Appendix B

Biological Resources Technical Report

BIOLOGICAL RESOURCES TECHNICAL REPORT
PALEN SOLAR PV PROJECT
BLM CASE FILE NUMBER CACA-48810
RIVERSIDE COUNTY, CALIFORNIA

Prepared for
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List of Acronyms

agl	above ground level
amsl	above mean sea level
AC	Alternating Current
BRSA	Biological Resources Study Area
BRTR	Biological Resources Technical Report
BBCS	Bird and Bat Conservation Strategy
BUC	Bird Use Count
BBI	Bloom Biological, Inc.
BLM	Bureau of Land Management
CDD	California Desert District
CDFG	California Department of Fish and Game (now Wildlife)
CDFW	California Department of Fish and Wildlife
CDFA	California Department of Food and Agriculture
CDPA	California Desert Protection Act of 1994
CESA	California Endangered Species Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
Cal-IPC	California Invasive Plant Council
CNPS	California Native Plant Society
CNDDB	California Natural Diversity Database
CRPR	California Rare Plant Rank
CDV	Canine Distemper Virus
CHUs	Critical Habitat Units
DRECP	Desert Renewable Energy Conservation Plan
DWMA	Desert Wildlife Management Area
DC	Direct Current
EA	Environmental Assessment
FESA	Federal Endangered Species Act
FWS	Fish and Wildlife Service
GIS	Geographic Information Systems
GPS	Global Positioning System
IWMP	Integrated Weed Management Plan
I-10	Interstate 10
MCL	Midline Carapace Length
MBTA	Migratory Bird Treaty Act
MFTL	Mojave Fringe-toed Lizard
NEPA	National Environmental Protection Act
NPS	National Park Service
NECO Plan	Northern and Eastern Colorado Desert Coordinated Management Plan

O&M	Operations and Maintenance
POD	Plan of Development
PSEGS	Palen Solar Energy Generating Station
PSPP	Palen Solar Power Project
PV	Photovoltaic
PA/FEIS	Plan Amendment/Final Environmental Impact Statement
PVA	Population Viability Assessment
RTHA	Red-tailed Hawk
RSA	Revised Staff Assessment
RESEZ	Riverside East Solar Energy Zone
TCAs	Tortoise Conservation Areas
USFWS	US Fish and Wildlife Service
WHMA	Wildlife Habitat Management Area
WRI	Wildlife Research Institute

1 INTRODUCTION

1.1 Background

In 2007, Chevron Energy Solutions and Solar Millennium proposed the Palen Solar Power Project (PSPP) in unincorporated Riverside County, California, through an application for a right-of-way (ROW) grant from the Bureau of Land Management (BLM). The PSPP included over 4,300 acres of concentrating solar project (solar parabolic trough technology). In 2011, the California Energy Commission (CEC) prepared a Staff Assessment, the BLM prepared a Final Environmental Impact Statement (FEIS), and the U.S. Fish and Wildlife Service prepared a Biological Opinion for effects to desert tortoise (*Gopherus agassizii*) for the PSPP. In 2012, BrightSource acquired the pending ROW grant application and proposed the Palen Solar Electric Generating System (PSEGS), which included a change in technology that consisted of two 750-foot towers, associated heliostat arrays, and modifications to linear project components (including the generation interconnection line (gen-tie) to accommodate the relocation of the Red Bluff Substation). In 2013, BrightSource and its joint venture, Abengoa Solar, Inc., submitted updated documentation to the CEC and BLM. The BLM prepared a Draft Supplemental EIS for the PSEGS project in July 2013. In 2015, EDF Renewable Energy (EDF RE) acquired the pending ROW grant application. Palen Solar III, LLC (Applicant), a fully owned subsidiary of EDF RE (and Palen Solar Holdings, LLC), has applied to amend the ROW grant application (Case File Number CACA-48810) from the BLM to construct, operate, and decommission a solar photovoltaic (PV) energy generating facility. The solar facility and associated gen-tie are collectively referred to in this report as the Palen Solar PV Project (Project), which is proposed to be sited within the previously analyzed PSPP and PSEGS footprints.

1.2 Purpose

This Biological Resources Technical Report (BRTR) provides a description of methods and results of biological resource surveys and investigations conducted between 2009 and 2016 for the PSPP, PSEGS, and Palen Solar PV Project.

The primary purpose of this report is to provide biological information that will be used as the foundation for impact assessments pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The focus of this report is to consolidate and describe relevant biological resource data. A full assessment of impacts to biological resources can be found in the NEPA/CEQA environmental document. The discussion included herein may also be used to support formal consultation between Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act

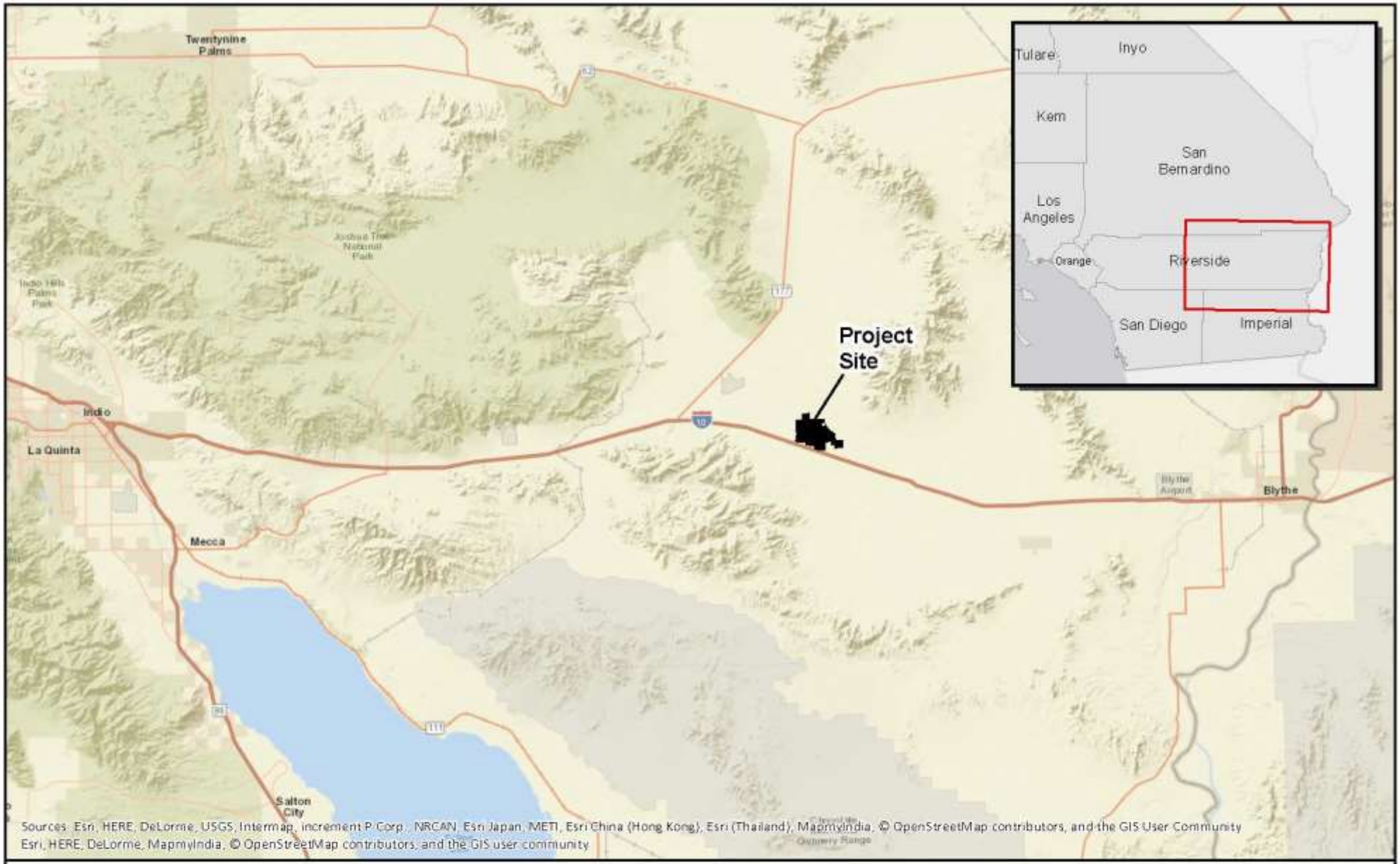
(FESA), and any necessary incidental take authorization from the California Department of Fish and Wildlife (CDFW) with respect to the California Endangered Species Act (CESA).

1.3 Site Location

The Project site is located entirely on lands administered by the U.S. Department of the Interior, Bureau of Land Management (BLM), located in unincorporated Riverside County, California. The site is located approximately ten miles east of the unincorporated community of Desert Center along Interstate 10 (I-10), halfway between the cities of Indio and Blythe (Figures 1 and 2). The Project site can be found on the Sidewinder Well 7.5-Minute U.S. Geological Survey topographic quadrangle. The Project site is located within the Riverside East Solar Energy Zone (SEZ) of BLM's Western Solar Plan, as designated in the Solar Programmatic Environmental Impact Statement and approved by a Record of Decision signed by the BLM on October 12, 2012.

The Project site is located within two wildlife habitat management areas (WHMA) designated in the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO): Palen-Ford WHMA and Desert Wildlife Management Area (DWMA) Connectivity WHMA. Management emphasis for the Palen-Ford WHMA is on the dunes and playas within the Palen-Ford dune system. Management emphasis for the DWMA Connectivity WHMA is on the geographic connectivity for the desert tortoise between the Chuckwalla DWMA and the wilderness area north of I-10. The Palen-McCoy Wilderness is 3 miles to the northeast, Chuckwalla Mountains Wilderness is 1.5 miles to the south, Little Chuckwalla Mountains Wilderness is 16 miles to the southeast, and the Joshua Tree Wilderness is 8.5 miles northwest of the Project site. Approximately 200 acres of the Chuckwalla desert tortoise critical habitat unit (CHU) overlaps the Project site. The majority of the CHU (over 1,023,000 acres) is located south and west of the Project site.

The site is located in the Sonoran Desert ecoregion setting, Chuckwalla Valley ecoregion subsection, of the Desert Renewable Energy Conservation Plan (DRECP). The DRECP includes areas managed by the BLM as the first implementation step. These lands were addressed in the Proposed Land Use Plan Amendment (LUPA) and Final Environmental Impact Statement (FEIS) (BLM 2015). The preferred alternative proposed in the LUPA/FEIS includes the Project site as a Development Focus Area (DFA). The preferred alternative also includes an expansion of Areas of Critical Environmental Concern (ACEC) within the proximity of the Project site including approximately 20,000 acres within the Chuckwalla DWMA, approximately 320,000 acres associated with desert tortoise linkage between the Chuckwalla and Chemehuevi DWMAs, approximately 3,600 acres associated with Palen Dry Lake, and approximately 41,000 acres associated with the Palen-Ford Playa Dunes.



Ironwood Consulting

0 10 20
Kilometers

FIGURE 1

Regional Location
Riverside County, CA

Palen Solar PV Project

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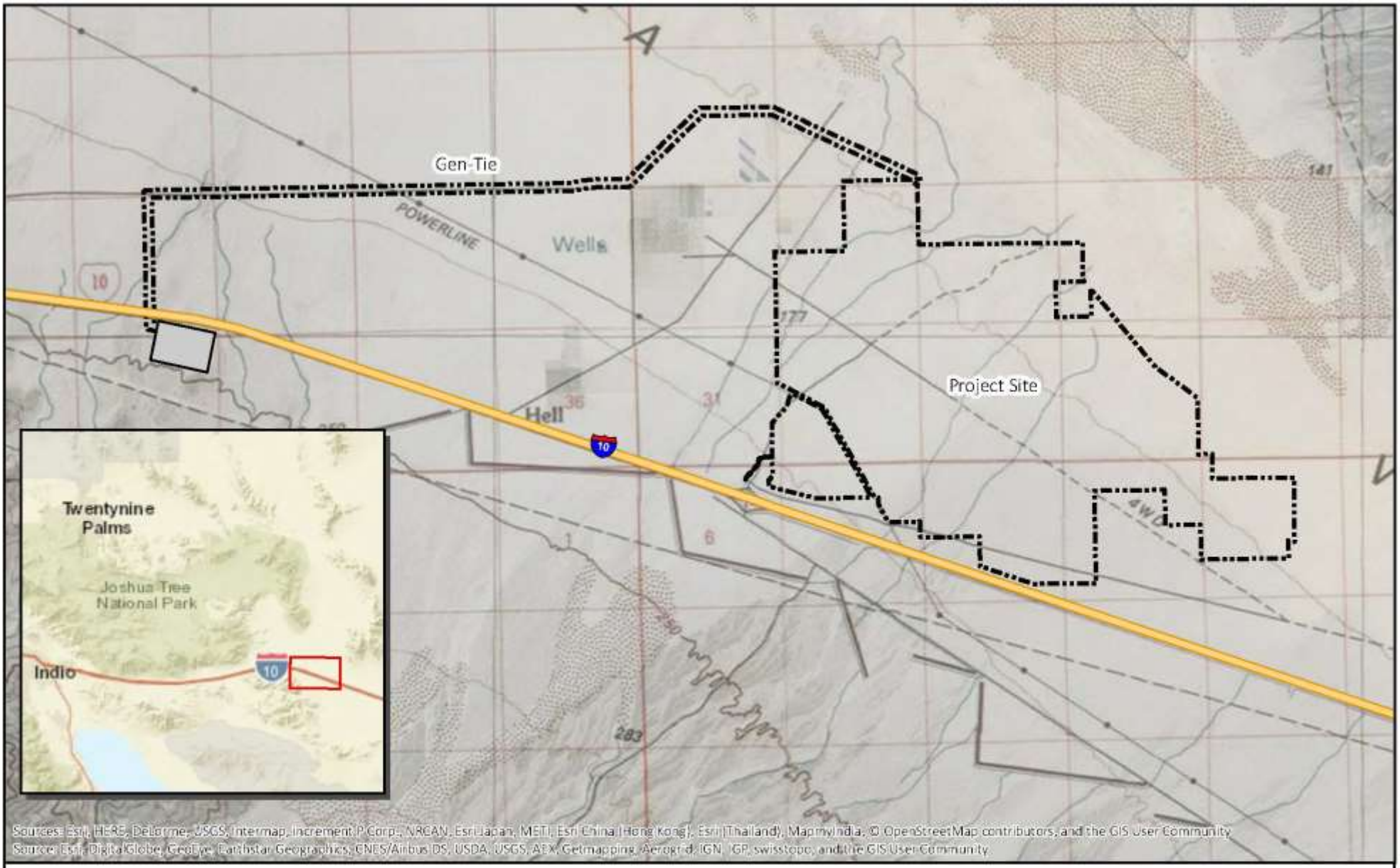

Ironwood Consulting

0 0.75 1.5
Kilometers

Project Study Area

SCE Red Bluff Substation

** Alternative solar facility configurations, all within the Project Study Area are likely to be evaluated during the CEQA/NEPA process.*

FIGURE 2

Site Location

Riverside County, CA

Palen Solar PV Project

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1.4 Project Summary

The 500 MW (alternating current [AC]) Project would entail a single-axis tracking system with mounted photovoltaic (PV) technology. For the purpose of this report, Ironwood evaluated an approximately 4,200-acre study area, which included the proposed solar facility, main access road, and 300-foot wide, 7-mile long gen-tie line (Figure 2) as well as approximately 840 acres that are not planned for project use. The project disturbance area, equipment used, and schedule estimates may be reduced and/or modified consistent with the final engineering and permit requirements. As part of the Supplemental EIS/EIR, an evaluation of alternatives will be thoroughly analyzed. It is anticipated that BLM will propose and evaluate alternative solar facility configurations, technologies and or other land uses contained within the study area boundary referenced in this report. Alternatives examined will be evaluated during the CEQA/NEPA process. The Project would consist of several main components:

- Main project access road;
- Main generation area—PV arrays, switchyard, inverters, overhead lines, and access corridors;
- O&M Facility – either on or off site;
- On-site electrical substation and switch gear;
- Site security, fencing, and lighting; and
- Gen-tie Line with access road.

1.4.1 Solar Facility

The field of panels consists of repeating blocks of up to 2.50 MW (alternating current [AC]). The approximate dimensions of an array block consisting of 8,046 panels, separated into four quadrants. Within each quadrant, there would be 25 rows comprised of 27-panel strings. Each block would employ two inverters of up to 1.25 MW, set along the access roads, in the middle of the panel array area.

A horizontal single-axis balanced-mass tracker with independently-driven rows is proposed to be used for the PV modules. Tracking systems have a motor that rotates the PV modules from east to west during the day to track the sun across the sky. The tracking system would utilize a wireless communication system so that no communication wiring would be needed. Engineering design of the tracking system would be designed in accordance with code for wind loading and would be constructed of galvanized and stainless steel.

The panel field would be laid out by installing vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. A preliminary walk-through by civil engineers suggests that this foundation would be sufficient to meet geotechnical requirements for wind

stability. Site-specific soil tests would be required to validate the preliminary engineering. If tests conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts. No welding would be required for assembly.

Spacing of the rows is driven primarily by engineering and shading constraints, but would also involve some micro-topography compensation.

1.4.2 Onsite Towers, Substation and Transmission Lines

A PV inverter would convert the DC electric input into grid-quality AC electric output. The AC electrical output would be transmitted from the PV inverter to the adjacent transformer. The transformer would step up the voltage of the AC electrical input and then would transmit the power via the PV collection system to the Project substation. The PV collection system connecting the panels to the inverters will be underground and utilize trenches for the electrical cabling, which would be 3 feet deep and from 3 feet to 6.5 feet wide. The substation would be located in the northerly portion of the Project site and would cover an estimated 5 acres. At the on-site substation, the generated electricity would be stepped up to 230 kV and routed via a new gen-tie line to the approved Southern California Edison (SCE) Red Bluff Substation.

Steel monopoles approximately 115 to 135 feet tall would be used for the gen-tie line. Typical spans between poles would be 900 to 1,100 feet. Self-weathering steel would be used for the monopoles, which are intended to blend with the surrounding mountains. The tower foundations for the gen-tie line would require ground disturbance to a depth of 20 to 30 feet. All fiber optic communication lines necessary to support the on-site telecommunication equipment would be located on the same poles used to support the gen-tie line.

1.4.3 Access Roads

The primary point of access to the Project site would be via the I-10 off the Corn Springs Exit along an existing road. Leaving the northern terminus of Corn Springs Road, the project will have an access road of less than a ¼ mile to the main gates. Although the existing road would be used to the extent possible, a new, 24-foot wide unpaved road would be constructed to serve as a primary point of access from the I-10 Corn Springs exit to the Project site. The access road would be constructed from a point just north of the I-10 Corn Springs Road exit, northerly along the existing dirt road for a short distance, then east to the Project site entrance. The new entrance road would enter the site at its western-most extent, near the temporary construction laydown area. Access roads within the Project site would be 24 feet wide and would be cleared, graded and covered with aggregate. Up to a 30-foot wide perimeter road, separating the solar arrays from the perimeter fencing, would be constructed around the entire perimeter of the

Project, on the inside of the fenceline. The roads would be constructed to allow fire and maintenance vehicle access.

1.4.4 Site Security Fencing

Site security would be of the utmost importance due to the high value of the solar panels used and the safety of personnel and the public. At the onset of construction, site access would be controlled for personnel and vehicles. Prior to panel installation, security fencing would be erected around the entire perimeter of the Project area, with an access gate in the southwesterly corner of the site at the access road and immediately north of the Project substation. The security fence would be 8 feet high and have an overall height of no more than 12 feet from the bottom of the fabric to the top barbed wire. The fence would have top rail, bottom tension wire, and three strands of barbed wire mounted on 45-degree extension arms. Posts would be set in concrete. The security fence will be installed near the start of construction but may be preceded by mowing and or vegetation clearance as required. The on-site substation would be surrounded by 12-foot security fencing and locked gates. All required laydown areas are expected to be contained within the defined Project boundaries, and thus no additional temporary fencing would be required. Additional gates may be installed to provide access in the event of an emergency.

1.4.5 Operations and Maintenance (O&M) Building

The onsite O&M building would be located within the southwesterly portion of the site in the laydown yard area near the main entrance to the Project and would consist of a 120-foot-wide by 240-foot-long prefabricated building set on concrete slab-on-grade that would be poured in place. The building would be an estimated 19 feet tall at its highest point. The facility would be designed for Project security, employee offices, and parts storage.

1.4.6 Gen-Tie Line

The Project's gen-tie route would remain the same as described and analyzed in Revision 5 of the existing Plan of Development (POD), as was proposed in the Palen Solar Energy Generating Station (PSEGS) project. Detailed plans to interconnect via a stand-alone gen-tie transmission line inclusive of the required electrical interconnection facilities would be developed in coordination with CAISO requirements and finalized prior to construction. Approximately six (6) temporary construction pull-sites for purposes of stringing the gen-tie line would be required.

1.4.7 Temporary Construction and Staging Areas

The staging area would include temporary construction trailers for the management of the construction, a parking area, and site security facilities. The Applicant has specified the

southwesterly corner of the Project for this area. This area would accommodate delivery of materials, vehicles, etc. Material deliveries for the solar field would be ongoing, and panels and framing structures would be delivered throughout the solar field adjacent to the subunit locations. Portable latrines would also be located in this area.

Temporary staging areas for material laydown including boxes of solar panels, steel, aluminum framing, conduit for underground electrical, transformers, and other materials would be located throughout the Project area. The laydown areas would be subsumed by the build-out of the panel array with some exceptions. Laydown areas would not be required within the solar field as such. Materials such as boxes of panels, steel and aluminum framing, etc. would be laid out between rows of panels and along the access roads.

1.4.8 Site Preparation

The Project would use construction site preparation techniques that prepare the site for safe and efficient installation and operation of PV arrays.

The Applicant proposes to use site preparation techniques that would minimize the required volume of earth movement, including a “disc and roll” technique that uses grading equipment to till the soil over much of the solar facility site and then roll it level, as well as “micro-grading” or “isolated cut and fill and roll” of other areas of the site to trim off high spots and use the material to fill in low spots.

Much of the solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Scarifying, where required, would disturb the soil to several inches and potentially allow some roots to remain to assist in soil stabilization and reduce the possibility of erosion.

The Applicant will minimize grading and vegetation removal for the Project. When feasible, construction activities will implement drive and crush rather than grading. Construction equipment would drive over and crush native plants to minimize impacts to the roots of desert shrubs. Drive and crush is expected to reduce the recovery time of desert shrubs within the temporary construction areas. Mowing and/or trimming will be implemented wherever possible, allowing some native vegetation to remain in place under the PV panels.

Solar tracking and framing structures will generally follow the existing land contours with localized grading utilized only where necessary to address major variations in topography in areas that would not significantly impact existing vegetation or surface hydrology. Site grading within the Project site will be localized in nature and limited to major access roads (described in Section 1.4.3 above), inverter pad locations, lay down areas, internal and external transmission poles, and ancillary facilities (including parking area, material storage, operations and maintenance building and substation).

As described above, trenches will be excavated for electrical conductors that connect the PV modules and the inverters to the substation. The PV modules would be electrically connected by wire harnesses and combiner boxes that would collect power from several rows of modules and feed the Project's power conversion stations via direct current (DC) cables placed in underground covered trenches.

With regard to California Department of Fish and Wildlife (CDFW) jurisdictional streambeds, localized grading will be required to allow vehicle access when the slope is greater than 1 percent at the boundaries of delineated CDFW jurisdictional streambeds and the streambed is deeper than 12 inches (i.e., too steep for vehicles to traverse unassisted). Additionally, grading within CDFW jurisdictional streambeds is anticipated to only occur when no other equally-sound method of engineering will allow development of the Project at an equal or lesser cost than grading. Grading within CDFW jurisdictional areas with occur in accordance with the permit requirements. Temporarily disturbed areas will be revegetated.

Best Management Practices will be employed to prevent loss of habitat due to erosion caused by Project-related impacts (i.e., grading or clearing for new roads). All detected erosion will be remedied within 2-days of discovery. Additionally, fueling of equipment will take place within designated areas and not within or adjacent to drainages or native desert habitats. Contractor equipment will be checked for leaks prior to operation and any identified leaks will be repaired immediately.

Access roads would be moderately graded to allow regular access with a small vehicle. Where temporary access is needed to install facilities, such as along the perimeter fencing, no removal of existing vegetation or grading would occur. Instead, equipment would drive over or around existing desert scrub vegetation without direct removal. As noted above, crushed vegetation is more likely to recover faster than where vegetation is removed and reseeded, or where soils are disturbed. Revegetation with native species would be implemented where feasible in areas of temporary disturbance.

Continued weed management in cleared areas would be maintained through regular monitoring and targeted application of the herbicide glyphosate, which is approved for use on BLM lands and/or by occasional blading. Some vegetation may be allowed to grow back among the field of solar panels. Additional soil disturbance by regular operations of the plant is not expected. The Project would implement a Weed Management Plan (WMP). The WMP would tier from the BLM's 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement and would describe applicable regulations for the use of herbicides on federally managed lands in California, and provide the basis for proper management and use of herbicides at the site. The WMP would include weeding, annual pruning, and soil monitoring if necessary. Weeding would

occur frequently during the initial growth period to ensure that invasive plants do not mature and set seed. Weeding activities would follow the approved WMP. Once revegetated native plant species are established in the temporarily disturbed areas at the site, weeding frequency would drop to less frequent levels. Native vegetation would be allowed to re-grow within the solar panel field to the extent that it does not interfere with the panels themselves (no higher than 18 inches) to avoid growing into electrical connections and creating a fire hazard, or disrupting the panel's performance. The access roads would be kept clear of vegetation through the use of targeted herbicide spraying, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays.

