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July 27, 2018

Mr. Kenneth Gethers
C&S Companies
2020 Camino del Rio N., Suite 1000
San Diego, CA 92108

Subject: Biological Resources Letter Report for the Apple Valley Airport Detention Basin Project

Dear Mr. Gethers:

HELIX Environmental Planning, Inc. (HELIX) has prepared this biological resources letter report for the Apple Valley Airport Detention Basin Project: herein referred to as "Proposed Project" or "Project" located in the City of Apple Valley (City), San Bernardino County, California. The project occurs adjacent to the southwest side of the Apple Valley Airport. The purpose of this report is to (1) document the existing biological conditions, (2) identify potential regulatory issue, (3) analyze project impacts, and (4) recommend potential mitigation measures.

PROPERTY/PROJECT LOCATION

Property Location and Description

The project is located in the City of Apple Valley, San Bernardino County, California (Figure 1) adjacent to the southwest corner of the Apple Valley Airport (Figure 2). Specifically, the project site is situated south and east of Corwin Road and immediately north of Papago Road (Figure 3).

The project site is relatively flat with an elevation range of 2,960 feet above mean sea level (amsl) in the northeast to 2,948 feet amsl in the southwest. Vegetation on site primarily consists of white bursage scrub (Figure 4) with an unnamed drainage forming the western border.

Project Description

The project proposes to construct a storm water detention basin to provide improved control of runoff from the Apple Valley Airport. The detention basin would be installed in the northern portion of Assessor Parcel Number 0463-381-77 (Figure 4, *Site Plan/Proposed Storm Water Detention Basin*). On-site runoff from the airport property combines with off-site runoff from surrounding desert areas and generally flows in a southerly direction toward Runway 8-26. Three existing storm drains along Runway 8-26 direct flows into a swale that runs parallel to the runway. Flows within the swale then continue westward and currently discharge to the natural ground surface. A proposed drainage channel/swale would connect to the existing swale near the west end of Runway 8-26 and direct flows

to the proposed detention basin. Storm water would then be retained in the basin and released slowly to the existing natural drainage channel to the south.

The proposed maximum dimensions of the detention basin are 465 feet wide by 709.5 feet long by 4 feet deep. The proposed drainage channel/swale would be approximately 20 feet wide, with a channel depth estimated at 2.9 feet. The detention basin would include an approximately 200-foot-long emergency spillway/outlet near the southwestern corner of the basin that would discharge to an existing drainage channel. Construction of the detention basin would involve excavation and removal of fill material. Approximately 25 percent of the excavated fill would be used to construct the side slopes of the basin, and the remaining material would be hauled off site to an appropriate disposal facility. An estimated 800 cubic yards (cy) per day would be removed, with a total of approximately 54 truck trips (at 15 cy-capacity per truck).

METHODS

The biological surveys covered the entire project site. The burrowing owl survey and jurisdictional delineation included additional adjacent habitat as described in the specific method descriptions below.

Nomenclature and Literature Review

Nomenclature in this report utilizes Holland (1986) for vegetation community classifications, with Latin names of plants from Baldwin et al.(2012) and common names following Baldwin or the California Native Plant Society (CNPS; 2018). Sensitive plant and animal status is taken from the California Natural Diversity Database (CNDDB) of the California Department of Fish and Wildlife (CDFW; 2017) and the CNPS (2018). Nomenclature follows Emmel and Emmel (1973) for butterflies ,Taggart (2014) for amphibians and reptiles, American Ornithologists' Union (2015) for birds, and Baker et al. (2003) for mammals.

General Biological Survey

HELIX senior scientist Rob Hogenauer conducted the general biological survey on January 5, 2018. The survey was conducted by walking transects 10 to 20 meters wide across the entire project site. Vegetation was mapped by Mr. Hogenauer during the January 5 site visit using a mapping unit size of 0.1 acre for uplands and 0.01 acre for riparian habitat.

The general biological survey included assessing the site for potential habitat for sensitive plants and wildlife. Plants of note that were included in the assessment included smoketree (*Dalea spinosa*), plants of the family Agavaceae including but not limited to Joshua tree (*Hesperoyucca brevifolia*), Mohave yucca (*Yucca schidigera*), and chaparral yucca (*Hesperoyucca whipplei*), all mesquites (*Prosopis* spp.), and cacti (*Cylindropuntia* spp. and *Opuntia* spp.). Wildlife of note that was included in the assessment includes desert tortoise (*Gopherus agassizii*) and burrowing owl (*Athene cunicularia*).

Burrowing Owl Survey

The burrowing owl survey was conducted in accordance with the California Department of Fish and Wildlife Staff Report on Burrowing Owl Mitigation (2012; Attachment A). HELIX biologists conducted four complete surveys of the site, with a minimum of three weeks between each survey (Table 1). The

habitat assessment on January 5, 2018, included walking the entire site searching for burrows with potential to support burrowing owls. The four survey visits were conducted by walking transects no greater than 20 meters wide across the entire project site. The survey included adjacent habitat up to 500 feet from the project site, where potential habitat bordered the property and access was available (Figure 4). Potential habitat does not occur to the north as the project is bordered by development (Apple Valley Airport). Potential habitat to the east was visually assessed from the fence line that occurs adjacent to the eastern side of the property. Transects were surveyed out to approximately 100 yards from the project site to the west and south, with the remainder of the 500-foot buffer surveyed visually with aid of binoculars. Survey 1 included mapping the location of burrows on site and within those portions of the 500-foot buffer that had potential to support burrowing owls.

Table 1
BURROWING OWL SURVEY DATA

Survey Number and Date	Start Time and Conditions	End Time and Conditions	Surveyor
Habitat Assessment January 5, 2018	0730 hrs	1000 hrs	RH
Survey 1 March 14, 2018	0640, 51°F, 50% clouds, wind 5-8 mph	1000, 53°F, 50% clouds, wind 8-10 mph	RH, EC
Survey 2 April 18, 2018	0605, 37°F, 5% clouds, wind 0-2 mph	0900, 53°F, 5% clouds, wind 0-2 mph	RH, LS
Survey 3 March 14, 2018	0545, 48°F, Clear, wind 0-1 mph	0830, 57°F, Clear, wind 1-3 mph	RH, AL
Survey 4 June 20, 2018	0610, 63°F, Clear, wind 0-1 mph	0845, 77°F, Clear, wind 1-3 mph	AL, LS

*RH=Rob Hogenauer, EC=Ezekiel Cooley, LS=Lauren Singleton, AL=Amy Lee

Sensitive Plant Survey

Sensitive plant surveys were conducted on April 18 and May 16, 2018. The timing of the surveys coincides with the blooming period of the sensitive species known to occur in the project vicinity. The survey was conducted by walking transects across the entire project site. The plant surveys focused on identifying plant species that occur on the project site (Attachment B). Sensitive plants with potential to occur on the property area included in the list of plants in Table 4. Additional plants that do not have a sensitivity rating with the CDFW, U.S. Fish and Wildlife Service (USFWS), or the CNPS were included in the search. These additional plants include those that are protected by both the City and the California Native Desert Plant Act (CNDPA; CDFW 2018).

Jurisdictional Delineation

Prior to beginning fieldwork, aerial photographs (1" to 150' scale), and topographic maps were reviewed to determine the location of potential jurisdictional areas that may occur on site. The aerial review included an assessment of adjacent lands to locate connectivity of potential jurisdictional areas. An initial assessment of potential jurisdictional waters was conducted by Mr. Hogenauer on January 5, 2018. Data were collected by HELIX biologists Ezekiel Cooley and Mr. Hogenauer on March 14, 2018, in areas that were suspected to support potential jurisdictional resources. Potential U.S. Army Corps of Engineers (USACE) wetland boundaries were determined using the three criteria (vegetation, hydrology, and soils)

established for wetland delineations, as described within the Wetlands Delineation Manual (Environmental Laboratory 1987) and since updated in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008a). Potential USACE non-wetland boundaries were further determined using methods suggested by the USACE in A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States (USACE 2008b). The same methods were used to determine potential Regional Water Quality Control Board (RWQCB) jurisdiction in the form of waters of the State.

Potential CDFW jurisdictional boundaries were determined based on the presence of riparian vegetation or regular surface flow. Streambeds within CDFW jurisdiction were delineated based on the definition of streambed as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation" (Title 14, Section 1.72).

EXISTING CONDITIONS

Soils

Soils on site consist of a single soil type, Helendale-Bryman loamy sands 2 to 5 percent slopes (U.S. Department of Agriculture 2013).

Vegetation Communities

The project site consists primarily of white bursage scrub along with areas of disturbed habitat (Figure 4).

White Bursage Scrub

White bursage scrub is an open low (less than two meter) shrub community that is dominated by white bursage (*Ambrosia dumosa*). The herbaceous layer is usually open or intermittent, with seasonal annuals. Other species typically associated with this habitat include California croton (*Croton californicus*), cholla (*Cylindropuntia* spp.), Mojave yucca (*Hesperoyucca schidigera*), creosote bush (*Larrea tridentata*), saltbush (*Atriplex* spp.), and many other desert species. On site, this community's shrub layer is a near monoculture of white bursage. Other shrub species observed in limited numbers include pencil cholla (*Cylindropuntia ramosissima*), California croton, slender buckwheat (*Eriogonum gracile*), and a few rubber rabbitbush (*Ericameria nauseosa*) along the drainage in the northeast corner.

Disturbed

Disturbed habitat includes unvegetated or sparsely vegetated areas, particularly where the soil has been heavily compacted by either vehicles (roads) or prior development, or where agricultural lands have been abandoned. Disturbed habitat is generally dominated by non-native weedy species that adapt to frequent disturbance or consists of dirt trails and roads, as is the case on site. Disturbed habitat on site is made up of unimproved dirt roads and trails, and a patch of habitat adjacent to the runway cleared of shrub vegetation. Species observed on site within the disturbed habitat are sparse and include but are not limited to annual bursage (*Ambrosia acanthicarpa*), black mustard (*Brassica nigra*), tumble mustard (*Sisymbrium* sp.), red brome (*Bromus madritensis*), slender buckwheat, Russian thistle (*Salsola tragus*), and Mediterranean bunch grass (*Schismus barbatus*).

Jurisdictional Waters

The jurisdictional delineation revealed the presence of ephemeral drainages on the site (Figure 5). An incised ephemeral drainage occurs along the western border of the site. The drainage flows from the culvert under the Apple Valley Airport runway and travels south toward Papago Road. The drainage becomes disturbed along the south third of the property where it is part drainage and part dirt road. The drainage dissipates at the intersection of Papago Road and Ramona Road. As this drainage dissipates and has no downstream connection to a Traditional Navigable Water (TNW), Relatively Permanent Water (RPW), or other USACE jurisdictional waterbody it was determined to not be a USACE jurisdictional water. This drainage is considered to be jurisdictional to the RWQCB (via the Porter Cologne Act) and as a CDFW streambed.

In the central portion of the site are the remnants of two barely detectable historic drainages. A review of historic aerials revealed that these drainages are historic and no longer receive flows. The flows were redirected when the second runway was built between 1996 and 2003. These two barely detectable drainages were determined to not be jurisdictional to USACE, RWQCB, or CDFW.

Jurisdictional waters on the property total 0.12 acre of streambed that is jurisdictional to the RWQCB under the Porter Cologne Act (Table 2), and 0.24 acre of CDFW jurisdictional streambed (Table 3). The jurisdictional waters are located in a single drainage that occurs on the western border of the property (Figure 5). The widths vary along the streambed and based on agency criteria, with RWQCB widths measuring approximately two to three feet, and CDFW widths measuring approximately four to five feet along the majority of the feature (Figure 5). The width for both jurisdictions reduces down to less than a foot where the streambed dissipates at the southern end of the site. The CDFW width increases to as wide as 12 feet at the northern end of the site.

Table 2
REGIONAL WATER QUALITY CONTROL BOARD
JURISDICTIONAL WATERS ON SITE*

Habitat	Existing Acres	Linear Feet
Streambed	0.12	1,848
TOTAL	**0.12**	**1,848**

*data rounded to the nearest 0.01 ace and nearest linear foot.

Table 3
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
JURISDICTIONAL WATERS ON SITE*

Habitat	Existing Acres	Linear Feet
Streambed	0.24	1,848
TOTAL	**0.24**	**1,848**

*data rounded to the nearest 0.01 ace and nearest linear foot.

Sensitive Plants

Twenty one listed or sensitive plants were evaluated for potential to occur on the project site (Table 4). The 21 species evaluated were based on a search of the CNPS and CNDDB databases using a 9

quadrangle search using the United States Geological Survey Apple Valley North quadrangle as the center for the search. One of the plants evaluated is listed, the federal endangered cushenbury oxytheca (*Acanthoscyphus parishii* var. *goodmaniana*). This species is not expected to occur on the project site. Five of the sensitive (non-listed) species have low to moderate potential to occur on site. Ribbed cryptantha (*Johnstonella costata*) has moderate potential to occur. White pygmy-poppy (*Canbya candida*), Mojave monkeyflower (*Diplacus mohavensis*), Latimer's woodland-gilia (*Saltugilia latimeri*), and beaver dam breadroot (*Pediomelum castoreum*) each have low potential to occur on site. These plants were not detected during the sensitive plant survey conducted on the property. Database records show one sensitive plant species, desert cymopterus (*Cymopterus deserticola*), occurring within three miles of the project (Figure 6).

In addition to CNPS, CDFW, and USFWS sensitive plants, there are additional plant species considered sensitive by the City and CNDPA. These additional species protected by the City include: smoketree, Joshua tree, Mohave yucca, chaparral yucca, barrel cactus (*Ferocactus cylindraceus*), mesquite, and creosote rings. Additional species protected under the CNDPA include all plants Agavaceae, Cactaceae, and Fouquieriaceae families, catclaw acacia (*Acacia greggii*), desert holly (*Atriplex hymenelytra*), and desert ironwood (*Olneya tesota*). The City and CNDPA plants are easily detectable when present and none were observed on site with the exception of four pencil cholla (*Cylindropuntia ramosissima*; Figure 5). These species that are protected under the CNDPA and the City are not included in the table below, but were included in the search for sensitive plants.

Table 4
POTENTIAL FOR LISTED OR SENSITIVE PLANTS TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status in Study Area
Barstow woolly sunflower (*Eriophyllum mohavense*)	--/-- CNPS Rank 1B.2	Playas within Chenopod scrub, Creosote scrub, alkali scrub.	Not expected. Playas do not occur on site.
Beaver Dam breadroot (*Pediomelum castoreum*)	--/-- CNPS Rank 1B.2	Joshua tree woodland, creosote scrub, sandy washes and roadcuts.	Low. Sandy drainage occurs along western border, no creosote or Joshua tree habitat on site.
California androsace (*Androsace elongata* ssp. *acuta*)	--/-- CNPS Rank 4.2	Chaparral, cismontane woodland, coastal scrub, meadows, seeps, pinyon and juniper woodland and grasslands.	Not expected to low. Desert scrub habitat not typical for species.
Crowned muilla (*Muilla coronata*)	--/-- CNPS Rank 4.2	Chenopod scrub, Joshua tree woodland, creosote scrub, Pinyon and juniper woodland.	Not expected. Desert scrub on site does not include creosote, Joshua tree or other elements associated with species.
Cushenbury oxytheca (*Acanthoscyphus parishii var. goodmaniana*)	FE/-- CNPS Rank 1B.1	Pinyon and Juniper woodland. Sandy Carbonite soils.	Not expected. Habitat does not occur on the property.
Desert cymopterus (*Cymopterus deserticola*)	--/-- CNPS Rank 1B.2	Joshua tree woodland, creosote scrub, sandy soils. Typically below 2,600 feet amsl.	Not expected. Site above 2,600 feet, desert scrub on site not typical for species.

Table 4 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE PLANTS TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status in Study Area
Latimer's woodland-gilia (*Saltugilia latimeri*)	--/-- CNPS Rank 1B.2	Chaparral, desert scrub, Pinyon and juniper woodland /rocky or sandy, often granitic, sometimes washes.	Low. Desert scrub onsite, drainage occurs along western border.
Mojave fish-hook cactus (*Sclerocactus polyancistrus*)	--/-- CNPS Rank 4.2	Great basin scrub, Joshua tree woodland, desert scrub. Usually in carbonate soils.	Not expected. Species relatively conspicuous, not observed on site, soils sandy.
Mojave monkeyflower (*Diplacus mohavensis*)	--/-- CNPS Rank 1B.2	Joshua tree woodland, desert scrub, sandy or gravely soils, often in washes.	Low. Drainage occurs along western side of site. Desert scrub and sandy soils are present on site.
Mojave paintbrush (*Castilleja plagiotoma*)	--/-- CNPS Rank 4.3	Great basin scrub (alluvial), Joshua tree woodland, coniferous forest, pinyon, and juniper woodland.	Not expected. Typical habitat associations for species not present on site.
Mojave spineflower (*Chorizanthe spinosa*)	--/-- CNPS Rank 4.2	Chenopod scrub, Joshua tree woodland, desert scrub, usually in playas, sometimes in alkaline soils.	Not expected. Playa habitat not present.
Pinyon rock cress (*Boechera dispar*)	--/-- CNPS Rank 2B.3	Found in creosote bush scrub, Joshua tree woodland and Pinyon-juniper woodland.	Low. Desert scrub habitat occurs on site, but lacks creosote, Joshua trees, and junipers.
Plummer's mariposa lily (*Calochortus plummerae*)	--/-- CNPS Rank 4.2	Rocky and sandy soils, in scrub, chaparral, woodland and grassland.	Not expected to low. Scrub on site not typical for species.
Purple-nerve cymopterus (*Cymopterus multinervatus*)	--/-- CNPS Rank 2B.2	Joshua tree or pinyon and juniper woodland, sandy or gravely soils.	Not expected. No woodland habitats on site.
Ribbed cryptantha (*Johnstonella costata*)	--/-- CNPS Rank 4.3	Desert dunes, desert scrub with sandy soils.	Moderate. Species can occur in a variety of desert scrub habitats.
San Bernardino aster (*Symphyotrichum defoliatum*)	--/-- CNPS Rank 1B.2	Near ditches, streams, seeps, marshes in grassland, scrub, forest.	Low. Limited potential habitat occurs on site in drainage that occurs along western border.
San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*)	--/-- CNPS Rank 1B.2	Pebble plain, Pinyon and juniper woodland, Upper montane coniferous forest granitic, quartzite, or carbonate. Occurs above 4,000 feet amsl.	Not expected. Project site below 3,000 feet amsl. Preferred habitat does not occur on site.

