X		X	X	B	No
House Finch	X	X	X		X	X		X	X	B	No
Lesser Goldfinch			X							PB	No

B = Breeding
PB = Potential Breeder

M = Migrant

4.3.4 Mammals-Bats

The NHD2 project area and associated borrow sites do have suitable foraging habitat for bat species. However, borrow site 24 is the only site within the project area that has potentially suitable roosting habitat for bats. This includes a rocky outcrop near a power line on the midwestern boundary of the site. The rocky outcrop has multiple rock and ledge crevices and a small cave entrance whose end could not be determined visually with flashlights. No guano was observed at the base of the outcrop; however, it was determined that an exit survey was necessary to rule out whether the outcrop was being utilized. An exit survey was conducted on July 24, 2015, which resulted in no bat observations.

Results from the CNDDB quad search indicated that a Townsend's big-eared bat maternity colony is present at the Pumice mine, approximately 1,350 feet south of borrow site 24. The maternity colony was discovered in 1987 and the population estimate between 1987 and 1991 was 75 female bats. In May 1998 approximately 100 adults were observed. The colony was noted as being at moderately high risk due to human disturbances. In 2014 the site was not accessible to the public. LADWP Biologists conducted a visual estimate survey of this maternity roost and counted 54 bats on July 31, 2014. Records from 1998 indicated the colony is highly site fidelic and to date, this colony continues to utilize the mine for pup rearing. Due to the close vicinity within the project area, an exit survey was conducted on July 31, 2014, which resulted in 54 Townsend's Big-eared bats. Due to the survey being conducted during the pup-rearing season, these results presumably included adult females and juveniles. An additional exit survey was conducted May 25, 2015. Only 40 Townsend's bats were counted exiting the mine. This exit survey may have been too early in the season to account for pups that may have been at that time non-volant (unable to fly).

The D500x Pettersson recorder was deployed within various vegetation alliances at the NHD2 and borrow sites, including the rocky outcrop at site 24. This acoustic detector and Sonobat software recorded and analyzed 380 bat calls from 11 species of bats passing over the detector, seven of which have some sort of status as determined by the CNDDB and literature review (Table 8).

Table 8. Bat species and number of bat passes detected by the D500x Pettersson in the project area from late May through early June, 2015.

			Project Area				
Scientific name	**Common Name**	**Status**	**LAA Inlet**	**NHD2**	**BLM Disturbance**	**Site 9**	**Site 24**
Myotis yumanensis	Yuma myotis	BLM:S	134	2			
Myotis californicus	California myotis	None	46	22			
Myotis ciliolabrum	Western small-footed myotis	BLM:S; WBWG:M	6	16			
Myotis lucifufus	Little brown myotis	None	1	0			
Parastrellus hesperus	Western pipistrelle	None	5	15	3		4
Antrozous pallidus	Pallid bad	BLM:S; USF:S; SSC; WBWG:H	1	0	1		
Lasionycteris noctivagans	Silver-haired bat	WBWG:M	1	3		1	
Tadarida brasiliensis	Mexican Free-tailed Bat	None	52	22	5	8	3
Lasiurus blossevillii	Western red bat	USFS:S; WBWG:H; SSC	2	0			
Lasiurus cinereus	Hoary bat	WBWG:M	5	1	6	11	1
Corynorhinus townsendii	Townsend's big eared bat	BLM:S; USF:S; Candidate ST; WBWG:H; SSC		2			1
		Total bat passes at each site	**253**	**83**	**15**	**20**	**9**
		Total bat passes	**380**				

Bats may use the project area for foraging and many of the species detected on the D500x Pettersson recorder may occur as seasonal transients or migrants. Although local bat populations may utilize the project area for foraging no roosting bats were found where actual project construction is proposed to occur. The Pumice Mine maternity colony of special status Townsend's big-eared bats are sensitive to noise and disturbance and if felt threatened by such disturbance may abandon their pups and colony. However these potential impacts are not expected to occur as the closest project construction would be over 1,300 feet away. Additionally, implementing mitigation measure MM BIO-9 "Timing of Ground-clearing Activities" would ensure that no bat species are impacted during the breeding season by conducting ground disturbing activities from September through February.

Most habitats within the project area consist of desert scrub associations and no bat roosts will be removed or blocked by project development. It is possible that some tree roosting bats (either residents or migrants) may use the small clump of cottonwoods and tamarisk to the northeast area of the Haiwee Dam as day roosts in an opportunistic

fashion; however, tree bat species have generally low fidelity for roost sites (Lewis 1995) and groves of riparian trees are prevalent along the Haiwee reservoir that could provide roost sites for potentially displaced bats. The Haiwee reservoir and surrounding habitat provides optimal water and foraging sources outside of the project area. No significant displacement risk to bats is expected from project implementation. Additionally, no project phase will create bat day or night roost sites or provide open water sources that may be attractive to bats. Project construction is not expected to permanently impact foraging or roosting habitats for bat species utilizing the area.

Bats may be temporarily indirectly affected by construction activities through effects on habitat and behavior from project operation, human activity, or noise (e.g., construction activities, roads, etc.). Lighting may also affect behavior, as it would likely attract nocturnal insects and, in turn, bats. Mitigation measure MM BIO-9 “Timing of Ground-clearing Activities” and MM BIO-14 “Night Lighting Control” would minimize potential indirect impacts of noise and lighting on foraging by ensuring lighting is focused only on work areas, not unnecessarily extending beyond work areas, and scheduling noisy construction activities within the project area outside the sensitive breeding season.

4.3.5 Other Mammals

Mohave Ground Squirrel (MGS)

In a total of 32,600 trap hours, no MGS were captured on any of the three trapping grids. The total trap hours = (Hours Trap is Open) (Number of Days) (100 Trap) Additionally, no MGS were observed in the vicinity of the trapping grids. A total of four species were captured on the three trapping grids including 96 antelope ground squirrels (AGS), two desert woodrats (*Neotoma lepida*), seven desert kangaroo rats (*Dipodomys deserti*), and one black-tailed jackrabbit (*Lepus californicus*). These species are common in the Mojave Desert, and do not have a special designated status within the project area (Table 9).

Table 9. Trapping results of species captured over three 5-consecutive day trapping periods at three grid locations within the project area, April-June 2015.