2 SITE CHARACTERISTICS

The following descriptions are primarily sourced from the California Energy Commission (CEC) Revised Staff Report (CEC 2010) and Palen Solar Power Project (PSPP) PA/FEIS (BLM 2011).

2.1 Regional Setting

The Project site is located in the central portion of Chuckwalla Valley, an area east of Palm Springs in the Colorado Desert. The elevation of Chuckwalla Valley ranges from under 400 feet at Ford Dry Lake to approximately 1,800 feet above mean sea level (amsl) west of Desert Center and along the upper portions of the alluvial fans that surround the valley perimeter. The surrounding mountains rise to over 3,000 feet amsl. The topography of the Project site generally slopes downward to the southeast at a slight gradient of less than 1 percent. Ground surface elevations at the Project site itself range from approximately 680 feet amsl in the southwest to 425 feet amsl in the northeast. Steeper grades are present at isolated sand dunes along the northern portion of the site.

Existing anthropogenic features and private land uses exist in the vicinity of the Project site includes agricultural, residential, renewable energy, energy transmission, historical military, and recreation development. Much of the agriculture has waned in the past 10-15 years, including most of the aquaculture (fish farms) and jojoba ventures; however, several crops are still grown, including a citrus orchard and date palm orchard just west of the Project site. Approximately 1,600 acres of private lands occur within one mile west of, and immediately adjacent to, the Project site. Approximately 830 acres of these private lands currently support active agricultural practices on converted natural desert habitat.

Evidence of historical military use from the 1942 Desert Training Center, California-Arizona maneuvers can be found in the Project vicinity. There are also many tracks of four-wheel-drive vehicles near the freeway, presumably made during freeway construction, that have disrupted the surface and are clearly evident in the interfluvial desert pavement.

The I-10 is located just south of the Project site. The developed footprint of I-10 and associated wing dikes and bridges have altered natural habitat within and adjacent to the freeway. These alterations have likely resulted in changes to surface hydrology and condition of natural habitat within the Project site over time. These alterations are discussed further herein with regard to biological and hydrological resources.

2.2 Hydrology

The Project site occurs within the Chuckwalla Valley Drainage in the Colorado River Hydrologic Basin Planning Area. Palen Dry Lake and Ford Dry Lake represent the lowest elevations within the basin. Desert washes within this region contract and expand dramatically in size due to extreme variations in flow, which can range from high-discharge floods to periods when surface flow is absent. The Project site lies between the alluvial fans emanating from the Chuckwalla Mountains to the south, the Coxcomb Mountains to the north, and the Palen Mountains to the northeast. The Project site resides in the lower reaches of the neighboring alluvial fans and is characterized by less stabilized soils consisting of finer sand and silt as compared to the upper alluvial fan reaches that support stabilized, rocky soils with well-defined channels.

Alluvial processes across the majority of the site generally flow from southwest to northeast. To the south, the I-10 was constructed over 45 years ago across the alluvial fan outlet of Corn Springs Wash (CEC 2010). Interstate 10 and associated wing dikes have altered natural surface flows from dozens of meandering small alluvial washes into concentrated discrete channels. Flows associated with the alluvial fan emanating from the Chuckwalla Mountains (primarily associated with the Corn Springs Wash system) are routed under the I-10 via three bridge spans and enter the Project site. Measurements of these spans were conducted during wildlife connectivity surveys and analysis: Underpass 10 is 3.0 meters high, 30.1 meters wide, and 60.3 meters in length; Underpass 11 is 3.3 meters in height, 24.3 meters wide, and 58.4 meters in length; and Underpass 12 is 3.3 meters in height, 17.3 meters wide, and 57.8 meters in length (Solar Millennium 2010b). The westerly bridge (Underpass 10) near Corn Springs Road Interchange conveys flow from the main branch of Corn Springs Wash to the northwest corner of the site. This channel supports the most substantial flow depth of the three; however, the prominent channels eventually spread out into numerous small channels within the relatively flat topography to the north of the I-10 (CEC 2010). Underpasses 11 and 12 convey flows to the center and east side of the Project site respectively.

2.3 Soils

The Project site supports two general soil types per the United States General Soil Map: (1) the Rositas–Dune land–Carsitas map unit and (2) the Vaiva-Quilotosa-Hyder-Cipriano-Cherioni map unit (CEC 2010). The Rositas-Dune land-Carsitas map unit occurs on the northeastern 32 percent of the site and is characterized by soils with a very high sand percentage (greater than 95 percent) and is highly susceptible to wind erosion. The remaining 68 percent of the site was mapped as the Vaiva-Quilotosa-Hyder-Cipriano-Cherioni map unit characterized by soils with high percentage (greater than 65 percent) of sand with moderate susceptibility to wind erosion.

These data were used in conjunction with field observations and laboratory testing conducted as the result of field reconnaissance to better characterize the soils on site (CEC 2010).

Soil profiles observed in the test pits were typically sands, and laboratory analysis measured sand content from 83 to 94 percent. Silt content measured in the soils ranged from 2 to 8 percent, and clay content from 2 to 11 percent. Observed profiles exhibited a range of effervescence from none to slight in the top layers, but effervescence increased with depth indicating increasing percentages of carbonates (CEC 2010).

2.4 Rainfall

Measurements of precipitation during winter (October through March) and summer (April through September) periods are important in determining the efficacy of both desert tortoise and special status plant surveys. Data was obtained from the Western Regional Climate Center (WRCC 2016) for the most proximate stations to the Project site: Blythe Airport and Eagle Mountain weather stations (approximately 26 and 13 miles from the Project site, respectively). Historical rainfall data from 2009 to 2017 were totaled and averaged (Table 1). Over the period of analysis, the highest winter rainfall occurred in 2010 and highest summer rainfall occurred in 2012. Since 2014, annual winter and summer rainfall has measured less than 50% compared to the peaks in 2010 and 2012.

Table 1 - Regional Rainfall Totals Since 2009

Year	October to March (inches)	April to September (inches)
2009	2.4	0.2
2010	4.8[1, 2]	0.1
2011	2.5	1.2
2012	1.0	3.3[1]
2013	1.5	2.6
2014	0.7	1.2
2015	2.1	1.3
2016	1.5	0.7
2017	3.4	n/a

[1]Maximum average recorded winter and summer rainfall during 2009 – 2017

[2] Includes 0.72 inches in October 2010.

2.5 Sand Transport System

Sand transport within the Chuckwalla Valley region involves an interaction between hydrological (alluvial and fluvial) and aeolian (wind-blown) processes (Philip Williams and Associates [PWA] 2010, Kenney 2010, Desert Research Institute [DRI] 2013, Palen Solar Holdings [PSH] 2013, and Lancaster et al. 2014). The sand transport system located in the

Chuckwalla Valley has been the subject of several previous studies. Studies have centered on two distinct objectives; (1) characterizing the existing conditions of sand transport, including evaluating the patterns of sand migration, and (2) assessing the potential impacts of solar development on the sand transport system resulting from proposed solar facilities.

The Chuckwalla Valley Drainage System includes Palen Dry Lake and Ford Dry Lake, which represent the lowest elevations within the basin. Alluvial fans that emanate from the neighboring mountain ranges including the Chuckwalla Mountains, Coxcomb Mountains, and Palen Mountains entrain sediments during periods of surface flow and deposit sediments downstream. Larger sediments fall out higher in the alluvial fan, while finer sand is deposited further down the alluvial fan. At the lowest reaches of alluvial wash system along the edges of the valley basins, finer sand accumulates and is subject to wind erosion, becoming a source of sand within a larger aeolian sand transport corridor (PWA 2010).

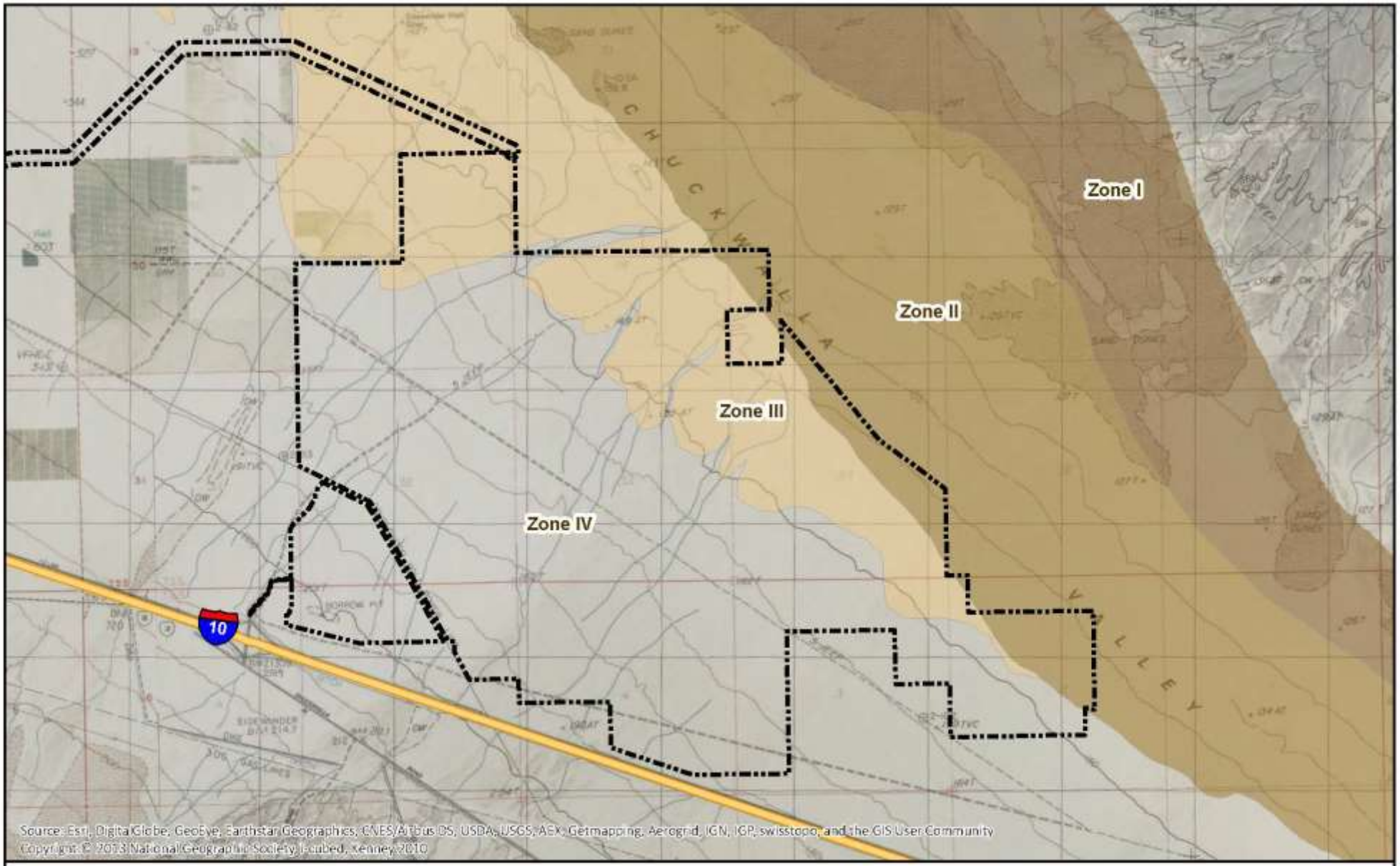
Within the Chuckwalla Valley, sand accumulates within three primary aeolian sand transport corridors: (1) Dale Lake-Palen Dry Lake-Ford Dry Lake sand migration corridor along the Chuckwalla Valley; (2) Palen Valley-Palen Dry Lake sand migration corridor where sand is transported southeast along the Palen Valley; and (3) Palen Pass-Palen-McCoy Valley sand migration corridor, located between the Palen and McCoy Mountains, where sand is transported in a southerly direction/towards the Chuckwalla Valley (BLM 2011). Prevailing winds in this region vary seasonally, and indicate two dominant wind directions during typical years. During the spring and summer months, the strongest winds are associated with monsoonal storm events, and come from the south. During the fall and winter months, the prevailing winds are associated with Pacific Ocean derived weather patterns, and come from the north-northwest. Regional aeolian system studies indicate that the prevailing wind responsible for aeolian sand transport was locally influenced by mountain range topography (BLM 2011). Sand delivered from upwind is deposited, replenishing sand that has been lost downwind (CEC 2014a). Additional sand is added to corridors from local wind corridors that can be thought of as ‘sand corridor tributaries’ and by fluvial sources. The activity and location of sand transport corridors are not fixed in time or space. Sand corridors can expand, contract or migrate with changing weather and climate (PWA 2010).

The Project site is located within and adjacent to the Palen-Ford sand migration corridor, which is part of the Clark’s Pass sand ramp running from northwest to southeast from the Dale Lake playa, north of Joshua Tree National Park (San Bernardino County), to sediment sinks in the Palen-Ford dune field in Sonoran Desert of Riverside County (Zimbelman et al. 1995). Aeolian processes play a major role in the creation and establishment of sand dune formations and habitat in the Chuckwalla Valley (BLM 2011). Winds enable the sand ramp to surmount topographic barriers that otherwise separate the Dale Lake Basin and the Palen-Ford Basin.

At a finer scale, the Project site and adjacent lands have been characterized by four relatively discrete sand transport zones (Kenney 2010) that vary along a southwest to northeast gradient in the degree of aeolian sand transport present (Figure 3). The Project site transitions from a currently stable coarse gravel alluvial fan surface with some relict sand dunes that have largely deflated (blown away) in the southwest extent, to more active wind-blown sand with relatively shallow sand deposits, and finally an area of deeper and more active vegetated sand dunes in the northeastern extent and outside the Project site. An updated assessment using high resolution satellite imagery compared two images from June 21, 2010 and April 16, 2016. The zones described by Kenney (2010) were used for reference to detect any major changes in surface conditions. RGB-alpha channels, contrast and brightness settings were adjusted using Geographic Information Systems (GIS), similarly between both images. Figure 4 illustrates the comparison of the soil surfaces between 2010 and 2016 and indicates that the extent of relatively fine sand (displayed as magenta) was consistent between the two images.

On behalf of the California Energy Commission (CEC) in 2010, PWA provided independent mapping of sand transport land units within the project area and acknowledged agreement with the delineation of sand transport zones mapped by Kenney (2010), except for the eastern limit of Zone I and degree of sand transport within Zones I and II (both outside the Project boundary). The authors noted that the zones were 'interwoven and gradual' and that hydrological and aeolian processes on the site occurred as a gradient, from southwest to northeast. PWA (2010) also provided valuable context to the dynamic nature (expansion and contraction) of the sand transport corridors that result from annual cycles of wet and dry conditions:

> *The activity and location of sand transport corridors is not fixed in time or space. Fluvial delivery of sediment from mountain fronts to the alluvial fans, troughs and playas tends to occur in wet winters associated with El Niño events that occur on average every 3-5 years. Due to the wet conditions wind transport may be less active during these years, so sediment may be temporarily stored in downstream channel areas or playas. During La Niña events (also approximately every 3-5 years) winters tend to be drier, promoting wind transport and aeolian processes. Fluvially delivered sand deposited in channels or playas during an El Niño event can be transported by the wind during a subsequent La Niña event. In an analogous manner, sand corridors can expand, contract or migrate with changing weather and climate. Wetter than average conditions may allow vegetation to encroach on the edges of a sand transport corridor, thinning it; dryer or windier condition may add more sand to the corridor and bury vegetation, widening the corridor. Changes in prevailing wind direction or strength may change the location or intensity of sand transport.*



Ironwood Consulting

0 500 1,000
Meters

Base Layers

- Project Study Area
- I10

Aeolian Sand Zones

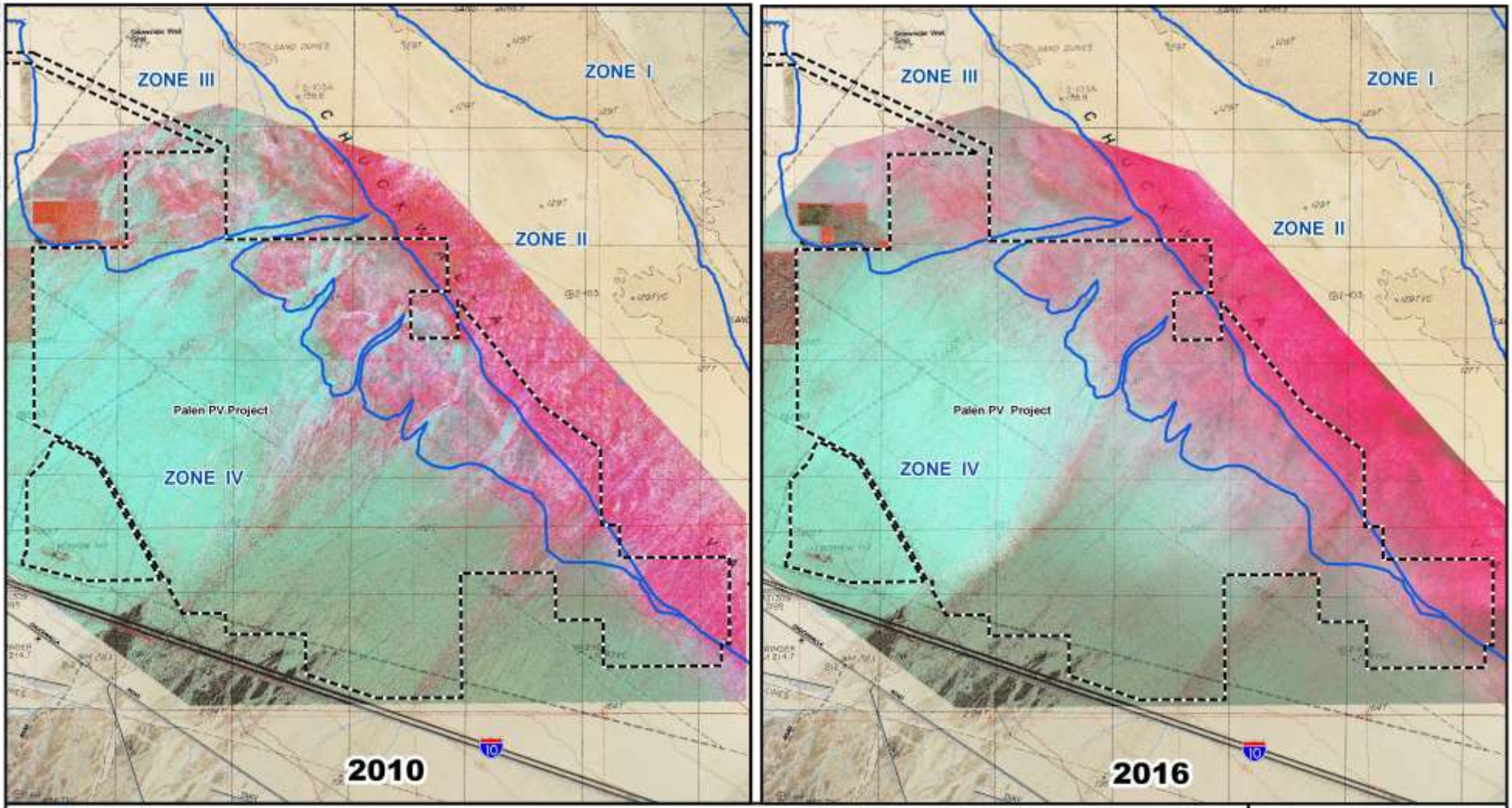
- Zone I
- Zone II
- Zone III

FIGURE 3

Sand Transport Zones

Palen Solar PV Project

F:\Ironwood-Server\Share\GIS\Projects\Palen EDF - Maverick\BRTR Fig 03 - Sand Transport Zones.mxd | 2/3/2017



Aeolian Sand Zones

Palen PV Project Study Area

Layer Properties - Symbology Settings

RGB Composite
Red = Band 4, Green = Band 1, Blue = Band 2, Alpha = Band 3
Stretch = ESRI, Statistics 'From Each Raster Dataset'
Contrast = 60, Brightness = 0, Transparency = 0

0 1,500 3,000 Feet

PALEN PHOTOVOLTAIC SOLAR PROJECT

Figure 4

High Resolution Imagery Soil Assessment

Zone IV

In the southern and western extent of the Project site, the surface is a mixture of deflated vegetated dunes with thin coarse sand and patches of alluvial gravel and desert varnish with little available fine loose sand for transport to dunes downwind (BLM 2011). Zone IV represents an area where wind transport is not the significant process for sand migration rather hydrological (alluvial and fluvial) erosion is more prominent (Kenney 2010). The majority of the Project site (approximately 71 percent) is located within Zone IV. PWA (2010) described Zone IV as the mid-alluvial fan with degraded vegetated dunes and coarse alluvial surfaces. The authors noted that patches of vegetated, deflated sand dunes occurred within this zone and sand was being removed by wind but not replaced. It was observed that fine, loose sand was not readily present within this zone.

In conjunction with the DRECP process, the Department of Conservation's California Geological Survey (CGS) prepared a regional *Eolian System Mapping Report for Eastern Riverside County in 2014* (Lancaster et al. 2014). The report characterized the map units in Zone IV as consisting primarily of Qyf, which is described as modern alluvial fan deposits consisting of 'unconsolidated to slightly consolidated sand and gravel'. Within this map unit, local alluvial fans serve as a source of aeolian sand. PWA (2010) noted that the major washes, notably the central major wash, supported bordering sandy zones within one mile of Interstate 10 that appeared suitable for Mojave fringe-toed lizards. The authors asserted that the minor washes were likely degraded (transporting lower volumes of water and entrained sediment) due to the obstruction of Interstate 10 and, subsequently, the major washes receiving more surface flow, thus distributing a higher volume and fine sediment than prior to construction of Interstate 10. Lancaster et al. (2014) noted, like PWA (2010) that changes to upstream drainage patterns (e.g., construction of Interstate10 and associated dykes) result in downstream hydrological degradation, resulting in portions of the alluvial fan less active than under historical conditions. Lancaster et al. (2014) mapped the major washes that bisect Zone IV as map unit (Qw), which is described as unconsolidated fine to coarse-grained sand and sandy gravel with subordinate fine sand and silt with bar and swale morphology and is noted as an active aeolian source.

Zone III

Moving north and east the fan surface supports sandier conditions with slightly more active wind-blown sand area with relatively shallow sand deposits. Zone III supports shallow vegetated sand dunes and sand sheets that are deflated, although less than in Zone IV and that this zone contains more abundant sand than the dunes in the mid-alluvial fan. Approximately 23 percent of the Project site is located within Zone III. PWA (2010) asserted that the dunes appeared to be in relative equilibrium; losses of sand due to wind erosion were matched by deposition of sand from upwind; however, this contrasts with Kenney (2010) and PSH (2013) in

that there were consistent observations that aeolian landforms within this zone were more extensive in the past than at present and that alluvial processes have disturbed relic sand dunes. PWA (2010) maintained that there was evidence of moderate levels of aeolian sand transport in Zone III, and this surface appears to form the outer zone of the sand transport corridor. Lancaster et al. (2014) provided additional observations of aeolian activity within the zone and mapped two relatively small units ranging from stabilized to active windblown deposits less than 1.5m thick. Due to the scale of mapping, Lancaster et al. (2014) provided additional context about the margins of the sand transport corridors by asserting these areas may have experienced a period of inactivity and substantial interactions (intergrading of fluvial erosion, active sand sheet accumulation, and aeolian dune formation) occur near the lower reaches of alluvial fans.

The high-resolution satellite imagery comparison between 2010 and 2016 reveals that the western boundary of Zone III corresponds well with the surface soil conditions and follows the topographical features derived from the mid-alluvial fan.

Zone II

Active aeolian sand migration occurs in migration corridors located along the northeastern boundary of the Project site. The vegetated dunes become deeper and the sand becomes more abundant in Zone II (PWA 2010). This area has hummocky vegetated dunes with greater topographic expression than the zone to the west, implying that they are more actively supplied by sand. This portion of the sand transport corridor is more active than the shallow vegetated sand dunes (Kenney 2010). Approximately 6 percent of the Project site is located within Zone II. Lancaster et al. (2014) mapped Zone II as Qe, which is described as active windblown deposits consisting of dunes and sand sheets typically greater than 1.5 m in thickness with fine to medium grained sand.

The high-resolution satellite imagery comparison between 2010 and 2016 reveals that the western boundary of Zone II is distinct and consistent between both years (Figure 4). The western boundary of Zone II near the Project site has not substantially changed since the original assessment in 2010.

Zone I

Zone I is located outside and northeast of the Project site. This area has the greatest rate, most active, of sand transport of the four zones. Zone I supports active transverse dunes that are not stabilized and range from 8 to over 20 feet high. This area and portions of Zone II are included in the Palen Dune system. Potter and Weigand (2016) performed a comprehensive review of Landsat image spectral data between 1985 and 2014 to evaluate sand dune migration within the Palen Dunes. The study area was situated within the active dunes with sampling transects

that were outside the Project boundary, apart from the southern-most transect that was located adjacent to the northern Project boundary. During the 30-year period of analysis, the study found that the aerial extent of the Palen Dunes had grown by 47%, active dune aerial extent had grown by 60%, and scattered bush decreased by approximately 18%. The authors estimated that the Palen dune had migration rates up to 50 m per year, with most active rates in 2014 and least active rates in 1995. These measurements were greatest in the middle of the Palen Dunes, with are located greater that two kilometers north of the Project site. The models indicated negligible dune formation within the periphery of the Palen Dunes, where the Project site is located. Potter and Weigand (2016) asserted that no active threats to energy facilities at Chuckwalla Solar I and the Palen Solar I [approximate location of the Palen Solar PV Project] was evident and that the leading edge of sand accumulation in 2014 remained greater than two kilometers from the Project site.