Table 4 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE PLANTS TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status in Study Area
Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*)	--/-- CNPS Rank 1B.2	Joshua tree and juniper woodlands, Mojavean desert scrub and chaparral.	Not expected. No Opuntia species observed on site during surveys.
southern mountains skullcap (*Scutellaria bolanderi* ssp. *austromontana*)	--/-- CNPS Rank 1B.2	Woodland, chaparral, usually in mesic habitats.	Not expected. No mesic habitat on site. No woodland or chaparral habitats on site.
Torrey's box-thorn (*Lycium torreyi*)	--/-- CNPS Rank 4.2	Desert scrub, sandy rocky soils in washes and streambanks.	Not expected. Limited potential habitat on site in drainage along western border. Species conspicuous and was not observed.
White pygmy-poppy (*Canbya candida*)	--/-- CNPS Rank 4.2	Joshua tree woodland, Creosote scrub, pinyon and juniper woodland. Gravelly, sandy, granitic soils.	Low. Desert scrub on site not typical for species. Gravely granitic soils not present.

*Refer to Attachment D for an explanation of the sensitivity statuses.

Branched Pencil Cholla (*Cylindropuntia ramosissima*)
Listing: --/--; no sensitivity status. Protected under CNDPA and by City of Apple Valley.
Distribution: Mainly occurs in the desert regions of San Bernardino, Riverside, San Diego and Imperial Counties.
Habitat: Joshua tree woodland, Creosote bush scrub, and other desert scrubs.
Status on site: Four individual were observed on the southern half of the property (Figure 5).

Sensitive Wildlife

Thirty-three wildlife species were evaluated for potential to occur on the project site (Table 5). The species selected for evaluation were chosen using a 9 quadrangle search of the CNDDB database centered on the Apple Valley North quadrangle. Nine of the species evaluated are listed at the federal and/or state level. These nine species include the federal and state endangered Mohave tui chub (*Siphatelies bicolor mohavensis*), least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), federal endangered arroyo toad (*Anaxyrus californicus*), federal threatened and state endangered western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), federal and state threatened desert tortoise (*Gopherus agassizii*), federal threatened California red-legged frog (*Rana aurora draytonii*), state threatened Swainson hawk (*Buteo swainsoni*), and Mohave ground squirrel (*Xerospermophilus mohavensis*). Three of the listed species have low potential to occur on site. Swainson's hawk and desert tortoise both have been observed approximately three miles from project site; they have potential to utilize the site for foraging. The project is within the range for Mohave ground squirrel and the habitat on site is suitable for the species. The report on the current status of Mohave ground squirrel shows that trapping efforts conducted east of Interstate 15 in the vicinity of Apple Valley have been negative for the species (Leitner 2008). The rest of the listed species require

various riparian habitats that are not present on or adjacent to the site. Animals in the database search that occur within three miles of the project site are shown on Figure 7.

In addition to the nine listed species that were evaluated, 24 sensitive (non-listed) species were also evaluated for potential to occur on site. Eight of the 24 sensitive species have potential to occur on the project site. Burrowing owl has high potential to occur on the site. Sensitive species with low potential to occur on site include Crotch bumblebee (*Bombus crotchii*), Victorville shoulderband (*Helminthoglypta mohaveana*), coast horned lizard (*Phrynosoma coronatum blainvillii*), golden eagle (*Aquila chrysaetos*), and Le Conte's thrasher (*Toxostoma lecontei*). Sensitive species with moderate potential to occur on site include loggerhead shrike (*Lanius ludovicianus*) and prairie falcon (*Falco mexicanus*). All wildlife species observed or detected on site during the general biological survey are included in Attachment C.

Table 5
POTENTIAL FOR LISTED OR SENSITIVE WILDLIFE TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status In Study Area
INVERTEBRATES			
Crotch bumblebee (*Bombus crotchii*)	--/--	Scrub and grassland habitats. Uses sage, sunflowers, and similar species for nectar.	Low to not expected. Sunflowers, sage, or similar species not observed on site. Species observed three miles to north.
San Emigdio blue butterfly (*Plebulina emigdionis*)	--/--	Desert scrub, typically in canyons and along riverbeds.	Not expected. Desert scrub occurs on site, but no canyons or riverbeds.
Victorville shoulderband (*Helminthoglypta mohaveana*)	--/--	Terrestrial, Mojave Desert. Little other information available on species.	Low. Site very dry not typical habitat for snails.
VERTEBRATES			
Fish			
Mohave tui chub (*Siphatelies bicolor mohavensis*)	FE/SE	Only known to occur in highly modified refuge sites in San Bernardino County. Formerly found in deep pools of Mojave River.	Not expected. River habitat does not occur on or adjacent to site.
Reptiles and Amphibians			
arroyo toad (*Anaxyrus californicus*)	FE/SC	Low flow streams with sparse cover in foothills, valleys and mountains. Requires sandy terraces.	Not expected. Flowing streams not present on or adjacent to site.
California red-legged frog (*Rana aurora draytonii*)	FT/SC	Lowland stream, riparian woodland, wetlands.	Not expected. No flowing streams, woodlands, or wetlands.

Table 5 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE WILDLIFE TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status In Study Area
VERTEBRATES (cont.)			
Reptiles and Amphibians (cont.)			
Coast horned lizard (*Phrynosoma coronatum blainvillii*)	--/SC	Grassland, scrub, chaparral, and woodland, with ant populations.	Low. Scrub habitat present. Limited ant populations observed on site.
Desert tortoise (*Gopherus agassizii*)	FT/ST	Variety of desert scrub habitats, sandy flats, alluvial fans, rocky foothills, washes and canyons	Not expected. Burrows with potential for species limited to two burrows currently in use by burrowing owls. Tortoise burrows do not occur on site. Species documented three miles to west.
western pond turtle (*Actinemys marmorata pallida*)	--/SC	Slow-moving streams, ponds, reservoirs, other water bodies deeper than six feet with logs or other submerged cover.	Not expected. No flowing streams on or adjacent to site.
Birds			
Bendire's thrasher (*Toxostoma bendirei*)	--/SC	Desert habitats, typically with variety of shrub, cholla, or yucca.	Not expected. Shrubs on site are near monoculture. A single cholla observed on site. No yucca observed.
Burrowing owl (*Athene cunicularia*)	--SC	Grassland, fallow agriculture, and areas of sparse cover, preferably with burrows of fossorial mammals.	**PRESENT.** Pair of burrowing owls observed using burrow on north end of the project site. A second burrow with recent burrowing owl sign occurs close to occupied burrow. A third burrow located off site to the north was observed being used by the burrowing owl pair.
California horned lark (*Eremophila alpestris actia*)	--/WL	Grassland, agriculture fields, and disturbed fields.	**PRESENT.** Small flock (10-12 individuals) observed foraging as it moved across the site.
Cooper's hawk (*Accipiter cooperii*)	--/SC	Forest and woodland habitats. Will forage in grasslands.	Not expected. Forest and woodland habitats not present on or adjacent to site. No grasslands present.
golden eagle (*Aquila chrysaetos*)	--/Fully protected	Open country, prefers mountains or hills.	Low. Mountain and hills not present on site. Species documented in hills to east. Species may forage in open desert.
Gray vireo (*Vireo vicinior*)	--/SC	Brushy mountain slopes above 3,000 feet amsl.	Not expected. Site below 2,500 feet asml. No mountain slopes on or adjacent to site.

Table 5 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE WILDLIFE TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status In Study Area
VERTEBRATES (cont.)			
Birds (cont.)			
Le Conte's thrasher (*Toxostoma lecontei*)	--/SC	Desert flats, washes, alluvial with sandy alkali soils. In Antelope Valley known only to nest in allscale (*atriplex polycarpa*)	Low. Site is dominated by white bursage with little other shrubs, not typical for species. Species documented in nearby habitats.
Least Bell's vireo (*Vireo bellii pusillus*)	FE/SE	Riparian areas with dense groundcover and stratified canopy; prefers willows.	Not expected. Riparian habitat not present on or adjacent to site.
loggerhead shrike (*Lanius ludovicianus*)	--/SC	Open grassland or shrubland with trees, utility poles, fence post or other perch sites.	Moderate. Shrubland habitat is present on site. Species previously documented in nearby habitat.
long-eared owl *(Asio otus)*	--/SC	Dense vegetation adjacent to open grassland or shrubland, and open forests.	Not expected. No dense vegetation on or adjacent to site.
Prairie Falcon (*Falco mexicanus*)	--/--	Prefers open grassland with cliffs for nesting	Moderate. Species observed at several locations near site. May forage on site. No nesting habitat on site.
southwestern willow flycatcher (*Empidonax traillii extimus*)	FE/SE	Breeds within thickets of willows or other riparian understory usually along streams, ponds, lakes, or canyons. Migrants may be found among other shrubs in wetter areas	Not expected. No willow or similar habitat present on or adjacent to site.

Table 5 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE WILDLIFE TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status In Study Area
VERTEBRATES (cont.)			
Birds (cont.)			
Summer tanager (*Piranga rubra*)	--/SC	Breeds in deciduous forests in eastern part of range, especially open woods and near gaps. In Southeast, breeds in pine-oak forests. In West, uses riparian woodlands. Winters in wide range of open and second-growth habitats.	Not expected. Habitat does not occur on or adjacent to the site.
Swainson's hawk (*Buteo swainsoni*)	--/ST	Grassland, Joshua tree woodland, desert scrub, and agricultural lands all with sparse vegetative cover. Nests in trees, often using an isolated tree.	Low . Scrub habitat present on site. Species observed a few miles to north. No trees for nesting on site, species may the open desert scrub for foraging.
tricolored blackbird (*Agelaius tricolor*)	--/SC	Wetland with dense cattails, tall grasses or thickets of willows.	Not expected. no wetlands or similar habitats on site.
western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT/SE	Dense, thick riparian with willows, dense understory, slow-moving watercourses.	Not expected. No habitat for species present on or near site.
Yellow breasted chat (*Icteria virens*)	--/SC	Wide riparian woodland, moderate to dense willow thickets, with well-developed understory.	Not expected. No riparian habitat occur on or adjacent to the site.
Yellow warbler (*Dendroica petechia brewsteri*)	--/SC	Riparian woodland adjacent to flowing streams.	Not expected. No riparian habitat on or adjacent to site.

Table 5 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE WILDLIFE TO OCCUR IN THE STUDY AREA

Species	Sensitivity Status*	Habitat	Status In Study Area
Mammals			
Hoary bat (*Lasiurus cinereus*)	--/--	Solitary. Roosts in trees in dense habitat but on the edge of clearings.	Not expected. Tree habitat not present on or adjacent to site.
Mohave ground squirrel (*Xerospermophilus mohavensis*)	--/ST	Desert with deep sandy or gravelly soils, abundance of annual herbaceous vegetation. Flat terrain with desert scrub.	Low. Desert scrub habitat present. Small burrows present. Low to moderate cover of herbaceous annual present. Site on edge of range. 2009 species status report indicated surveys conducted for species in vicinity were negative.
Mohave River vole (*Microtus californicus mohavensis*)	--/SC	Moist habitats including meadows, marshes, irrigated land. Often adjacent to ponds and canals.	Not expected. Site is dry. Preferred habitat does not occur on or adjacent to site.
Pallid bat (*Antrozous pallidus*)	--/SC	Coniferous forests, various woodlands, deserts and rocky terrain.	Not expected. No appropriate habitat in Study Area.
Pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*)	--/SC	Rocky gravelly habitat, typically in desert scrub with a yucca overstory and nearby pine-juniper belt.	Not expected. Site lacks yucca, no nearby pine or juniper and soils not rocky or gravelly.
Silver-haired bat (*Lasionycteris noctivagans*)	--/SC	Forest habitat, particularly old growth forest for roosting.	Not expected. No forest habitat occurs on or adjacent to site.
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/SC	Roosts in cave and similar cover with open dark areas. Uses a variety of habitats including desert scrub and pine forests.	Not expected. No caves or similar habitat on site. Adjacent habitat open scrub that lacks caves.

*Refer to Attachment D for an explanation of the sensitivity statuses.

Burrowing Owl

Two burrows (Burrows 1 and 2) were observed in the northeast corner of the project site. Both burrows showed recent sign of burrowing owl occupation. A pair of burrowing owls was observed utilizing one of the burrows (Burrow 1) during the third burrowing owl survey visit (Figure 5). A third burrow (Burrow 3) was observed approximately 75 feet off site to the north between the project site and an airport runway.

Burrow 3 was originally thought to be inactive, but one of the burrowing owls was observed using this burrow during Survey 4. A fresh pellet and some white wash was also observed at Burrow 3 during Survey 4. No sign was observed at Burrow 3 during Surveys 1-3. Burrow 3 is believed to be an alternate burrow used by the burrowing owl pair. The burrowing owl is a California Species of Concern and is also protected under CDFW code as a raptor or bird of prey.

The pair of burrowing owls was observed during Surveys 3 and 4. During Survey 3, one burrowing owl was observed outside the burrow entrance and the second burrowing owl was observed flushing from within the burrow. The pair flushed short distance to the west to a location that lacks burrows. Both owls returned to the burrow once the biologist moved away from the area. The behavior of the burrowing owls observed during Survey 3 indicates a high probability that they are incubating eggs. During Survey 4, one of the owls flushed to Burrow 3, while the other flushed to the west. The owls returned to Burrow 1 once the biologist moved away.

Desert Tortoise

The habitat assessment was conducted by Mr. Hogenauer, a biologist with experience surveying for desert tortoise. The habitat assessment revealed that potential desert tortoise habitat does occur on the site, but no sign of desert tortoise occupation was observed. The site included numerous small mammal burrows (about one inch in diameter), but only two burrows on site were larger than two inches in diameter. Both burrows were located in the northeast quarter of the site and both had sign of burrowing owl occupation. No desert tortoise sign was observed. No burrows of appropriate size and shape were observed on site. Mr. Hogenauer and HELIX biologist Amy Lee conducted additional transects during the burrowing surveys to search for desert tortoise sign, and none was observed. Although a focused desert tortoise survey was not specifically conducted, the multiple survey visits by a desert tortoise qualified biologist, including two complete site surveys during the spring desert tortoise survey window, indicate that desert tortoise do not occur on the property.

Mohave Ground Squirrel

The project site is on the extreme edge of the Mohave ground squirrel historic habitat. The Endangered Species Recovery Program report on Current Status of the Mohave Ground Squirrel shows that numerous surveys were conducted in the Apple Valley and Victorville areas with negative results (Leitner 2008). The CNNDB database shows that the most recent documented Mohave ground squirrel occurs just over five miles from the project and is from 40 years ago.

Prairie Falcon

The CNDDB records show that prairie falcon have been observed throughout the area in proximity to the Apple Valley Airport. Prairie falcon was not observed on or adjacent to the site during the various surveys conducted. This species may forage on site, but prefers cliffs for nesting, that do not occur on site. The project is for the creation of a detention basin and will not result in impacts to the species.

Non-listed Wildlife

Several sensitive, non-listed wildlife species have potential to on site, two of which were observed on site: burrowing owl and California horned lark (*Eremophila alpestris actia*). The California horned lark is a

CDFW watch list species. The global rank for the local subspecies is G5T4Q, which indicates a subspecies ranking of "Apparently Secure" but with some taxonomic questions. Apparently Secure is defined as "Uncommon but not rare; some cause for long-term concern due to declines or other factors."

A flock of approximately 10 to 12 California horned larks were observed moving across the project site in the survey conducted on March 14, 2018. The flock moved off site and appeared to be favoring the habitat void of shrubs that occur adjacent to airport runway located northeast of the project site. The flock was primarily observed off site to the northeast of the project.

Nesting Birds

Other than the aforementioned burrowing owl, nesting birds were not observed on site. The site does include habitat for shrub- and ground-nesting birds.

Critical Habitat

No USFWS-designated critical habitat occurs on the project site. The nearest critical habitat occurs just over five miles southwest of the project site (Figure 8) and is critical habitat for southwestern willow flycatcher (*Empidonax traillii extimus*). No southwestern willow flycatcher potential habitat occurs on or adjacent to the project site. Construction of the project will not result in direct or indirect impacts to critical habitat.

Significant Ecological Areas

Designated Significant Ecological Areas do not occur on or adjacent to the project site. Construction of the project will not result in direct or indirect impacts to Significant Ecological Areas.

IMPACTS

The proposed project impacts to biological resources are discussed in this section. As the project design has not been finalized at this time, impacts are generalized. Where appropriate, estimated impact acreages are provided.

Vegetation

The project is for the creation of an approximately 7.5-acre detention basin along with an inlet channel and an overflow channel. The detention basin and channels will be maintained and, therefore, are considered as permanent impacts. The project is expected to include temporary impacts from a staging area, access routes, spoils pile, and other temporary construction impacts.

Jurisdictional Waters

The project proposes to set up a 25-foot buffer from the jurisdictional drainage along the western border with the exception of the proposed impact areas from the basin inlet and spillway/outlet connection points to the jurisdictional drainage. The specific impacts have yet to be quantified but have been estimated to result in less than 0.01 acre of impact to jurisdictional waters. Precise impacts to

waters will be quantified during final engineering and will be detailed in information submitted in the permitting process.

Sensitive Plants

The project site includes four pencil cholla that are protected under City ordinance and by the CNDPA. The project current design has high potential to result in impacts to at least two of the four pencil cholla.