	Grid 9	**Grid 24**	**Cactus Flat Road**
Species	**Number of animals trapped**		
Antelope ground squirrel (*Ammospermophilus leucurus*)	24	32	40
Black-tailed Jackrabbit (*Lepus californicus*)	0	1	0
Desert Wood Rat (*Neotoma lepida*)	0	2	0
Desert Kangaroo Rat (*Dipodomys deserti*)	0	7	0
Total Animals Trapped	24	42	40

This trapping effort occurred after the fourth consecutive year of drought in the Great Basin and Mojave Desert. However, local rainfall events provided fairly productive conditions for annual and perennial plant species. Trap results showed that antelope ground squirrel are reproducing, as pregnant females were captured during the first trapping session in April and juveniles were trapped during the last session in June. Although local conditions were fairly productive during the first trapping session, early warm weather casued perennial shrubs and annual plants to dry out rapidly. However, trap success revealed an abundance of AGS in the full range of life stages. No MGS were trapped within the NHD2 project area or associated burrow sites; however MGS were trapped adjacent to the project area in the Coso Mountains, in the last week of March of 2015 (personal communication with MGS expert Phil Leitner) which provides evidence that MGS are active and reproducing nearby even with limited rainfall in the area. Additionally, the joshua tree woodland on the upper bluff of the new proposed Cactus Flat Road alignment is good quality habitat, with a high diversity of shrubs and annuals, whereas the lowland habitat where the NHD2 is proposed for construction is low quality habitat, with a very low diversity of shrubs and annuals.This information, along with the abundance of AGS trapped within the project area representing adults and offspring, yields a level of confidence that the trapping effort conducted would have found MGS if they were present in the project area.

The project area is located on the northern boundary of the Western Mojave recovery unit (WEMO 2005). The recovery objectives identified in the West Mojave Plan revolve around the concept of the recovery unit. These objectives include: maintain self-sustaining populations of MGS within each recovery unit into the future; maintain well-

distributed populations of MGS throughout each recovery unit; and ensure that habitat within each recovery unit is protected and managed to support long-term viability of MGS populations. The project will not significantly impact the objectives of the West Mojave Plan as MGS have not been observed and were not trapped within the project area. Additional trapping may occur within one year of ground breaking construction to further validate MGS absence within the project area. Furthermore, the implementation of minimization and avoidance measures described in this report such as MM BIO-1 "Biological Monitor," MM BIO-2 "Worker Education Training" and MM BIO-3 "Special Status Wildlife Surveys" will ensure that no impacts occur to MGS if incidentally observed within the project area.

Owens Valley Vole

No Owens Valley vole habitat was found present within the NHD2 project area or associated borrow sites; therefore no trapping surveys were conducted and no impacts to this species will occur from project implementation.

American Badger and Desert Kit Fox

No live individual American badgers were sighted during visual transect surveys; however, sign was observed throughout the project area particularly at the NHD2 area. Sign observed included scat, tracks and hundreds of burrows. Because American badgers have territories that range around 1,600 to 2,200 acres (2.5-3.5 square miles), and dig multiple dens each having 30-40 exits of which may be utilized seasonally (Lindzey 1978), therefore a majority of the burrows and burrow complexes found in the project area may only be utilized by a small number of badgers. Burrows were particularly abundant in the lower elevation flatlands of the NHD2 project area (Figure 12) and a few were scattered throughout the borrow sites (Figures 13-14). During summer and fall, badgers range more frequently and one to three burrows may be dug from foraged out prey holes in a single day, used for a day to a week, and then abandoned, with possible returns later, while other small wildlife may utilize these abandoned burrows in the interim (Long and Killingley 1983).

No live desert kit foxes were observed during visual transect surveys and no other sign such as tracks or scat was found; however some keyhole-shaped burrows were found in the project area, which are typically indicative of canid burrows. Most of these burrows are larger than that of the badger burrows and are most likely occupied by coyotes. Unlike the American badger, the desert kit fox inhabits habitats that are solely that of desert ecosystems (Wozencraft 2005). Because their range is within the desert habitat of the project area, it is possible that this species could utilize one of the canid burrows or even an abandoned badger burrow complex. There is potential for direct impacts to badger and kit fox if a burrow is graded or heavy machinery is working close to the burrow location. These potential impacts would be minimized through the implementation of MM BIO-6 "American Badger and Desert Kit Fox Exclusion Plan".

4.4 Native Resident and Migratory Wildlife

Wildlife movements within particular corridors in or through the project area were not observed during special status wildlife surveys conducted from fall 2014 through summer 2015. Some wildlife occurrences were habitat specific, but the characteristic of wildlife movement corridors was not observed. Native wildlife species observed in the project area during the 2014 and 2015 biological surveys are listed in Table 7 for birds and Table 10 for insects, reptiles and mammals. Bat species are only included in Table 8 as they were detected acoustically and not visually. The proposed project is located along a known flyway for migratory shorebirds and may provide foraging grounds for raptors and bats. However, because these species travel and disperse via flight, no impacts are expected to occur with consequences to wildlife movement or nursery site availability. Within the NHD2 project area and associated borrow sites there are no major terrestrial wildlife crossings or corridors nor are there any significant nursery sites present for native terrestrial species. There are a few scattered ephemeral drainages that terrestrial wildlife may utilize. If these drainages are altered by construction activities wildlife may have to navigate to other nearby drainages for dispersal. However, based on special status plant and wildlife surveys conducted for the project, there are larger, more extensive drainages and networks of unpaved roads present outside and within the vicinity of the project area that wildlife may alternately utilize. Additionally, wildlife may use thick saltbush scrub as cover outside of these drainages for dispersal pathways.

The presence of US Highway 395, the LAA, the Haiwee reservoir, pumice mine quarry and agricultural lands within southern Owens Valley have created barriers to dispersal for large migration pathways; however, the majority of terrestrial species within the project area (with the exception of coyote who are known to cross these types of barriers) are smaller terrestrial wildlife with smaller home ranges, such as reptiles and rodents. The project area and surrounding landscape contain abundant and contiguous open habitat for these species, thus wildlife can move essentially freely throughout the area. Project construction would limit connectivity by temporarily eliminating movement opportunities across the project area for terrestrial wildlife species, but the actual consequence to wildlife movement would be minor and insignificant due to the availability of surrounding habitat, drainages and unpaved roads that could be utilized. There could be a temporary disruption of foraging, burrowing, and nesting activities due to an increase of human activity, use of heavy equipment, and noise associated with construction activities; however implementation of recommended avoidance and minimization measures such as MM BIO-1 “Biological Monitor,” MM BIO-2 “Worker Education Training,” MM BIO-4 “Preconstruction Nesting Surveys,” MM BIO-9 “Timing of Ground-clearing Activities,” MM BIO-10 “Avoid Wildlife Entrapment,” BMP BIO-12 “Personnel Guidelines and Traffic” and MM BIO-14 “Night Lighting Control,” should minimize impacts to less than significant levels.