2.6 Vegetation

2.6.1 Natural Communities

The Project site consists almost entirely of four natural vegetation communities (Figure 5 and Table 2). Vegetation communities in the Project area were classified by Holland (1986) and cross-referenced with *A Manual of California Vegetation, 2nd edition* (Sawyer et al. 2009) and the National Vegetation Classification System (NVCS) referenced in the DRECP. Two communities (desert dry wash woodland and unvegetated ephemeral wash) that occur within the Project site are considered sensitive due to their association with alluvial processes and likely State water jurisdiction. One community (stabilized and partially stabilized desert dunes) that occurs within the Project site is considered sensitive due to its association with aeolian processes. Other sensitive groundwater-dependent vegetation communities described under PSPP (BLM 2011; CEC 2010) include honey mesquite woodlands, alkali (desert) sink scrubs, sparsely vegetated playa lake beds, and jackass clover. These vegetation types do not occur within the Project site and are not discussed in further detail herein.

Ironwood Consulting

0 750 1,500
Meters

Project Study Area
SCE Red Bluff Substation
I10

Agriculture
Sonoran Creosote Bush Scrub
Desert Dry Wash Woodland
Developed/Disturbed
Unvegetated Ephemeral Dry Wash
Stabilized and Partially Stabilized Sand Dunes

FIGURE 5

Vegetation Communities

Palen Solar PV Project

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Table 2 - Vegetation Communities within Project Survey Area[1]

Vegetation Communities	Community	Area (acres)
Sonoran Creosote Bush Scrub	Upland	3,362
Desert Dry Wash Woodland	Sensitive	322
Stabilized and Partially Stabilized Desert Dunes	Sensitive	123
Unvegetated Ephemeral Dry Wash	Sensitive	335
Agriculture	Upland	6
Developed/Disturbed	Upland	8
Total		**4,156**

[1] Acreages for survey area, not impact areas, and includes solar facility and 300-foot wide gen-tie survey areas.

2.6.1.1 Sonoran Creosote Bush Scrub

Sonoran creosote bush scrub habitat characterizes most of the Project site and intergrades with desert dry wash woodland along desert washes. This community is synonymous with *Larrea tridentata -Ambrosia dumosa* alliance (Sawyer et. al 2009) and *Lower Bajada and Fan Mojavean-Sonoran Desert Scrub* (NVCS). This vegetation community is not designated as a sensitive plant community by BLM (NECO Plan) but has a State Rarity rank of S5, and is classified in the DRECP (CEC 2014c). Sonoran creosote bush scrub occurs on well-drained, secondary soils of slopes, fans, and valleys and is the basic creosote bush scrub habitat of the Colorado Desert (Holland 1986). Within the Project site, this community is characterized by sandy soils with a shallow clay pan. Dominant plants within this community are creosote bush and white burr-sage. Other occasional components include indigo bush (*Psorothamnus* spp.), white rhatany (*Krameria bicolor*), Anderson's desert thorn (*Lycium andersonii*), Saltbush (*Atriplex* spp,), and a rich annual flora. Past anthropogenic disturbances within the vicinity of the Project site have resulted in a substantial presence of invasive plant species within the creosote bush scrub community. The I-10 and associated diversion dykes located south of I-10 may contribute to the overall sparse vegetative cover and low diversity of creosote bush scrub due to alteration of historical alluvial flows (BLM 2011). As a result, the majority of surface flow has been modified from occurring within the broader fan and is presently concentrated within more narrow channels as they cross under the I-10.

2.6.1.2 Stabilized and Partially Stabilized Desert Dunes

Stabilized and partially stabilized desert dunes are considered sensitive by the state of California, and are classified as S3 in the California Natural Diversity Database (CNDDB 2016; CEC 2010), by the BLM (NECO Plan) and within the DRECP (CEC 2014d). This community is synonymous with *Dicoria canescens - Abronia villosa* Desert Dunes alliance (Sawyer et. al 2009) and *North American Warm Desert Dunes and Sand Flats* (NVCS).

These dune systems consist of sand accumulations in the desert that have stabilized or partially stabilized as evergreen and/or deciduous shrubs and scattered, low grasses have colonized. These dunes retain water just below the sand surface. Water availability allows deep-rooted, perennial vegetation to survive during longer drought periods (Holland 1986). This community occurs within the margins of Palen Dry Lake and extends into the eastern edge of the Project study area. Dominant plants within this community included creosote bush, big galleta grass (*Hilaria rigida*), desert twinbugs (*Dicoria canescens*), desert sand verbena (*Abronia villosa*) and dyebush (*Psorothamnus emoryi*). Desert sand dunes provide unique habitats that often support plants, mammals, reptiles and insects that are restricted to sand dunes.

2.6.1.3 Desert Dry Wash Woodland

Desert dry wash woodland is a sensitive vegetation community recognized as S4 by the CNDDB and the BLM (NECO Plan) and the DRECP (CEC 2014d). As described in supporting documentation for PSPP (BLM 2011; CEC 2010), desert dry wash woodland habitat is likely regulated by CDFW as State waters. This community is synonymous with blue palo verde (*Parkinsonia florida*) - ironwood (*Olneya tesota*) (microphyll) woodland alliance (Sawyer et. al 2009) and *Sonoran - Coloradan Semi Desert Wash Woodland / Scrub* (NVCS). Desert dry wash woodland was mapped consistent with the *Vegetation Survey and Classification for the Northern & Eastern Colorado Desert Coordinated Management Plan* (CNPS 2007). Holland (1986) describes this community as an open to relatively densely covered, drought-deciduous, microphyll (small compound leaves) riparian scrub woodland. These habitats often are supported by braided wash channels that change patterns and flow directions following every surface flow event (CEC 2010). Desert dry wash woodland provides habitat for common and special status wildlife species.

Within the Project site, this vegetation community is dominated by an open tree layer of ironwood (*Olneya tesota*), with occasional blue palo verde, and smoke tree (*Psorothamnus spinosus*). Ironwood, palo verde, and smoke tree are desert phreatophytes (deep-rooted plant that obtain water from a permanent ground supply or from the water table). The understory is a modified creosote scrub with big galleta grass (*Hilaria rigida*), cheesebush (*Ambrosia salsola*), desert lavender (*Hyptis emoryii*), and occasional Russian thistle (CEC 2010). Desert dry wash woodland is associated with the three wash systems that are channelized under the I-10. As the washes flow northeast, they become less defined within the flatter topography of the Project site. Desert dry wash woodland eventually is replaced by smaller washes of mixed creosote bush and big galleta grass, and a mixture of other upland and wash-dependent species (CEC 2010). Outside the three major wash systems, desert dry wash woodland appears to be declining, evidenced by a relative decrease in the cover, vigor, diversity, and overall habitat function, due to hydrological alterations associated with the I-10 freeway that likely resulted in

reduced water supply to the broad network of channels that once crossed the Project site (CEC 2010).

2.6.1.4 Unvegetated Ephemeral Dry Wash

In the Project site, the smaller channels lacking desert dry wash woodland consist of a sparse to intermittent cover of shrubs and perennial herbs. These habitats are likely regulated as State waters. These smaller channels are subject to frequent channel avulsion and highly variable flow pathways contained within broad active alluvial fans. Vegetative cover typically occurs adjacent to the channels and consists largely of mixed upland and wash-dependent perennial herbs in a community of creosote bush and big galleta grass, occurring along the banks and within the desert dry wash woodland interfluves. To a lesser extent compared to desert dry wash woodland habitats, ephemeral dry washes may support wildlife use by small and large mammals as movement corridors; they also may provide a food and water source for many species of migrating songbirds, raptors, and reptiles (CEC 2010).

2.6.1.5 Agriculture

Agricultural land is not a natural vegetation community described by Holland (1986) or Sawyer and Keeler-Wolfe (2009). Areas of active and fallow agricultural fields occurred within the buffer of the Project site, within the biological survey area, and outside the Project disturbance area. The majority of the lands mapped as agriculture consist of date palm plantations located northwest of the proposed solar facility and south of the gen-tie alignment. A portion of the mapped agricultural land consisted of fallow fields where ruderal vegetation has recolonized with exotic plant species interspersed with sparse native vegetation (CEC 2010). Fallow and active agriculture fields may provide forage and cover for local and migratory wildlife, especially in areas that are actively irrigated (CEC 2010).

2.6.1.6 Developed/Disturbed

Developed and disturbed areas consist of existing roads including Interstate 10, Corn Springs Road, and unnamed dirt roads that are actively being used under current conditions.

2.6.2 Invasive and Noxious Weeds

Noxious and invasive weeds are species of non-native (exotic) plants included on the weed lists of the California Department of Food and Agriculture (CDFA), the California Invasive Plant Council (Cal-IPC), or those weeds of special concern identified by the BLM. They are of concern in wild lands because of their potential to degrade habitat and disrupt the ecological functions of an area (Cal-IPC 2016). Non-native plant species recorded as part of project botanical surveys during 2009, 2010, and 2016 were primarily located in the eastern and southern extent of the Project site (CEC 2010).

Sahara Mustard (*Brassica tournefortii)*

Sahara mustard is a dicot of the mustard family, native to the deserts of North Africa, the Middle East, and the Mediterranean regions of southern Europe (Bossard et al. 2000). Initial establishment of this species in California occurred through the importation of date palms from the Middle East to the Coachella Valley during the early 1900s (Bossard et al. 2000). Sahara mustard currently occurs across Riverside County, as well as all neighboring counties (Cal-IPC 2016). Sahara mustard is considered by Cal-IPC to have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure, as well as having reproductive biology and other attributes that are conducive to moderate to high rates of dispersal and establishment (Cal-IPC 2016). Sahara mustard is not listed on the California Department of Food and Agriculture (CDFA) Noxious Weed List (CDFA 2016). This species was found in disturbed areas throughout Sonoran creosote bush scrub habitat within the Project site (BLM 2011).

Russian Thistle (*Salsola tragus*)

Russian thistle is a dicot, annual herb that is found in open and disturbed areas in the Mojave Desert and throughout western North America (MacKay 2003). Otherwise known as tumbleweed, this annual becomes large and round with age, breaking off and rolling with the wind to aid in seed dispersal. Native to Eurasia, this plant was probably introduced around the turn of the century, is salt tolerant, and can be found in both dry and wetland habitats (CDFA 2016). Russian thistle has a Limited-to-Moderate rating by the Cal-IPC, indicating a species that is invasive but has an ecological impact that is minor on a statewide level, or there was not enough information to justify a higher score. Its reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but it may be locally persistent and problematic. Russian thistle is listed on the CDFA Noxious Weed List, making it subject to State laws and regulations regarding its spread and pollution of an area (CDFA 2016). Russian thistle was found in several habitat types in the Project site, including dune, desert scrub, desert dry wash woodland, and Sonoran creosote bush scrub (BLM 2011).

Tamarisk or Saltcedar (*Tamarix ramosissima*)

Tamarisk or saltcedar was observed interspersed throughout desert dry wash woodland within the Project site. This species continues to be a BLM weed species of concern, to have a Cal-IPC inventory rating of Highly invasive, and a CDFA “B” rated species, meaning it is a pest of known economic or environmental detriment of limited distribution.

Mediterranean grass (*Schismus* spp.)

Mediterranean grass is an annual monocot grass found in both central and southern California, particularly in disturbed areas and deserts, probably introduced at the turn of the century (CDFA 2016). Cal-IPC considers this plant to have limited invasive potential. *S. barbatus* and *S. arabicus* contribute to increased fire threat due to lack of decomposition during dry seasons. Because of its aid in the destruction of native shrub species by wildfire, both species contribute to the type-conversion of desert shrubland into annual grassland. Mediterranean grass has a Limited rating indicating it is invasive though its ecological impacts are minor on a statewide level, or there was not enough information to justify a higher score. These species' reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited. Spread may occur due to soil disturbance and vegetation cutting, which could disperse seeds, as well as from vehicle tires and footwear. Increase of these species is most likely to occur in areas where this species already exists. Mediterranean grass is not listed on the CDFA's Noxious Weed List (CDFA 2016). Mediterranean grass is prevalent throughout Sonoran creosote bush scrub within the Project site. BLM and other agencies recognize that because of the widespread distribution of Mediterranean grass, this species is not considered feasible to eradicate.

2.6.3 Cacti, Yucca, and Native Trees

Native cacti, succulents, and native trees are not special status plant species but the harvesting of these native plants is regulated under the California Native Plant Protection Act (Fish and Game Code §§1900-1913) and the California Desert Native Plant Act of 1981 (Food and Agricultural Code § 80001 et. seq.; Fish & Game Code §§1925-1926). A total of five species in the Cactaceae family were observed within the solar facility boundary, including hedgehog cactus, (*Echinocactus engelmannii*), teddybear cholla (*Cylindropuntia bigelovii*), silver cholla (*C. echinocarpa*), pencil cholla (*C. ramosissima*), and common fishhook cactus (*Mammillaria tetrancistra*). Two additional succulent species were observed along the gen-tie including California barrel cacti (*Ferocactus cylindraceus*) and cottontop cactus (*Echinocactus polycephalus*). Additionally, ocotillo (*Fouquieria splendens* ssp. *splendens)* and three species of native trees were found within the Project site, which included smoke tree, ironwood, and blue palo verde.

3 METHODS

3.1 Special Status Species Definition

Special status species are those that have been afforded special recognition by federal, State, or local resource agencies or organizations, are often of relatively limited distribution, and typically require unique habitat conditions, which also may be in decline. Special status criteria have not changed since publication of the PSPP PA/FEIS (BLM 2011) and PSEGS DSEIS (BLM, 2013), which include:

- Officially listed, or candidate for listing, by California or the Federal Government as Endangered, Threatened, or Rare;
- Taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA);
- BLM, USFWS, or U.S. Forest Service Sensitive Species;
- Taxa listed in the CNPS Inventory of Rare and Endangered Plants of California; and
- Protected under other statutes or regulations (e.g., Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, etc.).

3.2 Study Areas

The PSPP Biological Resources Study Area (BRSA) consisted of 14,771 acres that encompass the Project site and a surrounding buffer area (1,000-foot, 0.75-mile, and 1-mile intervals from and parallel to the edge of nonlinear portions of disturbance areas as well as at 1,000 feet from the edge of linear project components). The majority of the BRSA was surveyed in 2009, with supplemental surveys performed in 2010 to address new alternative layouts at the time resulting in an expanded BRSA. Surveys conducted for PSEGS addressed changes to proposed disturbance areas including the natural gas line extension, distribution yard, and gen-tie line reroute. Surveys performed in 2016 focused on the potential Palen Solar PV Project disturbance areas, which included the solar facility and 300-foot wide, 7-mile gen-tie line. The 2016 survey area encompasses the Palen Solar PV Project as well as a buffer (size dependent upon final facility design). The original BRSA and supplemental survey areas are shown in Figure 6.

Ironwood Consulting

0 1 2
Kilometers

Palen Solar PV - 2016
- Focused Survey Area (10m)
- Focused Survey Area (20m)

General Layers
- SCE Red Bluff Substation

PSEGS 2013
- Surveyed I-10 Underpass
- Focused Survey Area (10m)
- Wildlife Transects (200m)
- Burrowing Owl Transects

PSPP - 2009/2010
- Focused Survey Area (10m)
- Full BRSA
- I10

FIGURE 6

Study Areas
2009-2016

Palen Solar PV Project

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3.3 Wildlife Species

3.3.1 Agassiz's Desert Tortoise

Full coverage protocol desert tortoise surveys were conducted during the following periods:

- March 17 to May 22, 2009 (PSPP BRSA except substation)
- October 24 to 25, 2009 (PSPP substation and buffer)
- March 16 to May 16, 2010 (PSPP alternative disturbance areas and buffers)
- April 7 to April 29, 2013 (PSEGS modified linear facilities)
- April 30 to May 15, 2016 (Palen Solar PV Project)

The full coverage survey option described in the revised protocols (USFWS 2010a) was unchanged from the previous protocol (USFWS 1992). These surveys employed belt transects approximately 10 meters (32.8 feet) apart in order to provide 100 percent (full) coverage of the focused survey area (Figure 6; USFWS 2009). Surveys performed from 2009 to 2013 included additional transect-based sign surveys within the buffer zone at 1,000-foot, 0.75-mile, and 1-mile intervals from and parallel to the edge of nonlinear portions of disturbance areas as well as at 1,000 feet from the edge of linear portions of disturbance areas (e.g., gen-tie line) (Solar Millennium 2010a).

The Project site consists of two primary zones based on the soil conditions (see Sections 2.4 and 2.5) that correspond with potential habitat for certain species including desert tortoise. Previously documented distribution of desert tortoise sign, ammophilous special status plants, and Mojave fringe-toed lizard follow these zone boundaries with a slight degree of an intergrading ecotone. The eastern extent of the site is characterized by the presence of shallow sand sheets and dunes that support special status plants and Mojave fringe-toed lizard (Davis and Soong 2013). The eastern extent is mapped as "clearance survey area only" for desert tortoise and the western extent of the site is mapped as a "desert tortoise protocol survey area" per the DRECP (CEC 2014a, Figure H-6). The boundary of the DRECP desert tortoise survey zones correlate with the desert tortoise habitat modeled by Nussear et al. (2009) along the 0.4 model unit value, which is slightly more conservative than previous assessments that have used the threshold of 0.5 or greater as the predicted value that corresponds with suitable desert tortoise habitat (USFWS 2011 and 2012).

The 2016 desert tortoise surveys employed belt transects approximately 10 meters (32.8 feet) apart in order to provide 100 percent (full) coverage within 2,346 acres of the solar facility and within a 300-foot wide corridor along the 7-mile gen-tie line (USFWS 2009). Within 1,601 acres in the northern and eastern extent of the solar facility, surveys employed belt transects approximately 20 meters (65.6 feet) apart.

The survey crews during all desert tortoise surveys consisted of experienced desert tortoise surveyors. Surveys were conducted by slowly and systematically walking linear transects while surveyors visually search for desert tortoise and sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. All tortoise sign [e.g., live tortoises (all age classes), shell/bone/scutes, scats, burrows/pallets, tracks, egg shell fragments, and courtship rings] were recorded if present. The condition of sign was categorized per the following class designations (USFWS 2009):

1. currently active, with desert tortoise or recent desert tortoise sign;
2. good condition (no evidence of recent use) - definitely desert tortoise;
3. deteriorated condition (including collapsed burrows) - definitely desert tortoise;
4. good condition - possibly desert tortoise; and
5. deteriorated condition (including collapsed burrows) - possibly desert tortoise.

The location of all tortoise sign was recorded using a Global Positioning System (GPS) unit. In addition to recording sign with the GPS unit, standardized paper datasheets were completed. All data were digitally entered and used in GIS to determine approximate abundance and distribution of desert tortoise.

In August 2016, Ironwood biologists revisited fourteen desert tortoise burrows and twelve bone fragment locations that were previously identified during the 2009/2010 surveys. The GPS coordinates were used to navigate to the previously collected data points. The immediate area of each location was surveyed for any remaining sign, taking into consideration of potential variation in GPS accuracy.

3.3.2 Mojave Fringe-toed Lizard

Surveys for Mojave fringe-toed lizard were performed concurrently with desert tortoise transects in 2009, 2010, 2013, and 2016. As described in Section 3.3.1, suitable habitat for Mojave fringe-toed lizard is largely discrete from that of desert tortoise within the Project site apart from a narrow ecotone between the two. This distinction allowed for effective surveys for both species using belt transects during previous surveys. In 2016, surveys employed approximately 201 linear miles of belt transects averaging 20 meters (65.6 feet) apart within the eastern extent of the solar facility (within an area of 1,601 acres) and approximately 324 linear miles of belt transects averaging 10 meters (32.8 feet) apart within the western extent of the solar facility (within an area of 2,346 acres) and 300-foot wide corridor along the gen-tie line. The transects were walked systematically while surveyors visually searched for live Mojave fringe-toed lizards. All observations were noted in hardcopy datasheets. Location information was recorded using GPS. In areas of higher density of lizards sighting, groups of lizards were tallied and represented by a single data point.

3.3.3 Avian Species

The *Draft Bird and Bat Conservation Strategy (BBCS) for the Palen Solar Photovoltaic Project* (WEST 2016), which provides a thorough account of avian studies performed to date, has been summarized herein (Table 3). A suite of avian habitat assessments, focused surveys, and baseline sampling have been performed since 2009 to characterize existing and potential avian use of the Project site (WEST 2016). Beginning in 2009 in support of PSPP, focused surveys were performed for special status species and breeding season point count surveys were performed at 48 stations.

Initiating in 2013, extensive surveys and analysis were performed to evaluate avian risks related to the PSEGS technology including:

- Multi-season small bird count (SBC) surveys designed to provide a larger sample size than in in previous years;
- Multi-season bird use count (BUC) surveys to detect large birds over wider areas;
- Shorebird and waterfowl surveys at offsite agricultural ponds;
- Mist net surveys to detect species that may otherwise go undetected under other methods;
- Nocturnal radar surveys;
- Habitat evaluations for Elf Owl and Gila Woodpecker;
- Golden eagle nesting, winter, and prey abundance surveys; and
- Burrowing owl surveys.

Point counts were performed at a series of pre-determined points located along a survey route (EDAW and BBI 2009, BBI 2013a, BBI 2013b, Levenstein et al. 2014). Trained observers recorded all the birds seen and heard during a set period of time at each station. Point counts are effective for detecting small birds (visually or by their calls) located near the point location, but have limited effectiveness in detecting rare species, except as incidental observations. That said, point count data may be used to estimate avian species diversity, abundance, and richness, which can be filtered by season.

Bird use count (BUC) surveys were performed to primarily detect larger avian species, particularly raptors, which soar overhead and are visible from long distances (BBI 2013a, BBI 2013b; Levenstein et al. 2014). By design, BUCs consist of fewer sampling stations than the aforementioned point counts and are spaced more widely on the landscape with longer periods of observation time associated with each station.

Table 3 - Avian Studies Performed Since 2009

STUDY (TAXA)	PURPOSE	PROTOCOL	SURVEY AREA	SURVEY DATES
Bird Use Count (BUC) Surveys (medium large birds)	Estimate the spatial and temporal use of site by medium to large birds, particularly vultures and diurnal raptors	8 hrs/survey Point counts using 800-m (2,625-ft) radius circular plots (similar to those described by Reynolds et al. 1980, Bibby et al. 1992) 6 BUC observations points established throughout the PSEGS site and surrounding 0.6-mile (1.0-km) buffer	96 BUC surveys; 762 hrs	April 8– May 4, 2013
			24 BUC surveys; 192 hrs	May 5 – June 1, 2013
			414 BUC surveys; 3,234 hrs	August 20 – December 13, 2013
			2 stations; 666 hrs	March 24 – June 5, 2014
			2 stations; 785 hrs	March 9 – June 5, 2015
Small Bird Count (SBC) Surveys	Characterize use by migrant and resident birds, particularly songbirds, within the site and surrounding area during the spring and fall migration periods	10 min/survey Transects across solar facility footprint including 1-mile buffer	48 stations; 1,920 min; 6 transects	April 12 – May 8, 2009
			120 stations; 4,790 min; 14 transects	April 8 – May 4, 2013
			186 stations; 12,960 min; 14 transects	May 5 – June 29, 2013
			150 stations; 19,390 min; 14 transects	August 19 – November 14, 2013
			72 stations; 7,870 min; 14 transects	March 24 – June 5, 2014
			64 stations; 7,000 min; 14 transects	March 16 – June 5, 2014
Mist Net Surveys	Increase the probability of	12, 12x2.6m nets/survey	502.7 mist net hours	April 11 – May 4, 2013
			1,322.4 mist net hours	May 9 – June 14, 2013

STUDY (TAXA)	PURPOSE	PROTOCOL	SURVEY AREA	SURVEY DATES
	detecting inconspicuous birds that might otherwise go undetected		1,080 mist net hours	September 18 – October 30, 2013
Agricultural Pond Surveys (Shorebirds, Waterbirds, and Waterfowl)	Evaluate use of agricultural ponds adjacent to the northwest boundary of the site	3 stations 323 hours	Three agricultural ponds within the privately-owned land to the northwest of the site and just beyond the palm plantation	August 19 – December 10, 2013 March 27 – June 2, 2014 March 13 – June 3, 2015
Nocturnal Radar Surveys (migrants)	Document migration over the project area and to measure parameters of the migration	1, 3 km radius station 600 hours	PSEGs footprint and buffer	August 19 – October 31, 2013 March – June 2014
Gila woodpecker	Determine presence or absence of Gila Woodpecker	Concurrent with SBCs	Transects across solar facility footprint including 1-mile buffer 120 stations; 4,790 min	April 8 – May 4, 2013
			Transects across solar facility footprint including 1-mile buffer 186 stations; 12,960 min	May 5 – June 29, 2013
Elf Owl Surveys	Determine presence or absence of Elf Owl	143 callback stations 63 listening stations 10 – 14 min/station		May 18 – June 15, 2013
Habitat Evaluation for Elf Owl and Gila Woodpecker	Assess habitat suitability for Elf		29, 50-meter radius Habitat Suitability stations	July 2 – July 19, 2013

STUDY (TAXA)	PURPOSE	PROTOCOL	SURVEY AREA	SURVEY DATES
	Owl and Gila Woodpecker			
Winter Golden Eagle Surveys	Evaluate use of the site and surrounding region by wintering and resident golden eagles	Baited camera trapping (7 stations) and visual surveys	7 stations	January 23 – February 27, 2013
Golden Eagle Nest Surveys	Estimate number of territories within 10-mile buffer of project and determine if active nests occur.	Surveys by air and ground as per USFWS Guidelines (Pagel et al. 2010) All areas of suitable golden eagle nesting habitat and known eagle nest sites within the Palen Mountains and the Chuckwalla Mountains, including transmission structures along the Interstate 10 (I-10) power lines.	10-mile buffer Coxcomb Mountains Palen Mountains Chuckwalla Mountains, including transmission structures along the Interstate 10 (I-10) power lines	March 20 – April 15, 2013 Ground-based March 20, 21, and 22, 2013 in the Coxcomb Mountains Aerial April 6 and 7, 2013 Ground-based April 8 and April 15, 2013 in the Chuckwalla Mountains
			10-mile buffer Palen Mountains, and along a 20-mile (32-km) length of the DPV2, and Chuckwalla Mountains Coxcomb Mountains	May 24 – August 3, 2013 Aerial May 24 and 25, 2013 and August 2-3 Ground-based May 24 and 25, 2013, and June 9, 11, and 15, 2013.
			Same as above	April 8 to 12, July 1 to 3, 2014
			Same as above	March 10 to 19, 2015
Golden Eagle Prey Abundance Surveys	Obtain data on the presence and general abundance of rabbits on site.	Conducted as surveyors walked along transects between SBC	122 miles of transects between SBC points	April 9 to June 29, 2013

STUDY (TAXA)	PURPOSE	PROTOCOL	SURVEY AREA	SURVEY DATES
		survey points and recorded lagomorphs		
Burrowing Owl Surveys	Determine presence or absence of Burrowing Owl within the site.	per CBOC 1993 Protocol Guidelines and concurrent with desert tortoise survey	Throughout PSPP footprint and buffer	March 10 – June 14, 2009
		per CDFW 2012 Protocol Guidelines	Linear facilities only (gen-tie and gas line modifications)	April 7 – June 26, 2013

Mist nets were used to detect inconspicuous species that might have gone otherwise undetected during other surveys. This method uses fine-thread nets to capture birds for identification and release (BBI 2013a, BBI 2013b, Levenstein et al. 2014).