Burrowing Owl

The project site is currently being used by a pair of burrowing owls. They were observed utilizing 2 burrows on site, and an additional burrow located just off site to the north (Figure 5). The current project design will result in direct impacts to the two on-site burrows, and indirect impacts to the off-site burrow. Project impacts are proposed to occur approximately 200 feet from the off-site burrow with potential for temporary impacts to occur within 75 feet.

SIGNIFICANCE OF PROJECT IMPACTS AND PROPOSED MITIGATION

Issue 1: Special-Status Species

Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Issue 1 Impact Analysis

Burrowing Owl

The CDFW considers a site occupied when at least one burrowing owl, or sign of burrowing owl occupation is observed within the last three years (CDFW 2012). A pair of burrowing owls was observed utilizing a burrow (Burrow 1) on the site. A second burrow (Burrow 2), in relative close proximity to the first, was observed to have recent sign of burrowing owl use. The project as currently designed would result in direct impacts to Burrows 1 and 2, and indirect impacts to Burrow 3, which would be an estimated 75 to 200 feet from project construction activities. Impacts to burrowing owl will be considered significant. Implementation of BIO MM-1 will mitigate impacts to burrowing owl.

Prairie Falcon

No impacts are anticipated and no mitigation is required.

Desert Tortoise

The species was not observed on site and is not expected to occur on the property; however, there is a 28-year old CNDDB record of a tortoise occurring 2.5 miles to the west of the property. No desert tortoise or sign of desert tortoise was observed on site, and there is low potential for the species to wander on the site during construction. Direct impacts to desert tortoise would be considered

significant, if they were to occur. Implementation of BIO MM-2 will preclude desert tortoise from entering the site during construction and prevent potential impacts to the species.

Mohave Ground Squirrel

The Mojave ground squirrel is not expected to occur on site. Mitigation measure BIO-MM-2 for the desert tortoise includes a tortoise exclusionary fence. This fence should aid in preventing Mojave ground squirrel from wandering on the site should they occur nearby.

Nesting Birds

The project site has potential to support nesting bird species. The Migratory Bird Treaty Act (MBTA) protects nesting bird from direct impacts. The CDFW code protects nesting birds from both direct and indirect impacts. Implementation of BIO MM-3 and MM-4, along with BIO MM-1 for burrowing owls, will prevent impacts to nesting birds.

Pencil Cholla

The project site is occupied by four individual pencil cholla. The project proposes to avoid impacts to this species; however, there is potential for impacts to one or more individuals. Implementation of BIO MM-5 will prevent impacts, and/or mitigate impacts to pencil cholla.

Issue 1 Mitigation Measures

BIO MM-1 Burrowing Owl The following measures (Subject to CDFW approval) shall be required to mitigate impacts to burrowing owl:

- A pre-construction (Take Avoidance) survey shall occur within 14 days prior to initiating ground disturbance activities, and prior to initiation of on-site mitigation activities. As the site is known to be occupied by burrowing owl, this survey will serve to confirm that no new burrowing owl locations are present on site or within the 500-foot buffer of the project site. The pre-construction survey will also be required prior to construction following the implementation of a burrowing owl exclusion/relocation plan.

- If occupied burrows can be avoided, the following measures, in accordance with the CDFW Staff Report on Burrowing Owl Mitigation, shall be required:

    - Occupied burrows shall have a minimum 200-meter (656-foot) buffer from construction activities between April 1 and October 15.

    - Occupied burrows shall have a 50-meter (164-foot) buffer from construction activities between October 16 and March 31.

    - Construction fencing shall be installed at the appropriate buffer distance to avoid activities from encroaching on the burrow.

    - A biological monitor shall conduct periodic checks to ensure construction activities are not adversely affecting burrowing owls.

- The buffer can be extended by the monitor to as much as 500 meters (1,640 feet), if required.

- If occupied burrows cannot be avoided, a Burrowing Owl Exclusion Plan shall be prepared and submitted to the CDFW for approval. Implementation of the Plan shall occur during the non-breeding season (October 15 through February 15), unless the burrow is deemed unoccupied or after the young have fledged. Detailed information on burrowing owl mitigation is included on pages 11-14 of the Staff Report on Burrowing Owl Mitigation (Attachment A) The Burrowing Owl Exclusion Plan shall include but not be limited to the following:

  - One way doors shall be used and left in place for 48 hours prior to excavating the burrow.

  - The burrow shall be excavated by hand by a qualified biologist.

  - The burrowing owl(s) shall be allowed to passively relocate into adjacent habitat that will be monitored by a qualified biologist.

  - The adjacent habitat shall be no more than 100 meters (328 feet) from the original burrow.

  - The habitat provided for the burrowing owls shall be preserved in accordance with CDFW guidelines.

    - Develop and implement a mitigation land management plan.

    - Fund the long-term maintenance and management of the mitigation land.

    - The Plan and funding shall be in place and approved by CDFW prior to burrowing owl exclusion or habitat disturbance.

  - Two artificial burrows shall be created for each active burrow excavated.

  - Relocated owls shall be closely monitored (checked weekly) during construction.

  - Relocated burrowing owls shall be monitored for one year following construction. The monitoring shall include monthly visits from April 1 until the young have fledged. Monitoring shall occur every two months once the young have fledged until March 31. A report shall be prepared and submitted to the CDFW documenting the status of the relocated owls and breeding success.

BIO MM-2 Desert Tortoise Desert tortoise are not expected to occur on site, but there is a potential for tortoise to wander on to the site during construction should they occur nearby. To prevent desert tortoise from wandering on the project site, construction fencing should be installed around the work area. The entire project impact area shall be fenced with a tortoise-proof fence. The fence shall consist of a wire mesh with a maximum one-inch mesh. The fence shall be buried a minimum of 12 inches in the ground and extend above ground at least 24 inches. This fence is in addition to the existing chain link fence that borders the north and east side of the project. A biological monitor shall be on site

to monitor the installation of the fence. Fence installation should be monitored by an approved desert tortoise monitor. The desert tortoise monitor shall complete a desert tortoise clearance survey after fence install to insure no desert tortoise are within the fencing. A letter documenting the results of fence installation and monitoring will be submitted by the biologist to the CDFW.

A monitor shall inspect the tortoise fence weekly. Due to the lack of desert tortoise sign on and adjacent to the project site, full time monitoring of the construction activities is not recommended. If the fence is damaged, the project proponent shall make repairs immediately. During construction, if a tortoise is observed within the fencing, the following measures shall occur:

- All construction activities shall cease;
- The biological monitor and the CDFW shall be contacted immediately;
- The fence shall be opened to allow the tortoise to leave the site;
- The qualified biologist shall monitor the tortoise until it is at least 100 meters from the site; and
- Once the tortoise has left the site the fence shall be repaired and the qualified biologist shall conduct a desert tortoise clearance survey to ensure no other tortoise(s) are on the site

No handling of desert tortoise shall occur by the biologist or other personnel associated with the project.

BIO MM-3 Nesting Birds Clearing of on-site vegetation should occur outside the breeding season (March 1 to August 31) if feasible to avoid potential impacts to nesting birds. If clearing must occur during the breeding season, a nesting bird survey shall be conducted by a qualified biologist prior to clearing activities. If birds covered under the MBTA are observed nesting or displaying breeding/nesting behaviors within the area, an appropriate buffer shall be established by a qualified biologist and construction shall be delayed until the nesting cycle is completed.

BIO MM-4 Raptors As raptors are known to begin nesting earlier than other birds and will rebuild and use the same nesting sites year after year, a nesting raptor survey shall occur prior to ground- or vegetation-disturbing activities. In particular, the Joshua trees within 500 feet of the project site shall be surveyed prior to disturbance. If raptors are observed nesting or displaying breeding/nesting behaviors within the area, an appropriate buffer shall be established by a qualified biologist and construction delayed in that area until the nesting cycle is completed.

BIO MM-5 Pencil Cholla Four individual pencil cholla occur on site. To avoid impacts to pencil cholla fencing shall be installed at a minimum 10 foot radius from each individual cholla on the site. The fence will be installed as an above ground fence in order to limit ground disturbance outside the project impact area. If impacts are not avoidable then the pencil cholla to be impacted will be transplanted to an area on site not proposed for impacts. Prior to initiation of clearing or grading, a permit must be obtained from the City. Compliance with the CNDPA must be demonstrated prior to the City issuing a permit. Transplanting shall occur using hand tools only to minimize impacts to the project site. Plants of the cholla genus (*Cylindropuntia* spp.) are known to have a high success rate when transplanted. A biological monitor shall be consulted for the location of the transplanting of the pencil cholla. Once the pencil cholla are planted a construction avoidance fence shall be installed.

Issue 2: Sensitive Natural Communities

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?

Issue 2 Impact Analysis

The project would result in a minimal impact to the drainage course along the western side of the project site, at the locations of the proposed connections of the inlet and outflow channels to/from the proposed basin. Specific acreage of impacts are anticipated to be approximately 0.01 acre of RWQCB/CDFW jurisdictional waters, as required for the connection of the basin in-flow channel. Mitigation measure MM-6 will minimize and mitigate impacts to jurisdictional waters. The specific amount of impacts will be quantified prior to initiating MM-6.

The project would result in permanent impacts to approximately nine acres of white bursage scrub comprised of approximately 7.5 acres of basin and up to 1.5 acres of impact associated with the inlet and outlet channels. The CDFW considers white bursage a sensitive plant community with a global and state ranking of G5S5, which is the least sensitive of the possible rankings. Implementation of **BIO MM-7** will minimize impacts to white bursage scrub.

Issue 2 Mitigation Measures

BIO MM-6 Jurisdictional Waters The project proposes minor impacts to the drainage along the western side of the project site. Impacts to the majority of the drainage will be avoided by utilizing a 25-foot setback from the drainage. Fencing or similar demarcation shall be installed to mark the 25-foot buffer and to mark the limits of disturbance around the inlet and outlet channels. The drainage is jurisdictional to the RWQCB and to the CDFW. In the absence of impacts to USACE jurisdiction under Section 404 of the Clean Water Act, the RWQCB regulates nonpoint discharges under the Porter Cologne Act and implements Waste Discharge Requirements (WDRs). The CDFW regulates impacts to waters under Section 1600 of the state code, and requires a Lake and Streambed Alteration (LSA) agreement. The project will be required to obtain a WDR for the project from the RWQCB and a LSA from the CDFW prior to initiating impacts to the jurisdictional waters. The specific amount of impacts are to be determined in the application process. The WDR and LSA from the aforementioned resource agencies will include appropriate mitigation measures, such as on- or off-site creation of waters, in lieu fees, or purchase of credits within an approved mitigation bank. Specific mitigation measures will be determined during the permitting process.

BIO MM-7 White Bursage Scrub The impacts to white bursage scrub will be minimized by restricting construction activities to within the proposed project footprint, staging areas, and access routes. The project will replant all temporary impact acres with a native plant mix similar to what occurs on the project site. The plant/seed palette will include a plant mix that is comprised of at least 50 percent white bursage, along with a mix of other native species that occur on site. Creosote bush (*Larrea tridentata*) shall not be included in the plant/seed palette as it's not present within the existing white bursage scrub plants. The plant/seed palette shall be approved by a qualified biologist. A brief restoration plan shall be developed and include at minimum three years of monitoring following

installation, complete removal of all non-native plants within the temporary impact area, and a 10-foot buffer prior to plant/install seed. Monitoring reports will be submitted to the City annually.

Issue 3: Jurisdictional Features/Wetlands

Would the project have a substantial adverse effect on any federally-protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coast, etc.) through direct removal, filling, hydrological interruption or other means?

Issue 3 Impact Analysis

No impact would occur. There are no wetlands on the project site. No Section 404, USACE Waters of the U.S. (WUS) occur on the project site.

Issue 3 Mitigation Measures

No mitigation is required due to a lack of federal WUS on the site.

Issue 4: Wildlife Movement and Nursery Sites

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?

Issue 4 Impact Analysis

No Impact. The project does not propose impacts to migratory waterways, wildlife corridors, or wildlife nursery sites. The project site is bordered by open land to the west, east, and south and by the Apple Valley airport to the north.

Issue 4 Mitigation Measures

No mitigation is required.

Issue 5: Local Policies, Ordinances, and Adopted Plans

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Issue 5 Impact Analysis

A total of four individual pencil cholla occur on the project site. This species is protected under the CNDPA and the City. The project may result in impacts to two of the four individuals. Implementation of mitigation measure BIO MM-5 shall eliminate or mitigate potential impacts to the pencil cholla.

Issue 5 Mitigation Measures

See BIO MM-5, above.

Issue 6: Adopted Conservation Plans

Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?

Issue 6 Impact Analysis

The City is in the process of developing a Multiple Species Habitat Conservation Plan (MSHCP). Projects are to be processed on a case by case basis per the accepted CEQA process until the MSHCP is finalized and approved.

The CNDPA protects a suite of species, one of which is pencil cholla. The project has potential impacts to one or more of the four pencil cholla that occur on site.

Issue 6 Mitigation Measures

Implementation of BIO MM-5 will reduce the potential impacts to pencil cholla to less than significant.

Rob Hogenauer
Senior Scientist

Attachments:

Figure 1: Regional Location
Figure 2: USGS Topography
Figure 3: Aerial Vicinity
Figure 4: Vegetation
Figure 5: Sensitive Resources
Figure 6: Plants
Figure 7: CNDDB Animal Species
Figure 8: Critical Habitat
Attachment A: CDFW Staff Report on Burrowing Owl Mitigation
Attachment B: Plant Species Observed
Attachment C: Animal Species Observed or Detected
Attachment D: Explanation of Status Codes for Plant and Animal Species

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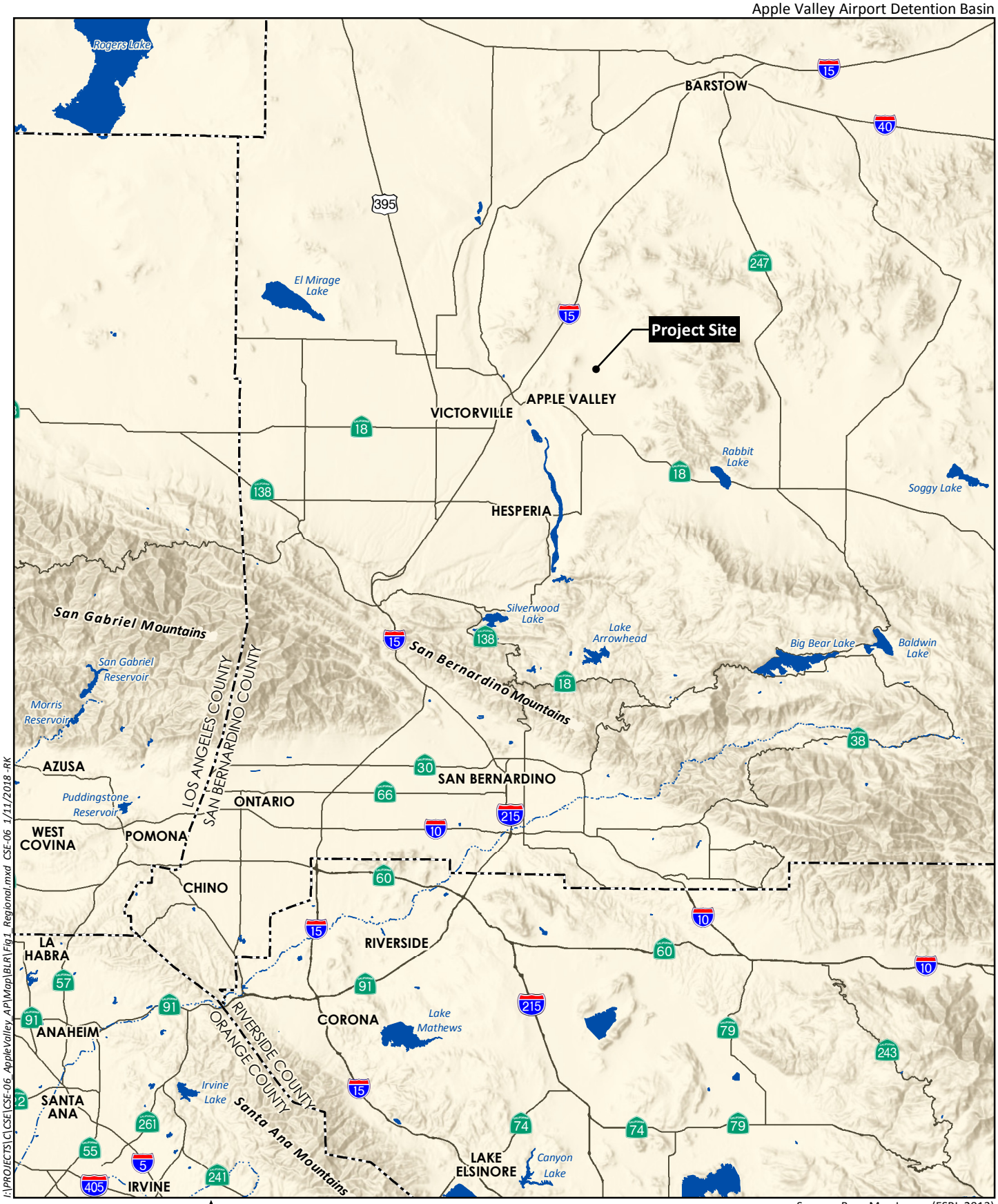