Table 10. Wildlife species observed (excluding birds and bats) in the project area during 2014 and 2015 biological surveys

Species	Common Name
Insects	
Stenopelmatus spp.	Jerusalem cricket
Pleocoma badia badia	Rain beetle
Pieris rapae	cabbage white butterfly
Vanessa cardui	painted lady butterfly
Gnaptor spp.	Tenebrionid beetle
Reptiles	
Coluber flagellum piceus	red racer
Pituophis catenifer deserticola	Great Basin gopher snake
Crotalus cerastes cerastes	Mohave desert sidewinder
Gambelia wislizenii	Long-nosed leopard lizard
Callisaurus draconoides rhodostictus	Western zebra-tailed lizard
Phrynosoma platyrhinos calidiarum	Southern desert horned lizard
Sceloporus uniformis	Yellow-backed spiny lizard
Uta stansburiana elegans	common side-blotched lizard
Aspidoscelis tigris tigris	Great Basin whiptail
Mammals	
canis latrans	coyote
Lepus californicus	black-tailed jackrabbit
Sylvilagus audubonii	desert (Audubon) cottontail rabbit
Ammospermophilus leucurus	antelope ground squirrel
Neotoma lepida	desert woodrat
Dipodomys deserti	desert kangaroo rat

5.0 Impact Analysis

This section summarizes potential impacts to the biological resources occurring within the project area that could result from construction-related activities and includes the mitigation measures that will be implemented to reduce potential impacts to less than significant levels.

5.1 Wetland and Jurisdictional Areas

The wetland delineation conducted for the 0.8 acre riparian tree area at the southeastern section of the NHD2 resulted in only one (hydrophytic vegetation, i.e. riparian tree species) of three indicators (i.e. hydrophytic vegetation, hydric soil,

wetland hydrology), indicating the area is not a designated wetland. This area will be impacted by the project as the proposal includes the removal of these tamarisk thicket riparian trees. Additionally 1,100 feet west of the tamarisk thicket there is another small tamarisk thicket proposed for removal. Nesting and roosting birds that utilize this area may be displaced by the removal of these trees. However, because the Haiwee reservoir is just south of the NHD2 project area and east of the borrow sites there is a large and significant amount of riparian habitat with mature riparian trees present for wildlife. Additionally, prior to any tree disturbance, nesting bird surveys will be conducted via guidelines of mitigation measure (MM) BIO-4 "Preconstruction Nesting Surveys" and BMP BIO-11 "Minimize Construction-Related Impacts." If any nesting birds are found, the area will not be disturbed for 300 feet in all directions (500 feet for raptors) until all young have fledged. Riparian trees will not be removed unless absolutely necessary for project construction. These mitigation measures and the availability of surrounding riparian habitat will reduce potential impacts to less than significant levels.

There is potential for three ephemeral washes to be impacted by construction activities. Although these washes may function to transport sediment during rain events, they terminate either at the LAA, the Haiwee reservoir or the NHD2 project area. There are also larger, more complex washes surrounding the project area that would retain hydrologic value and function if impacts to these washes were to occur. Additionally, mitigation measures described in this report MM BIO-1 "Biological Monitor," MM BIO-2 "Worker Education Training", MM BIO-8 "Topsoil Salvage" and BMP BIO-11 "Minimize Construction-Related Impacts" will be implemented to ensure that potentially significant impacts to these washes are minimized.

5.2 Natural Communities and Special Status Plants

Eleven vegetation alliances occur in the project area. Unavoidable permanent and temporary impacts will occur to these vegetation alliances within the project area; however these alliances are common throughout the project vicinity and Owens Valley. MM BIO-8 "Topsoil Salvage and Revegetation Plan," BMP BIO-11 "Minimize Construction-Related Impacts" and MM BIO-13 "Integrated Weed Management Plan" will minimize impacts to these vegetation alliances to the greatest extent feasible. Implementation of these measures would reduce potentially significant impacts to less than significant levels.

A comprehensive species list was generated for all plant species identified during three plant transect surveys conducted in Spring 2015, which resulted in 131 plant species. One special status species, sanicle cymopterus, was identified within the project area. This species has a CNPS 1B.2 status and is also a BLM sensitive species. The plant was found during the second survey, on April 20, 2015, in two locations. Seven plants were recorded on the eastern edge of the NHD2 project area in the flats and one plant was found along the Cactus Flat Road re-alignment, on the bench along the existing road. There is potential for this species to be impacted by project construction; however implementation of MM BIO-7 "Special-Status Plant Species Surveys" will avoid significant impacts to this plant.

Of the 13.7 acres proposed disturbance area on BLM property within the Project Site, 11.5 acres consists of undisturbed natural plan communities that may be impacted by Project activities. The remaining 2.2 arcres in the proposed disturbance area on BLM property were identified as previously disturbed. Existing roads on BLM property will be widened and improved as needed to access the project site for project activities for construction including hauling material. Pursuant to BLM guidelines, revegetation will be implemented as identified in MM Bio-8, “Topsoil Salvage and Revegetation Plan,” and MM BIO-15, “Joshua Tree Plan.”

5.3 Special Status Wildlife

5.3.1 Desert Tortoise

The absence of desert tortoise sign, combined with no identification of live tortoises in any of the project area surveys, indicate that the probability of desert tortoises inhabiting the project area is low. However, this probability is not unlikely due presence of suitable habitat and prior CNDDB records indicating presence of tortoise in the vicinity. Additional surveys may occur within one year of ground breaking construction to further validate desert tortoise absence within the project area. The project will not significantly impact the objectives of the USFWS recovery plan as desert tortoise and/or sign have not been observed within the project area. Furthermore, the implementation of minimization and avoidance measures described in this report such as MM BIO-1 "Biological Monitor," MM BIO-2 "Worker Education Training, MM BIO-3 "Special Status Wildlife Surveys" and MM BIO-10 "Avoid Wildlife Entrapment" will ensure that no impacts occur in the rare instance a desert tortoise moved into the project area.

5.3.2 Burrowing Owl

Burrowing owl habitat suitability and occupancy surveys resulted in so sign or owls present, indicating that the owls have not occupied the area for years. However, individuals could migrate into the area anytime due to CNDDB records indicating presence of burrowing owl in the project vicinity. Occupancy surveys will take place again prior to project construction via MM BIO-3 "Special Status Wildlife Surveys." If any burrowing owl are detected guidelines for avoidance shall be implemented via the CDFG 2012 "Staff Report on Burrowing Owl Mitigation." Additionally, MM BIO-1 "Biological Monitor," MM BIO-2 "Worker Education Training," and MM BIO-10 "Avoid Wildlife Entrapment" will be implemented to reduce any potential impacts to burrowing owl to less than significant levels.