Nocturnal radar surveys were performed to provide estimates of the rate, intensity, flight altitudes, and timing of birds migrating through a given area (Levenstein and Nations 2013).

3.3.3.1 Western Burrowing Owl

The Project site is considered suitable habitat for western burrowing owl, with one exception being the northern end of the Project site that is densely covered in Sahara mustard (CEC 2010). Survey recommendations in both the 1993 CBOC Guidelines and 2012 CDFW Staff Report include baseline data collection and an assessment of site use. Surveys (consistent with Phase II of the CBOC 1993 Guidelines and the 2012 CDFW Staff Report) were conducted concurrently with surveys for desert tortoise and other fossorial species in 2009, 2010, 2013, and 2016 to provide details of burrowing owl occupancy and site use. Surveys included pedestrian transects spaced 10-to-20 meters apart, which provided a greater level of survey effort and coverage than the 30-meter spacing recommended in the 1993 Guidelines. The concurrent survey effort was successful in identifying all burrows that could support any special status species, including burrowing owl. Biologists were prompted to assess each burrow for burrowing owl sign when completing field datasheets. All sign, including the presence of individuals, feathers, tracks, white wash, pellets, and suitable burrows were recorded if present.

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 (CDFW 2012; California Burrowing Owl Consortium 1993). Breeding season surveys (Phase III) were conducted in the project footprint and buffer during the peak of the 2009 breeding season and along linear facilities during the 2013 breeding seasons (CEC 2010; Karl 2013a).

In August 2016, Ironwood biologists revisited five locations of burrowing owl sign that were previously identified during the spring 2016 surveys. The GPS coordinates were used to navigate to the previously collected data points. Changes in the presence of burrowing owl sign were recorded.

3.3.3.2 Golden Eagle

<u>Nest Surveys</u>

Aerial and ground-based golden eagle nesting surveys were conducted in 2010, 2012, 2013, 2014 and 2015 following the *USFWS February 2010 Interim Golden Eagle Inventory and Monitoring Protocols* (Pagel et al. 2010). During surveys, all areas within the study area were

searched for large stick nests used by golden eagles, other raptors, and ravens on cliff faces and transmission towers.

Spring 2010 aerial surveys for golden eagles were conducted by Wildlife Research Institute (WRI) covering the area within a 10-mile radius from the PPSP boundaries as well as three other proposed solar projects (CEC 2010). The surveys covered eleven mountain ranges between and around Blythe and Desert Center (BBI 2013b, BBI 2013c, BBI 2013d).

In 2012, the BLM contracted BioResource Consultants Inc. to collect updated field data and report current breeding status of golden eagles within the BLM's California Desert District and Northern California District. The objective of this effort was to survey all of the mountain ranges containing known and potential golden eagle nesting habitat. Aerial surveys (167 flight hours) and/or ground-based surveys (30,205 miles) were performed in the vicinity of 350 previously documented nest sites using methodology consistent with currently accepted guidelines (Pagel et al. 2010). The first phase of the survey effort included documentation of occupancy and condition of known and newly discovered golden eagle nests. The second phase focused on determining the breeding status and reproductive output of active golden eagle nests.

Spring and summer 2013 aerial and ground-based golden eagle nesting surveys were conducted by Bloom Biological Inc. (BBI) covering all areas of suitable golden eagle nesting habitat and known eagle nest sites within the Palen Mountains, Coxcomb Mountains, and Chuckwalla Mountains, including transmission structures along the I-10 power lines (BBI 2013c). Due to bighorn sheep (*Ovis canadensis*) lambing season flight restrictions, aerial surveys in the Chuckwalla Mountains were conducted from heights of greater than 1,500 ft (457 m) in all areas. Follow-up ground-based surveys were conducted on foot in the Chuckwalla Mountains in April 2013, to visit and observe potential golden eagle nest sites identified during aerial surveys. Three additional days of foot and vehicular surveys were conducted in March 2013 in the Coxcomb Mountains, which could not be surveyed by helicopter at any reasonable height due to flight restrictions in Joshua Tree National Park. Summer ground surveys were conducted in the Coxcomb Mountains in May and June 2013.

Spring and summer aerial and ground golden eagle nesting surveys were repeated from April 8 to 12 and July 1 to 3, 2014 (WEST 2016). Aerial surveys were conducted on April 9 and July 1 to 3, 2014 within a 10-mile buffer of the boundary for the PSEGS project. Ground based surveys were also conducted during the entire April survey period, during which all previously documented eagle nests were visited, and observers scanned for suitable habitat for new nests. As in other seasons, aerial surveys were limited due to restrictions for big horn sheep lambing.

Spring ground-based golden eagle nesting surveys were conducted from March 10 to 19, 2015 to obtain the status of previously documented golden eagle nests within a 10-mile buffer of the

previously proposed project (WEST 2016). Aerial surveys were not performed during this time period due to flying restrictions as a result of desert bighorn sheep lambing activity.

Winter Surveys

Winter golden eagle surveys were conducted by BBI in January and February (BBI 2013e). The purpose of the surveys was to evaluate use of the Project site and surrounding region by wintering and resident golden eagles using a combination of baited camera traps and visual surveys (WEST 2016). Carcasses were placed as bait and infrared motion-activated cameras were used to capture all visiting predators and scavengers. Visual surveys for golden eagles and other avian predators were conducted at the location of each bait station and by driving all accessible roads and stopping at random locations and scanning the skyline and potential perch locations such as cliffs, rock outcroppings and trees with high powered binoculars and spotting scopes (WEST 2016).

Prey Abundance Surveys

Golden eagle prey abundance surveys were conducted concurrently with SBC surveys by BBI during the spring of 2013 (BBI 2013c). Prey abundance surveys were conducted as surveyors walked along transects between SBC survey points and recorded the number of lagomorphs [black-tailed jackrabbits (*Lepus californicus*) and desert cottontails (*Sylvilagus audubonii*)] detected incidentally since leaving the previous station (WEST 2016). Similar counts of lagomorphs were performed during the desert tortoise and other special status species transects walked in spring 2016.

3.3.4 Bat Species

A survey for bat roosts within the Project site and surrounding region (e.g., freeway underpasses, bridges, buildings) was conducted in 2009 and 2013 (WEST 2016). Potential bat roosts were surveyed within the Project site in 2016 during transect surveys. Emphasis was given to the desert dry wash woodland areas that support relatively larger vegetation (e.g., ironwood trees) that may support hollowed trunks.

Acoustic bat surveys were conducted in May 2013 and October through mid-December 2013 with the objective of assessing the potential for bat roosting and foraging habitat (WEST 2016). Passive acoustic monitors were stationed at 13 locations throughout the Project site, approximately 3 feet off the ground. The acoustic monitoring devices utilized in spring 2013 included two ranges of ultrasonic microphones to enhance the detection of species such as pallid bat (*Antrozous pallidus*), California leaf-nosed bat (*Macrotus californicus*), hoary bat (*Lasiurus cinereus*), western mastiff (*Eumops perotis*), and other larger free-tail bat calls (WEST 2016). The fall/winter acoustic survey consisted of ultrasonic detectors with standard microphones deployed at three of the stations previously surveyed in the spring and one

additional station located at a pond associated with the adjacent agricultural property. Acoustic data were analyzed and call sequences were visually examined.

3.3.5 Other Special Status Wildlife Species

Surveys were performed in spring 2016 over the Project site by systematically walking linear transects while surveyors visually searched for burrows and other sign of special status fossorial species. In addition to sign of desert tortoise and western burrowing owl, presence of desert kit fox (e.g., dens, complexes, scat, and tracks) and American badger were recorded.

During all biological resource surveys, biologists recorded all wildlife species, regardless of status, that were encountered during the survey. All special status species recorded incidentally during all survey efforts were recorded by GPS and assigned a unique identifier. Common species were tallied at the end of each transect and recorded throughout each day by each crew. All data was entered from these datasheets and was incorporated into GIS.

In August 2016, Ironwood biologists revisited twenty locations of desert kit fox and two locations of American badger that were previously identified during the 2009/2010 surveys. The GPS coordinates were used to navigate to the previously collected data points. The presence or absence of sign was recorded.

3.4 Special Status Plants

Focused special status plant surveys (CDFW 2016c) were conducted during the following periods:

- February to April 2009 (PSPP BRSA)
- Spring 2010 (PSPP alternative disturbance areas)
- October 11 to 15, 2010 (PSPP BRSA)
- March 30, 2013 (PSEGS modified linear facilities)
- April 30 to May 15, 2016 (Palen Solar PV Project)
- March 22 to April 6, 2017 (selected areas of Palen Solar PV Project)

Survey methodology followed the intuitive controlled survey approach (Whiteaker 1998) as described in Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species (BLM 2009) and consistent with the following guidance documents: (1) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 2000); (2) Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (CDFG 2009); (3) CNPS Botanical Survey Guidelines (CNPS 2001); and (4) Survey Protocols for Survey and Manage Strategy 2:

Vascular Plants (Whiteaker 1998). CNPS List 3 and 4 may be considered regionally significant if, for example, the occurrence is located at the periphery of the species' range, or exhibits unusual morphology, or occurs in an unusual habitat/substrate (CDFG 2009). For these reasons, List 3 and 4 species were included in the literature search and targeted during field surveys.

Substantial rain events occurred in the Chuckwalla Valley in October 2010, which resulted in 0.72 inches (18 mm) of rain averaged between the Eagle Mt. and Blythe met stations. Surveys performed in October 2010 (AECOM 2010) targeted late-blooming special status plants including Abram's spurge (*Chamaesyce abramsiana*), flat-seeded spurge (*Chamaesyce platysperma*), glandular ditaxis (*Ditaxis claryana*), pink velvet mallow (*Horsfordia alata*), lobed ground cherry (*Physalis lobata*), California ditaxis (*Ditaxis serrata* var. *californica*), jackass clover (*Wislizenia refracta* ssp. *refracta*), and Palmer's jackass clover (*Wislizenia refracta* ssp. *palmeri*). Reference sites were visited prior to conducting focused surveys in fall 2010.

Surveys performed in spring 2016 included visual coverage across the entire Project site. Surveys employed belt transects approximately 10 meters apart in order to provide 100 percent coverage within 2,346 acres of the solar facility boundary and within a 300-foot wide corridor along the 7-mile gen-tie line (USFWS 2010c). Within 1,601 acres in the northern and eastern extent of the solar facility boundary, surveys employed belt transects approximately 20 meters apart. Transect spacing was adequate to detect the target species, if present. Plant surveys were performed with experienced lead botanists alongside the wildlife survey field crews. All surveyors were trained on diagnostic features, habitat notes, and location maps of targeted species. A cumulative list of all plant species observed during the surveys was maintained. Reference locations previously documented were revisited. The efficacy of 2016 plant surveys was limited due to the lack of preceding winter rainfall, and in an average rain year, the phenology of most desert annuals would be well past fruiting stage and drying-up by the time of the survey.

Rainfall during the 2016/2017 winter was above-average, which provided an opportunity to gain greater confidence in special status plant species occurrence. Additional surveys were performed in spring 2017 included a systematic survey of the following areas:

- 2,326 acres (corresponding with sandy soils within the solar facility study area);
- 227 acres (corresponding with sand sheets in Zone II and potential habitat for Harwood's eriastrum [*Eriastrum harwoodii*], if present); and
- 209 acres (associated with the gen-tie line).

Survey methods were consistent with accepted survey protocols (BLM 2009; USFWS 2000; CDFW 2009; CNPS 2001; and Whiteaker 1998). Nearby reference populations of target species including ribbed cryptantha (*Cryptantha costata*) and Harwood's eriastrum were visited to confirm germination and flowering status prior to conducting formal transects. Transects were

spaced 10m apart within the 227-acre Zone II and 209-acre gen-tie line survey areas. Transects within the remaining survey area were spaced no greater than 100m apart. Additional intuitive controlled transects were performed within portions of Zone III that supported suitable habitat for target species.

4 SPECIAL STATUS SPECIES DISCUSSION

4.1 Special Status Wildlife

Sixty-three special status wildlife species were reviewed for their potential to occur within the Project site and its vicinity based on regional plans and database records (Table 4 and Appendix A). The status of each species has been updated to reflect any recent changes. Several species were determined to have a low probability of occurrence due to the absence of suitable habitat and are discussed in Appendix A. Special status wildlife species that were detected within the Project site, buffer, or have the potential to occur based on the presence of suitable habitat within the Project site are discussed further in this section. A comprehensive list of wildlife species observed during previous surveys is included in Appendix B.

4.1.1 Agassiz's Desert Tortoise

Background

The desert tortoise was State-listed in California as threatened on August 3, 1989. The Mojave population was listed as threatened under FESA on April 2, 1990 (USFWS 1990), and critical habitat was designated on February 8, 1994 (USFWS 1994). The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California (USFWS 1990).

Desert tortoises are well adapted to living in a highly variable, and often harsh, desert environment (USFWS 2011). They spend much of their lives in burrows, even during their seasons of activity. In late winter or early spring, desert tortoises emerge from over-wintering burrows and typically remain active through fall. Activity does decrease in summer, is often crepuscular during the hottest times, and tortoises often emerge after summer rain storms. Activity and movement is generally influenced by temperature and precipitation, which correlate with potential food and water resources. Extreme temperatures, both high and low, and periods of drought typically result in reduced tortoise activity (Peterson, 1996). Mating occurs both during spring and fall. Tortoises are long-lived and grow slowly, requiring 13 to 20 years to reach sexual maturity [at approximately 180mm midline carapace length (MCL)]. Eggs are generally laid in friable soil near burrow entrances between April and June and occasionally September and October. Eggs hatch within three to four months (Rostal 1994).

Table 4 - Special Status Wildlife Species

Species	Status[1]			Potential to Occur on Project Site[2]
	State	Federal	WBWG	
REPTILES				
Agassiz's desert tortoise *Gopherus agassizii*	ST	FT	-	Low to Moderate
Mojave fringe-toed lizard *Uma scoparia*	SSC	BLMS	-	High
AMPHIBIANS				
Couch's spadefoot toad *Scaphiopus couchii*	SSC	BLMS	-	Low
MAMMALS				
Colorado Valley woodrat *Neotoma albigula venusta*	-	-	-	Low
Burro deer *Odocoileus hemionus eremicus*	CPGS	-	-	High
Desert bighorn sheep *Ovis canadensis nelsoni*	CFP	BLMS	-	Low
Yuma mountain lion *Puma concolor browni*	SSC	-	-	Low to Moderate
American badger *Taxidea taxus*	SSC	-	-	High
Desert kit fox *Vulpes macrotis arsipus*	CPF	-	-	High
BATS				
Pallid bat *Antrozous pallidus*	SSC	BLMS	H	Foraging - Moderate Roosting - Low
Townsend's big-eared bat *Corynorhinus townsendii*	SSC	BLMS	H	Foraging - Moderate Roosting - Low
Big brown bat *Eptesicus fuscus*	-	-	L	Low
Spotted bat *Euderma maculatum*	SSC	BLMS	H	Low
Western mastiff bat *Eumops perotis*	SSC	BLMS	H	Low
Hoary bat *Lasiurus cinereus*	-	-	M	Foraging - Moderate Roosting - Low
Western yellow bat *Lasiurus xanthinus*	SSC	-	H	Moderate
California leaf-nosed bat *Macrotus californicus*	SSC	BLMS	H	Low
California myotis *Myotis californicus*	-	-	L	Foraging - Moderate Roosting - Low
Arizona myotis *Myotis occultus*	SSC	-	-	Low
Cave myotis *Myotis velifer*	SSC	BLMS	M	Low
Yuma myotis *Myotis yumanensis*	-	BLMS	LM	Low
Pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	-	M	Low
Big free-tailed bat *Nyctinomops macrotis*	SSC	-	MH	Foraging - Moderate Roosting - Low

Species	Status[1]			Potential to Occur on Project Site[2]
Canyon bat *Parastrellus hesperus*	-	-	L	Foraging - Moderate Roosting - Low
Mexican free-tailed bat *Tadarida brasiliensis*	-	-	L	Foraging - Moderate Roosting - Low
Birds				
Golden eagle (Nesting and wintering) *Aquila chrysaetos*	CFP, WL	BCC, BLMS	-	Nesting/Wintering - Absent Foraging - Low
Short-eared owl (Nesting) *Asio flammeus*	SSC	-	-	Low
Western burrowing owl *Athene cunicularia hypugaea*	SSC	BCC, BLMS	-	High
Redhead (Nesting) *Aythya americana*	SSC	-	-	Low
Ferruginous hawk (Wintering) *Buteo regalis*	WL	BCC	-	Moderate
Swainson's hawk *Buteo swainsoni*	ST	BCC	-	Nesting - Low Migration - High
Costa's hummingbird (Nesting) *Calypte costae*	-	BCC	-	Moderate
Vaux's swift (Nesting) *Chaetura vauxi*	SSC	-	-	Nesting - Low Migration - High
Mountain plover (Wintering) *Charadrius montanus*	SSC	BCC, BLMS	-	Nesting - Low Migration - Moderate
Black tern *Chlidonias niger*	SSC	-	-	Low
Northern harrier (Nesting) *Circus cyaneus*	SSC	-	-	Nesting - Low Wintering/Migration - High
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	SE	FT, BCC, BLMS	-	Low
Gilded flicker *Colaptes chrysoides*	SE	BCC, BLMS	-	Low
Black swift (Nesting) *Cypseloides niger*	SSC	BCC	-	Low
Willow flycatcher (Nesting) *Empidonax traillii* Southwestern willow flycatcher *E. t. extimus*	SE SE	- FE	- -	Low Low
California horned lark *Eremophila alpestris actia*	WL	-	-	High
Prairie falcon (Nesting) *Falco mexicanus*	WL	BCC	-	Nesting - Low Foraging - High
American peregrine falcon (Nesting) *Falco peregrinus anatum*	CFP	BCC	-	Nesting - Low Foraging - Moderate
Sandhill crane (Wintering) *Grus canadensis*	SSC	-	-	Nesting - Low Migration - Moderate
Yellow-breasted chat (Nesting) *Icteria virens*	SSC	-	-	Low
Loggerhead shrike (Nesting) *Lanius ludovicianus*	SSC	BCC	-	High
Gila woodpecker *Melanerpes uropygialis*	SE	BCC, BLMS	-	Low
Elf owl *Micrathene whitneyi*	SE	BCC, BLMS	-	Low

Species	Status[1]			Potential to Occur on Project Site[2]
Long-billed curlew (Nesting) *Numenius americanus*	WL	BCC	-	Nesting - Low Migration - Moderate
Lucy's warbler (Nesting) *Oreothlypis luciae*	SSC	BCC, BLMS	-	Moderate
American white pelican (Nesting colony) *Pelecanus erythrorhynchos*	SSC	-	-	Nesting/Wintering - Low Migration - Moderate
Black-tailed gnatcatcher *Polioptila melanura*	WL	-	-	High
Vesper sparrow *Pooecetes gramineus*	SSC	-	-	Low
Purple martin *Progne subis*	SSC	-	-	Low
Vermilion flycatcher (Nesting) *Pyrocephalus rubinus*	SSC	-	-	Low
Ridgway's clapper rail *Rallus obsoletus yumanensis*	ST, CFP	FE	-	Low
Bank swallow (Nesting) *Riparia riparia*	ST	BLMS	-	Nesting/Wintering - Low Migration - Moderate
Sonora Yellow warbler (Nesting) *Setophaga petechia sonorana*	SSC	BCC	-	Nesting - Low Migration - Moderate
Lawrence's goldfinch (Nesting) *Spinus lawrencei*	-	BCC	-	Low
Bendire's thrasher *Toxostoma bendirei*	SSC	BCC, BLMS	-	Low
Crissal thrasher *Toxostoma crissale*	SSC	-	-	Low
Le Conte's thrasher *Toxostoma lecontei*	SSC	-	-	High
Arizona Bell's vireo *Vireo bellii arizonae*	SE	BCC, BLMS	-	Low
Least Bell's vireo *V. b. pusillus*	SE	FE		
Yellow-headed blackbird (Nesting) *Xanthocephalus xanthocephalus*	SSC	-	-	Low

[1] Status

Federal FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future
FCT = Proposed for federal listing as a threatened species
BCC = Fish and Wildlife Service: Birds of Conservation Concern:

State SSC = State Species of Special Concern
CFP = California Fully Protected
SE = State listed as endangered
ST = State listed as threatened
WL = State watch list
CPF = California Protected Furbearing Mammal
CPGS = California Protected Game Species

Bureau of Land Management
BLMS = BLM Sensitive

Western Bat Working Group (WBWG)
H = are imperiled or are at high risk of imperilment
M = warrant closer evaluation, more research, and conservation actions
L = most of the existing data support stable populations

[2] Species not detected during previous surveys may have the potential to occur on the Project site in the future.

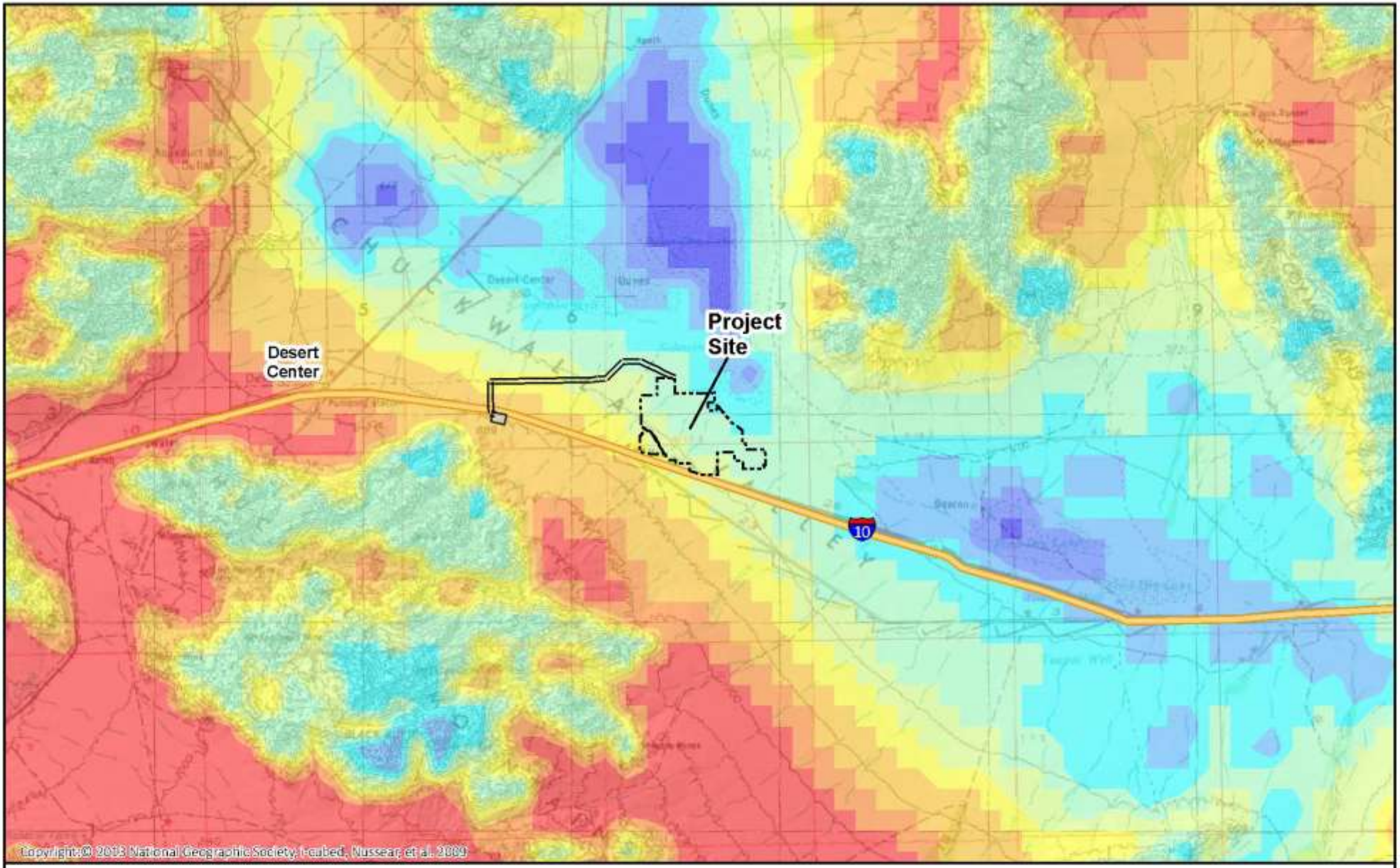
Desert tortoises inhabit a variety of habitats from flats and slopes dominated by creosote-white bursage communities, where a diversity of perennial plants is relatively high, to a variety of habitats in higher elevations. Tortoises are found most often on gentle slopes with sandy-gravel soils. Soils must be appropriately soft for digging burrows, but firm enough so that burrows do not collapse (Anderson et al., 2000). Tortoises typically prefer habitats with abundant annual forbs, grasses and cactus, which constitute its primary food sources. Current research has suggested that plant species that have high potential for potassium excretion (high-PEP) may be critical to the diet of desert tortoise (Oftedal 2002; Oftedal et. al 2002). Excess potassium can be detrimental to the health tortoises. When excreting potassium salts from their bladder, tortoises risk expelling valuable water and protein in the process.