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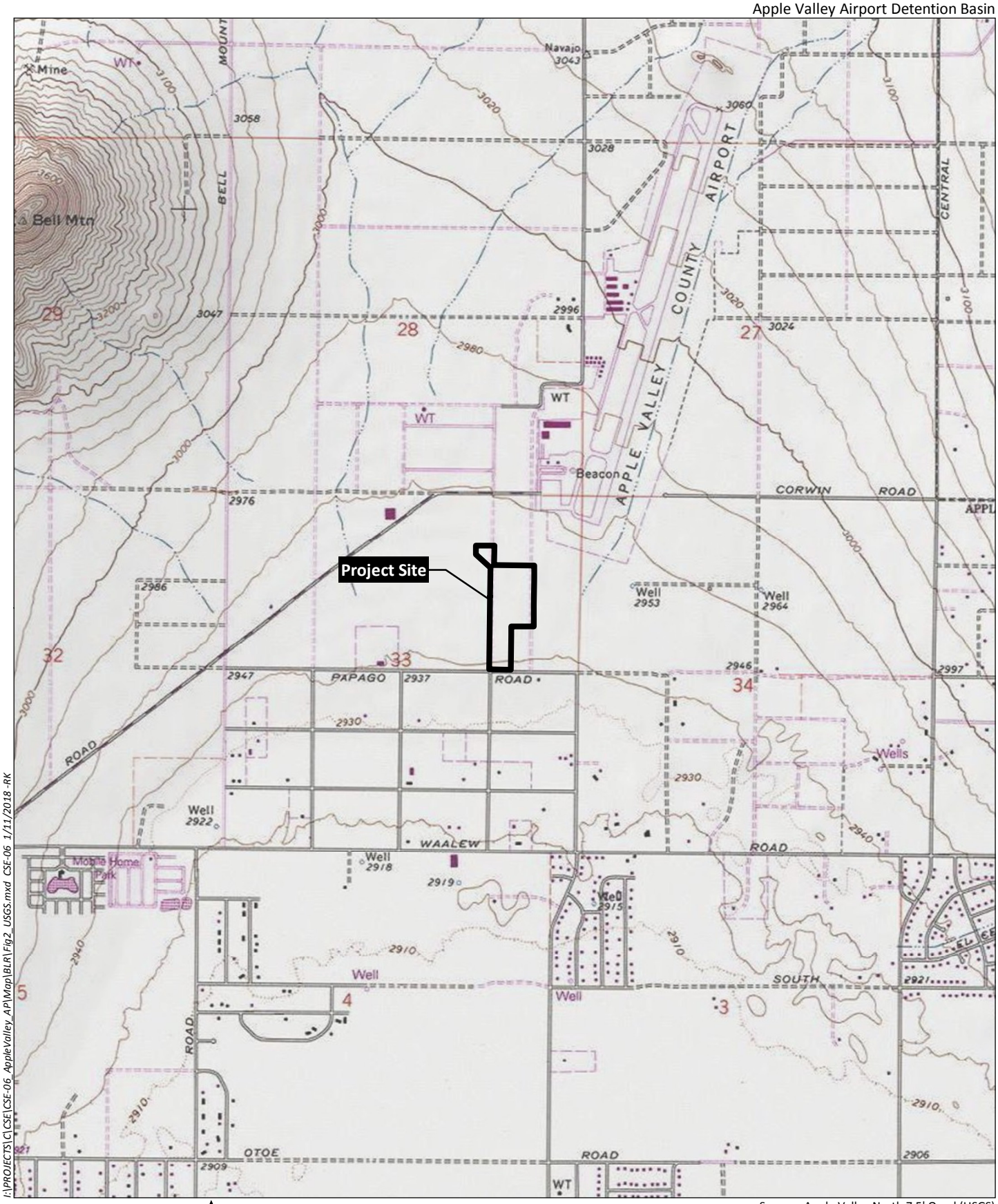
0 10 Miles

Source: Base Map Layers (ESRI, 2013)

HELIX Environmental Planning

Regional Location

Figure 1



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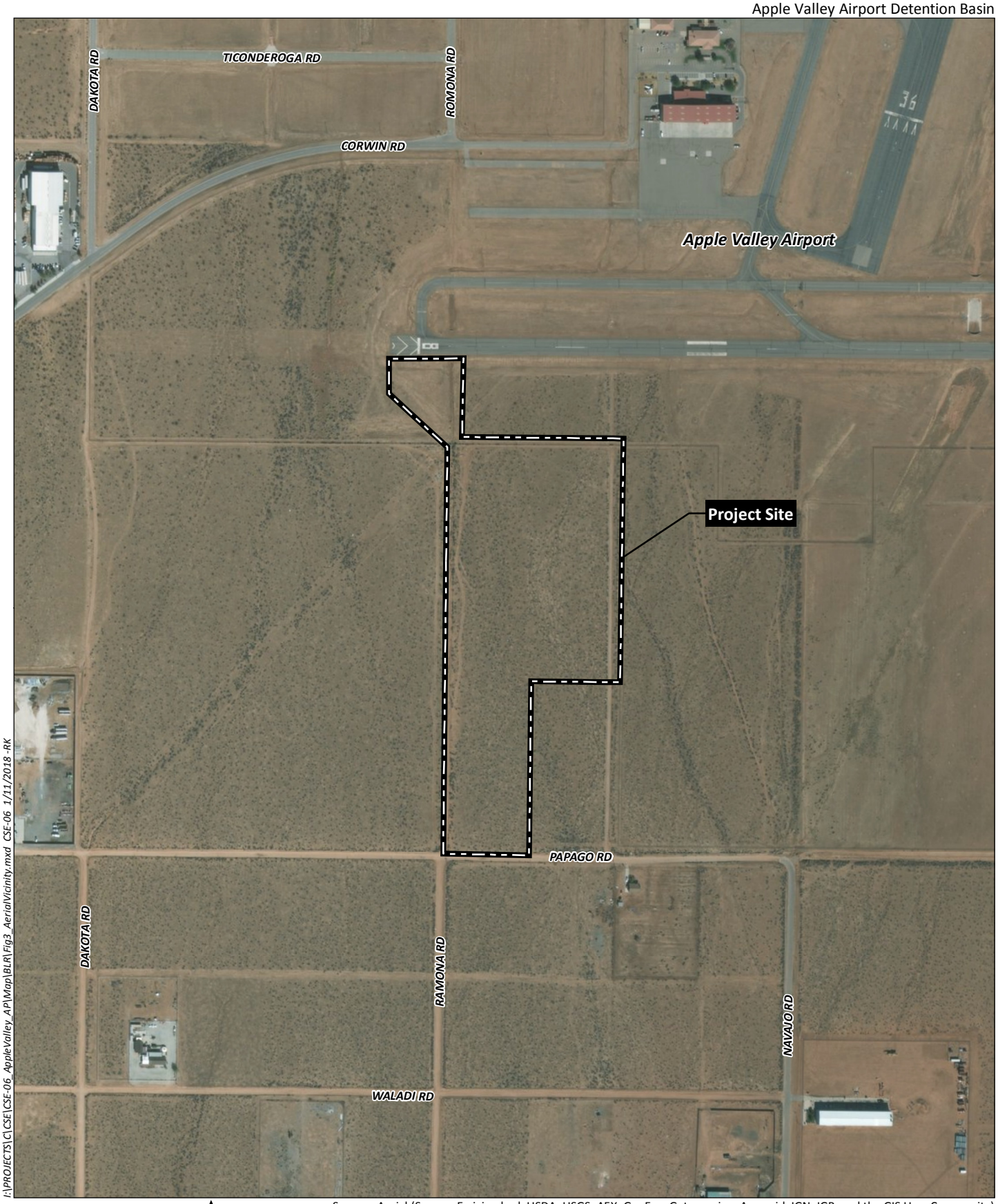
0 2,000 Feet

Source: Apple Valley North 7.5' Quad (USGS)

HELIX Environmental Planning

USGS Topography

Figure 2



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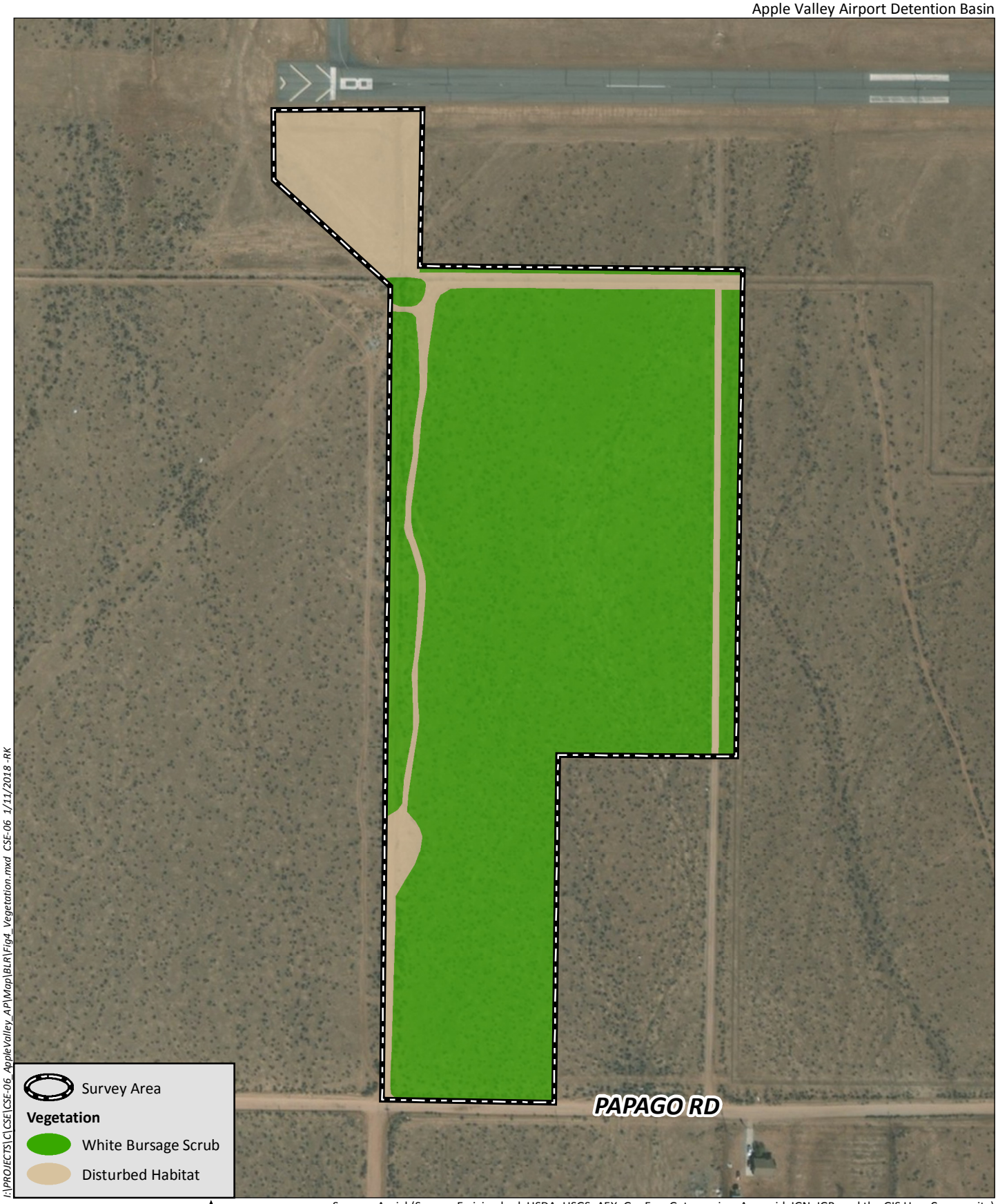
0 500 Feet

Source: Aerial (Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community)

HELIX Environmental Planning

Aerial Vicinity

Figure 3

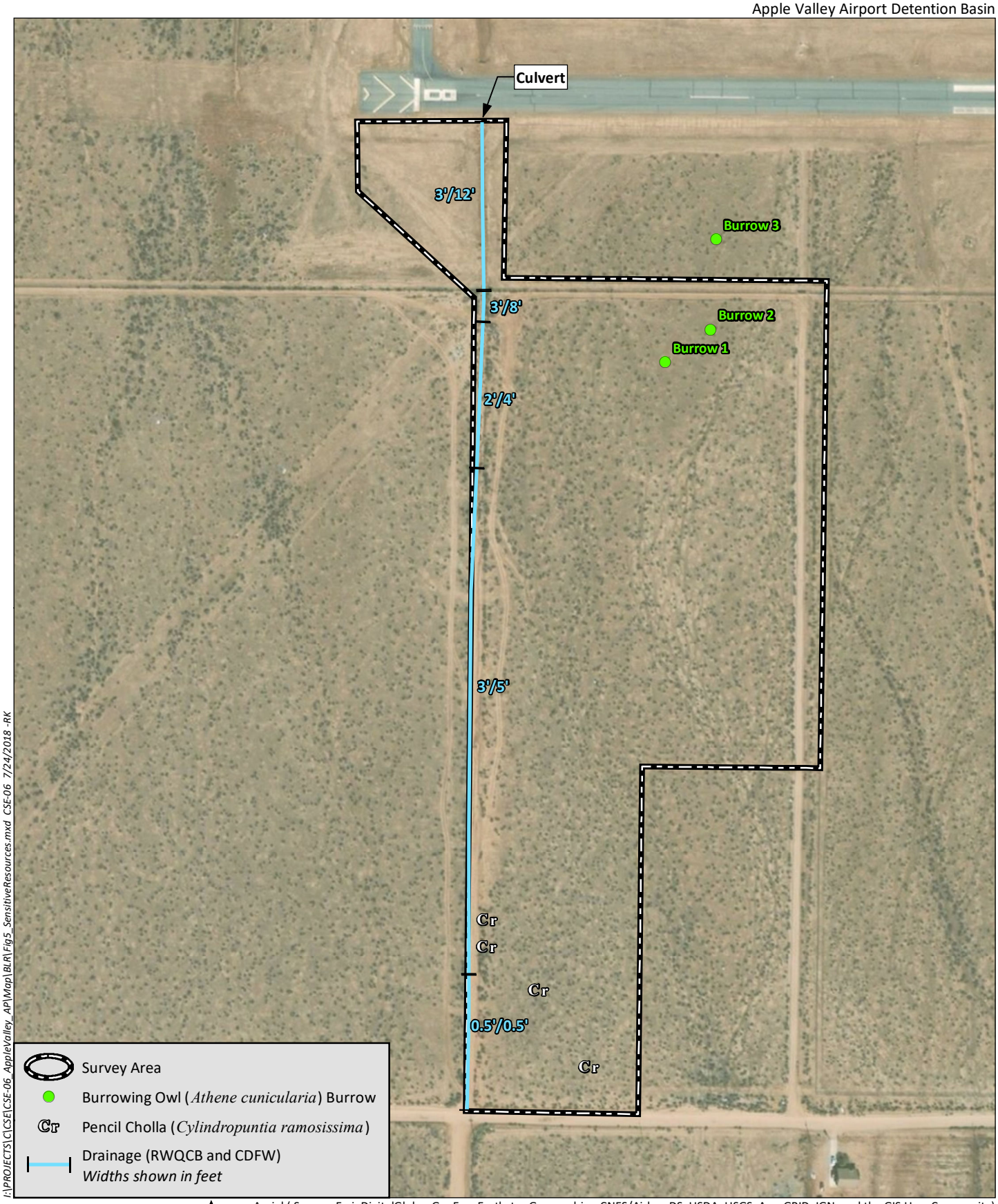


Source: Aerial (Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community)

HELIX Environmental Planning

Vegetation

Figure 4



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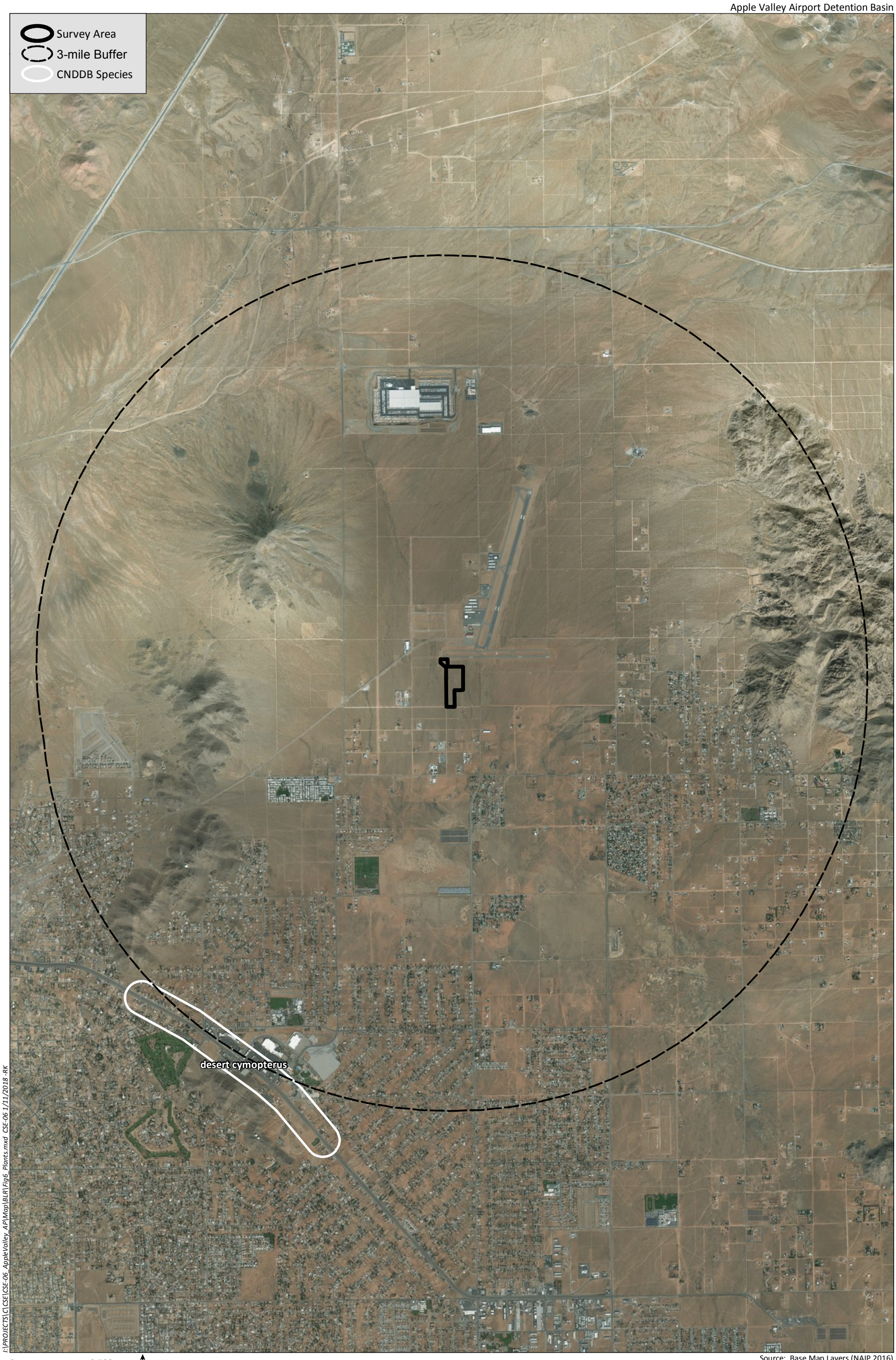
HELIX Environmental Planning