5.3.3 Raptors and Birds

Overall, project construction is not expected to significantly impact breeding birds and raptors, as most of these species were observed either nesting along the Haiwee reservoir outside of the project area or migrating through the project area. Butterworth Ranch, a large alfalfa horse ranch, exists on the northern border of the NHD2 project area. The tree lined alfalfa fields at this ranch attracted a variety of birds that may be indirectly affected by project construction. The trees along the haul route were heavily used by migrating flycatchers and an active red-tailed hawk nest was found present. The ranch is a documented breeding location for Swainson's hawk, a special status species. Several Swainson's hawks were observed at the ranch in the spring, but none appeared to be breeding. Many raptor species were observed nesting within the project vicinity; however, only two raptor nesting sites have the potential to be impacted by the project. These include the LAA inlet (just south of the NHD2 project area) where barn owls were observed nesting and the riparian tree stand in the southeast corner of the NHD2 project area where American kestrels were observed nesting. The extent of impacts to the LAA riparian zone has

yet to be determined within the LAA. Construction in the area may prevent barn owls previously utilizing the area from using that site. Project construction includes a proposal to remove the small riparian tree stand in the southeast corner of the NHD2 project area. Such an action will remove a tree with a cavity where a pair of American kestrels was nesting. It will also remove nesting habitat for greater roadrunners, blue-gray gnatcatchers and red-tailed hawks. It will also remove habitat for migratory birds that use the area for foraging and roosting. However, there is abundant riparian habitat outside of the project area throughout the Haiwee reservoir that is more contiguous and less fragmented than the small patch of riparian trees at the NHD2 project area. Although direct impacts could occur to nesting birds at the riparian tree stand in the NHD2 project area indirect impacts could occur to nesting birds at Butterworth Ranch during project construction from increased traffic and noise, these impacts would be offset to less than significant levels by implementing MM BIO-1 "Biological Monitor," MM BIO-2 "Worker Education Training," MM BIO-4 "Preconstruction Nesting Surveys," MM BIO-9 "Timing of Ground-clearing Activities," BMP BIO-12 "Personnel Guidelines and Traffic" and MM BIO-14 "Night Lighting Control" would minimize the impacts of noise and lighting by ensuring lighting is focused only on work areas, not unnecessarily extending beyond work areas, and scheduling noisy construction activities within the project area outside the sensitive breeding season.

5.3.4 Bats

Although local bat populations may utilize the project area for foraging no roosting bats were found where actual project construction is proposed to occur. The Pumice Mine maternity colony of special status Townsend's big-eared bats are sensitive to noise and disturbance and if felt threatened by such disturbance may abandon their pups and colony. However these potential impacts are not expected to occur as the closest project construction would be over 1,300 feet away. Additionally, implementing mitigation measures MM BIO-5 "Roosting Bat Surveys," and MM BIO-9 "Timing of Ground-clearing Activities" would ensure that no bat species are impacted during the breeding season by conducting ground disturbing activities from September through February at borrow site 24. Bats may be temporarily indirectly affected by construction activities through effects on habitat and behavior from project operation, human activity, or noise (e.g. construction activities, roads, etc.). Lighting may also affect behavior, as it would likely attract nocturnal insects and, in turn, bats. Mitigation measures MM BIO-2 "Worker Education Training," MM BIO-9 "Timing of Ground-clearing Activities" and MM BIO-14 "Night Lighting Control" would minimize potential indirect impacts of noise and lighting on foraging by ensuring lighting is focused only on work areas, not unnecessarily extending beyond work areas, and scheduling noisy construction activities within the project area outside the sensitive breeding season.

5.3.5 Mohave Ground Squirrel

In a total of 32,600 trap hours, no MGS were captured on any of the three trapping grids. Additionally, no MGS were observed in the vicinity of the trapping grids;

however MGS were trapped approximately 15 miles southeast of the project area in the Coso Mountains, in the last week of March (personal communication with MGS expert Mr. Phil Leitner) which provides evidence that MGS are active and reproducing nearby even with limited rainfall in the area. This information, along with the abundance of AGS trapped during focused trapping surveys representing adults and offspring, yields a level of confidence that the trapping effort conducted would have found MGS if they occurred in the project area. The project will not significantly impact the objectives of the West Mojave Plan as MGS have not been observed and were not trapped within the project area. However, due to a past CNDDB occurrence within the southern portion of the NHD2 project area, an Incidental Take Permit (ITP) was issued by CDFW in 2012 for the geotechnical investigation phase of the current proposed project. This permit assumed presence and covered incidental take of MGS over approximately 25 acres of disturbed habitat from the geotechnical investigations that took place from 2012-2013. It is currently unknown how much of the 460 acre NHD2 project area will be directly impacted from new construction in addition to the 25 acres already disturbed. A new ITP may be issued by CDFW assuming presence in a portion of the NHD2 project area, with consideration that no MGS were captured during spring 2015 trapping sessions.

Additional trapping may occur within one year of ground breaking construction to further validate MGS absence within the project area. Furthermore, the implementation of minimization and avoidance measures described in this report such as MM BIO-1 “Biological Monitor,” MM BIO-2 “Worker Education Training,” MM BIO-3 “Special Status Wildlife Surveys,” and MM BIO-10 “Avoid Wildlife Entrapment” will ensure that no impacts occur to MGS if incidentally observed within the project area.

5.3.6 American Badger and Desert Kit Fox

No American badgers were sighted during visual transect surveys; however, sign was observed throughout the project area, which included scat, tracks and hundreds of burrows. Burrows were particularly abundant in the lower elevation flatlands of the NHD2 project area. No live desert kit foxes were observed during visual transect surveys and no other sign such as tracks or scat was found; however some keyhole-shaped burrows were found in the project area, which are typically indicative of canid burrows. Most of these burrows are larger than that of the badger burrows and are most likely occupied by coyotes. However, because the desert kit fox range is within the project area, it is possible that this species could utilize one of the canid burrows or even an abandoned badger burrow complex. There is potential for direct impacts to badger and kit fox if a burrow is graded or heavy machinery is working close to the burrow location. Potential natal burrows and burrow complexes will be avoided by implementing construction activities outside of the pup-rearing season. If this is not feasible, potential impacts to these species would be minimized through the implementation of MM BIO-1 “Biological Monitor,” MM BIO-2 “Worker Education Training,” MM BIO-3 “Special Status Wildlife Surveys, “MM BIO-6 “American Badger and Desert Kit Fox Exclusion Plan” and MM BIO-10 “Avoid Wildlife Entrapment.”