Desert tortoises occupy home ranges, which are generally defined as the area traversed while carrying out a range of normal activities (e.g., foraging and mating) (USFWS 2011). The size of desert tortoise home ranges can vary with respect to sex, geographic location, substrate, topography, and year depending on climate factors such as rainfall and temperature. Tortoises are philopatric, establishing home ranges between 15 and 45 hectares (Barrett 1990, O'Connor et al., 1994, Harless et al. 2009) depending on region. Home ranges of females are generally smaller than those of males (Duda et al. 1999). Some tortoises have been known to travel great distances, although these movements may occur outside their usual home range (Berry 1986).

The Project is located within the Colorado Desert Recovery Unit. The highest desert tortoise densities within this recovery unit (Murphy et al. 2007) occur in Chemehuevi and Ward valleys (approximately 60 miles north of the project site), on the Chuckwalla Bench within the Chuckwalla Desert Wildlife Management Area (DWMA), and in Joshua Tree National Park (approximately 40 miles northwest of the project site).

Project Surveys

The Project site supports desert tortoise habitat with low predicted occupancy values, not accounting for habitat degradation resulting from existing anthropogenic features (Nussear et al. 2009). The Project site consists of two primary zones based on the soil conditions that correspond with suitable habitat for desert tortoise. The eastern extent of the site is characterized by the presence of shallow sand sheets and dunes that support ammophilous species and correlates with a predicted occupancy value (Nussear et al. 2009) of less than 0.4 (Figure 7). This value falls below the 0.5 threshold that has been used in previous assessments as corresponding with suitable desert tortoise habitat (USFWS 2011 and 2012).



Ironwood Consulting

0 2,750 5,500
Meters

Facilities

- Project Boundary
- Gen-Tie Line
- SCE Red Bluff Substation
- I10

Predicted Occupancy

0	0.4 - 0.5
0 - 0.1	0.5 - 0.6
0.1 - 0.2	0.6 - 0.7
0.2 - 0.3	0.7 - 0.8
0.3 - 0.4	0.8 - 0.9

FIGURE 7

Desert Tortoise
Predicted Occupancy Model
Nussear, et. al., 2009

Palen Solar PV Project

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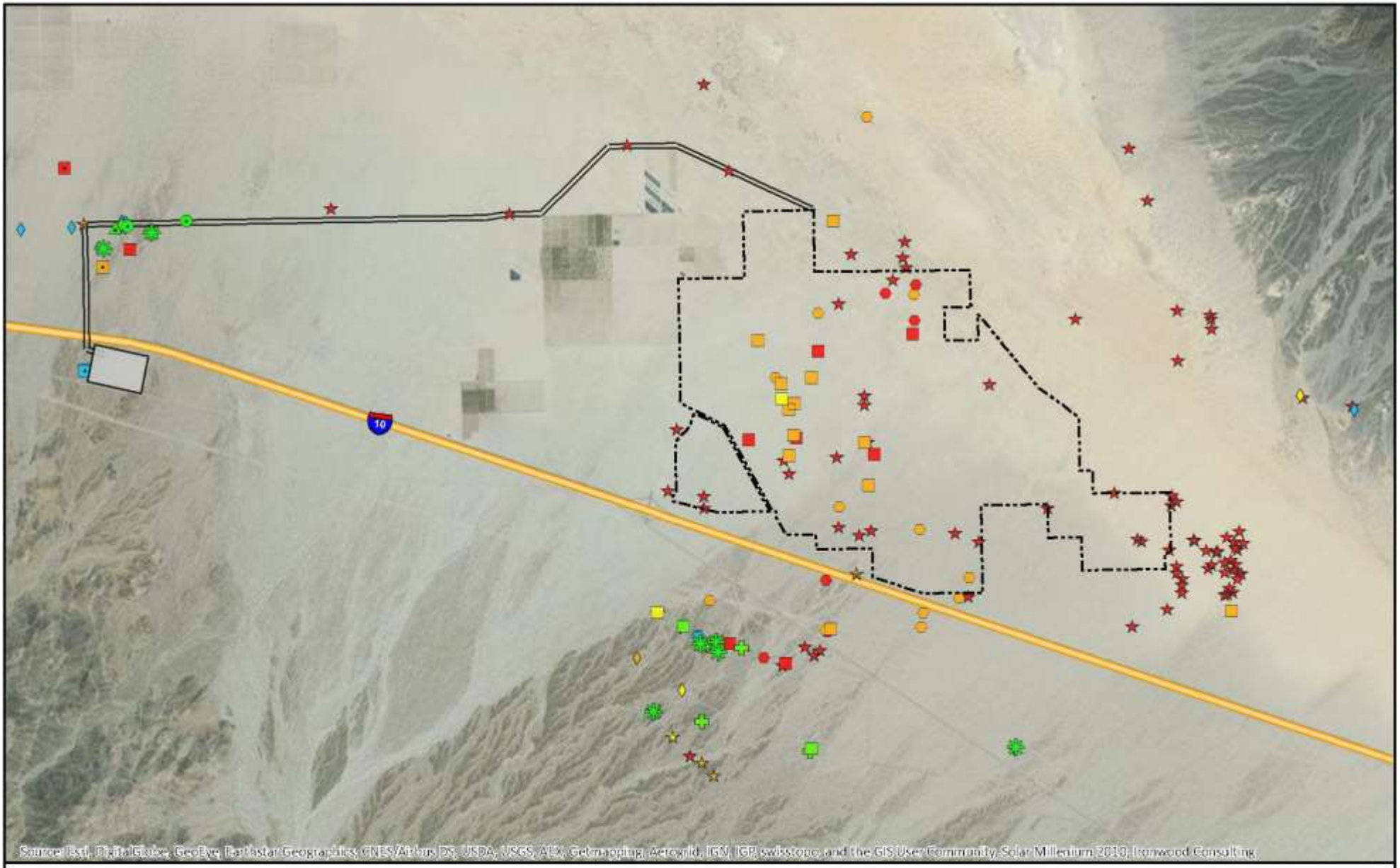
Prior surveys resulted in no live desert tortoises, seventeen burrows (Class 3–5), fifteen pallets (Class 4 or 5), and nineteen tortoise shell remains (Class 5) within the solar facility boundary of the Project site (Figure 8; CEC 2010). As described in Section 3.3.1, Class 4 and 5 sign is defined as not active and possibly, but not definitely, attributable to desert tortoise. Class 5 sign is in deteriorated condition. Active and recent tortoise use was not evident during the most recent surveys performed in spring of 2016, which identified no live desert tortoises, no active sign, and no deteriorated sign within the Project site. In August 2016 during the re-visitation of desert tortoise sign that was previously identified in 2009/2010, none of the previously identified burrows remained and only two locations of disarticulated bone fragments remained.

The portion of the Chuckwalla Critical Habitat Unit that overlaps the Project site did not exhibit notably higher quality tortoise habitat compared to elsewhere within the Project site.

Habitats with higher predicted occupancy values (Nussear et al. 2009) and documented sign of recent tortoise activity are associated with the western two miles of the gen-tie line. The 2009 surveys identified four live desert tortoises along the gen-tie line, three within the buffer and one within the proposed disturbance area. During spring 2013 surveys, two recent burrows were found within buffer zones along the gen-tie line reroute and one north of I-10 (Karl 2013a). During the 2016 surveys, active tortoise sign (one active burrow with tracks and scat and two records of scat) was found along the gen-tie line near the previous observations. Habitats with higher predicted occupancy values (Nussear et al. 2009) are found south of I-10 corresponding with higher elevation alluvial fan plant communities. Seven live tortoises (adult and juvenile) were found within the buffer surveys south of I-10 in 2010.

The lower amount of detectable sign found in 2016 versus in prior years within the solar facility boundary may be a result of several factors including natural erosion from wind and rain coupled with the low dispersal onto the site. Flood events have been documented occurring in the region since 2010. Such events may have washed away or buried the small amount of historical disarticulated shell remains. Alluvial processes would also be expected to transport similar sign onto the site from habitat upslope as surface flow is directed across the majority of the site from the southwest where the predicted occupancy values (Nussear et al. 2009) is relatively higher within the alluvial fans; however, there are existing anthropogenic features and private land uses that likely buffer the site from the adjacent habitat.

The agricultural properties adjacent to the solar facility's western and northern boundary include a large-scale date palm farm. The farm supports a modern irrigation system and up to two large, open reservoirs. Since its development prior to 2009, the farm has likely subsidized wildlife that has been known to prey on desert tortoises, including canids and ravens.



Ironwood Consulting

0 650 1,300
Meters

- Project Boundary
- Gen-Tie Line
- SCE Red Bluff Substation
- I10

2009-2010
- Adult Tortoise
- Tracks
- Burrow
- Pallet
- Scat
- Carcass or Shell/Bone Fragment

2013
- Burrow
- Carcass or Shell/Bone Fragment

2016
- Burrow
- Scat

Class Key
- Class 1 (active)
- Class 2
- Class 3
- Class 4
- Class 5

FIGURE 8

Desert Tortoise Observations
2009-2016

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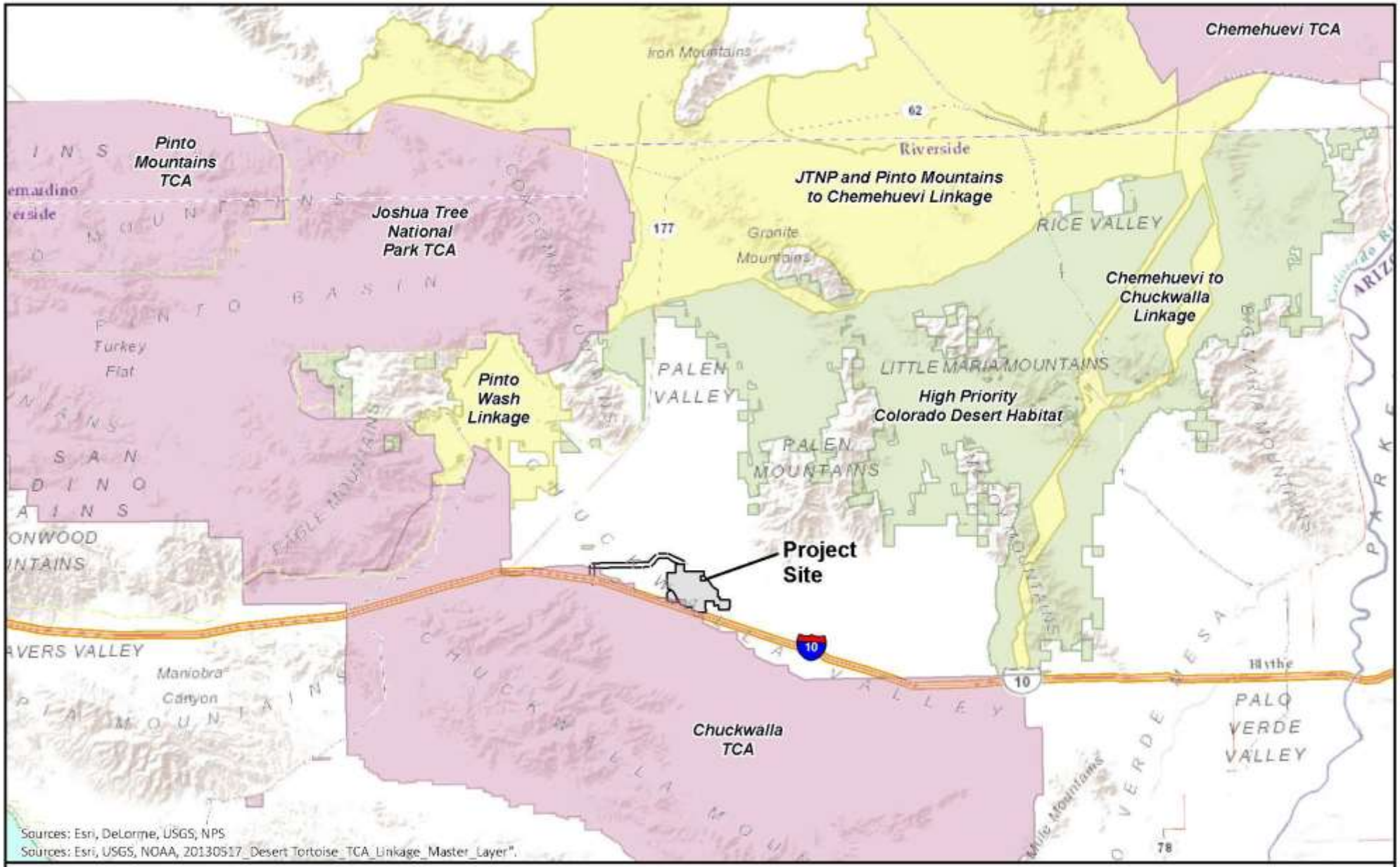
During the 2016 surveys, a substantial coyote presence was documented near the existing farm and throughout the Project site. An abundant amount of coyote tracks and scat were documented during the surveys. The majority of coyote scat contained palm fruit seeds. One active coyote den was located within the Project site. Three pups from this season were observed. Free-roaming domestic dogs were also observed during the surveys of the Project site in the vicinity of the agricultural land. The increased presence of coyotes over the last several years may have negatively affected the local population of desert tortoises.

Connectivity

The population structure of desert tortoise is characterized as isolation-by-distance, resulting in a genetic gradient across the Mojave Desert that is consistent with a continuous-distribution model of gene flow (USFWS 2011). Habitat connectivity for desert tortoise has become the subject of increased focus due to the unique demographic and genetic characteristics of the species. There remain challenges in creating an interconnected reserve that adequately links CHUs, or Tortoise Conservation Areas (TCAs), to meet the conservation metrics outlined in the Population Viability Assessment (PVA) of the 1994 Recovery Plan (USFWS 1994). The existing reserve for the Mojave population of desert tortoise may be limited due to its size and shape not meeting the recommendations in the PVA; therefore, the importance of preserving adequate linkages outside the periphery of the reserve has been emphasized (Averill-Murray et. al 2013). Identifying and evaluating the threat of barriers to gene flow on population viability is a critical factor in recovery (USFWS 2011). Preservation should aim at maintaining linkages that demonstrate that they are large enough for resident tortoises to persist within the linkage and continue to interact with tortoises within and outside the linkage.

On a regional scale, the Project site is situated outside priority habitat and linkages (Figure 9; CEC 2015). The layers associated with these features were developed from least cost pathway with the highest relative potential to support desert tortoises based on the predicted occupancy model (Nussear et al. 2009). Within the NECO plan area, the identified linkages are consistent with the least cost paths modeled by Hagerty et al. (2011). The predicted occupancy model (Nussear et al. 2009) and the resulting regional tortoise habitat linkage areas indicate that the site is located within an area of low predicted occupancy and outside modeled linkage areas. As previously noted, the Project site overlaps the Chuckwalla CHU, which is included in the TCA reserve. While the tortoise habitat within this portion of overlap may appear marginal, it may be important as dispersal habitat, especially in the desert dry wash woodlands. The value is also somewhat impaired with regard to local-scale connectivity due to the I-10 corridor located to the south of the Project site (Figure 10).



Ironwood Consulting

0 5 10
Kilometers

- Project Boundary
- Gen-Tie Line
- I10
- High Priority Habitat
- Linkage
- Tortoise Conservation Area

FIGURE 9

Desert Tortoise Conservation Areas (TCA) and Habitat Linkages

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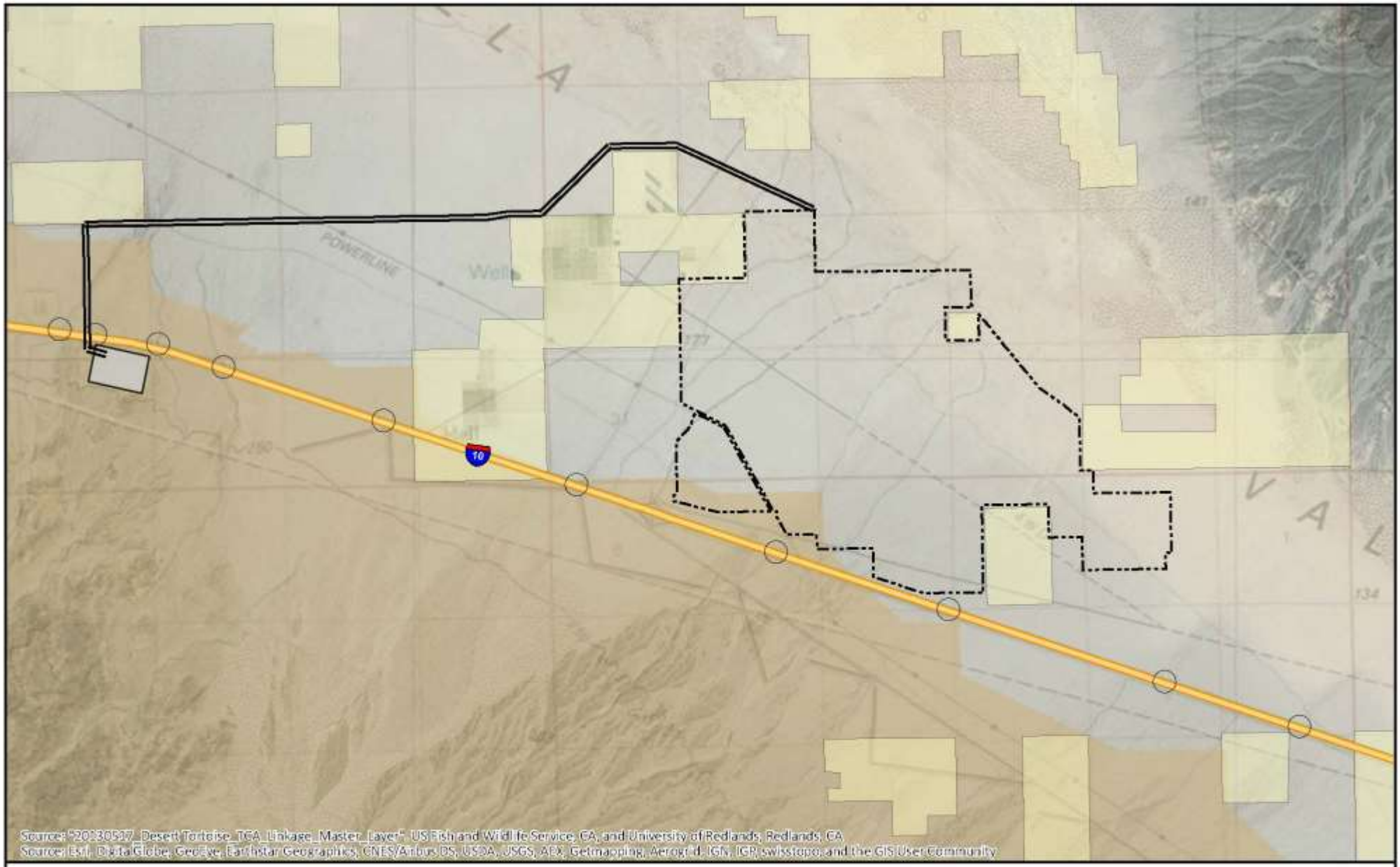

Ironwood Consulting

0 650 1,300
Meters

- Project Boundary
- Gen-Tie Line
- SCE Red Bluff Substation
- I10
- 2013 PSEGS I-10 Underpass Survey Areas
- Private Land Ownership
- Tortoise Conservation Area

FIGURE 10

Local Desert Tortoise Connectivity

Palen Solar PV Project

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In addition to the I-10 corridor to the south, the Project site is bounded by private land to the west and sand dune habitat to the east and north (Figure 10). Approximately 1,600 acres of private lands are located west of the Project site, of which approximately 830 acres support active agricultural practices. On a local scale, this land conversion has eliminated suitable habitat for desert tortoises and created a semi-permeable barrier to tortoise movement from west-to-east. The Project site is located south of the margins of a sand transport zone, and south of Palen Dry Lake. While desert tortoises may be found in dunes and desert dry lake areas, these areas are generally not a regular part of tortoises' home ranges due to poor cover, low forage, and non-friable soils; however, desert tortoise sign has been documented within these habitats, which demonstrates that these areas are, in fact, used by the species.

To evaluate the degree of existing connectivity in the vicinity of the Project site, a survey effort was conducted in April 2010 (Solar Millennium 2010b) to locate culverts and bridges crossing I-10. This survey investigated fencing along I-10 and all potential wildlife underpasses along a 32-mile stretch of the interstate between the Desert Center and Wiley Wells Road exits.

This survey identified 24 crossings (oriented approximately in a north-south direction) that were further evaluated for suitability for use by large mammals, small mammals, and reptiles. For each of the crossings, data was collected on undercrossing type (box culvert, bridge, etc.) and dimensions (length, width, height), animal sign within the vicinity of the crossing, estimated degree of perennial vegetation cover at the approach and within the undercrossing, where criteria ranged from Bare-to-Dense (60 – 85% cover).

The survey additionally identified two types of fencing within the I-10 corridor, and concluded the fencing does not function to restrict wildlife access across the roadway. The fencing was often missing or in disrepair, and was not tethered to the underpasses, and does not function to funnel wildlife under the interstate.

Wildlife species and/or sign detected at the undercrossings included lizards, rodent (*Peromyscus* sp., *Dipodomys* sp., *Neotoma* sp.), rabbit (*Sylvilagus* sp.), roadrunner (*Geococcyx californianus*), ground squirrel (*Spermophilus* sp.), fox, coyote (*Canis latrans*), bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*).

Perennial vegetation type, typical of the Colorado (Sonoran) desert habitat was identified near the underpasses, and included *Psorothamnus* sp., cheesebush (*Ambrosia salsola*), ironwood (*Olneya tesota*), mesquite (*Prosopsis glandulosa*), and palo verde (*Cercidium floridum*), brickell bush (*Brickellia* sp.) scorpion weed (*Phacelia* sp.), *Psorothamnus* sp., cattle saltbush (*Atriplex polycarpa*), brittlebush (*Encelia farinosa*), white bursage (*Ambrosia dumosa*), creosote (*Larrea tridentata*).

It was concluded the underpasses provide connectivity and safe movement corridors between the habitat to the north and south of the I-10 interstate, and that current fencing does not prevent animals from accessing I-10, or funnel animals to the underpasses (Solar Millennium 2010b).

Summary

The PSPP PA/FEIS (Section 3.23) asserted that PSPP disturbance area consisted of lower predicted desert tortoise habitat north of I-10 and moderate habitat south of I-10, which is consistent with the current conditions of the Project. The potential for desert tortoises to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.2 Mojave Fringe-Toed Lizard

The Mojave fringe-toed lizard (*Uma scoparia*) is a California Species of Special Concern. The Mojave fringe-toed lizard is found in arid, sandy, sparsely vegetated habitats and is associated with creosote scrub throughout much of its range (Jennings and Hayes 1994). This species is restricted to aeolian sand habitats in the deserts of Los Angeles, Riverside, and San Bernardino Counties in California and La Paz County in Arizona (Hollingsworth and Beaman 1999; Stebbins 1985; Murphy et al. 2006). Within these regions, they are known to occur at more than 35 sand dune complexes in California and one in Arizona (Jarvis 2009). Nearly all records for this species are associated with present-day and historical drainages and associated sand dune complexes associated with three major river systems with blow sand: Amargosa River, Mojave River, and Mojave and Colorado Rivers (BLM 2015).

Mojave fringe-toed lizards normally hibernate from November to February, emerging from hibernation sites from March to April. The breeding season is April to July (Mayhew 1965). From May to September, they are active in mornings and late afternoon, but seek cover during the hottest parts of the day. It burrows in the sand for both cover from predators and protection from undesirable temperatures (Stebbins 2003), though it also will seek shelter in rodent burrows. Home ranges for Mojave fringe-toed lizards vary greatly between sexes with adult males typically holding large (0.10 hectare or 0.3 acre) home ranges that are on average three times that of females (BLM 2015). They are primarily insectivorous, but also eat plant food including leaves, seeds and buds (Stebbins 2003).