Sensitive Resources

Figure 5



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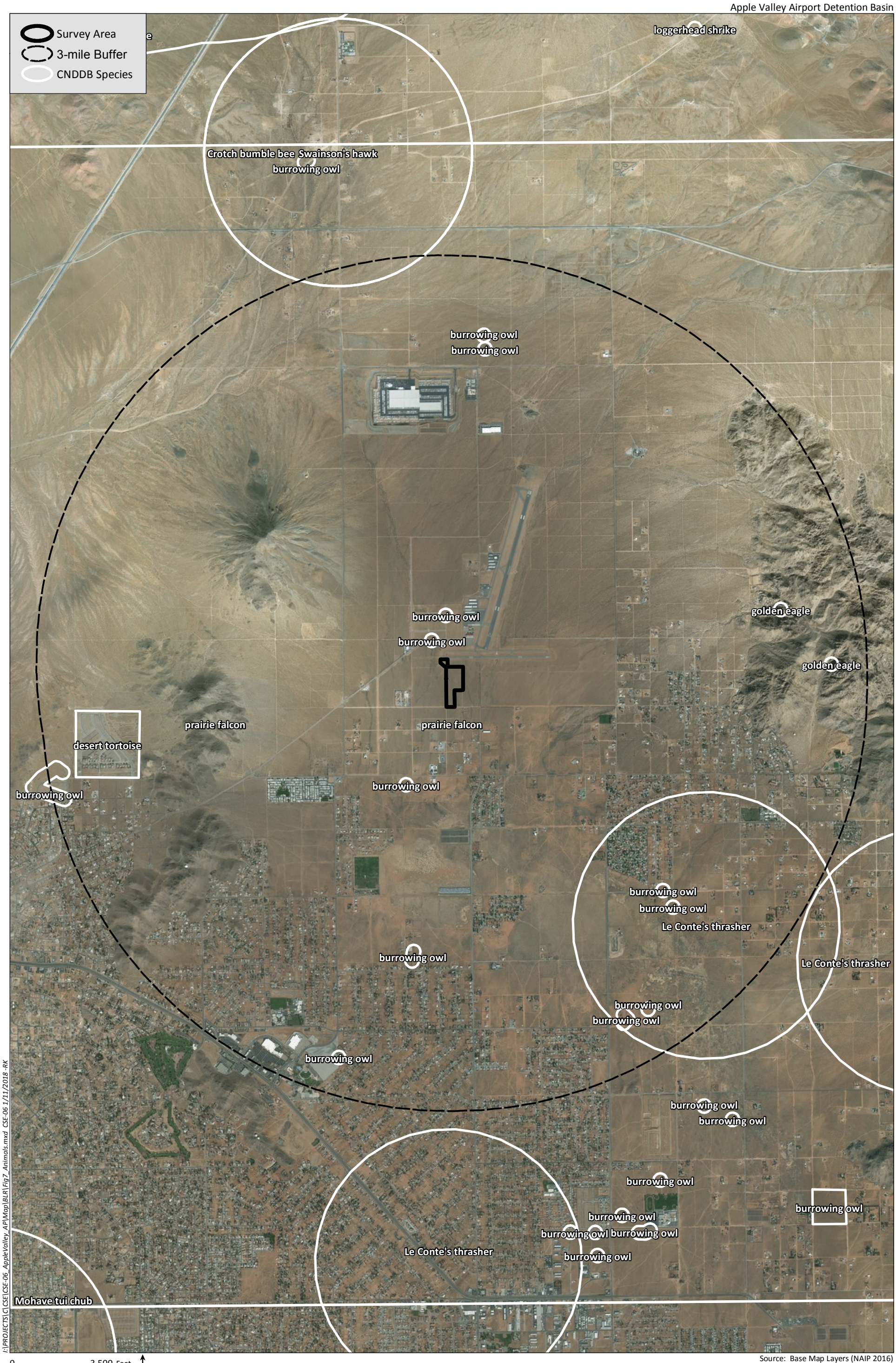
0 3,500 Feet

Source: Base Map Layers (NAIP 2016)

HELIX Environmental Planning

Plants

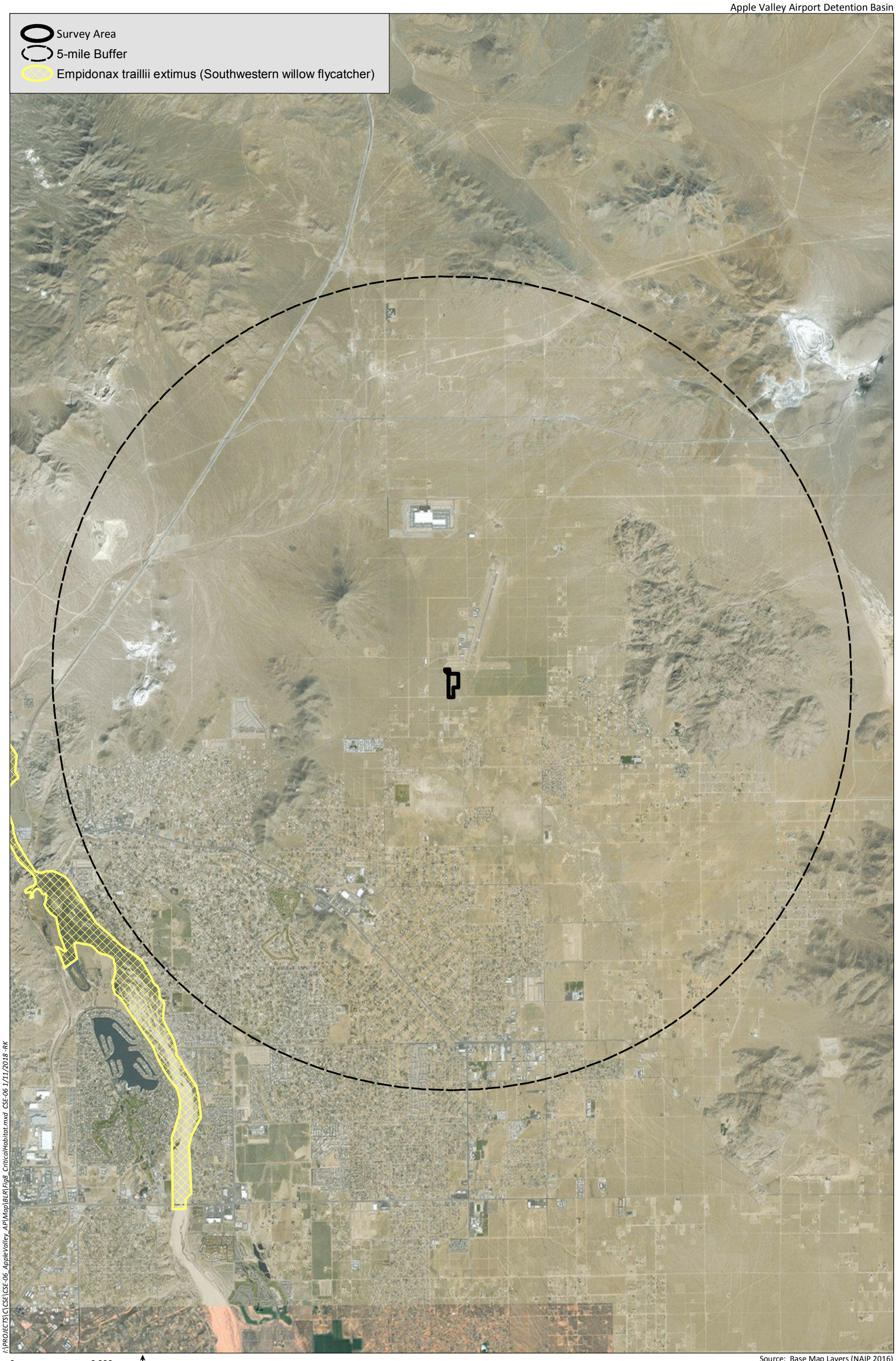
Figure 6



HELIX Environmental Planning

Animals

Figure 7



Source: Base Map Layers (NAIP 2016)

HELIX Environmental Planning

Critical Habitat

Figure 8

Staff Report on Burrowing Owl Mitigation

State of California

Natural Resources Agency

Department of Fish and Game

March 7, 2012[1]

[1] This document replaces the Department of Fish and Game 1995 Staff Report On Burrowing Owl Mitigation.

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INTRODUCTION AND PURPOSE

Maintaining California's rich biological diversity is dependent on the conservation of species and their habitats. The California Department of Fish and Game (Department) has designated certain species as "species of special concern" when their population viability and survival is adversely affected by risk factors such as precipitous declines or other vulnerability factors (Shuford and Gardali 2008). Preliminary analyses of regional patterns for breeding populations of burrowing owls (*Athene cunicularia*) have detected declines both locally in their central and southern coastal breeding areas, and statewide where the species has experienced modest breeding range retraction (Gervais et al. 2008). In California, threat factors affecting burrowing owl populations include habitat loss, degradation and modification, and eradication of ground squirrels resulting in a loss of suitable burrows required by burrowing owls for nesting, protection from predators, and shelter (See Appendix A).

The Department recognized the need for a comprehensive conservation and mitigation strategy for burrowing owls, and in 1995 directed staff to prepare a report describing mitigation and survey recommendations. This report, "1995 Staff Report on Burrowing Owl Mitigation," (Staff Report) (CDFG 1995), contained Department-recommended burrowing owl and burrow survey techniques and mitigation measures intended to offset the loss of habitat and slow or reverse further decline of this species. Notwithstanding these measures, over the past 15+ years, burrowing owls have continued to decline in portions of their range (DeSante et al. 2007, Wilkerson and Siegel, 2010). The Department has determined that reversing declining population and range trends for burrowing owls will require implementation of more effective conservation actions, and evaluating the efficacy of the Department's existing recommended avoidance, minimization and mitigation approaches for burrowing owls.

The Department has identified three main actions that together will facilitate a more viable, coordinated, and concerted approach to conservation and mitigation for burrowing owls in California. These include:

1. Incorporating burrowing owl comprehensive conservation strategies into landscape-based planning efforts such as Natural Community Conservation Plans (NCCPs) and multi-species Habitat Conservation Plans (HCPs) that specifically address burrowing owls.
2. Developing and implementing a statewide conservation strategy (Burkett and Johnson, 2007) and local or regional conservation strategies for burrowing owls, including the development and implementation of a statewide burrowing owl survey and monitoring plan.
3. Developing more rigorous burrowing owl survey methods, working to improve the adequacy of impacts assessments; developing clear and effective avoidance and minimization measures; and developing mitigation measures to ensure impacts to the species are effectively addressed at the project, local, and/or regional level (the focus of this document).

This Report sets forth the Department's recommendations for implementing the third approach identified above by revising the 1995 Staff Report, drawing from the most relevant and current knowledge and expertise, and incorporating the best scientific information

available pertaining to the species. It is designed to provide a compilation of the best available science for Department staff, biologists, planners, land managers, California Environmental Quality Act (CEQA) lead agencies, and the public to consider when assessing impacts of projects or other activities on burrowing owls.

This revised Staff Report takes into account the California Burrowing Owl Consortium's Survey Protocol and Mitigation Guidelines (CBOC 1993, 1997) and supersedes the survey, avoidance, minimization and mitigation recommendations in the 1995 Staff Report. Based on experiences gained from implementing the 1995 Staff Report, the Department believes revising that report is warranted. This document also includes general conservation goals and principles for developing mitigation measures for burrowing owls.

DEPARTMENT ROLE AND LEGAL AUTHORITIES

The mission of the Department is to manage California's diverse fish, wildlife and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitats necessary to maintain biologically sustainable populations of those species (Fish and Game Code (FGC) §1802). The Department, as trustee agency pursuant to CEQA (See CEQA Guidelines, §15386), has jurisdiction by law over natural resources, including fish and wildlife, affected by a project, as that term is defined in Section 21065 of the Public Resources Code. The Department exercises this authority by reviewing and commenting on environmental documents and making recommendations to avoid, minimize, and mitigate potential negative impacts to those resources held in trust for the people of California.

Field surveys designed to detect the presence of a particular species, habitat element, or natural community are one of the tools that can assist biologists in determining whether a species or habitat may be significantly impacted by land use changes or disturbance. The Department reviews field survey data as well as site-specific and regional information to evaluate whether a project's impacts may be significant. This document compiles the best available science for conducting habitat assessments and surveys, and includes considerations for developing measures to avoid impacts or mitigate unavoidable impacts.

CEQA

CEQA requires public agencies in California to analyze and disclose potential environmental impacts associated with a project that the agency will carry out, fund, or approve. Any potentially significant impact must be mitigated to the extent feasible. Project-specific CEQA mitigation is important for burrowing owls because most populations exist on privately owned parcels that, when proposed for development or other types of modification, may be subject to the environmental review requirements of CEQA.

Take

Take of individual burrowing owls and their nests is defined by FGC section 86, and prohibited by sections 3503, 3503.5 and 3513. Take is defined in FGC Section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill."

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the United States and Canada, Japan, Mexico, and Russia for the protection of migratory birds, including the burrowing owl (50 C.F.R. § 10). The MBTA protects migratory bird nests from possession, sale, purchase, barter, transport, import and export, and collection. The other prohibitions of the MBTA - capture, pursue, hunt, and kill - are inapplicable to nests. The regulatory definition of take, as defined in Title 50 C.F.R. part 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect. Only the verb "collect" applies to nests. It is illegal to collect, possess, and by any means transfer possession of any migratory bird nest. The MBTA prohibits the destruction of a nest when it contains birds or eggs, and no possession shall occur during the destruction (see Fish and Wildlife Service, Migratory Bird Permit Memorandum, April 15, 2003). Certain exceptions to this prohibition are included in 50 C.F.R. section 21. Pursuant to Fish & Game Code section 3513, the Department enforces the Migratory Bird Treaty Act consistent with rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act.

Regional Conservation Plans

Regional multiple species conservation plans offer long-term assurances for conservation of covered species at a landscape scale, in exchange for biologically appropriate levels of incidental take and/or habitat loss as defined in the approved plan. California's NCCP Act (FGC §2800 et seq.) governs such plans at the state level, and was designed to conserve species, natural communities, ecosystems, and ecological processes across a jurisdiction or a collection of jurisdictions. Complementary federal HCPs are governed by the Endangered Species Act (7 U.S.C. § 136, 16 U.S.C.§ 1531 et seq.) (ESA). Regional conservation plans (and certain other landscape-level conservation and management plans), may provide conservation for unlisted as well as listed species. Because the geographic scope of NCCPs and HCPs may span many hundreds of thousands of acres, these planning tools have the potential to play a significant role in conservation of burrowing owls, and grasslands and other habitats.

Fish and Game Commission Policies

There are a number of Fish and Game Commission policies (see FGC §2008) that can be applied to burrowing owl conservation. These include policies on: Raptors, Cooperation, Endangered and Threatened Species, Land Use Planning, Management and Utilization of Fish and Wildlife on Federal Lands, Management and Utilization of Fish and Wildlife on Private Lands, and Research.

GUIDING PRINCIPLES FOR CONSERVATION

Unless otherwise provided in a statewide, local, or regional conservation strategy, surveying and evaluating impacts to burrowing owls, as well as developing and implementing avoidance, minimization, and mitigation and conservation measures incorporate the following principles. These principles are a summary of Department staff expert opinion and were used to guide the preparation of this document.

1. Use the Precautionary Principle (Noss et al.1997), by which the alternative of increased conservation is deliberately chosen in order to buffer against incomplete knowledge of burrowing owl ecology and uncertainty about the consequences to burrowing owls of potential impacts, including those that are cumulative.
2. Employ basic conservation biology tenets and population-level approaches when determining what constitutes appropriate avoidance, minimization, and mitigation for impacts. Include mitigation effectiveness monitoring and reporting, and use an adaptive management loop to modify measures based on results.
3. Protect and conserve owls in wild, semi-natural, and agricultural habitats (conserve is defined at FGC §1802).
4. Protect and conserve natural nest burrows (or burrow surrogates) previously used by burrowing owls and sufficient foraging habitat and protect auxiliary "satellite" burrows that contribute to burrowing owl survivorship and natural behavior of owls.

CONSERVATION GOALS FOR THE BURROWING OWL IN CALIFORNIA

It is Department staff expert opinion that the following goals guide and contribute to the short and long-term conservation of burrowing owls in California:

1. Maintain size and distribution of extant burrowing owl populations (allowing for natural population fluctuations).
2. Increase geographic distribution of burrowing owls into formerly occupied historical range where burrowing owl habitat still exists, or where it can be created or enhanced, and where the reason for its local disappearance is no longer of concern.
3. Increase size of existing populations where possible and appropriate (for example, considering basic ecological principles such as carrying capacity, predator-prey relationships, and inter-specific relationships with other species at risk).
4. Protect and restore self-sustaining ecosystems or natural communities which can support burrowing owls at a landscape scale, and which will require minimal long-term management.
5. Minimize or prevent unnatural causes of burrowing owl population declines (e.g., nest burrow destruction, chemical control of rodent hosts and prey).
6. Augment/restore natural dynamics of burrowing owl populations including movement and genetic exchange among populations, such that the species does not require future listing and protection under the California Endangered Species Act (CESA) and/or the federal Endangered Species Act (ESA).
7. Engage stakeholders, including ranchers; farmers; military; tribes; local, state, and federal agencies; non-governmental organizations; and scientific research and education communities involved in burrowing owl protection and habitat management.