5.3.7 Native and Resident Migratory Wildlife

Within the NHD2 project area and borrow sites there are no major terrestrial wildlife crossings or corridors nor are there any significant nursery sites present for native terrestrial species. There are a few scattered ephemeral drainages that terrestrial wildlife may utilize. If these drainages are altered by construction activities connectivity would be limited by temporarily eliminating movement opportunities across the project area for terrestrial wildlife species. These species may then have to navigate to other nearby drainages for dispersal. However, based on special status plant and wildlife surveys conducted for the project, there are larger, more extensive drainages and networks of unpaved roads present outside and within the vicinity of the project area that wildlife may alternately utilize. Additionally, wildlife may use thick saltbush scrub as cover outside of these drainages for dispersal pathways.

Project construction, operation, and decommissioning would cause some temporary and permanent disturbance to native vegetation and common wildlife. There could be a temporary disruption of foraging, burrowing, and nesting activities due to an increase of human activity, use of heavy equipment, and noise associated with construction activities. Some common small terrestrial wildlife species, such as mice, lizards and snakes could be injured or killed by construction equipment and construction activities. Most individuals would scatter due to construction noise. Some wildlife may be displaced and have to compete with other wildlife in the vicinity of the project area for resources. Loss of a few individuals may occur but would not be considered significant because of the abundance of these species throughout the project area and vicinity. There are similar habitats surrounding the project area for species to disperse to during construction. The loss of habitat, loss of wildlife and wildlife displacement that would result from construction of the proposed project would not be considered significant because these impacts would not substantially diminish habitat for wildlife in the project vicinity nor reduce any specific wildlife populations in the project vicinity to below self-sustaining numbers. Additionally, mitigation measures would be implemented to reduce potential impacts to less than significant levels. These measures include MM BIO-1 “Biological Monitor,” MM BIO-2 “Worker Education Training,” MM BIO-4 “Preconstruction Nesting Surveys,” MM BIO-9 “Timing of Ground-clearing Activities,” MM BIO-10 “Avoid Wildlife Entrapment,” BMP BIO-12 “Personnel Guidelines and Traffic” and MM BIO-14 “Night Lighting Control.”

6.0 Mitigation Measures

Potentially significant impacts to biological resources from project implementation would be minimized or avoided by the mitigation measures described below.

MM BIO-1 Biological Monitor. A biological monitor will be on site during all initial ground-disturbing activities. Biological monitors shall be familiar with the wildlife species and other sensitive biological resources known to occur in the general project area and be qualified to recognize potential construction effects on these resources. They will coordinate with the construction foreman or supervisor daily and with LADWP project management when necessary for any biological resource issues that may arise.

Biological monitors will conduct preconstruction clearance surveys prior to each day's construction activities, stake and flag biological resources for avoidance and ensure compliance with the biological resources mitigation measures and Best Management Practices (BMP's). They shall also have the authority to immediately stop any activity that is not in compliance with these measures. After initial ground disturbing activities, the biological monitor will be on-call to resolve any biological resource issues that arise during project construction.

MM BIO-2 Worker Education Training. All field related project personnel, including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, and subcontractors will be required to undergo a worker environmental awareness program (WEAP) prior to construction. The WEAP shall be implemented during site preconstruction, construction and closure. WEAP training shall include a brief review of special-status species and other sensitive resources that could exist in the project area (including their life history and habitat requirements), the locations of sensitive biological resources, and their legal status and protection under the U.S. Endangered Species Act of 1973 and the California Endangered Species Act (Sections 2080-2080.5 of the California Fish and Game Code). The education program shall include materials describing sensitive resources, resource avoidance, how to address dead or injured wildlife, permit conditions, and possible fines for violations of State or federal environmental laws. The program shall also cover the Mitigation Measures (MM's), Best Management Practices (BMP's), environmental permits, and the proposed project plan. Morning "tailgate" sessions may be conducted at the biological monitor's discretion, to update crews as they advance into sensitive areas. A record of all personnel trained during the project shall be maintained and made available for compliance verification.

MM BIO-3 Special Status Wildlife Surveys. Pending requirements under an Incidental Take Permit issued by CDFW, preconstruction surveys for special-status wildlife may be conducted prior to project construction. Surveys will be conducted by a qualified biologist(s) and the biologist will be able to identify all special status or incidental wildlife by sight, sound, or track, as applicable. All stationary occurrences (e.g. burrows) will be documented with a Garmin GPS unit and identified to species by tracks, scat and other sign if possible. Biologists conducted USFWS and CDFW protocol level desert tortoise surveys, Mohave ground squirrel trapping surveys, bat surveys, burrowing owl surveys, and nesting raptor and bird surveys in the fall of 2014 and the spring/summer of 2015 within the project area to ensure that special status wildlife will not be impacted by construction activities. Prior to and within one year of project implementation, additional protocol level surveys may be conducted during the appropriate season for special status wildlife that have the potential to occur within the project area. If any special-status wildlife are encountered, minimization and avoidance measures will be implemented as required.

MM BIO-4 Preconstruction Nesting Surveys. Prior to ground disturbing activities during bird breeding season March 1- August 15 (as early as February 1 for raptors), a biologist will conduct preconstruction nesting surveys within the potential areas of

disturbance. These surveys will be conducted no more than three days prior to the initiation of clearance/construction work. If an active nest is located, clearing and construction within 300 feet of the nest (within 500 feet for raptor nests) shall be postponed until the nest is vacated and juveniles have fledged and when there is no evidence of a second attempt at nesting. Limits of construction to avoid a nest should be established in the field with flagging and stakes or construction fencing. Construction personnel will be instructed on the sensitivity of the area. If there are periods of inactivity of two weeks or more during the breeding bird season the construction area will be resurveyed.

MM BIO-5 Roosting Bat Surveys. Preconstruction surveys for burrows and crevices containing suitable bat roosting habitat that could be used as individual bat roosts will be conducted within seven days in areas prior to disturbance. If bat roosts are found they shall be identified as night roosts or day roosts. Night roosts are typically utilized from the approach of sunset until sunrise. In most parts of the state, night-roost use will only occur from spring through fall. If a night roost is identified, project disturbance will not occur within 100 feet of the roost between sunset and sunrise. Day-roosts are utilized during the spring, summer, and fall in California, and some other areas where large, non-hibernating winter colonies can be found. The most critical time, known as the non-volant period, occurs during the breeding season (from April through August) when young are present, but are not yet ready to fly. Project disturbance will be avoided during the breeding season and will not occur within 100 feet of an identified day roost.