The assessment of the sand transport system (see Section 2.5) associated with the Project site and adjacent lands have assisted in characterizing suitable Mojave fringe-toed lizard habitat. As this species requires loose, wind-blown sand, its distribution within the survey areas is consistent with the presence of suitable soil conditions. The distribution of Mojave fringe-toed lizards resulting from the 2016 surveys was largely consistent with previously described suitable

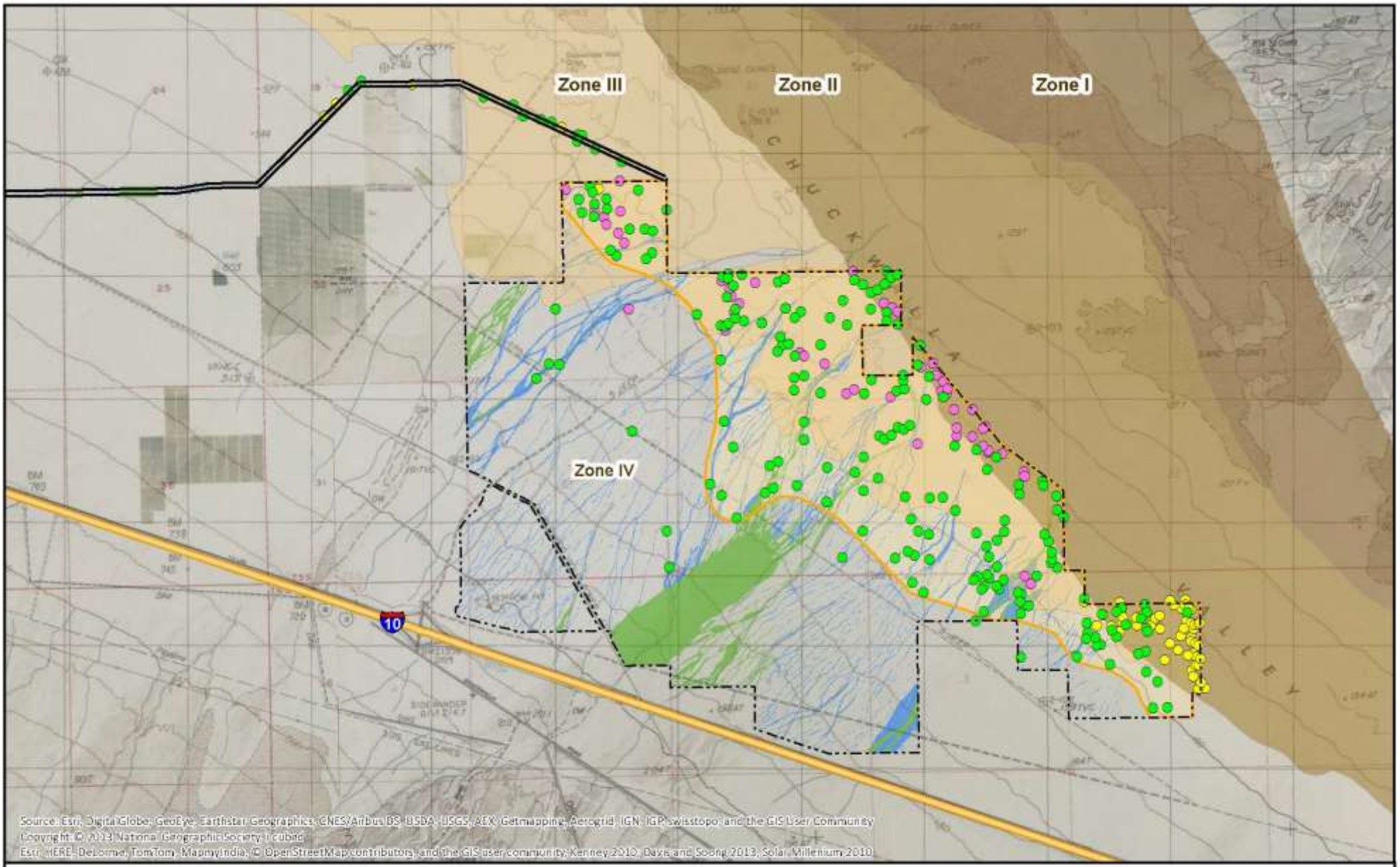
habitat, which primarily included all stabilized and partially stabilized sand dunes and also included contiguous wash habitat that supported appropriate soils (CEC 2010).

Wildlife surveys conducted in 2009 and 2010 identified highest concentrations within Zone II outside of the Project site (Figure 11). Zone II is characterized by vegetated active sand dunes (Kenney 2010). While the majority of Zone II occurs outside the Project site, approximately 6 percent of the Project site is located within Zone II. Within the Project site, surveys conducted in 2009, 2010, and 2016 had consistent results in that Zone II supported the highest density of observations compared to other portions of the Project site. In 2016, 34 observations were recorded within 228 acres within Zone II. In 2009 and 2010, a total of 66 observations were recorded within Zone II.

Approximately 23 percent (903 acres) of the Project site is located within Zone III. In 2016, 114 observations of Mojave fringe-toed lizards were recorded within Zone III and 65 observations in Zone IV (2,776 acres). In 2009 and 2010, a total of 26 observations were recorded within Zone III and 2 observations were recorded in Zone IV. Although a higher number of Mojave fringe-toed lizard observations were recorded in 2016 within Zone III and Zone IV than in previous years, they were located within habitat that was previously identified as suitable for this species (BLM 2011).

The variation in recorded observations between previous surveys and 2016 data may be most attributed to differences in survey timing, resulting in differences in temperature at time of surveys, and volume of existing data at the time of surveys. In spring 2009 when the majority of the PSPP site was surveyed, surveys began in mid-March when temperatures are often lower than optimal for Mojave fringe-toed lizards. Jones and Lovich (2009) noted that this species was most active starting in late spring, during the hotter periods of the day when temperatures reach optimum levels (greater than 99 degrees Fahrenheit), and were rarely active when air temperatures were less than optimum. In 2016, surveys occurred later in the spring season, commencing in late April and the survey effort was refined to survey suitable habitat for Mojave fringe-toed lizard when daily temperatures were high, increasing the likelihood for detection of Mojave fringe-toed lizards.

Additionally, each subsequent survey can be more focused and refined based on the information collected and analyzed during previous efforts, as well as considering new datasets and models that broaden the understanding of habitat suitability for target species. The surveys in 2009 were the first focused field effort at the site and Mojave fringe-toed lizard observations were largely incidental to those of other species. The 2016 surveys were performed with an enhanced understanding of species' potential occurrence due to previous records and newly available data sources including the desert tortoise probability of occurrence model (Nussear et al. 2010) and the DRECP species suitability models for both Mojave fringe-toed lizard and desert tortoise, which were not available in 2009.



Ironwood Consulting

0 0.5 1
Kilometers

- Project Boundary
- Gen-Tie Line
- I10
- SCE Red Bluff Substation

MFTL Observations
- MFTL Observations (2016)
- MFTL Observations (2010)
- MFTL Observations (2009)
- MFTL Estimated Suitable Habitat

Aeolian Sand Zones
- Zone I
- Zone II
- Zone III

Wash Vegetation Type
- Desert Dry Wash Woodland
- Ephemeral Dry Wash

FIGURE 11
Mojave Fringe-Toed Lizard Observations within Project Site
2009-2016
Palen Solar PV Project

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Separate from the Mojave fringe-toed lizard studies performed in 2010, PWA (2010) described the alluvial fan within Zones III and IV and characterized both minor and major wash systems across the site. The major washes, notably the central major wash, were described as supporting wide sandy zones (at times as broad as 1,500 feet) within one mile of Interstate 10 (Zone IV) that appeared suitable for Mojave fringe-toed lizards. This description is consistent with the observations of Mojave fringe-toed lizards recorded in 2016.

Observations in Zone IV appear to correlate with mapped washes, as previously described, that were contiguous with occupied habitat to the east (Figure 11). This may be due to the lower wash reaches supporting relatively unconsolidated, fine sediments at the time of surveys in 2016. The presence of suitable habitat within these washes likely fluctuates between years depending on recent surface flow and adequate sand deposition. The number of Mojave fringe-toed lizard observations associated with wash habitat was relatively lower than areas of more suitable habitat to the east and north.

Eighteen records (five in 2010 and thirteen in 2016) of Mojave fringe-toed lizards were associated within the eastern-most two miles of the gen-tie line. The western five miles of the gen-tie is located outside suitable habitat for this species.

The PSPP PA/FEIS (Section 3.23) asserted that nearly one-half (1,781 acres) of the PSPP disturbance area contained suitable habitat for Mojave fringe-toed lizards. The estimated boundary of suitable habitat was updated based on observations of Mojave fringe-toed lizards recorded in 2016 (95 percent of the total observations) resulting in approximately 1,622 acres within the Project site (Figure 11). The total acreage of estimated suitable habitat is consistent the description in the PSPP PA/FEIS.

4.1.3 American Badger

The American badger is a State Species of Special Concern associated with dry open forest, shrub, and grassland communities with an adequate burrowing rodent population and friable soils. Badgers generally are associated with treeless regions, prairies, parklands, and cold desert areas (Zeiner et al. 1990). Badgers inhabit burrows and often predate and forage on other small mammals that inhabit burrows, as evidenced by claw marks along the edges of existing burrows. Most of the CNDDB records from the Palo Verde Valley area of Riverside County are prior to 1960; the closest to the Project site is northwest of Palo Verde approximately 12 miles southeast of the project site (CNDDB 2016; CEC 2010).

The entire Project site is considered suitable habitat for badgers. Badger sign was found during spring 2009 field surveys; burrow predation evidence by badgers was found throughout the Project site and buffer (Figure 12). Surveyors observed five badger dens and over 10 small mammal burrows showing evidence of predation by badgers, and a badger skull was observed

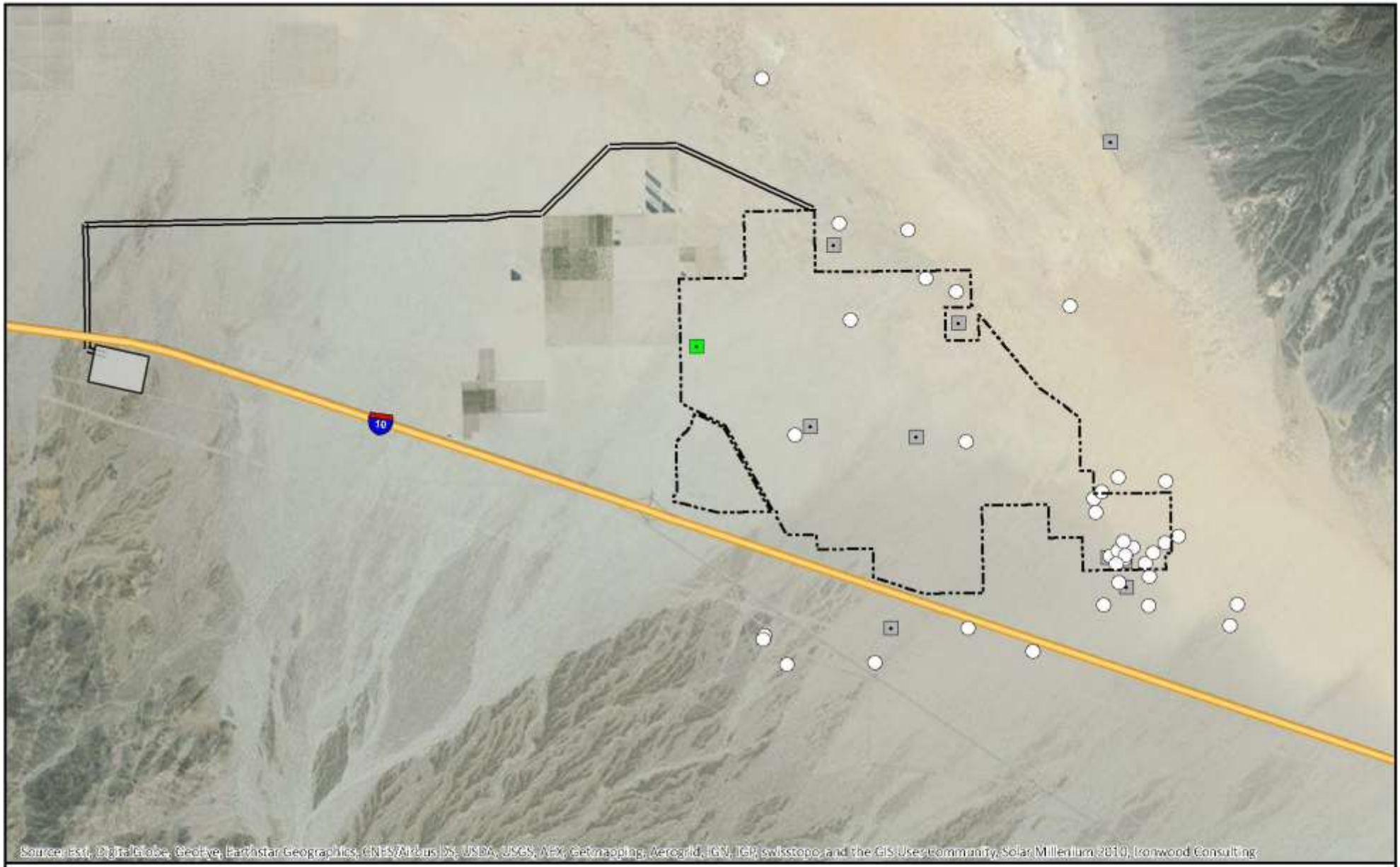
within the buffer, south of I-10. No badgers were observed during 2013 surveys of the modified linear components. The 2016 surveys noted one den with indication of badger use near the western boundary of the solar facility.

The PSPP PA/FEIS (Section 3.23) asserted that the entire PSPP disturbance area contained suitable habitat for American badger, which is consistent with the current conditions of the Project. The potential for American badger to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.4 Desert Kit Fox

Desert kit fox (*Vulpes macrotis arsipus*) is protected by the California Code of Regulations (Title 14, CCR: §460) and Fish and Game Commission Section 4000 as a fur-bearing mammal. Title 14 of the California Code of Regulations, Section 460, stipulates that desert kit fox may not be taken at any time. Desert kit foxes are fossorial mammals that occur in arid open areas, shrub grassland, and desert ecosystems within the Mojave Desert. Desert kit fox typically occur in association with their prey base, which includes small rodents, primarily kangaroo rats, rabbits, lizards, insects, and in some cases, immature desert tortoises (Zeiner et al. 1990). Dens that support multiple entrances provide shelter, escape, cover, and reproduction, but desert kit fox may utilize single burrows for temporary shelter. Litters of one to seven young are typically born in February through April (McGrew 1979).

In 2011, the first known cases of canine distemper virus (CDV) were observed in desert kit foxes about 20 miles west of Blythe on public lands managed by the BLM for the Genesis Solar Energy Project. CDV is transmitted by contact with body fluids containing the virus, and can be transmitted among multiple carnivore species. The outbreak was thought to have originated from an infected host animal entering the site, possibly a wild or domestic dog, American badger, or other carnivore. Desert kit foxes were captured for disease testing at several project sites within the region (including Desert Sunlight, Genesis Ford Dry Lake, SCE's Colorado River Substation, and PSPP) due to a concern that the spread of CDV within the kit fox population was facilitated by project-related displacement of infected animals. CDV was identified at the two latter sites, which span a distance of about 40 miles on the I-10 corridor within the Chuckwalla Valley (BLM 2010). The CDFW Wildlife Investigations Lab continues to monitor the health of desert kit foxes and is attempting to characterize the spread and significance of the disease on regional kit fox populations.



Ironwood Consulting

0 750 1,500
Meters

- Project Boundary
- Gen-Tie Line
- SCE Red Bluff Substation
- I10
- American Badger Den (2016)
- American Badger Den (2009-2010)
- American Badger Predation Burrow (2009-2010)

FIGURE 12

American Badger Observations
2009-2016

Palen Solar PV Project

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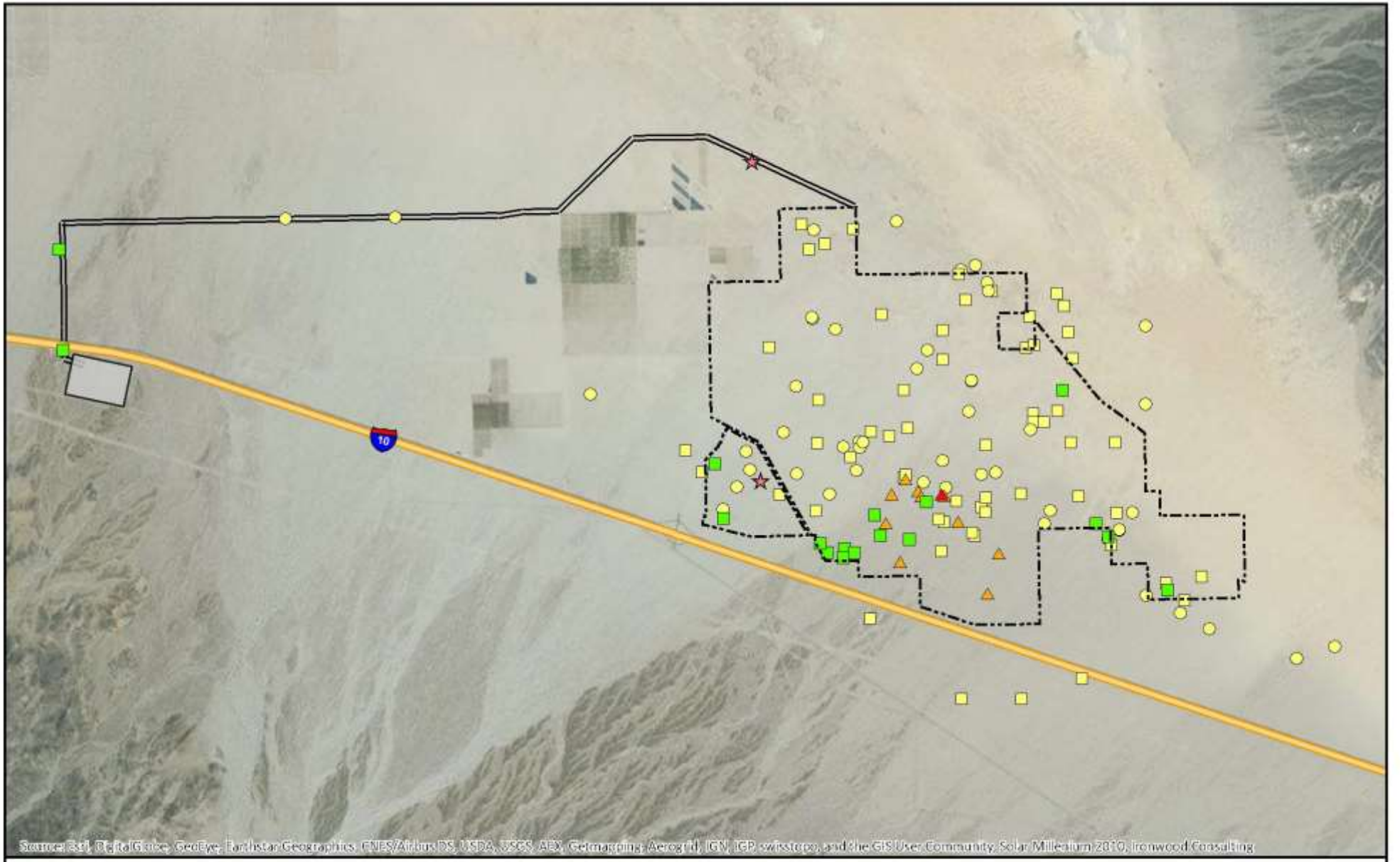

Ironwood Consulting

0 600 1,200
Meters

- Project Boundary
- Gen-Tie Line
- SCE Red Bluff Substation
- I10

2016 Canid Observations

- Desert Kit Fox Burrow
- Coyote Burrow & Live Individuals
- Coyote - Live individual
- Coyote Burrow

2009-2010 DKF Observations

- Desert Kit Fox Burrow
- Kit Fox Burrow Complex

FIGURE 13

Desert Kit Fox Observations
2009-2016

Palen Solar PV Project

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During spring 2009 surveys, desert kit fox burrows, burrow complexes, and scat were observed throughout the Project site and buffer. There were approximately 71 burrows and burrow complexes recorded. In fall 2009, Desert kit fox scat and a burrow were observed along the gen-tie line (Figure 13; CEC 2010). During spring 2010 field surveys, two kit fox complexes were found in the Project site and four burrow complexes were found in the buffer area. No kit fox dens were observed during spring 2013 surveys of the modified linear features (Karl, 2013a). Spring 2016 surveys were performed to update site conditions and recorded 14 desert kit fox burrows/complexes, 20 pieces of scat, and 18 sets of desert kit fox tracks within the Project site. One additional active kit fox complex was recorded approximately 30 m outside the southeast Project boundary in August 2016. Spring 2016 surveys along the gen-tie yielded 4 desert kit fox burrows, 3 scat, and 3 tracks.

The reduction in the number of observations from the 2009/2010 recorded data could be a result of changing conditions on the Project site. Desert kit fox distribution is dynamic and would be expected to change over time under natural conditions due to available prey and other environmental factors. As noted in Section 4.1.1, the existing date palm farm may have subsidized the local coyote population allowing it to flourish more than under natural conditions. The presence of coyotes could dissuade desert kit fox from their previous recorded activity areas. Coyotes are known to prey on young kit fox pups.

Recent trapping and radio tracking efforts of desert kit fox in the region by CDFW indicate that foxes were using the region below I-10 and the Southern California Edison Devers-Palo Verde #2 (DPV2) transmission corridor and utilizing the Project site (Magdelena Rodriguez, CDFW, pers. comm.). During this program, seven dens that exhibit varying level of activity have been documented within the Project site.

The PSPP PA/FEIS (Section 3.23) asserted that the entire PSPP disturbance area contained suitable habitat for desert kit fox, which is consistent with the current conditions of the Project. The potential for desert kit fox to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.5 Desert Bighorn Sheep

The Desert Bighorn Sheep (*Ovis canadensis nelsoni)* is a BLM Sensitive Species. The desert bighorn sheep is found from the Transverse Ranges through most of the desert mountain ranges of California, Nevada, and northern Arizona to Utah. Essential habitat for bighorn sheep includes steep, rocky slopes of Desert Mountains, and areas where surface water is available for foraging. In the spring, when annual plants are available, bighorn tend to disperse downhill to bajadas and alluvial fans to forage (CEC 2010).

Over the past 140 years, bighorn sheep have suffered considerable population declines throughout their range. One contributing factor to this is that meta-populations have been fragmented by roads and other barriers, with a resulting decline in genetic diversity (Bleich et al., 1996, Epps et al., 2005). Disease (possibly resulting from contact with domestic sheep) drought, predation, anthropogenic factors, and loss of surface water sources may contribute to the viability of existing sheep populations (Wehausen 2005).

Two metapopulations of bighorn sheep occur within the NECO planning area, the Southern Mojave and Sonoran. Within these metapopulations, there are smaller, isolated subpopulations of bighorn sheep known as demes. Nine demes occur in the Sonoran metapopulation (BLM CDD 2002 as cited in CEC 2010). The NECO Plan addresses the conservation of the bighorn sheep through the designation of Bighorn Sheep Wildlife Habitat Management Areas (WHMAs), which overlay the entire range of their occurrence and movement corridors (CEC 2010). Bighorn sheep metapopulations have been fragmented by highways, roads, railroads, and aqueducts. The I-10 and Interstate 40 represent major obstacles to bighorn sheep movements. Transportation corridors associated with Highways 66, 62, 177, 95, and 78, the AT&SF Railroad (parallel to Old Highway 66) and the Eagle Mountain Railroad (proposed for reactivation) inhibit bighorn sheep movements between demes. Nevertheless, bighorn sheep are known to successfully cross these and other linear features such as transmission lines and fences (CEC 2010).

The project site is located south of occupied bighorn sheep WHMAs in the Palen, Granite, and Coxcomb Mountains (CEC 2010). Recent surveys suggest that bighorn sheep may occur in the Little Maria Mountains, further to the northeast of the Project site (Wehausen, 2009). Desert bighorn sheep have been documented in the Chuckwalla Mountains southwest of the project site and the Palen, Granite, Coxcomb, and Eagle mountain ranges to the north, west, and east. Six rams were observed in the Coxcomb Mountains during Phase 2 golden eagle surveys performed jointly for various energy projects during 2010 (CEC 2010). The Project site is located over 3 miles southwest from suitable mountainous habitat in the Palen Mountains and over 4 miles from suitable habitat in the Chuckwalla Mountains (CEC 2014a). Bighorn sheep may disperse through these mountain ranges typically whenever forage and water conditions are suitable (CEC 2010).

No sign or evidence of desert bighorn sheep were found during field surveys; however, scat is often difficult to distinguish from burro deer. While the Project site supports possible intermountain habitat for desert bighorn sheep, the 7-mile wide potential linkage situated between suitable bighorn sheep mountainous habitat supports a low-intactness value near the I-10 due to restricted movement opportunities associated with the freeway (CEC 2014a).

The PSPP PA/FEIS (Section 3.23) asserted that the entire PSPP disturbance area did not support evidence of desert bighorn sheep and does not occur within a known movement corridor, which is consistent with the current condition of the Project. The potential for desert bighorn sheep to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.6 Burro Deer

Burro deer (*Odocoileus hemionus eremicus*) is a subspecies of mule deer (*Odocoileus hemionus*) that inhabits desert dry wash woodland communities in the Colorado region of the Sonoran Desert near the Colorado River. Some burro deer are resident along the Colorado River, while others are transient and move into desert areas in response to seasonal increases in water and forage. During hot summers burro deer concentrate along the Colorado River or the Coachella Canal where water developments have been installed and where microphyll woodland is dense and provides good forage and cover. With late summer thundershowers and cooler temperatures, burro deer move away from the Colorado River and Coachella Canal into larger washes or wash complexes in the foothills and nearby mountains (BLM CDD 2002).