ACTIVITIES WITH THE POTENTIAL TO TAKE OR IMPACT BURROWING OWLS

The following activities are examples of activities that have the potential to take burrowing owls, their nests or eggs, or destroy or degrade burrowing owl habitat: grading, disking, cultivation, earthmoving, burrow blockage, heavy equipment compacting and crushing burrow tunnels, levee maintenance, flooding, burning and mowing (if burrows are impacted), and operating wind turbine collisions (collectively hereafter referred to as "projects" or "activities"

whether carried out pursuant to CEQA or not). In addition, the following activities may have impacts to burrowing owl populations: eradication of host burrowers; changes in vegetation management (i.e. grazing); use of pesticides and rodenticides; destruction, conversion or degradation of nesting, foraging, over-wintering or other habitats; destruction of natural burrows and burrow surrogates; and disturbance which may result in harassment of owls at occupied burrows.

PROJECT IMPACT EVALUATIONS

The following three progressive steps are effective in evaluating whether projects will result in impacts to burrowing owls. The information gained from these steps will inform any subsequent avoidance, minimization and mitigation measures. The steps for project impact evaluations are: 1) habitat assessment, 2) surveys, and 3) impact assessment. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project. These three site evaluation steps are discussed in detail below.

Biologist Qualifications

The current scientific literature indicates that only individuals meeting the following minimum qualifications should perform burrowing owl habitat assessments, surveys, and impact assessments:

1. Familiarity with the species and its local ecology;
2. Experience conducting habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor;
3. Familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation;
4. Experience with analyzing impacts of development on burrowing owls and their habitat.

Habitat Assessment Data Collection and Reporting

A habitat assessment is the first step in the evaluation process and will assist investigators in determining whether or not occupancy surveys are needed. Refer to Appendix B for a definition of burrowing owl habitat. Compile the detailed information described in Appendix C when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report.

Surveys

Burrowing owl surveys are the second step of the evaluation process and the best available scientific literature recommends that they be conducted whenever burrowing owl habitat or sign (see Appendix B) is encountered on or adjacent to (within 150 meters) a project site

(Thomsen 1971, Martin 1973). Occupancy of burrowing owl habitat is confirmed at a site when at least one burrowing owl, or its sign at or near a burrow entrance, is observed within the last three years (Rich 1984). Burrowing owls are more detectable during the breeding season with detection probabilities being highest during the nestling stage (Conway et al. 2008). In California, the burrowing owl breeding season extends from 1 February to 31 August (Haug et al. 1993, Thompsen 1971) with some variances by geographic location and climatic conditions. Several researchers suggest three or more survey visits during daylight hours (Haug and Diduik 1993, CBOC 1997, Conway and Simon 2003) and recommend each visit occur at least three weeks apart during the peak of the breeding season, commonly accepted in California as between 15 April and 15 July (CBOC 1997). Conway and Simon (2003) and Conway et al. (2008) recommended conducting surveys during the day when most burrowing owls in a local area are in the laying and incubation period (so as not to miss early breeding attempts), during the nesting period, and in the late nestling period when most owls are spending time above ground.

Non-breeding season (1 September to 31 January) surveys may provide information on burrowing owl occupancy, but do not substitute for breeding season surveys because results are typically inconclusive. Burrowing owls are more difficult to detect during the non-breeding season and their seasonal residency status is difficult to ascertain. Burrowing owls detected during non-breeding season surveys may be year-round residents, young from the previous breeding season, pre-breeding territorial adults, winter residents, dispersing juveniles, migrants, transients or new colonizers. In addition, the numbers of owls and their pattern of distribution may differ during winter and breeding seasons. However, on rare occasions, non-breeding season surveys may be warranted (i.e., if the site is believed to be a wintering site only based on negative breeding season results). Refer to Appendix D for information on breeding season and non-breeding season survey methodologies.

Survey Reports

Adequate information about burrowing owls present in and adjacent to an area that will be disturbed by a project or activity will enable the Department, reviewing agencies and the public to effectively assess potential impacts and will guide the development of avoidance, minimization, and mitigation measures. The survey report includes but is not limited to a description of the proposed project or proposed activity, including the proposed project start and end dates, as well as a description of disturbances or other activities occurring on-site or nearby. Refer to Appendix D for details included in a survey report.

Impact Assessment

The third step in the evaluation process is the impact assessment. When surveys confirm occupied burrowing owl habitat in or adjoining the project area, there are a number of ways to assess a project's potential significant impacts to burrowing owls and their habitat. Richardson and Miller (1997) recommended monitoring raptor behavior prior to developing management recommendations and buffers to determine the extent to which individuals have been sensitized to human disturbance. Monitoring results will also provide detail necessary for developing site-specific measures. Postovit and Postovit (1987) recommended an analytical approach to mitigation planning: define the problem (impact), set goals (to guide mitigation development), evaluate and select mitigation methods, and monitor the results.

Define the problem. The impact assessment evaluates all factors that could affect burrowing owls. Postovit and Postovit (1987) recommend evaluating the following in assessing impacts to raptors and planning mitigation: type and extent of disturbance, duration and timing of disturbance, visibility of disturbance, sensitivity and ability to habituate, and influence of environmental factors. They suggest identifying and addressing all potential direct and indirect impacts to burrowing owls, regardless of whether or not the impacts will occur during the breeding season. Several examples are given for each impact category below; however, examples are not intended to be used exclusively.

Type and extent of the disturbance. The impact assessment describes the nature (source) and extent (scale) of potential project impacts on occupied, satellite and unoccupied burrows including acreage to be lost (temporary or permanent), fragmentation/edge being created, increased distance to other nesting and foraging habitat, and habitat degradation. Discuss any project activities that impact either breeding and/or non-breeding habitat which could affect owl home range size and spatial configuration, negatively affect onsite and offsite burrowing owl presence, increase energetic costs, lower reproductive success, increase vulnerability to predation, and/or decrease the chance of procuring a mate.

Duration and timing of the impact. The impact assessment describes the amount of time the burrowing owl habitat will be unavailable to burrowing owls (temporary or permanent) on the site and the effect of that loss on essential behaviors or life history requirements of burrowing owls, the overlap of project activities with breeding and/or non-breeding seasons (timing of nesting and/or non-breeding activities may vary with latitude and climatic conditions, which should be considered with the timeline of the project or activity), and any variance of the project activities in intensity, scale and proximity relative to burrowing owl occurrences.

Visibility and sensitivity. Some individual burrowing owls or pairs are more sensitive than others to specific stimuli and may habituate to ongoing visual or audible disturbance. Site-specific monitoring may provide clues to the burrowing owl's sensitivities. This type of assessment addresses the sensitivity of burrowing owls within their nesting area to humans on foot, and vehicular traffic. Other variables are whether the site is primarily in a rural versus urban setting, and whether any prior disturbance (e.g., human development or recreation) is known at the site.

Environmental factors. The impact assessment discusses any environmental factors that could be influenced or changed by the proposed activities including nest site availability, predators, prey availability, burrowing mammal presence and abundance, and threats from other extrinsic factors such as human disturbance, urban interface, feral animals, invasive species, disease or pesticides.

Significance of impacts. The impact assessment evaluates the potential loss of nesting burrows, satellite burrows, foraging habitat, dispersal and migration habitat, wintering habitat, and habitat linkages, including habitat supporting prey and host burrowers and other essential habitat attributes. This assessment determines if impacts to the species will result in significant impacts to the species locally, regionally and range-wide per CEQA Guidelines §15382 and Appendix G. The significance of the impact to habitat depends on the extent of habitat disturbed and length of time the habitat is unavailable (for example: minor – several days, medium – several weeks to months, high - breeding season affecting juvenile survival,

or over winter affecting adult survival).

Cumulative effects. The cumulative effects assessment evaluates two consequences: 1) the project's proportional share of reasonably foreseeable impacts on burrowing owls and habitat caused by the project or in combination with other projects and local influences having impacts on burrowing owls and habitat, and 2) the effects on the regional owl population resulting from the project's impacts to burrowing owls and habitat.

Mitigation goals. Establishing goals will assist in planning mitigation and selecting measures that function at a desired level. Goals also provide a standard by which to measure mitigation success. Unless specifically provided for through other FGC Sections or through specific regulations, take, possession or destruction of individual burrowing owls, their nests and eggs is prohibited under FGC sections 3503, 3503.5 and 3513. Therefore, a required goal for all project activities is to avoid take of burrowing owls. Under CEQA, goals would consist of measures that would avoid, minimize and mitigate impacts to a less than significant level. For individual projects, mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). In order for mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental conditions. As set forth in more detail in Appendix A, the current scientific literature supports the conclusion that mitigation for permanent habitat loss necessitates replacement with an equivalent or greater habitat area for breeding, foraging, wintering, dispersal, presence of burrows, burrow surrogates, presence of fossorial mammal dens, well drained soils, and abundant and available prey within close proximity to the burrow.

MITIGATION METHODS

The current scientific literature indicates that any site-specific avoidance or mitigation measures developed should incorporate the best practices presented below or other practices confirmed by experts and the Department. The Department is available to assist in the development of site-specific avoidance and mitigation measures.

Avoiding. A primary goal is to design and implement projects to seasonally and spatially avoid negative impacts and disturbances that could result in take of burrowing owls, nests, or eggs. Other avoidance measures may include but not be limited to:

- Avoid disturbing occupied burrows during the nesting period, from 1 February through 31 August.
- Avoid impacting burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls.
- Avoid direct destruction of burrows through chaining (dragging a heavy chain over an area to remove shrubs), disking, cultivation, and urban, industrial, or agricultural development.
- Develop and implement a worker awareness program to increase the on-site worker's recognition of and commitment to burrowing owl protection.
- Place visible markers near burrows to ensure that farm equipment and other machinery does not collapse burrows.
- Do not fumigate, use treated bait or other means of poisoning nuisance animals in areas where burrowing owls are known or suspected to occur (e.g., sites observed with nesting

owls, designated use areas).
- Restrict the use of treated grain to poison mammals to the months of January and February.

Take avoidance (pre-construction) surveys. Take avoidance surveys are intended to detect the presence of burrowing owls on a project site at a fixed period in time and inform necessary take avoidance actions. Take avoidance surveys may detect changes in owl presence such as colonizing owls that have recently moved onto the site, migrating owls, resident burrowing owls changing burrow use, or young of the year that are still present and have not dispersed. Refer to Appendix D for take avoidance survey methodology.

Site surveillance. Burrowing owls may attempt to colonize or re-colonize an area that will be impacted; thus, the current scientific literature indicates a need for ongoing surveillance at the project site during project activities is recommended. The surveillance frequency/effort should be sufficient to detect burrowing owls if they return. Subsequent to their new occupancy or return to the site, take avoidance measures should assure with a high degree of certainty that take of owls will not occur.

Minimizing. If burrowing owls and their habitat can be protected in place on or adjacent to a project site, the use of buffer zones, visual screens or other measures while project activities are occurring can minimize disturbance impacts. Conduct site-specific monitoring to inform development of buffers (see Visibility and sensitivity above). The following general guidelines for implementing buffers should be adjusted to address site-specific conditions using the impact assessment approach described above. The CEQA lead agency and/or project proponent is encouraged to consult with the Department and other burrowing owl experts for assistance in developing site-specific buffer zones and visual screens.

Buffers. Holroyd et al. (2001) identified a need to standardize management and disturbance mitigation guidelines. For instance, guidelines for mitigating impacts by petroleum industries on burrowing owls and other prairie species (Scobie and Faminow, 2000) may be used as a template for future mitigation guidelines (Holroyd et al. 2001). Scobie and Faminow (2000) developed guidelines for activities around occupied burrowing owl nests recommending buffers around low, medium, and high disturbance activities, respectively (see below).

Recommended restricted activity dates and setback distances by level of disturbance for burrowing owls (Scobie and Faminow 2000).

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

* meters (m)

Based on existing vegetation, human development, and land uses in an area, resource managers may decide to allow human development or resource extraction closer to these area/sites than recommended above. However, if it is decided to allow activities closer than

the setback distances recommended, a broad-scale, long-term, scientifically-rigorous monitoring program ensures that burrowing owls are not detrimentally affected by alternative approaches.

Other minimization measures include eliminating actions that reduce burrowing owl forage and burrowing surrogates (e.g. ground squirrel), or introduce/facilitate burrowing owl predators. Actions that could influence these factors include reducing livestock grazing rates and/or changing the timing or duration of grazing or vegetation management that could result in less suitable habitat.

Burrow exclusion and closure. Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls, or permanently exclude burrowing owls and close burrows after verifying burrows are empty by site monitoring and scoping. Exclusion in and of itself is not a take avoidance, minimization or mitigation method. Eviction of burrowing owls is a potentially significant impact under CEQA.

The long-term demographic consequences of these techniques have not been thoroughly evaluated, and the fate of evicted or excluded burrowing owls has not been systematically studied. Because burrowing owls are dependent on burrows at all times of the year for survival and/or reproduction, evicting them from nesting, roosting, and satellite burrows may lead to indirect impacts or take. Temporary or permanent closure of burrows may result in significant loss of burrows and habitat for reproduction and other life history requirements. Depending on the proximity and availability of alternate habitat, loss of access to burrows will likely result in varying levels of increased stress on burrowing owls and could depress reproduction, increase predation, increase energetic costs, and introduce risks posed by having to find and compete for available burrows. Therefore, exclusion and burrow closure are not recommended where they can be avoided. The current scientific literature indicates consideration of all possible avoidance and minimization measures before temporary or permanent exclusion and closure of burrows is implemented, in order to avoid take.

The results of a study by Trulio (1995) in California showed that burrowing owls passively displaced from their burrows were quickly attracted to adjacent artificial burrows at five of six passive relocation sites. The successful sites were all within 75 meters (m) of the destroyed burrow, a distance generally within a pair's territory. This researcher discouraged using passive relocation to artificial burrows as a mitigation measure for lost burrows without protection of adjacent foraging habitat. The study results indicated artificial burrows were used by evicted burrowing owls when they were approximately 50-100 m from the natural burrow (Thomsen 1971, Haug and Oliphant 1990). Locating artificial or natural burrows more than 100 m from the eviction burrow may greatly reduce the chances that new burrows will be used. Ideally, exclusion and burrow closure is employed only where there are adjacent natural burrows and non-impacted, sufficient habitat for burrowing owls to occupy with permanent protection mechanisms in place. Any new burrowing owl colonizing the project site after the CEQA document has been adopted may constitute changed circumstances that should be addressed in a re-circulated CEQA document.

The current scientific literature indicates that burrow exclusion should only be conducted by qualified biologists (meeting the Biologist's Qualifications above) during the non-breeding

season, before breeding behavior is exhibited and after the burrow is confirmed empty by site surveillance and/or scoping. The literature also indicates that when temporary or permanent burrow exclusion and/or burrow closure is implemented, burrowing owls should not be excluded from burrows unless or until:

- A Burrowing Owl Exclusion Plan (see Appendix E) is developed and approved by the applicable local DFG office;
- Permanent loss of occupied burrow(s) and habitat is mitigated in accordance with the Mitigating Impacts sections below. Temporary exclusion is mitigated in accordance with the item #1 under Mitigating Impacts below.
- Site monitoring is conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided. Conduct daily monitoring for one week to confirm young of the year have fledged if the exclusion will occur immediately after the end of the breeding season.
- Excluded burrowing owls are documented using artificial or natural burrows on an adjoining mitigation site (if able to confirm by band re-sight).

Translocation (Active relocation offsite >100 meters). At this time, there is little published information regarding the efficacy of translocating burrowing owls, and additional research is needed to determine subsequent survival and breeding success (Klute et al. 2003, Holroyd et al. 2001). Study results for translocation in Florida implied that hatching success may be decreased for populations of burrowing owls that undergo translocation (Nixon 2006). At this time, the Department is unable to authorize the capture and relocation of burrowing owls except within the context of scientific research (FGC §1002) or a NCCP conservation strategy.

Mitigating impacts. Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central and Imperial valleys is the greatest of many threats to burrowing owls in California (Shuford and Gardali, 2008). At a minimum, if burrowing owls have been documented to occupy burrows (see Definitions, Appendix B) at the project site in recent years, the current scientific literature supports the conclusion that the site should be considered occupied and mitigation should be required by the CEQA lead agency to address project-specific significant and cumulative impacts. Other site-specific and regionally significant and cumulative impacts may warrant mitigation. The current scientific literature indicates the following to be best practices. If these best practices cannot be implemented, the lead agency or lead investigator may consult with the Department to develop effective mitigation alternatives. The Department is also available to assist in the identification of suitable mitigation lands.

1. Where habitat will be temporarily disturbed, restore the disturbed area to pre-project condition including decompacting soil and revegetating. Permanent habitat protection may be warranted if there is the potential that the temporary impacts may render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable depending on the time frame, resulting in reduced survival or abandonment. For the latter potential impact, see the permanent impact measures below.
2. Mitigate for permanent impacts to nesting, occupied and satellite burrows and/or burrowing owl habitat such that the habitat acreage, number of burrows and burrowing owls impacted are replaced based on the information provided in Appendix A. Note: A

minimum habitat replacement recommendation is not provided here as it has been shown to serve as a default, replacing any site-specific analysis and discounting the wide variation in natal area, home range, foraging area, and other factors influencing burrowing owls and burrowing owl population persistence in a particular area.