MM BIO-6 American Badger and Desert Kit Fox Exclusion Plan. American badger (and potentially desert kit fox) must be excluded from all burrows and burrow complexes in the project area where ground disturbing activities will occur. All potential kit fox or badger burrows shall be classified as inactive, potentially active, or definitely active. Inactive burrows that are within the project area and will be impacted by construction will immediately be excavated by hand and backfilled to prevent reuse. Potentially active burrows within the project area shall be monitored for up to three consecutive nights using a tracking medium around the burrow apron (such as diatomaceous earth or fine clay) and/or motion-activated infrared camera stations at the entrance, as needed. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the burrow shall be considered inactive, and excavated and backfilled by hand. If tracks are present or badgers or foxes are captured in camera photos, then “passive hazing” may be implemented to deter them from using the burrow or burrow complex. These options will further be developed in the exclusion plan in coordination with CDFW.

MM BIO-7 Special-Status Plant Species Surveys. A botanist(s) will be familiar with potential plant species of concern in all potential identifiable life stages. Special-status plant species that may be impacted by project activities shall be avoided, where feasible. Botanists conducted rare plant surveys during four floristic blooming periods in spring and summer 2015 within the project area to ensure that rare plants (i.e. sanicle cymopterus), will not be impacted by construction activities. Prior to and within one year

of project implementation, additional surveys will be conducted during optimal blooming periods for species with the potential to occur within the project area. Rare plants will be identified during pre-construction surveys, and their populations will be counted and flagged. They will be marked with yellow stakes, and pink flagging will mark an area 10 feet around all known locations. If a rare plant is identified within the construction footprint, the plants will be counted and may be transplanted to a suitable habitat adjacent to the project site. Topsoil from the site containing rare plants will be salvaged and used during the vegetation post construction in sites as close to practicable to the original locations.

MM BIO-8 Topsoil Salvage and Revegetation Plan. Native vegetated areas subject to temporary Proposed Project disturbance shall be restored to pre-project grade and allowed to revegetate. A detailed Revegetation plan will be prepared and implemented to ensure that success is achieved to revegetate disturbed areas. The Revegetation plan shall include top soil salvage, seeding with native locally adapted species, as needed, and minimizing the spread of invasive weeds. Topsoil shall be stockpiled from the Project Site for use in natural revegetation of the disturbed soils. The upper soil horizons which contain the seed bank as identified in the Revegetation plan shall be segregated as needed and stockpiled under conditions shown to sustain seed bank viability for use as the top-dressing for revegetation areas. After construction is complete, the salvaged topsoil will be spread over disturbed areas and seeded with native species using methods appropriate for the area.

MM BIO-9 Timing of Ground-clearing Activities. Ground-clearing and ground-disturbing activities will be timed to minimize and reduce impacts to wildlife species, where feasible. When possible, ground- disturbing and ground-clearing activities will take place early fall through late winter (September through February) to minimize impacts during the breeding season to terrestrial wildlife, nesting birds and roosting bats.

MM BIO-10 Avoid Wildlife Entrapment. At the end of each work day, the biological monitor or project personnel shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If backfilling is not a feasible option, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access. All trenches, bores, and other excavations shall be inspected periodically by the biological monitor or project personnel. If escape ramps are not a feasible option, all trenches, bores and excavations will be monitored no less than three times throughout the day and at the end of each workday. If wildlife were to become trapped, the biological monitor shall be contacted to either guide the animal to an earthen ramp for escape or safely remove and relocate the individual a safe distance from construction activities. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

BMP BIO-11 Minimize Construction-Related Impacts. Project design shall minimize temporary construction work areas to the extent feasible and minimize the impacts to

native vegetation and habitat. Prior to the start of construction, work areas (including, but not limited to, staging areas, access roads, and sites for temporary placement of construction materials and spoils) will be delineated with orange construction fencing or staking to clearly identify the limits of work and will be verified by the biological monitor prior to ground-disturbing activities. Fencing/staking will remain in place for the duration of construction. Spoils will be stockpiled in disturbed areas lacking native vegetation or where habitat quality is poor. To the extent possible, disturbance of shrubs and surface soils due to stockpiling will be minimized. All disturbances, vehicles, and equipment will be confined to the fenced/flagged areas. When feasible, construction activities will implement the drive and crush method rather than grading. Under this method, construction equipment would drive over and crush native plants to minimize impacts to their roots. Drive and crush is expected to reduce the recovery time of native plants within temporary construction areas. Construction personnel and contractors shall be responsible for working around all shrubs and trees within the construction zone to the extent feasible. Particular avoidance shall be applied to Joshua trees and riparian trees (i.e., cottonwoods and willows). Shrubs and trees shall be flagged by the biological monitor to indicate top priority for avoidance.

BMP BIO-12 Personnel Guidelines and Traffic. Precautionary measures will be implemented during construction to protect wildlife resources. During construction all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Personnel shall not feed wildlife or bring pets to the project site. Vehicular traffic shall be confined to approved routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes shall not exceed 25 miles per hour. Workers shall be trained to comply with the speed limit, and enforcement provisions shall apply. Any vehicle-wildlife collisions shall be immediately reported to the construction manager and biological monitor to determine if further action is required.

MM BIO-13 Integrated Weed Management Plan. Containment measures will be implemented to prevent the introduction and spread of weed species in the project area ad will be addressed in the preparation of a weed management plan. These measures may include limiting disturbance areas during construction to the minimum required to perform work; limiting ingress and egress to defined routes; maintaining and utilizing vehicle wash and inspection stations; and closely monitoring the types of materials brought on site to minimize the potential for weed introduction.

MM BIO-14 Night Lighting Control. The project will minimize the use of lighting that could attract migrating birds and bats (that could feed on concentrations of insects at lights). Lighting will be kept to the minimum level necessary for safety and security and will be designed, installed, and maintained to prevent side casting of light towards wildlife habitat outside of the project footprint.

MM Bio-15. Joshua Tree Salvage. In accordance with the California Desert Native Plants Act, LADWP will implement Joshua Tree salvage measures, in cooperation with

CDFW and BLM, that outlines the necessary steps for salvaging and relocating Joshua trees in the Project area that cannot be avoided during Project construction activities.

7.0 Literature Cited

Alberta Fish and Wildlife Division (AFWD). 2006. Handbook of inventory Methods and Standard Protocols for Surveying Bats in Alberta. Edmonton, Alberta. 71 pp.

Altringham, J. D. 1996. Bats: Biology and Behaviour. Oxford University Press, Oxford. 262 pp.

Ballmer, G. R. and G. Pratt. 1991. Quantification of Ant Attendance (Myrmecophily) of Lycaenid Larvae. Jour. Research on the Lepidoptera 30(1-2):95-112.

Bauer, C.M. 2002. The Hydrogeology of Rose Valley and Little Lake Ranch, Inyo County, California. Master's Thesis, California State University at Bakersfield, 150p.