During 2009 field surveys, burro deer scat and tracks were observed in rocky substrate and deep washes including the western, central, and eastern desert washes that transect the project site. Deer sign was found within the washes and 150-foot-wide box culverts that convey the washes underneath I-10 (CEC 2010). Burro deer are also known to use a culvert associated with the western-most Project site wash to access a water source at the adjacent agricultural property (CEC 2010). The full Project site supports suitable habitat for burro deer. Surveys conducted in 2013 found burro deer scat and tracks in washes east of the proposed gen-tie alignment and adjacent to I-10, and tracks were observed in the natural gas line extension buffer zone proposed for PSEGS (Karl, 2013a). Surveys conducted in spring 2016 found scat and tracks throughout the Project site.

The PSPP PA/FEIS (Section 3.23) asserted that the entire PSPP disturbance area contained suitable habitat for burro deer and sign of burro deer was detected within the larger washes within the study area, which is consistent with the current conditions of the Project. The potential for burro deer to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.7 Bats

Bat roosts are known to occur in the vicinity of the Project site in the McCoy Mountains, Eagles Nest Mine (Little Maria Mountains), and Paymaster Mine located within 16km of the Project site (Larry LaPre, BLM, pers. comm.; CEC 2010). During roost surveys performed in 2009 and 2013, one roost site was recorded under the I-10 bridge across Corn Springs Road and no other

bat roosts were identified (WEST 2016). Bridges surveyed in the Project vicinity tended to be smooth cement and provided minimal to negligible roosting habitat (Pat Brown, pers. comm.). No active bat roosts were documented on the Project site; however, roosting opportunities for several bat species (e.g., canyon bat and California myotis) are available in tree cavities, soil crevices and rock outcroppings primarily within dry desert wash woodland habitats (CEC 2010). Surveys performed in 2016 noted many large ironwood trees that had the potential to serve as roost sites; however, no sign of bats were detected. It is not expected that any special status bat species would have a substantial roost on the Project site because habitat features most associated with these species (e.g. rock ledges, cliffs, large tree hollows, mine shafts) do not occur on site. The possibility exists for incidental observations for these species.

Several common and special status bat species were detected during acoustic monitoring and likely utilize habitats within the Project site for foraging especially when water is present within the desert washes and insects are more abundant (Table 5; CEC 2010; WEST 2016; Brown and Rainey 2013). Seven species of bats were detected during the spring and fall 2013 acoustic surveys. Seven additional species have the potential to occur on the Project site (Table 5). Two bat species (California leaf-nosed bat and Townsend's big-eared bat) typically have low intensity echolocation signals and may not have been acoustically detectable. Several call sequences were associated with either hoary or pocketed free-tailed bats; however, the calls lacked features for confirmation of species (WEST 2016).

Table 5 - Bat Species

COMMON NAME	SCIENTIFIC NAME	STATUS[1] (FEDERAL/STATE/WBWG)	DOCUMENTED PRESENCE[2]
High Frequency (> 40 kHz)			
California myotis	*Myotis californicus*	- / - /L	Detected during acoustic surveys
California leaf-nosed bat	*Macrotus californicus*	BLMS/SSC/H	Not detected
canyon bat	*Parastrellus hesperus*	- / - /L	Detected during acoustic surveys
cave myotis	*Myotis velifer*	BLMS/SSC/M	Not detected
Yuma myotis	*Myotis yumanensis*	BLMS/- /L	Not detected
Mid Frequency (30 - 40 kHz)			
western yellow bat	*Lasiurus xanthinus*	- /SSC/H	Detected during acoustic surveys
Low Frequency (< 30 kHz)			
big brown bat	*Eptesicus fuscus*	-/- /L	Not detected
big free-tailed bat	*Nyctinomops macrotis*	-/SSC/M	Detected during acoustic surveys
hoary bat	*Lasiurus cinereus*	-/- /L	Possibly detected during acoustic surveys

COMMON NAME	SCIENTIFIC NAME	STATUS[1] (FEDERAL/STATE/WBWG)	DOCUMENTED PRESENCE[2]
Mexican free-tailed bat	*Tadarida brasiliensis*	-/-/L	Detected during acoustic surveys
pallid bat	*Antrozous pallidus*	BLMS/SSC/L	Detected during acoustic surveys
pocketed free-tailed bat	*Nyctinomops femorosaccus*	-/SSC/M	Possibly detected during acoustic surveys
Townsend's big-eared bat	*Corynorhinus townsendii*	BLMS/SSC/H	Not detected
Very Low Frequency (< 15 kHz)			
western mastiff bat	*Eumops perotis*	BLMS/SSC/M	Detected during acoustic surveys

[1]Status

BLMS = Bureau of Land Management Sensitive Species (BLM 2010b)
SSC = CDFW Species of Special Concern (CDFW 2016)
WBWG = Western Bat Working Group (WBWG 2016)
H = are imperiled or are at high risk of imperilment
M = warrant closer evaluation, more research, and conservation actions
L = most of the existing data support stable populations

[2] Species not detected during previous surveys may have the potential to occur on the Project site in the future. Some bat species (e.g., Townsend's big-eared bat) are difficult to detect with acoustic surveys.

In spring 2013, a total of 989 identified bat call minutes were recorded for the four nights across the 12 detector locations (WEST 2016). The highest number of call minutes (443) was recorded at the site located in the northernmost station located next to a large palo verde tree. Canyon bats were the most common species detected at all stations, followed closely by California myotis (WEST 2016). Pallid and Mexican free-tailed bats were detected less frequently and not detected at all stations (WEST 2016). In fall 2013, the highest number of call minutes and species were recorded at the artificial pond located in the agricultural land outside the northwestern boundary of the Project site (WEST 2016).

4.1.7.1 Special Status Bats

Seven special status bat species that may forage on or near the Project site and were detected or possibly detected during acoustic surveys in 2013; therefore, are discussed further below. Suitable, but limited, roosting habitat may occur for several of these species within the dry wash woodland habitat on the Project site. Other special status bat species known from the region typically inhabit rocky sites and would not be expected to use the Project site for roosting.

Two special status species (e.g., cave myotis and Yuma myotis) were described in the PSPP PA/FEIS (Section 3.23) as having the potential to occur in the PSPP disturbance area; however, these species were not detected during acoustic surveys in 2013. The potential for these species to occur within the Project site has not changed from, and are likely less than, the description in the PSPP PA/FEIS.

Townsend's Big-Eared Bat

Townsend's big-eared bat (*Corynorhinus townsendii*) is a CDFW Species of Special Concern, BLM Sensitive Species, and was a recent candidate for state listing prior to CDFW recommending that listing was not warranted in a status review it prepared for the Fish and Game Commission in June 2016 (CDFW 2016b). This species roosts in caves, mines, abandoned dwellings, and large basal hollows of large trees (e.g., redwoods). Townsend's big-eared bat has been recorded occurring from sea level to approximately 9,000 feet elevation within a range of various habitats. This species typically forages along streams and within woodlands habitats.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat, but lacked suitable roosting habitat, for Townsend's big-eared bat. Townsend's big-eared bat was not detected during acoustic surveys in 2013 and this species typically has low intensity echolocation signals thus may not have been acoustically detectable (WEST 2016). Townsend's big-eared bat may forage within the Project site but it is not expected to roost due to absence of suitable structures (e.g., abandoned buildings) and natural features (e.g., caves and large hollowed trees). The potential for Townsend's big-eared bat to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

California Leaf-Nosed Bat

California leaf-nosed bat (*Macrotus californicus*) is a CDFW Species of Special Concern and BLM Sensitive Species. This species occurs in the deserts of California, southern Nevada, Arizona and south to northwestern Mexico. In California, they are currently known from eastern San Bernardino, Riverside, and San Diego counties and all of Imperial County (CEC 2012). California leaf-nosed bat relies on caves and mines for roosting habitat. Foraging habitat typically consists of riparian and desert wash habitats.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable habitat for California leaf-nosed bat. California leaf-nosed bat was not detected during acoustic surveys in 2013 and this species typically has low intensity echolocation signals thus may not have been acoustically detectable (WEST 2016). This species may forage within the Project site but it is not expected to roost due to absence of suitable caves and mines. The potential for California leaf-nosed bat to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a CDFW Species of Special Concern and BLM Sensitive Species. It is a locally common species throughout California, and a year-round resident in most of the range. This species occupies a wide variety of habitats at elevations less than 6,000 feet including grasslands, shrublands, woodlands, and forests, and is most common in open, dry habitats with rocky areas for roosting; pallid bat roosts in cliffs, caves, crevices, mines, hollow trees, and various human-made structures (Zeiner 1990).

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging and roosting habitat for the pallid bat. The pallid bat was detected during acoustic surveys in 2013 (WEST 2016). This species may forage and roost, primarily within the dry wash woodland, within the Project site. The potential for pallid bat to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

Western Mastiff Bat

The western mastiff bat (*Eumops perotis californicus;* greater bonneted bat) is a CDFW Species of Special Concern and BLM Sensitive Species. This species is widespread through the southwest U.S. and into Mexico. Its distribution in California is widespread, with year-round occurrence data primarily in central and southern California (Zeiner 1990). The western mastiff bat is found in a range of habitats, including coastal, forests, woodland, and desert scrub areas that are associated with roosting sites (Pierson and Rainey 1998). Roosting habitat typically consists of rocky crevices in canyons and cliffs with vertical or nearly vertical walls. The majority of roost sites are at least two meters above the ground (e.g., on cliff faces) and lacking obstructions.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat for the western mastiff bat, but that suitable roosting habitat for this species was absent. The western mastiff bat was detected during acoustic surveys in 2013, but relatively less frequently than other species (WEST 2016). The potential for western mastiff bat to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

Western Yellow Bat

The western yellow bat (*Lasiurus xanthinus*) is a CDFW Species of Special Concern. It is found in Arizona, New Mexico, Mexico, and year-round in California. It is found in arid regions, in riparian, desert riparian, desert wash and palm oasis habitat. The western yellow bat is insectivorous, and roosts and feeds in palm oases and riparian habitats (Zeiner 1990).

The PSPP PA/FEIS (Section 3.23) did not address the western yellow bat. This species was detected during acoustic surveys in 2013, but only at the artificial pond located near the date

palm farm outside the northwestern boundary of the Project site (WEST 2016). The Project site lacks typical foraging and roosting habitat for western yellow bat; however, this species may be found on the Project site due to the proximity of the existing offsite date palm farm.

Big Free-Tailed Bat

The big free-tailed bat (*Nyctinomops macrotis*) is a CDFW Species of Special Concern. Its distribution is south west U.S., and northern South America, generally from sea level to 8,000 feet in elevation. It is rare in California, prefers rocky terrain, and roosts in tree cavities and man-made structures. It is known to wander in autumn, out of its normal range (Zeiner 1990).

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging and roosting habitat for the big free-tailed bat. This species was detected during acoustic surveys in 2013, but with the lowest detection rate of all species (WEST 2016). The big free-tailed bat may forage and roost, primarily within the dry wash woodland, within the Project site. The potential for this species to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

Pocketed Free-Tailed Bat

The pocketed free-tailed bat (*Nyctinomops femorosaccus*) is a CDFW Species of Special Concern. This species occurs but is less common in western North America, from southern California, central Arizona, southern New Mexico, western Texas, and more common in Mexico (WBWG 2016). The pocketed free-tailed bat has been documented in Riverside, San Diego, and Imperial counties. Typical habitats include pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis and roosting habitat typically includes rock crevices associated with granite boulders, cliffs, or rocky canyons at a height suitable for approach and takeoff (CNDDB 2016). Pocketed free-tailed bats are known to occur in the desert from March through August, when they then migrate out of the area (BLM 2011).

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging and roosting habitat for the pocketed free-tailed bat. This species was possibly detected during acoustic surveys in 2013; several call sequences were associated with either hoary or pocketed free-tailed bats and lacked features for confirmation of species (WEST 2016). The potential for pocketed free-tailed bat to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.8 Western Burrowing Owl

The Western burrowing owl *(Athene cunicularia hypugaea)* is a California Species of Special Concern, and a Federal Bird of Conservation Concern. Western burrowing owls inhabit arid lands throughout much of the western United States and southern interior of western Canada (Haug et al. 1993). Suitable habitat for western burrowing owl includes open habitat with available burrowing opportunities, including agricultural fields (active and fallow), creosote scrub, desert saltbush, ephemeral washes, and ruderal areas.

Burrowing owls are unique among the North American owls in that they nest and roost in abandoned burrows, especially those created by ground squirrels, kit fox, desert tortoise, and other wildlife. Burrowing owls have a strong affinity for previously occupied nesting and wintering habitats and will often return to previously-used burrows, particularly if they had successful reproduction in previous years (Gervais et al. 2008). The southern California breeding season (defined as from pair bonding to fledging) generally occurs from February to August, with peak breeding activity from April through July (Haug et al. 1993).

In the Colorado Desert, burrowing owls generally occur at low densities in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Gervais et al. 2008). Burrowing owls tend to be opportunistic feeders, and a large portion of their diet consists of mainly beetles and grasshoppers, and other larger arthropods and consumption of insects increases during the breeding season (Haug et al. 1993). Small mammals, especially mice and voles (*Microtus* and *Peromyscus* spp.) are important food items, and other prey animals include herpetofauna, young cottontail rabbits, bats, and birds such as sparrows and horned larks.

Phase I through III protocol-level surveys conducted in spring and summer 2009 identified two nesting pairs with juveniles and four active burrows (Figure 14; CEC 2010). One pair with juveniles was observed using two burrows near the center of the site, and a second pair with juveniles was observed using two burrows near the northwest corner of the site (WEST 2016).

Survey results from 2009 indicated that a total of 4 burrowing owls with active burrows within the Project site (CEC 2010). Surveys performed in 2016 identified five burrows with sign (e.g., whitewash, pellets, and/or feathers) within the Project site. Based on the results of several years of surveys, the Project site supports resident burrowing owl in low densities. Breeding season surveys were not performed in 2016 because the total number of burrows with sign was consistent with surveys performed in 2009, which included breeding season surveys that resulted in two pairs of reproducing burrowing owls on the Project site. The potential for burrowing owl occupancy within the Project did not vary substantially between 2009 and 2016 based on the number of burrows containing sign recorded during surveys.

Ironwood Consulting

0 550 1,100
Meters

Project Boundary
Gen-Tie Line
SCE Red Bluff Substation
I10

2016
Burrow with Sign

2013 PSEGS WBO Observations
Adult Individual

2010 AECOM WBO Observations
Burrow with Sign

2009 AECOM WBO Observations
Active Burrow (Natal)
Burrow with Sign

FIGURE 14

Western Burrowing Owl Observations
2009-2016

Palen Solar PV Project

F:\Ironwood-Server\Share\GIS\Projects\Palen EDF - Maverick\Updated 110816\BRTR Fig 14 - Western Burrowing Owl.mxd | 11/8/2016

The PSPP PA/FEIS (Section 3.23) asserted that the majority of the PSPP disturbance area contained suitable habitat for western burrowing owl and may support approximately four active burrows, which is consistent with the current conditions of the Project. The potential for western burrowing owl to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.9 Golden Eagle

Background

Golden eagles are a Federal bird species of conservation concern and are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668a - d, as amended), and are typically year-round residents throughout most of their western United States range. They breed from late January through August with peak activity March through July (Kochert et al. 2002). Migratory patterns are usually fairly local in California where adults are relatively sedentary, but dispersing juveniles sometimes migrate south in the fall. Habitat for golden eagles typically includes rolling foothills, mountain areas, and deserts. Golden eagles need open terrain for hunting and prefer grasslands, deserts, savanna, and early successional stages of forest and shrub habitats. Golden eagles primarily prey on lagomorphs and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al. 2002). This species prefers to nest in rugged, open habitats with canyons and escarpments, often with overhanging ledges and cliffs or large trees used as cover.

Recent data analysis and population modeling suggest the status of the golden eagle population in the western United States is gradually declining towards a new lower equilibrium of about 26,000 individuals, down from an estimated 34,000 in 2009 and 2014 (USFWS 2016). The future population estimate relies on the continuation of current ecological and biological conditions. The authors estimate 3,400 golden eagles die annually from anthropogenic causes in the United States (USFWS 2016), and suggest a level of sustainable take is approximately 2,000 individuals annually. The authors add that additional unmitigated mortality will steepen the rate of decline that the golden eagle population is presently undergoing (USFWS 2016).

In the absence of interference from humans, breeding density is determined by either prey density or nest site availability (CEC 2010) of breeding season home ranges from several western United States studies showed an average home range of 20–33 square kilometers (7.7 to 12.7 square miles) that ranged from 1.9 to 83.3 square kilometers (0.7 to 32.2 square miles). In San Diego, a study of 27 nesting pairs found breeding ranges to be an average of 36 square miles with a range from 19 to 59 square miles (CEC 2010). Other studies from within and outside the United States include ranges from 9 to 74.2 square [range of 14.7 to 26.1 pairs per 1,000 square kilometers, or 386 square miles]) (CEC 2010).

Nest Surveys

There is no suitable eagle nesting habitat on the Project site. The site supports suitable foraging habitat, albeit low potential (WEST 2016). Nest surveys performed in 2010, 2012, 2013, 2014, and 2015 encompassed a 10-mile radius of the Project site with the objective of identifying and characterizing golden eagle occurrences proximate to the Project site.

In spring 2010, aerial surveys found two active golden eagle nests within one territory, approximately 7 miles southwest of the Project site in the Chuckwalla Mountains. Additionally, three inactive nests were located approximately 6 miles southwest of the Project site in the Chuckwalla Mountains; two of these nests were associated with the aforementioned active territory, the other was likely associated with a territory located further south (Solar Millennium, 2010c).

The 2012 golden eagle surveys performed by BioResource Consultants Inc. investigated 397 golden eagle nesting sites in the BLM California Desert District (CDD). Within the entire CDD, 74 sites were determined occupied (as indicated by courtship, a pair present, or the nest being maintained), of which 44 were active (as evidenced by incubation, eggs, brooding, chicks, and fledglings). No nest sites within 10 miles of the Project site were found to be occupied. Two golden eagle observations to the Project site were located greater than 14 miles north within the Little Maria and Granite Mountains, both of which had unknown status with no nesting observed.

In spring and summer 2013, aerial and ground-based surveys identified no active golden eagle within the 10-mile radius of the Project site, including the Palen Mountains. A single golden eagle observation was recorded: a third-year golden eagle flying around the cliffs in the southwestern portion of the Palen Mountains (WEST 2016). Twelve inactive golden eagle nests were recorded (WEST 2016).

Three potential golden eagle nests were identified in the Palen Mountains; two nests were inactive while the third was recently active by red-tailed hawks, which over the decades probably has alternated usage between red-tailed hawks and golden eagles with most recent use associated with red-tailed hawks (Bloom Biological, 2013c). Several active and inactive red-tailed hawk territories were identified, all in cliffs (Bloom Biological, 2013c). No physical signs of active golden eagle nesting activity (e.g., eagles, eagle white wash, fresh nest material, etc.) was observed at any of the previously known nest sites in the Chuckwalla Mountains; however, the altitude that aerial surveys were flown in this region (above 1,500 ft) limited the certainty of aerial survey results (BBI 2013c). Follow-up ground-based surveys were conducted on foot in the Chuckwalla Mountains in April 2013, to visit and observe potential golden eagle nest sites identified during aerial surveys. No eagle nests were identified during ground-based surveys in the Coxcomb Mountains within the 10-mile radius of the Project site (BBI 2013c). No eagle

nests were identified during aerial surveys of the approximately 22-mile length of east-west trending DPV2 power lines within the 10-mile radius of the Project site; however, several active red-tailed hawk nests were recorded (BBI 2013c).

Under ideal environmental conditions, the 10-mile radius around the Project site might support up to eight golden eagle territories (WEST 2016). In 2013, none of the eight approximated territories were active or exhibited sign of activity. The observed low numbers of golden eagles within the Project study area was consistent between several years of surveys and typical of the California deserts in that there is a relatively high probability that golden eagle nesting territories are vacant or contain inactive nests due to low prey availability (WEST 2016).

During the 2014 surveys, all previously described golden eagle nests were monitored, as well as a number of additional nests. In total, 35 eagle nests were documented during the April and July surveys. None of the nests newly identified in 2014 showed signs of recent activity. Moreover, no golden eagles were observed during aerial or ground-based surveys (WEST 2016). During the spring 2015 ground-based surveys, 20 previously observed golden eagle nests and one newly discovered nest were monitored. Sixteen nests showed no signs of occupancy, three nest territories were occupied by red-tailed hawks in early stages of visiting/refurbishing nests, and two nests were being actively occupied by red-tailed hawks incubating or raising. The newly identified nest did not show signs of recent activity. In summary, none of the previously-identified golden eagle territories, which were visited in spring 2015, were determined to be occupied by golden eagles (WEST 2016).

Winter Surveys

Surveys were performed in January and February 2013 that involved visual surveys and six baiting stations. A single sub adult was present all five weeks at bait station 6 located in the Palen Mountains north of the site, feeding on the carcass 2-3 days each week. No other golden eagles were observed during any of the six full-length survey sessions (BBI 2013e).

Prey Abundance Surveys

In 2013, 196.5 km (122 miles) of transects were performed within and adjacent to the solar facility area, which resulted in seventeen black-tailed jackrabbits and one desert cottontail observations. Observations were concentrated in two general areas: southeast extent of the Project site near the I-10 and smaller cluster in the north-central part of the Project site. Fewer lagomorph observations were noted in 2016 than in 2013 during the 1,273 km (791 miles) of transects performed at more variable daily time periods. The low abundance of lagomorphs may have been further reduced over the recent several years due to the presence of a local coyote population that is likely subsidized by the nearby agricultural lands. Although the site remains suitable for foraging by golden eagles, it supported a relatively low density of

lagomorphs during 2013 surveys under conditions similar to those of 2016, a year in which low densities of lagomorphs also appear to persist.

Summary

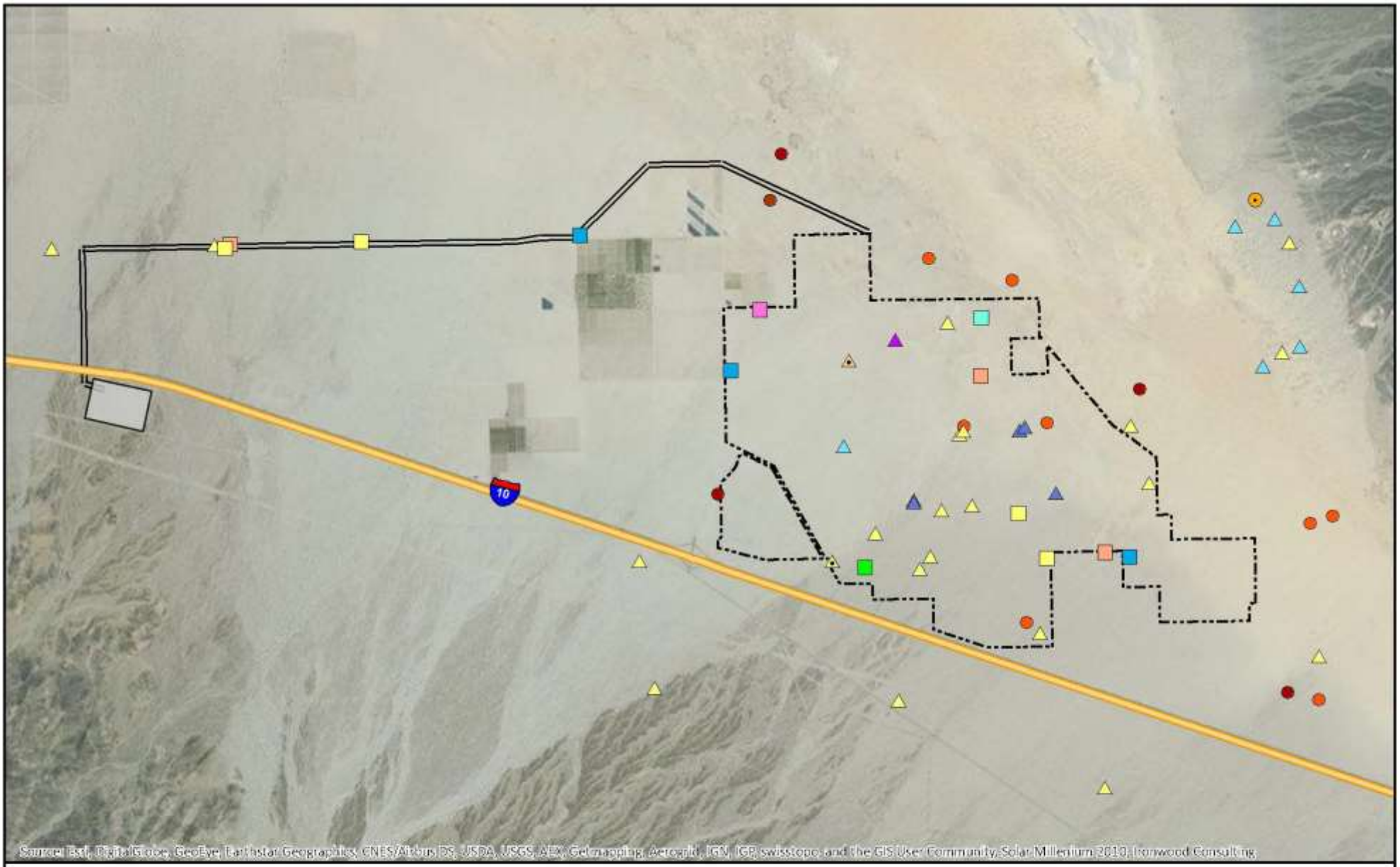
The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area was located more than one mile from suitable nesting habitat for golden eagles and the nearest active nest was approximately seven miles from the site. The potential for golden eagles to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.10 Loggerhead Shrike

The Loggerhead shrike (*Lanius ludovicianus*) is currently considered a CDFW Bird Species of Special Concern (nesting), and a USFWS Bird of Conservation Concern. Loggerhead shrikes are small predatory birds that are uncommon residents throughout most of the southern portion of their range, including southern California. In southern California, they are generally much more common in interior desert regions than along the coast (Humple 2008). This species can be found within lowland, open habitat types, including creosote scrub and other desert habitats, sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present. Loss of habitat to agriculture, development, and invasive species is a major threat; this species has shown a significant decline in the Sonoran Desert (Humple 2008). Loggerhead shrikes initiate their breeding season in February and may continue with raising a second brood as late as July; they often re-nest if their first nest fails or to raise a second brood (Yosef 1996). In general, loggerhead shrikes prey upon large insects, small birds, amphibians, reptiles, and small rodents over open ground within areas of short vegetation, usually impaling prey on thorns, wire barbs, or sharp twigs to cache for later feeding (Yosef 1996).