3. Mitigate for permanent impacts to nesting, occupied and satellite burrows and burrowing owl habitat with (a) permanent conservation of similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) to provide for burrowing owl nesting, foraging, wintering, and dispersal (i.e., during breeding and non-breeding seasons) comparable to or better than that of the impact area, and (b) sufficiently large acreage, and presence of fossorial mammals. The mitigation lands may require habitat enhancements including enhancement or expansion of burrows for breeding, shelter and dispersal opportunity, and removal or control of population stressors. If the mitigation lands are located adjacent to the impacted burrow site, ensure the nearest neighbor artificial or natural burrow clusters are at least within 210 meters (Fisher et al. 2007).
4. Permanently protect mitigation land through a conservation easement deeded to a non-profit conservation organization or public agency with a conservation mission, for the purpose of conserving burrowing owl habitat and prohibiting activities incompatible with burrowing owl use. If the project is located within the service area of a Department-approved burrowing owl conservation bank, the project proponent may purchase available burrowing owl conservation bank credits.
5. Develop and implement a mitigation land management plan to address long-term ecological sustainability and maintenance of the site for burrowing owls (see Management Plan and Artificial Burrow sections below, if applicable).
6. Fund the maintenance and management of mitigation land through the establishment of a long-term funding mechanism such as an endowment.
7. Habitat should not be altered or destroyed, and burrowing owls should not be excluded from burrows, until mitigation lands have been legally secured, are managed for the benefit of burrowing owls according to Department-approved management, monitoring and reporting plans, and the endowment or other long-term funding mechanism is in place or security is provided until these measures are completed.
8. Mitigation lands should be on, adjacent or proximate to the impact site where possible and where habitat is sufficient to support burrowing owls present.
9. Where there is insufficient habitat on, adjacent to, or near project sites where burrowing owls will be excluded, acquire mitigation lands with burrowing owl habitat away from the project site. The selection of mitigation lands should then focus on consolidating and enlarging conservation areas located outside of urban and planned growth areas, within foraging distance of other conserved lands. If mitigation lands are not available adjacent to other conserved lands, increase the mitigation land acreage requirement to ensure a selected site is of sufficient size. Offsite mitigation may not adequately offset the biological and habitat values impacted on a one to one basis. Consult with the Department when determining offsite mitigation acreages.
10. Evaluate and select suitable mitigation lands based on a comparison of the habitat attributes of the impacted and conserved lands, including but not limited to: type and structure of habitat being impacted or conserved; density of burrowing owls in impacted and conserved habitat; and significance of impacted or conserved habitat to the species range-wide. Mitigate for the highest quality burrowing owl habitat impacted first and foremost when identifying mitigation lands, even if a mitigation site is located outside of

a lead agency's jurisdictional boundary, particularly if the lead agency is a city or special district.

11. Select mitigation lands taking into account the potential human and wildlife conflicts or incompatibility, including but not limited to, human foot and vehicle traffic, and predation by cats, loose dogs and urban-adapted wildlife, and incompatible species management (i.e., snowy plover).
12. Where a burrowing owl population appears to be highly adapted to heavily altered habitats such as golf courses, airports, athletic fields, and business complexes, permanently protecting the land, augmenting the site with artificial burrows, and enhancing and maintaining those areas may enhance sustainability of the burrowing owl population onsite. Maintenance includes keeping lands grazed or mowed with weed-eaters or push mowers, free from trees and shrubs, and preventing excessive human and human-related disturbance (e.g., walking, jogging, off-road activity, dog-walking) and loose and feral pets (chasing and, presumably, preying upon owls) that make the environment uninhabitable for burrowing owls (Wesemann and Rowe 1985, Millsap and Bear 2000, Lincer and Bloom 2007). Items 4, 5 and 6 also still apply to this mitigation approach.
13. If there are no other feasible mitigation options available and a lead agency is willing to establish and oversee a Burrowing Owl Mitigation and Conservation Fund that funds on a competitive basis acquisition and permanent habitat conservation, the project proponent may participate in the lead agency's program.

Artificial burrows. Artificial burrows have been used to replace natural burrows either temporarily or long-term and their long-term success is unclear. Artificial burrows may be an effective addition to in-perpetuity habitat mitigation if they are augmenting natural burrows, the burrows are regularly maintained (i.e., no less than annual, with biennial maintenance recommended), and surrounding habitat patches are carefully maintained. There may be some circumstances, for example at airports, where squirrels will not be allowed to persist and create a dynamic burrow system, where artificial burrows may provide some support to an owl population.

Many variables may contribute to the successful use of artificial burrows by burrowing owls, including pre-existence of burrowing owls in the area, availability of food, predators, surrounding vegetation and proximity, number of natural burrows in proximity, type of materials used to build the burrow, size of the burrow and entrance, direction in which the burrow entrance is facing, slope of the entrance, number of burrow entrances per burrow, depth of the burrow, type and height of perches, and annual maintenance needs (Belthoff and King 2002, Smith et al. 2005, Barclay et al. 2011). Refer to Barclay (2008) and (2011) and to Johnson et al. 2010 (unpublished report) for guidance on installing artificial burrows including recommendations for placement, installation and maintenance.

Any long-term reliance on artificial burrows as natural burrow replacements must include semi-annual to annual cleaning and maintenance and/or replacement (Barclay et al. 2011, Smith and Conway 2005, Alexander et al. 2005) as an ongoing management practice. Alexander et al. (2005), in a study of the use of artificial burrows found that all of 20 artificial burrows needed some annual cleaning and maintenance. Burrows were either excavated by predators, blocked by soil or vegetation, or experienced substrate erosion forming a space beneath the tubing that prevented nestlings from re-entering the burrow.

Mitigation lands management plan. Develop a Mitigation Lands Management Plan for projects that require off-site or on-site mitigation habitat protection to ensure compliance with and effectiveness of identified management actions for the mitigation lands. A suggested outline and related vegetation management goals and monitoring success criteria can be found in Appendix E.

Mitigation Monitoring and Reporting

Verify the compliance with required mitigation measures, the accuracy of predictions, and ensure the effectiveness of all mitigation measures for burrowing owls by conducting follow-up monitoring, and implementing midcourse corrections, if necessary, to protect burrowing owls. Refer to CEQA Guidelines Section 15097 and the CEQA Guidelines for additional guidance on mitigation, monitoring and reporting. Monitoring is qualitatively different from site surveillance; monitoring normally has a specific purpose and its outputs and outcomes will usually allow a comparison with some baseline condition of the site before the mitigation (including avoidance and minimization) was undertaken. Ideally, monitoring should be based on the Before-After Control-Impact (BACI) principle (McDonald et al. 2000) that requires knowledge of the pre-mitigation state to provide a reference point for the state and change in state after the project and mitigation have been implemented.

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Appendix A. Burrowing Owl Natural History and Threats

Diet

Burrowing owl diet includes arthropods, small rodents, birds, amphibians, reptiles, and carrion (Haug et al. 1993).

Breeding

In California, the breeding season for the burrowing owl typically occurs between 1 February and 31 August although breeding in December has been documented (Thompson 1971, Gervais et al. 2008); breeding behavior includes nest site selection by the male, pair formation, copulation, egg laying, hatching, fledging, and post-fledging care of young by the parents. The peak of the breeding season occurs between 15 April and 15 July and is the period when most burrowing owls have active nests (eggs or young). The incubation period lasts 29 days (Coulombe 1971) and young fledge after 44 days (Haug et al. 1993). Note that the timing of nesting activities may vary with latitude and climatic conditions. Burrowing owls may change burrows several times during the breeding season, starting when nestlings are about three weeks old (Haug et al. 1993).

Dispersal

The following discussion is an excerpt from Gervais et al (2008):

> "The burrowing owl is often considered a sedentary species (e.g., Thomsen 1971). A large proportion of adults show strong fidelity to their nest site from year to year, especially where resident, as in Florida (74% for females, 83% for males; Millsap and Bear 1997). In California, nest-site fidelity rates were 32%–50% in a large grassland and 57% in an agricultural environment (Ronan 2002, Catlin 2004, Catlin et al. 2005). Differences in these rates among sites may reflect differences in nest predation rates (Catlin 2004, Catlin et al. 2005). Despite the high nest fidelity rates, dispersal distances may be considerable for both juveniles (natal dispersal) and adults (postbreeding dispersal), but this also varied with location (Catlin 2004, Rosier et al. 2006). Distances of 53 km to roughly 150 km have been observed in California for adult and natal dispersal, respectively (D. K. Rosenberg and J. A. Gervais, unpublished data), despite the difficulty in detecting movements beyond the immediate study area (Koenig et al. 1996)."

Habitat

The burrowing owl is a small, long-legged, ground-dwelling bird species, well-adapted to open, relatively flat expanses. In California, preferred habitat is generally typified by short, sparse vegetation with few shrubs, level to gentle topography and well-drained soils (Haug et al. 1993). Grassland, shrub steppe, and desert are naturally occurring habitat types used by the species. In addition, burrowing owls may occur in some agricultural areas, ruderal grassy fields, vacant lots and pastures if the vegetation structure is suitable and there are useable burrows and foraging habitat in proximity (Gervais et al 2008). Unique amongst North

American raptors, the burrowing owl requires underground burrows or other cavities for nesting during the breeding season and for roosting and cover, year round. Burrows used by the owls are usually dug by other species termed host burrowers. In California, California ground squirrel (*Spermophilus beecheyi*) and round-tailed ground squirrel (*Citellus tereticaudus*) burrows are frequently used by burrowing owls but they may use dens or holes dug by other fossorial species including badger (*Taxidea taxus*), coyote (*Canis latrans*), and fox (e.g., San Joaquin kit fox, *Vulpes macrotis mutica*; Ronan 2002). In some instances, owls have been known to excavate their own burrows (Thompson 1971, Barclay 2007). Natural rock cavities, debris piles, culverts, and pipes also are used for nesting and roosting (Rosenberg et al. 1998). Burrowing owls have been documented using artificial burrows for nesting and cover (Smith and Belthoff, 2003).

Foraging habitat. Foraging habitat is essential to burrowing owls. The following discussion is an excerpt from Gervais et al. (2008):

> "Useful as a rough guide to evaluating project impacts and appropriate mitigation for burrowing owls, adult male burrowing owls home ranges have been documented (calculated by minimum convex polygon) to comprise anywhere from 280 acres in intensively irrigated agroecosystems in Imperial Valley (Rosenberg and Haley 2004) to 450 acres in mixed agricultural lands at Lemoore Naval Air Station, CA (Gervais et al. 2003), to 600 acres in pasture in Saskatchewan, Canada (Haug and Oliphant 1990). But owl home ranges may be much larger, perhaps by an order of magnitude, in non-irrigated grasslands such as at Carrizo Plain, California (Gervais et al. 2008), based on telemetry studies and distribution of nests. Foraging occurs primarily within 600 m of their nests (within approximately 300 acres, based on a circle with a 600 m radius) during the breeding season."

Importance of burrows and adjacent habitat. Burrows and the associated surrounding habitat are essential ecological requisites for burrowing owls throughout the year and especially during the breeding season. During the non-breeding season, burrowing owls remain closely associated with burrows, as they continue to use them as refuge from predators, shelter from weather and roost sites. Resident populations will remain near the previous season's nest burrow at least some of the time (Coulombe 1971, Thomsen 1971, Botelho 1996, LaFever et al. 2008).

In a study by Lutz and Plumpton (1999) adult males and females nested in formerly used sites at similar rates (75% and 63%, respectively) (Lutz and Plumpton 1999). Burrow fidelity has been reported in some areas; however, more frequently, burrowing owls reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Burrow and nest sites are re-used at a higher rate if the burrowing owl has reproduced successfully during the previous year (Haug et al. 1993) and if the number of burrows isn't limiting nesting opportunity.

Burrowing owls may use "satellite" or non-nesting burrows, moving young at 10-14 days, presumably to reduce risk of predation (Desmond and Savidge 1998) and possibly to avoid nest parasites (Dechant et al. 1999). Successful nests in Nebraska had more active satellite burrows within 75 m of the nest burrow than unsuccessful nests (Desmond and Savidge

1999). Several studies have documented the number of satellite burrows used by young and adult burrowing owls during the breeding season as between one and 11 burrows with an average use of approximately five burrows (Thompsen 1984, Haug 1985, Haug and Oliphant 1990). Supporting the notion of selecting for nest sites near potential satellite burrows, Ronan (2002) found burrowing owl families would move away from a nest site if their satellite burrows were experimentally removed through blocking their entrance.

Habitat adjacent to burrows has been documented to be important to burrowing owls. Gervais et al. (2003) found that home range sizes of male burrowing owls during the nesting season were highly variable within but not between years. Their results also suggested that owls concentrate foraging efforts within 600 meters of the nest burrow, as was observed in Canada (Haug and Oliphant 1990) and southern California (Rosenberg and Haley 2004). James et al. (1997), reported habitat modification factors causing local burrowing owl declines included habitat fragmentation and loss of connectivity.

In conclusion, the best available science indicates that essential habitat for the burrowing owl in California must include suitable year-round habitat, primarily for breeding, foraging, wintering and dispersal habitat consisting of short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey within close proximity to the burrow.

Threats to Burrowing Owls in California

Habitat loss. Habitat loss, degradation, and fragmentation are the greatest threats to burrowing owls in California. According to DeSante et al. (2007), "the vast majority of burrowing owls [now] occur in the wide, flat lowland valleys and basins of the Imperial Valley and Great Central Valley [where] for the most part,...the highest rates of residential and commercial development in California are occurring." Habitat loss from the State's long history of urbanization in coastal counties has already resulted in either extirpation or drastic reduction of burrowing owl populations there (Gervais et al. 2008). Further, loss of agricultural and other open lands (such as grazed landscapes) also negatively affect owl populations. Because of their need for open habitat with low vegetation, burrowing owls are unlikely to persist in agricultural lands dominated by vineyards and orchards (Gervais et al. 2008).

Control of burrowing rodents. According to Klute et al. (2003), the elimination of burrowing rodents through control programs is a primary factor in the recent and historical decline of burrowing owl populations nationwide. In California, ground squirrel burrows are most often used by burrowing owls for nesting and cover; thus, ground squirrel control programs may affect owl numbers in local areas by eliminating a necessary resource.

Direct mortality. Burrowing owls suffer direct losses from a number of sources. Vehicle collisions are a significant source of mortality especially in the urban interface and where owls nest alongside roads (Haug et al. 1993, Gervais et al. 2008). Road and ditch maintenance, modification of water conveyance structures (Imperial Valley) and discing to control weeds in fallow fields may destroy burrows (Rosenberg and Haley 2004, Catlin and Rosenberg 2006) which may trap or crush owls. Wind turbines at Altamont Pass Wind Resource Area are known to cause direct burrowing owl mortality (Thelander et al. 2003). Exposure to

pesticides may pose a threat to the species but is poorly understood (Klute et al. 2003, Gervais et al. 2008).

Appendix B. Definitions

Some key terms that appear in this document are defined below.

Adjacent habitat means burrowing owl habitat that abuts the area where habitat and burrows will be impacted and rendered non-suitable for occupancy.

Breeding (nesting) season begins as early as 1 February and continues through 31 August (Thomsen 1971, Zarn 1974). The timing of breeding activities may vary with latitude and climatic conditions. The breeding season includes pairing, egg-laying and incubation, and nestling and fledging stages.

Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls or permanently exclude burrowing owls and excavate and close burrows after confirming burrows are empty.

Burrowing owl habitat generally includes, but is not limited to, short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey.

Burrow surrogates include culverts, piles of concrete rubble, piles of soil, burrows created along soft banks of ditches and canals, pipes, and similar structures.

Civil twilight - Morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon (civil dawn) and ends at sunrise. Evening civil twilight begins at sunset and ends when the geometric center of the sun reaches 6 degrees below the horizon (civil dusk). During this period there is enough light from the sun that artificial sources of light may not be needed to carry on outdoor activities. This concept is sometimes enshrined in laws, for example, when drivers of automobiles must turn on their headlights (called lighting-up time in the UK); when pilots may exercise the rights to fly aircraft. Civil twilight can also be described as the limit at which twilight illumination is sufficient, under clear weather conditions, for terrestrial objects to be clearly distinguished; at the beginning of morning civil twilight, or end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under clear atmospheric conditions.

Conservation for burrowing owls may include but may not be limited to protecting remaining breeding pairs or providing for population expansion, protecting and enhancing breeding and essential habitat, and amending or augmenting land use plans to stabilize populations and other specific actions to avoid the need to list the species pursuant to California or federal Endangered Species Acts.

Contiguous means connected together so as to form an uninterrupted expanse in space.

Essential habitat includes nesting, foraging, wintering, and dispersal habitat.

Foraging habitat is habitat within the estimated home range of an occupied burrow, supports suitable prey base, and allows for effective hunting.

Host burrowers include ground squirrels, badgers, foxes, coyotes, gophers etc.

Locally significant species is a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or occurring in a unique habitat type.

Non-breeding season is the period of time when nesting activity is not occurring, generally September 1 through January 31, but may vary with latitude and climatic conditions.

Occupied site or occupancy means a site that is assumed occupied if at least one burrowing owl has been observed occupying a burrow within the last three years (Rich 1984). Occupancy of suitable burrowing owl habitat may also be indicated by owl sign including its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance or perch site.

Other impacting activities may include but may not be limited to agricultural practices, vegetation management and fire control, pest management, conversion of habitat from rangeland or natural lands to more intensive agricultural uses that could result in “take”. These impacting activities may not meet the definition of a project under CEQA.

Passive relocation is a technique of installing one-way doors in burrow openings to temporarily or permanently evict burrowing owls and prevent burrow re-occupation.

Peak of the breeding season is between 15 April and 15 July.

Sign includes its tracks, molted feathers, cast pellets (defined as 1-2” long brown to black regurgitated pellets consisting of non-digestible portions of the owls’ diet, such as fur, bones, claws, beetle elytra, or feathers), prey remains, egg shell fragments, owl white wash, nest burrow decoration materials (e.g., paper, foil, plastic items, livestock or other animal manure, etc.), possible owl perches, or other items.