Berry, K.H. 1986. Desert Tortoise (*Gopherus agassizii*) relocation: Implications of social behavior and movements. Herpetologica 42:113-125.

Bleich, V.C., J.D. Wehausen, and S.A. Holl. 1990. Desert-dwelling mountain sheep: conservation implications of a naturally fragmented distribution. Conserv. Biol. 4:383-390

Bogan, M. A. 1974. Identification of *Myotis californicus* and *M. leibii* in southwestern North America. Proceedings Biological Society Washington 87:49-56.

Brown, P.E. and R.D. Berry. 1997. Surveys for bat species of special concern. Unpub. report prepared for California Department of Fish and Game, Wildlife Management Division. Sacramento , CA.
Contract FG5124WM. 6 pp.

Brown, P. E., R. Berry, and C. Brown. 1994. Foraging behavior of Townsend's big-eared bats (*Plecotus townsendii*) on Santa Cruz Island. Fourth California islands Symposium: Update on the status of resources, 367-369.

Bureau of Land Management (BLM). 2003. Draft Environmental Impact Report and Statement for the West Mojave Plan, A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment. Vols. I and II. U.S. Dept Interior.

_____2005. Final Environmental Impact Report and Statement for the West Mojave Plan. Vol. 1A.

_____2011. Draft Biological Assessment for the Desert Harvest Solar Project, Riverside County, California (CACA 48649). December.

California Department of Fish and Game, 1986. Mammalian Species of Special Concern in California.

_____1992. Bank Swallow Recovery Plan. Nongame Bird and Mammal Section Report 93.02. Prepared by Nongame Bird and Mammal Section Wildlife Management Division.

_____2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities.

_____2010. Mohave Ground Squirrel Survey Guidelines (January 2003; minor process and contact changes in July 2010).

_____2012. Staff Report on Burrowing Owl Mitigation.

California Department of Fish and Wildlife. 2015a. Rarefind, a California Natural Diversity Database. A database of special status biological resources maintained by the Natural Heritage Division. Sacramento, California. Version 5. Accessed January-February, 2015.

_____Nongame Wildlife Program. Species Accounts. 2015. http://www.dfg.ca.gov/wildlife/nongame/raptors/

_____2015b. California Natural Diversity Database. Special Animals List. Periodic Publication. 50pp.

California Native Plant Society. 2015. Inventory of rare and endangered plants (online edition). California Native Plant Society, Sacramento, CA. Online URL http://www.cnps.org/inventory.

California Water Resources Control Board (CWRCB).1993. "Draft Environmental Impact Report for the Review of Mono Basin Water Rights of the City of Los Angeles. 1993. California State Water Resources Control Board, Division of Water Rights, 901 P Street, 3rd Floor, Sacramento, CA 95814. Prepared by: Jones & Stokes Associates, Inc., 2600 V Street, Suite 100, Sacramento, CA., May 1993.

Craig, D. and P. L. Williams.1998. Willow Flycatcher (*Empidonax traillii*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

Crooks, KR. and Sanjayan M. 2006. Connectivity Conservation. New York, Cambridge University Press.

DeSante, D. F., E. D Ruhlen, and R. Scalf. 2007. The distribution and relative abundance of burrowing owls in California during 1991–1993: Evidence for a declining population and thoughts on it conservation. Pages 1-41 in J. H. Barclay, K. W. Hunting, J. L. Lincer, J. Linthicum, and T. A. Roberts, editors. Proceedings of the California Burrowing Owl Symposium, 11-12 November 2003 Sacramento, California, USA. Bird Populations Monographs No. 1. The Institute for Bird Populations and Albion Environmental, Inc., Point Reyes Station, CA.

Desert Renewable Energy Conservation Plan (DRECP) Baseline Biology Report. 2012. http://www.drecp.org/meetings/2012-02-24_meeting/species_profiles/American%20Peregrine%20Falcon.pdf

Desert Tortoise Council (DTC) 1994. Guidelines for Handling Desert Tortoises During Construction Projects. Edward L. LaRue, Jr., editor. Wrightwood, California. Revised 1999.

Egoscue, H. J. 1962. Ecology and life history of the kit fox in Tooele County, Utah. Ecology 43:482- 497.

Emmel, Thomas C. and J.F. Emmel. 1973. The Butterflies of Southem California. The Natural History Museum of Los Angeles County, Science Series 26.

Fenton, M. B. 1985. Communication in the Chiroptera. Indiana University Press, Bloomington. 161 pp.

Gannon, W.L. 2003. Bats (Vespertilionidae, Molossidae, Phyllostomidae). Pages 56-74 in Feldhamer, G.A., B.C. Thompson, and J.A. Chapman (eds.). Wild Mammals of North America: Biology, Management and Conservation, 2nd ed. Johns Hopkins University Press, Baltimore MD. 1216 pp.

Griffin, D. R. 1958. Listening in the dark. Yale University Press, New Haven. 413 pp.

Grinnel, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Harris, A.H. 1974. Myotis yumanensis in interior southwestern North America, with comments on Myotis lucifugus. Journal Mammalogy 55:589-607.

Harvey M.J., Altenbach, S. J. and T. L. Best. 1999. Bats of the United Sates. Arkansas Game & Fish Commission in Cooperation with the Asheville Field Office US Fish and Wildlife Service. 64pp.

Hoff, K.S. & Marlow, R.W. 2002. “Impacts of Vehicle Road Traffic on Desert Tortoise Populations with Consideration of Conservation of Tortoise Habitat in Southern Nevada.” Chelonian Conservation and Biology (4) 449-456.

Intress, C. and T.L. Best. 1990. Dipodomys panamintinus. Mammalian Species 354:1-7.

Jameson, E.W. and H.J. Peeters. 2004. Mammals of California. University of California Press, Berkeley California. 429 pp.

Kunz, T. H. 1982. Roosting ecology. Pp. 1-55 IN T. H. Kunz (ed.). Ecology of Bats. Plenum Press, NewYork.

Kunz T.H., E.B. Arnett, B.M. Cooper, W.P. Erickson, R.P. Larkin, T. Mabee, M.L. Morrison, M.D. Strickland, and J.M Szewczak. 2007. Assessing impacts of wind-energy development on nocturnally active birds and bats: a guidance document. Journal of Wildlife Management 71(8):2449-2486.

Kus, B. 2002. Least Bell's Vireo (Vireo bellii pusillus). *In* the Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Parteners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

Leitner, P., Leitner, B.M. 1998. Coso Grazing Exclosure Monitoring Study. Mohave Ground Squirrel Study. Coso Known Geothermal Resource Area. Major Findings 1988-1996. Final Report.

Lewis, S.E., 1995. Roost fidelity of bats: a review. J. Mammal. 76, 481–496.

Lindzey, Frederick G. (1978). "Movement patterns of badgers in northwestern Utah". *Journal of Wildlife Management* 42 (2): 418–422.

Long, Charles A.and Carl Arthur Killingley. 1983. The badgers of the world. Springfield, IL: Charles C. Thomas Publishing.

Manning, R.W. and J.K. Jones, Jr. 1989. Myotis evotis. American Society of Mammalogists, Mammalian Species, 329:1-5.

McGaugh, Chet. 1998. Tierra Madre Consultants, Inc. http://www.blm.gov/ca/pdfs/cdd_pdfs/Lbcu1.pdf

McGrew, J. C. 1979. Vulpes macrotis. Mammalian Species 123:1-6.

Messick, John P.; Hornocker, Maurice G. (1981). "Ecology of the Badger in Southwestern Idaho". *Wildlife Monographs* 76 (76): 1–53.

Munsell Color. 2009. Munsell Soil-Color Charts with genuine Munsell color chips. Grand Rapids, MI.

Nussear, K.E., et al. 2009. Modeling Habitat of the Desert Tortoise (*Gopherus agassizii*) in the Mojave and Parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona. U.S. Geological Survey Open-File Report 2009-1102.

O'Farrell, M. J., and E. H. Studier. 1980. Myotis thysanodes. American Society of Mammalogists, Mammalian Species, 137:1-5.

O'Farrell, M.J., and W.L. Gannon. 1999. A comparison of acoustic versus capture techniques for the inventory of bats. Journal of Mammalogy 80(1):24-30.

Pagel, J.E., Ph.D., D. M. Whittington, G.T. Allen, Ph.D. 2010. Interim Golden Eagle Inventory and Monitoring Protocols and Other Recommendations. U.S. Fish and Wildlife Service.

Pierson, E.D., W.E. Rainey, and C. Corben. 2000. Distribution and status of red bats, *Lasiurus blossevillii* in California. Report to Species Conservation and Recovery Program, Habitat Conservation Planning Branch, California Department of Fish and Game, Sacramento, CA, 40 pp.

Sawyer, J., T. Keeler-Wolf and J. Evans. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society. http://vegetation.cnps.org/

Schweich, T. 2012. Eastern Mojave Vegetation (and a few other things). http://www.schweich.com

Sherwin, R. E., W. L. Gannon, J. S. Altenbach, and D. Stricklan. 2000. Roost fidelity of Townsend's big-eared bat in Utah and Nevada. Transactions of the Western Section of the Wildlife Society, 36:15– 20.

Shuford, W.D., and Gardali, T. editors. 2008. California Bird Species of Special Concern. California Department of Fish and Game, Sacramento. https://www.dfg.ca.gov/wildlife/nongame/ssc/birds.html

Sierra Club. Mountains Group. San Gorgonio Chapter. http://www.sangorgonio.sierraclub.org/mountains/

Simmons, J. A., M. B. Fenton, W. R. Ferguson, M. Jutting, and J. Palin. 1979. Apparatus for research on animal ultrasignals. Life Sciences Miscellaneous Publications of the Royal Ontario Museum 1-31.

Smith, H. M. 1946. *Handbook of Lizards, Lizards of the United States and Canada*. Comstock Publishing Associates, Ithaca, New York.

Stebbins, Robert C., and McGinnis, Samuel M. 2012. *Field Guide to Amphibians and Reptiles of California: Revised Edition* (California Natural History Guides) University of California Press.

Steinwand, A.L., R.F. Harrington, and D. Or. 2006. Water Balance for Great Basin Phreatophytes Derived from Eddy Covariance, Soil Water, and Water Table Measurements, Journal of Hydrology, Volume 329, issues 3-4, October 15, 2006, pgs. 595-605.

Thomas, D. W., and R. K. LaVal. 1988. Survey and census methods. Pp. 77-89 IN T. H. Kunz (ed.). Ecological and Behavioral Methods for the Study of Bats. Smithsonian Institution Press, Washington, DC. 533 pp.

Trimble, Stephen. 1999. The Sagebrush Ocean. Tenth Anniversary Edition: A Natural history of the Great Basin. University of Nevada Press.

United Sates Army Corps of Engineers. 2008.Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Vicksburg, MS. 119 pp.

United States Fish and Wildlife Service (USFWS). 1996. Guidelines for conducting and reporting botanical inventories for federally listed plants on the Santa Rosa Plain. Sacramento, CA.

_____2009. Desert tortoise (Mojave population) Field Manual (*Gopherus agassizii)*. U.S. Fish and Wildlife Service, Region 8, Sacramento, California.

_____2010. Preparing for any Action that May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*). 2010 Field Season.

_____2011. Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii).* U.S. Fish and Wildlife Service, Region 8, Sacramento, California.

_____Environmental Conservation Online System (ECOS). http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HA

_____2015. National Wetlands Inventory. http://www.fws.gov/wetlands/

United States Forest Service (USFS). 2006. Multiple Species Inventory and Monitoring Technical Guide. General Technical Report WO-73. Version 1.0. 216 pp.

Vaughan, T. A. 1959. Functional morphology of three bats: Eumops, Myotis, Macrotus. Univ. Kans., Mus. Nat. Hist. Publ. 12:1-153.

Warner, R.M. and N.J. Czaplewski. 1984. Myotis volans. American Society of Mammalogists, Mammalian Species, 224:1-4.

Wai-Ping, V., and M. B. Fenton. 1989. Ecology of spotted bat (Euderma maculatum) roosting and foraging behavior. Journal of Mammology 70(3):617-622.

Western Bat Working Group. 2012. Species Accounts. http://www.wbwg.org/speciesinfo/species_accounts/species_accounts.html

Wetland Training Institute, Inc. 2013. 2013 Pocket Guide to Hydric Soil Field Indicators based on Field Indicators of Hydric Soils in the United States v. 7.0 with Updates. Glenwood, New Mexico.

Wozencraft, W. C. 2005. "Order Carnivora". In Wilson, D. E.; Reeder, D. M. Mammal Species of the World (3rd ed.). Johns Hopkins University Press. pp. 532–628.

Yolo Natural Heritage Program Draft Species Accounts. Technology Associates. 2009. http://www.yoloconservationplan.org/yolo_pdfs/speciesaccounts/birds/prairie-falcon.pdf

Yosef, R. 1996. Loggerhead Shrike (Lanius ludovicianus), in The Birds of North America (A. Poole and F. Gill, eds.) no. 231. Acad. Nat. Sci., Philadelphia.

Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, California.

This page intentionally left blank.