Appendix C. Habitat Assessment and Reporting Details

Habitat Assessment Data Collection and Reporting

Current scientific literature indicates that it would be most effective to gather the data in the manner described below when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report:

1. Conduct at least one visit covering the entire potential project/activity area including areas that will be directly or indirectly impacted by the project. Survey adjoining areas within 150 m (Thomsen 1971, Martin 1973), or more where direct or indirect effects could potentially extend offsite. If lawful access cannot be achieved to adjacent areas, surveys can be performed with a spotting scope or other methods.
2. Prior to the site visit, compile relevant biological information for the site and surrounding area to provide a local and regional context.
3. Check all available sources for burrowing owl occurrence information regionally prior to a field inspection. The CNDDB and BIOS (see References cited) may be consulted for known occurrences of burrowing owls. Other sources of information include, but are not limited to, the Proceedings of the California Burrowing Owl Symposium (Barclay et al. 2007), county bird atlas projects, Breeding Bird Survey records, eBIRD (http://ebird.org), Gervais et al. (2008), local reports or experts, museum records, and other site-specific relevant information.
4. Identify vegetation and habitat types potentially supporting burrowing owls in the project area and vicinity.
5. Record and report on the following information:
    a. A full description of the proposed project, including but not limited to, expected work periods, daily work schedules, equipment used, activities performed (such as drilling, construction, excavation, etc.) and whether the expected activities will vary in location or intensity over the project's timeline;
    b. A regional setting map, showing the general project location relative to major roads and other recognizable features;
    c. A detailed map (preferably a USGS topo 7.5' quad base map) of the site and proposed project, including the footprint of proposed land and/or vegetation-altering activities, base map source, identifying topography, landscape features, a north arrow, bar scale, and legend;
    d. A written description of the biological setting, including location (Section, Township, Range, baseline and meridian), acreage, topography, soils, geographic and hydrologic characteristics, land use and management history on and adjoining the site (i.e., whether it is urban, semi-urban or rural; whether there is any evidence of past or current livestock grazing, mowing, disking, or other vegetation management activities);
    e. An analysis of any relevant, historical information concerning burrowing owl use or occupancy (breeding, foraging, over-wintering) on site or in the assessment area;
    f. Vegetation type and structure (using Sawyer et al. 2009), vegetation height, habitat types and features in the surrounding area plus a reasonably sized (as supported with logical justification) assessment area; (Note: use caution in discounting habitat based on grass height as it can be a temporary condition variable by season and conditions (such as current grazing regime) or may be distributed as a mosaic).

g. The presence of burrowing owl individuals or pairs or sign (see Appendix B);
h. The presence of suitable burrows and/or burrow surrogates (>11 cm in diameter (height and width) and >150 cm in depth) (Johnson et al. 2010), regardless of a lack of any burrowing owl sign and/or burrow surrogates; and burrowing owls and/or their sign that have recently or historically (within the last 3 years) been identified on or adjacent to the site.

Appendix D. Breeding and Non-breeding Season Surveys and Reports

Current scientific literature indicates that it is most effective to conduct breeding and non-breeding season surveys and report in the manner that follows:

Breeding Season Surveys

Number of visits and timing. Conduct 4 survey visits: 1) at least one site visit between 15 February and 15 April, and 2) a minimum of three survey visits, at least three weeks apart, between 15 April and 15 July, with at least one visit after 15 June. Note: many burrowing owl migrants are still present in southwestern California during mid-March, therefore, exercise caution in assuming breeding occupancy early in the breeding season.

Survey method. Rosenberg et al. (2007) confirmed walking line transects were most effective in smaller habitat patches. Conduct surveys in all portions of the project site that were identified in the Habitat Assessment and fit the description of habitat in Appendix A. Conduct surveys by walking straight-line transects spaced 7 m to 20 m apart, adjusting for vegetation height and density (Rosenberg et al. 2007). At the start of each transect and, at least, every 100 m, scan the entire visible project area for burrowing owls using binoculars. During walking surveys, record all potential burrows used by burrowing owls as determined by the presence of one or more burrowing owls, pellets, prey remains, whitewash, or decoration. Some burrowing owls may be detected by their calls, so observers should also listen for burrowing owls while conducting the survey.

Care should be taken to minimize disturbance near occupied burrows during all seasons and not to "flush" burrowing owls especially if predators are present to reduce any potential for needless energy expenditure or burrowing owl mortality. Burrowing owls may flush if approached by pedestrians within 50 m (Conway et al. 2003). If raptors or other predators are present that may suppress burrowing owl activity, return at another time or later date for a follow-up survey.

Check all burrowing owls detected for bands and/or color bands and report band combinations to the Bird Banding Laboratory (BBL). Some site-specific variations to survey methods discussed below may be developed in coordination with species experts and Department staff.

Weather conditions. Poor weather may affect the surveyor's ability to detect burrowing owls, therefore, avoid conducting surveys when wind speed is >20 km/hr, and there is precipitation or dense fog. Surveys have greater detection probability if conducted when ambient temperatures are >20º C, <12 km/hr winds, and cloud cover is <75% (Conway et al. 2008).

Time of day. Daily timing of surveys varies according to the literature, latitude, and survey method. However, surveys between morning civil twilight and 10:00 AM and two hours before sunset until evening civil twilight provide the highest detection probabilities (Barclay pers. comm. 2012, Conway et al. 2008).

Alternate methods. If the project site is large enough to warrant an alternate method, consult current literature for generally accepted survey methods and consult with the Department on the proposed survey approach.

Additional breeding season site visits. Additional breeding season site visits may be necessary, especially if non-breeding season exclusion methods are contemplated. Detailed information, such as approximate home ranges of each individual or of family units, as well as foraging areas as related to the proposed project, will be important to document for evaluating impacts, planning avoidance measure implementation and for mitigation measure performance monitoring.

Adverse conditions may prevent investigators from determining presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owls in any given year. Any such conditions should be identified and discussed in the survey report. Visits to the site in more than one year may increase the likelihood of detection. Also, visits to adjacent known occupied habitat may help determine appropriate survey timing.

Given the high site fidelity shown by burrowing owls (see Appendix A, Importance of burrows), conducting surveys over several years may be necessary when project activities are ongoing, occur annually, or start and stop seasonally. (See Negative surveys).

Non-breeding Season Surveys

If conducting non-breeding season surveys, follow the methods described above for breeding season surveys, but conduct at least four (4) visits, spread evenly, throughout the non-breeding season. Burrowing owl experts and local Department staff are available to assist with interpreting results.

Negative Surveys

Adverse conditions may prevent investigators from documenting presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owl in any given year. Discuss such conditions in the Survey Report. Visits to the site in more than one year increase the likelihood of detection and failure to locate burrowing owls during one field season does not constitute evidence that the site is no longer occupied, particularly if adverse conditions influenced the survey results. Visits to other nearby known occupied sites can affirm whether the survey timing is appropriate.

Take Avoidance Surveys

Field experience from 1995 to present supports the conclusion that it would be effective to complete an initial take avoidance survey no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the Detection Surveys section above. Implementation of avoidance and minimization measures would be triggered by positive owl presence on the site where project activities will occur. The development of avoidance and minimization approaches would be informed by monitoring the burrowing owls.

Burrowing owls may re-colonize a site after only a few days. Time lapses between project activities trigger subsequent take avoidance surveys including but not limited to a final survey conducted within 24 hours prior to ground disturbance.

Survey Reports

Report on the survey methods used and results including the information described in the Summary Report and include the reports within the CEQA documentation:

1. Date, start and end time of surveys including weather conditions (ambient temperature, wind speed, percent cloud cover, precipitation and visibility);
2. Name(s) of surveyor(s) and qualifications;
3. A discussion of how the timing of the survey affected the comprehensiveness and detection probability;
4. A description of survey methods used including transect spacing, point count dispersal and duration, and any calls used;
5. A description and justification of the area surveyed relative to the project area;
6. A description that includes: number of owls or nesting pairs at each location (by nestlings, juveniles, adults, and those of an unknown age), number of burrows being used by owls, and burrowing owl sign at burrows. Include a description of individual markers, such as bands (numbers and colors), transmitters, or unique natural identifying features. If any owls are banded, request documentation from the BBL and bander to report on the details regarding the known history of the banded burrowing owl(s) (age, sex, origins, whether it was previously relocated) and provide with the report if available;
7. A description of the behavior of burrowing owls during the surveys, including feeding, resting, courtship, alarm, territorial defense, and those indicative of parents or juveniles;
8. A list of possible burrowing owl predators present and documentation of any evidence of predation of owls;
9. A detailed map (1:24,000 or closer to show details) showing locations of all burrowing owls, potential burrows, occupied burrows, areas of concentrated burrows, and burrowing owl sign. Locations documented by use of global positioning system (GPS) coordinates must include the datum in which they were collected. The map should include a title, north arrow, bar scale and legend;
10. Signed field forms, photos, etc., as appendices to the field survey report;
11. Recent color photographs of the proposed project or activity site; and
12. Original CNDDB Field Survey Forms should be sent directly to the Department's CNDDB office, and copies should be included in the environmental document as an appendix. (http://www.dfg.ca.gov/bdb/html/cnddb.html).

Appendix E. Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans

Whereas the Department does not recommend exclusion and burrow closure, current scientific literature and experience from 1995 to present, indicate that the following example components for burrowing owl artificial burrow and exclusion plans, combined with consultation with the Department to further develop these plans, would be effective.

Artificial Burrow Location

If a burrow is confirmed occupied on-site, artificial burrow locations should be appropriately located and their use should be documented taking into consideration:

1. A brief description of the project and project site pre-construction;
2. The mitigation measures that will be implemented;
3. Potential conflicting site uses or encumbrances;
4. A comparison of the occupied burrow site(s) and the artificial burrow site(s) (e.g., vegetation, habitat types, fossorial species use in the area, and other features);
5. Artificial burrow(s) proximity to the project activities, roads and drainages;
6. Artificial burrow(s) proximity to other burrows and entrance exposure;
7. Photographs of the site of the occupied burrow(s) and the artificial burrows;
8. Map of the project area that identifies the burrow(s) to be excluded as well as the proposed sites for the artificial burrows;
9. A brief description of the artificial burrow design;
10. Description of the monitoring that will take place during and after project implementation including information that will be provided in a monitoring report.
11. A description of the frequency and type of burrow maintenance.

Exclusion Plan

An Exclusion Plan addresses the following including but not limited to:

1. Confirm by site surveillance that the burrow(s) is empty of burrowing owls and other species preceding burrow scoping;
2. Type of scope and appropriate timing of scoping to avoid impacts;
3. Occupancy factors to look for and what will guide determination of vacancy and excavation timing (one-way doors should be left in place 48 hours to ensure burrowing owls have left the burrow before excavation, visited twice daily and monitored for evidence that owls are inside and can't escape i.e., look for sign immediately inside the door).
4. How the burrow(s) will be excavated. Excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible (may include using piping to stabilize the burrow to prevent collapsing until the entire burrow has been excavated and it can be determined that no owls reside inside the burrow);
5. Removal of other potential owl burrow surrogates or refugia on site;
6. Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

7. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take;
8. How the impacted site will continually be made inhospitable to burrowing owls and fossorial mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

Appendix F. Mitigation Management Plan and Vegetation Management Goals

Mitigation Management Plan

A mitigation site management plan will help ensure the appropriate implementation and maintenance for the mitigation site and persistence of the burrowing owls on the site. For an example to review, refer to Rosenberg et al. (2009). The current scientific literature and field experience from 1995 to present indicate that an effective management plan includes the following:

1. Mitigation objectives;
2. Site selection factors (including a comparison of the attributes of the impacted and conserved lands) and baseline assessment;
3. Enhancement of the conserved lands (enhancement of reproductive capacity, enhancement of breeding areas and dispersal opportunities, and removal or control of population stressors);
4. Site protection method and prohibited uses;
5. Site manager roles and responsibilities;
6. Habitat management goals and objectives:
    a. Vegetation management goals,
        i. Vegetation management tools:
            1. Grazing
            2. Mowing
            3. Burning
            4. Other
    b. Management of ground squirrels and other fossorial mammals,
    c. Semi-annual and annual artificial burrow cleaning and maintenance,
    d. Non-natives control – weeds and wildlife,
    e. Trash removal;
7. Financial assurances:
    a. Property analysis record or other financial analysis to determine long-term management funding,
    b. Funding schedule;
8. Performance standards and success criteria;
9. Monitoring, surveys and adaptive management;
10. Maps;
11. Annual reports.

Vegetation Management Goals

- Manage vegetation height and density (especially in immediate proximity to burrows). Suitable vegetation structure varies across sites and vegetation types, but should generally be at the average effective vegetation height of 4.7 cm (Green and Anthony 1989) and <13 cm average effective vegetation height (MacCracken et al. 1985*a)*.
- Employ experimental prescribed fires (controlled, at a small scale) to manage vegetation structure;

- Vegetation reduction or ground disturbance timing, extent, and configuration should avoid take. While local ordinances may require fire prevention through vegetation management, activities like disking, mowing, and grading during the breeding season can result in take of burrowing owls and collapse of burrows, causing nest destruction. Consult the take avoidance surveys section above for pre-management avoidance survey recommendations;
- Promote natural prey distribution and abundance, especially in proximity to occupied burrows; and
- Promote self-sustaining populations of host burrowers by limiting or prohibiting lethal rodent control measures and by ensuring food availability for host burrowers through vegetation management.

Refer to Rosenberg et al. (2009) for a good discussion of managing grasslands for burrowing owls.

Mitigation Site Success Criteria

In order to evaluate the success of mitigation and management strategies for burrowing owls, monitoring is required that is specific to the burrowing owl management plan. Given limited resources, Barclay et al. (2011) suggests managers focus on accurately estimating annual adult owl populations rather than devoting time to estimating reproduction, which shows high annual variation and is difficult to accurately estimate. Therefore, the key objective will be to determine accurately the number of adult burrowing owls and pairs, and if the numbers are maintained. A frequency of 5-10 years for surveys to estimate population size may suffice if there are no changes in the management of the nesting and foraging habitat of the owls.

Effective monitoring and evaluation of off-site and on-site mitigation management success for burrowing owls includes (Barclay, pers. comm.):

- Site tenacity;
- Number of adult owls present and reproducing;
- Colonization by burrowing owls from elsewhere (by band re-sight);
- Evidence and causes of mortality;
- Changes in distribution; and
- Trends in stressors.

Attachment B
Plant Species Observed

Family	Scientific name	Common Name
Asteraceae	Ambrosia acanthicarpa	annual bur sage
Asteraceae	Ambrosia dumosa	white bursage
Asteraceae	*Ericameria nauseosus*	rubber rabbitbush
Asteraceae	*Lasthenia californica*	California goldfields
Brassicaceae	*Brassica nigra**	black mustard
Brassicaceae	*Brassica tournefortii**	Saharan mustard
Brassicaceae	*Brassica* spp.*	mustard
Brassicaceae	*Hirschfeldia incana**	Mediterranean mustard
Brassicaceae	Lepidium sp.	peppergrass
Brassicaceae	*Sisymbrium* sp.	tumble mustard
Brassicaceae	*Sisymbrium irio**	London rocket
Cactaceae	*Cylindropuntia ramosissima*	branched pencil cholla
Chenopodiaceae	*Salsola tragus**	prickly Russian thistle
Euphorbiaceae	*Chamaesyce albomarginata*	rattlesnake weed
Euphorbiaceae	*Croton setiger*	dove weed
Fabaceae	*Astragalus lentiginosus* var. *variabilis variabli*	dapple pod locoweed
Geraniaceae	*Erodium cicutarium**	redstem filaree
Malvaceae	*Sphaeralcea ambigua*	apricot mallow
Onagraceae	*Camissonia boothii*	Booth's evening primrose
Poaceae	*Avena barbata**	slender oat
Poaceae	*Schismus barbatus**	Mediterranean schismus
Poeaceae	*Bromus madritensis**	fox chess
Polygonaceae	*Eriogonum angulosum*	angled stem buckwheat
Polygonaceae	*Eriogonum gracile*	slender woolly buckwheat
Solanaceae	*Lycium andersonii*	Anderson's desert thorn

*indicates non-native species

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Attachment C
Animal Species Observed or Detected

Order/Family	Scientific Name	Common Name
INVERTEBRATES		
Formicidae	*Messor* spp.	harvester ant
VERTEBRATES		
Reptiles		
Phrynosomatidae	*Uta stansburiana*	side blotched lizard
Birds		
Corvidae	*Corvus corax*	common raven
Emberizidae	*Amphispiza bilineata*	black throated sparrow
Strigidae	*Athene cunicularia*†	burrowing owl
Columbidae	*Zenaida macroura*	mourning dove
Alaudidae	*Eremophila alpestris actia*†	California horned lark
Mammals		
Heteromyidae	*Dipodomys deserti*	kangaroo rat
Leporidae	*Sylvilagus audubonii*	desert cottontail
Leporidae	*Lepus californicus*	black-tailed jack rabbit
Canidae	*Canis latrans*	coyote

† Sensitive species

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Attachment D
Explanation of Status Codes for Plant and Animal Species

FEDERAL AND STATE CODES

U.S. Fish and Wildlife Service (USFWS)

FE Federally listed endangered
FT Federally listed threatened

California Department of Fish and Wildlife (CDFW)

SE State listed endangered
SR State listed rare
ST State listed threatened
SSC State species of special concern
WL Watch List
FP Fully Protected species refers to all vertebrate and invertebrate taxa of concern to the Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFW.

OTHER CODES AND ABBREVIATIONS

California Native Plant Society California Rare Plant Rank (CRPR) Codes

Lists

1A = Presumed extirpated in California and either rare or extinct elsewhere. Eligible for state listing.

1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.

2A = Presumed extirpated in California but common elsewhere. Eligible for state listing.

2B = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.

3 = Review List: Plants about which more information is needed. Some eligible for state listing.

4 = Watch List: Plants of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

List/Threat Code Extensions

.1 = Seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Moderately threatened in California (20-80 percent occurrences threatened / moderate degree and immediacy of threat)

.3 = Not very threatened in California (less than 20 percent of occurrences threatened / low degree and immediacy of threat or no current threats known)

A "CA Endemic" entry corresponds to those taxa that only occur in California.

All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Code.

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