The Project site contains suitable habitat for loggerhead shrike (CEC 2010). Loggerhead shrikes were observed within the Project site during spring 2009 and 2010 surveys (Figure 15; CEC 2010). The species also was observed during spring 2013 avian field survey along the gen-tie line. Loggerhead shrike was also recorded during the 2016 surveys.

The PSPP PA/FEIS (Section 3.23) asserted that the entire PSPP disturbance area contained suitable nesting and foraging habitat for loggerhead shrike, which is consistent with the current conditions of the Project. The potential for loggerhead shrike to occur within the Project site has not changed from the description in the PSPP PA/FEIS.



Ironwood Consulting

Project Boundary
Gen-Tie Line
I10
SCE Red Bluff Substation

0 625 1,250
Meters

2016

- Black-Tailed Gnatcatcher, Nest live individual
- Le Conte's Trasher, Live individual
- Loggerhead Shrike, Live individual
- Prairie Falcon, Live individual
- Vaux's Swift, Live individual
- Yellow Warbler, Live individual

2009-2010 Special Status Avian Observations

- California Horned Lark Nest
- Ferruginous Hawk
- Le Conte's Thrasher
- Loggerhead Shrike
- Loggerhead Shrike Nest
- Nest Cavity - Unidentified Woodpecker Species
- Northern Harrier
- Purple Martin
- Swainson's Hawk (represents multiple individuals)
- Vaux's Swift

FIGURE 15

Special Status Avian Species

Palen Solar PV Project

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4.1.11 Le Conte's Thrasher

In California, Le Conte's thrasher (*Toxostoma lecontei*) is a resident in the San Joaquin Valley and the Mojave and Colorado Deserts (Weigand and Fitton 2008). This pale gray bird occurs in desert flats, washes and alluvial fans with sandy and/or alkaline soil and scattered shrubs. Preferred nest substrate includes thorny shrubs and small desert trees, and nesting rarely occurs in monotypic creosote scrub habitat or Sonoran Desert woodlands (Prescott 2005). Breeding activity occurs from January to early June, with a peak from mid- March to mid-April. Le Conte's thrashers forage for food by digging and probing in the soil. They eat arthropods, small lizards and snakes, and seeds and fruit; the bulk of their diet consists of beetles, caterpillars, scorpions, and spiders.

Suitable habitat for Le Conte's thrasher is located in the Project site, primarily within desert dry wash woodland. This species was observed during 2009 surveys, including avian-specific surveys conducted between 2010 and 2013 (CEC 2010; WEST 2016), as well as in spring 2016 (Figure 15).

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable habitat for Le Conte's thrasher primarily within desert dry wash woodland, which is consistent with the current conditions of the Project. The potential for Le Conte's thrasher to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.12 California Horned Lark

The California horned lark (*Eremophila alpestris actia*) is currently on the CDFW watch list. It is found throughout California except the north coast, and is less common in mountainous areas. This species prefers open areas that are barren or with short vegetation including deserts, brushy flats, and agricultural areas, and includes creosote scrub. Eggs are laid March to early June, and this species frequently lays a second clutch (Zeiner 1990). There are numerous records for this species in western Riverside County (CNDDB 2016). The Project site contains suitable habitat for this species, and it was observed frequently on the Project site, including the gen-tie line, during 2009 and 2010 surveys and during spring 2013 avian field surveys (Figure 15; WEST 2016).

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable habitat for California horned lark primarily within creosote bush scrub, which is consistent with the current conditions of the Project. The potential for California horned lark to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.13 Prairie Falcon

The prairie falcon (*Falco mexicanus*) is currently on the CDFW watch list, and a USFWS Bird of Conservation Concern. It inhabits dry environments in the North American west from southern Canada to central Mexico. It is found in open habitat at all elevations up to 3,350 m, but is associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. They require cliffs or bluffs for nesting though will sometimes nest in trees, on power line structures, on buildings, or inside caves or stone quarries. Ground squirrels and horned larks are the primary food source, but prairie falcon will also prey on lizards, other small birds, and small rodents (Zeiner 1990).

Prairie falcons were observed several times during Project surveys both as flyovers and perched in the Project site (Figure 15). The entire Project site contains suitable foraging habitat for this species. The Project site does not contain suitable nesting habitat, although mountains located over 3 miles away may provide nesting habitat. There are numerous CNDDB records in the region for this species, including eight records from Little Maria Mountains to the northeast (CEC 2010) and the Chuckwalla Mountains to the southwest (CEC 2010). During golden eagle Phase 2 nest surveys performed jointly for neighboring proposed energy projects, a pair of prairie falcons was documented to be nesting on the same cliff on which the golden eagle nest was located in the Palen Mountains (CEC 2010)

The PSPP PA/FEIS (Section 3.23) asserted that the entire PSPP disturbance area contained suitable foraging habitat and no nesting habitat for prairie falcon, which is consistent with the current conditions of the Project. The potential for prairie falcon to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.14 Gila Woodpecker

Gila woodpecker is designated as endangered in California, a BLM Sensitive Species, and a USFWS Bird of Conservation Concern. Gila woodpecker is predominantly a permanent resident across its range in areas of southeast California, southern Nevada, central Arizona, extreme southwest New Mexico, and parts of Mexico. The Gila woodpecker is an uncommon to fairly common resident in Southern California along the Colorado River, and locally near Brawley, Imperial County (Garrett and Dunn 1981). Suitable habitats include riparian woodlands, uplands with concentrations of large columnar cacti, old- growth xeric-riparian wash woodlands, and urban or suburban residential areas (Rosenberg et al. 1987; Edwards and Schnell 2000). Gila woodpeckers prefer large patches of woody riparian vegetation for nesting (greater than 49 acres), but others have documented the species in various habitat types, such as desert washes (McCreedy 2008) and residential areas (Mills et al. 1989). Suitable habitat within the Project site would be in desert washes, but would be expected to more readily use off-site palm trees than

on-site palo verde or ironwood trees. Surveys conducted in 2013 reported one incidental Gila woodpecker during point count surveys (WEST 2016). The probability of this species nesting on the Project site is low because the site supports sparse riparian woodland habitat and is located on the periphery of the geographic range for this species.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area did not support suitable nesting habitat for Gila woodpecker and that this species was not expected to occur in the project site. One observation of Gila woodpecker was recorded greater than 1 mile from the Project in 2013 during avian point count surveys, which represents a change in potential for this species to occur within the Project site since the description in the PSPP PA/FEIS; however, Gila woodpecker is still not expected to nest within the Project site due to lack of typical nesting habitat.

4.1.15 Black-tailed Gnatcatcher

Black-tailed gnatcatchers (*Polioptila melanura)* are currently on the CDFW watch list. They are permanent residents from southeastern California and Arizona to southern Texas and northern Mexico. They are found in arid scrublands, desert brush, and dry washes amongst creosote bush, ocotillo, mesquite, paloverdes, and cactus. They live pairs all year-round, defend their territory, and forage for small insects amongst low shrubs and trees. Black-tailed gnatcatchers were observed in 2013 and 2016 on the Project site. The Project site contains suitable foraging and potential nesting habitat for this species.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area did not support dense scrub suitable as nesting habitat for black-tailed gnatcatchers. This species was commonly detected during 2013 avian surveys and an active nest was observed in the dry wash woodland in 2016, which represents a change in potential for black-tailed gnatcatchers to occur within the Project site since the description in the PSPP PA/FEIS.

4.1.16 Sonora Yellow Warbler

The Sonora yellow warbler (*Setophaga petechia sonorana*) is currently considered a CDFW Bird Species of Special Concern (breeding), and a USFWS Bird of Conservation Concern. It occurs principally as a migrant and summer resident from late March through early October, and breeds from April to late July (Dunn and Garrett 1997). The Sonora yellow warbler breeds only along the lower Colorado River in California, and from southern Arizona and southwest New Mexico to north-central Mexico and possibly the Colorado River Delta. It arrives to breed on the lower Colorado River in early April and nests mainly from mid-May through July (Rosenberg et al. 1991). They generally occupy riparian shrubs and trees close to water. Its diet includes ants, bees, wasps, caterpillars, beetles, true bugs, flies, and spiders (Beal 1907, Shuford 2008). Sonora yellow warblers were observed during small bird count surveys in 2013 (WEST 2016).

The Project site contains suitable foraging habitat (during migration) and no suitable nesting habitat.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area did not support suitable nesting habitat for Sonora yellow warbler and that this species was not observed during surveys. This species was detected during avian surveys in 2013 and in 2016 and may be present during migration; however, Sonora yellow warbler is not expected to nest within the Project site due to lack of typical nesting habitat, which is consistent with the description in the PSPP PA/FEIS.

4.1.17 Short Eared Owl

The short-eared owl (*Asio flammeus*) is a California Species of Special Concern. It is a widespread winter migrant in central and western California, and generally present from September through April. It is an uncommon winter migrant in southern California. Habitat requirements include grasslands, prairies, dunes, meadows, irrigated lands, and wetlands, and Short-eared owls generally require dense vegetation for roosting and nesting (Shuford 2008). One short-eared owl was detected on site during surveys in 2013 (WEST 2016). The Project site does not provide suitable nesting habitat, although short-eared owls may be found on site incidentally during migration or foraging events.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable wintering habitat and lacked suitable nesting habitat for short-eared owl. One observation of short-eared owl was recorded during avian surveys in 2013; however, this species is not expected to nest within the Project site due to lack of typical nesting habitat, which is consistent with the description in the PSPP PA/FEIS.

4.1.18 Ferruginous Hawk

The ferruginous hawk (*Buteo regalis*) is a California Watch List species, and a USFWS Bird of Conservation Concern. It is an uncommon winter resident and migrant at lower elevations and open grasslands in the Central Valley and Coast Ranges, and a fairly common winter resident of grasslands and agricultural areas in southwestern California (Garrett and Dunn 1981). There are no breeding records from California. This species frequents open grasslands, sagebrush flats, and desert scrub. Prey items include lagomorphs, small mammals, reptiles and amphibians (Zeiner 1990). This species was observed during surveys small bird surveys in 2013 (WEST 2016). The project site provides potential wintering and migration habitat, and does not provide suitable nesting habitat.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable wintering habitat and lacked suitable nesting habitat for ferruginous hawk. Two observations of

ferruginous hawks were recorded during avian surveys in 2013; however, this species is not expected to nest within the Project site due to geographic restrictions, which is consistent with the description in the PSPP PA/FEIS.

4.1.19 Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is listed as Threatened by CDFW, and a Bird of Conservation Concern by the USFWS. The Swainson's hawk occurs as a breeding species in open habitats throughout much of the western United States and Canada, and in northern Mexico. In California, breeding populations of Swainson's hawks occur in desert, shrub and grasslands, and agricultural habitats; however, most of the state's breeding sites are in the Great Basin and Central Valley (Woodbridge 1998). These birds favor open habitats for foraging, and are near-exclusive insectivores as adults, but may also forage on small mammals and reptiles. This species was observed during surveys small bird surveys in 2013 (WEST 2016). The project site provides potential migration habitat, and does not provide suitable nesting habitat.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat during migration and lacked suitable nesting habitat for Swainson's hawk, which is consistent with the current condition of the Project site. The potential for Swainson's hawk to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.20 American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) is listed as CDFW Fully Protected species, and considered a USFWS Bird of Conservation Concern. It is distributed worldwide. In California, range is primarily central to northern California, with wintering habitat located in southern California. Migrants occur along the coast and in the western Sierra Nevada in spring and fall. It breeds mostly in woodland, forest, and coastal habitats, and favors open landscapes with cliffs as nest sites. Their diet consists primarily of birds and bats (Zeiner 1990). This species was located during bird-use count surveys in 2013 (WEST 2016). The project site provides suitable foraging habitat, and no suitable nesting habitat occurs on site.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat and no nesting habitat for American peregrine falcon, which is consistent with the current conditions of the Project. The potential for prairie falcon to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.21 Vaux's Swift

Vaux's swift (*Chaetura vauxi*) is a CDFW Species of Special Concern. It is a summer resident of northern California and a fairly common migrant throughout most of the state in spring and fall. It roosts in hollow trees and snags, and often in large flocks. Vaux's swifts feed exclusively on flying insects (Shuford 2008). This species was observed during small bird count surveys that were completed in 2013 (WEST 2016). Vaux's swift was also detected during spring 2016 surveys. The project site provides suitable habitat during migration, and no suitable nesting habitat.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat during migration and lacked suitable nesting habitat for Vaux's swift, which is consistent with the current condition of the Project site. The potential for Vaux's swift to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.22 Mountain Plover

Mountain plover (*Charadrius montanus)* is a CDFW Species of Special Concern, and a USFWS Bird of Conservation Concern. They are found in semi-arid plains, grasslands, and plateaus. They use open grasslands, plowed fields with little vegetation, and open sagebrush areas. Winter habitats include desert flats, and plowed fields. Mountain plovers are insectivores, feeding primarily on large ground-dwelling insects, including grasshoppers, beetles, and crickets (Shuford 2008). This species' distribution was modeled as occurring in the Chuckwalla Valley (CEC 2014a). One mountain plover was observed during bird use count surveys in 2013 (WEST 2016). The project site provides suitable habitat during migration, and is not likely to support suitable nesting habitat.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat during migration/winter and lacked suitable nesting habitat for mountain plover, which is consistent with the current condition of the Project site. The potential for mountain plover to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.23 Northern Harrier

Northern harrier (*Circus cyaneus)* is a CDFW Species of Special Concern. It inhabits most of California at various times of the year, found in elevations up to 3000m. Northern harriers frequent meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands. They are a widespread winter resident and migrant in suitable habitat. They primarily feed on small mammals, birds, frogs, small reptiles, crustaceans, and insects (Zeiner 1990).

Northern harriers were found on site during previous surveys on the Project site (WEST 2016). There is suitable foraging, and no suitable nesting habitat on the Project site.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area contained suitable foraging habitat during migration/winter and lacked suitable nesting habitat for northern harrier, which is consistent with the current condition of the Project site. The potential for northern harrier to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.24 Yellow-breasted Chat

The yellow-breasted chat (*Icteria virens*) is a CDFW Species of Special Concern. It is an uncommon summer resident and migrant in coastal California, in foothills of the Sierra Nevada, and within the Colorado Desert is known only from the Salton Sea and Colorado River. In southern California, chats breed locally on the coast, and very locally inland (Garrett and Dunn 1981). During migration, they may be found in lower elevations of mountains in riparian habitat (McCaskie et al. 1979; Shuford 1990). Yellow-breasted chat was recorded during small bird count surveys that were conducted in 2013, likely during migration (WEST 2016). The yellow-breasted chat may be found incidentally on site during migration, but suitable nesting habitat is not present.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area did not contain suitable habitat for yellow-breasted chat. One observation of yellow-breasted chat was recorded during avian surveys in 2013; however, this species is not expected to nest within the Project site due to lack of typical nesting habitat, which is consistent with the description in the PSPP PA/FEIS.

4.1.25 Crissal's Thrasher

Crissal's thrasher (*Toxostoma crissale*) is a CDFW Species of Special Concern. This species is a resident of southeastern deserts, occupying dense shrubs in desert riparian and desert wash habitats, including mesquite, ironwood, and acacia. This thrasher primarily forages on the ground, feeding on invertebrates, berries, and seeds (Bent 1948; Shuford 2008). One observation of Crissal's thrasher was recorded during small bird count surveys in 2013 (WEST 2016). The project site provides limited but suitable nesting and foraging habitat primarily associated with dry wash woodlands.

The PSPP PA/FEIS (Section 3.23) asserted that the PSPP disturbance area supported limited dense scrub suitable as nesting habitat for Crissal's thrasher, which is consistent with the current condition of the Project site. The potential for Crissal's thrasher to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.1.26 Other Listed Bird Species

No suitable breeding or wintering habitat for State or Federal listed bird species occurs within or near the Project; however, incidental detections of listed bird species including western yellow-billed cuckoo, willow flycatcher, Bell's vireos, and Ridgeway's [Yuma Ridgway's] rail have been recorded at existing utility-scale solar projects in California. Thus, an assessment of the Project's potential effects to these species was performed (Appendix E). Western yellow-billed cuckoo, willow flycatcher, and Bell's vireo breed in riparian habitats in California, winter south of the United States-Mexico border, and migrate though the Colorado Desert between breeding and wintering habitats. Yuma Ridgway's rail nests in freshwater marshes and is distinct from the other listed bird species in that they are not known to regularly migrate between areas of breeding habitat. Additional information is provided in Appendix E.

4.2 Special Status Plant Species

Forty-one special status plant species were reviewed for their potential to occur within the Project site and its vicinity based on regional plans and database records (Table 6; CNDDB 2016, CEC 2014c). The status of each species has been updated (CNPS 2016). Special status species that were detected within the Project site, buffer, or have moderate potential to occur based on the presence of suitable habitat within the Project site are discussed further in this section. Species that were determined to have a low probability of occurrence due to the absence of suitable habitat, differences in elevation range, or significant distance from known geographic range are detailed in Appendix C. A cumulative list of all plant species observed during previous surveys in included in Appendix D.

Two special status plant species were observed within the Project site during spring 2009, 2010, and 2017 surveys: Harwood's milk-vetch and ribbed cryptantha (Figure 16). Other sensitive plants recorded outside the project site or along the gen-tie were Harwood's eriastrum, California ditaxis, and Utah vining milkweed. In spring 2017, Harwood's eriastrum was recorded within the far eastern edge of the Project site, primarily within Zone II (Figure 16). A relatively new taxon of *Atriplex* was documented on the saline lake margin approximately 650m north of the Project site (Andre, pers. comm.). The previous locations of this species were relocated and populations were reconfirmed during the 2016 surveys.

No special status plant species were detected within the Project site during fall surveys in October 2010 botanical surveys. This fall survey was considered effective for late-season blooming species given that summer/fall annual plant species were detected in bloom and/or fruit within and in the vicinity. Eight common annual species were observed in bloom and/or fruit, and 17 common perennial species were observed in bloom and/or fruit, including 8 previously undocumented common species that were added to the floral inventory.

Table 6 - Special Status Plant Species

COMMON NAME	***SCIENTIFIC NAME***	**STATUS** STATE/FED/CRPR/BLM/ GLOBAL RANK/STATE RANK	**BLOOMING PERIOD**	**POTENTIAL TO OCCUR ON THE PROJECT SITE**
Chaparral sand verbena	*Abronia villosa* var. *aurita*	__/__/1B.1/BLM Sensitive_/G5T2T3/S2	Jan-Sep	Low. Not observed.
Angel trumpets	*Acleisanthes longiflora*	__/__/2B.3/__/G5/S1	May	Low. Not observed
Desert sand parsley	*Ammoselinum giganteum*	__/__/2B.1/__/G2G3/SH	Mar-Apr	Low. Not observed
Small-flowered androstephium	*Androstephium breviflorum*	__/__/2B.2/__/G4/S2	Mar-Apr	Low. Not observed
Harwood's milkvetch	*Astragalus insularis* var. *harwoodii*	__/__/2B.2/__/G5T3/S2	Jan-May	**Present.** Recorded within solar facility study area
Coachella Valley milkvetch	*Astragalus lentiginosus* var. *coachellae*	__/FE/1B.2/BLM Sensitive/G5T1/S1	Feb-May	Low. Not observed
California ayenia	*Ayenia compacta*	__/__/2B.3/__/G4/S3	Mar-Apr	Low. Not observed
Pink fairy duster	*Calliandra eriophylla*	__/__/2B.3/__/G5/S3	Jan-Mar	Low. Not observed
Sand evening-primrose	*Camissonia arenaria*	__/__/2B.2/__/G4?/S2S3	Nov-May	Low. Not observed
Crucifixion thorn	*Castela emoryi*	__/__/2B.2/__/G3G4/S2S3	Apr-Oct	Low. Not observed
Abram's spurge	*Chamaesyce abramsiana*	__/__/2B.2/__/G4/S2	Aug-Nov	Moderate. Not observed
Arizona spurge	*Chamaesyce arizonica*	__/__/2B.3/__/G5/S3	Mar-Apr	Low. Not observed
Flat-seeded spurge	*Chamaesyce platysperma*	__/__/1B.2/ BLM Sensitive / G3/S1	Feb-Sep	Low. Not observed
Las Animas colubrina	*Colubrina californica*	__/__/2B.3/__/G4/S2S3	Apr-Jun	Low. Not observed
Spiny abrojo	*Condalia globosa* var. *pubescens*	__/__/4.2/__/G5T4/S3	Mar-Nov	**Present**. Recorded within the southwestern terminus of the gen-tie
Foxtail cactus	*Coryphantha alversonii*	__/__/4.3/__/G3/S3	Apr-Jun	Low. Not observed
Ribbed cryptantha	*Cryptantha costata*	__/__/4.3/__/G4G5/S3.3	Feb-May	**Present.** Recorded within the northern and eastern portions of the

COMMON NAME	***SCIENTIFIC NAME***	**STATUS** STATE/FED/CRPR/BLM/ GLOBAL RANK/STATE RANK	**BLOOMING PERIOD**	**POTENTIAL TO OCCUR ON THE PROJECT SITE**
				solar facility study area
Winged cryptantha	*Cryptantha holoptera*	__/__/4.3/__/G4G5/S4	Mar-Apr	Low. Not observed
Wiggins' cholla	*Cylindropuntia wigginsii* [=*Opuntia wigginsii*]	__/__/3.3/__/G3?Q/S1?	Mar	Low. Not observed
Utah milkvine	*Cynanchum utahense (*syn=[=*Funastrum utahense*]	__/__/4.2/__/G4/S4	Mar-Oct	Low. Recorded offsite
Glandular ditaxis	*Ditaxis claryana*	__/__/2B.2/__/G3G4/S2	Oct-Mar	Moderate. Not observed
California ditaxis	*Ditaxis serrata* var. *californica*	__/__/3.2/__/G5T3T4/S2?	Mar-Dec	**Present.** Recorded along western extent of the gen-tie
Cottontop cactus	*Echinocactus polycephalus* var. *polycephalus*	__/__/ CBR /__/__/__	Mar-Aug	Low. Recorded offsite
Harwood's Eriastrum	*Eriastrum harwoodii*	__/__/1B.2/BLM Sensitive_/G2	Mar-Jun	**Present.** Recorded within eastern edge of solar facility study area
California satintail	*Imperata brevifolia*	__/__/2B.1__/G3/S3	Sep-May	Low. Not observed
Pink velvet mallow	*Horsfordia alata*	__/__/4.3/__/G5/S4	Feb-Dec	Low. Not observed
Bitter hymenoxys	*Hymenoxys odorata*	__/__/2B.1/__/G5/S2	Feb-Nov	Low. Not observed
Spearleaf	*Matelea parvifolia*	__/__/2B.3/__/G5?/S3	Mar-May	Low. Not observed
Argus blazing star	*Mentzelia puberula*	__/__/2B.2/__/G5/S2	Mar-May	Low. Not observed
Slender cotton-heads	*Nemacaulis denudata* var. *gracilis*	__/__/2B.2/__/G3G4T3?/S2	Mar-May	Low. Not observed
Lobed cherry	*Physalis lobata*	__/__/2.B3/__/G5/S1S2	May-Jan	Moderate. Not observed
Desert portulaca	*Portulaca halimoides*	__/__/4.2/__/G5/S3	Sep	Low. Not observed
Desert unicorn plant	*Proboscidea althaeifolia*	__/__/4.3/__/G5/S4	May-Oct	Moderate. Not observed
Orocopia sage	*Salvia greatae*	__/__/1B.3/BLM Sensitive/G2G3/S2S3	Mar-Apr	Low. Not observed

COMMON NAME	***SCIENTIFIC NAME***	**STATUS** STATE/FED/CRPR/BLM/ GLOBAL RANK/STATE RANK	**BLOOMING PERIOD**	**POTENTIAL TO OCCUR ON THE PROJECT SITE**
Desert spikemoss	*Selaginella eremophila*	__/__/2B.2/__/G4/S2S3	May-Jul	Low. Not observed
Cove's cassia	*Senna covesii*	__/__/2B.2/__/G5/S3	Mar-Aug	Low. Not observed
Mesquite nest straw	*Stylocline sonorensis*	__/__/2A/__/G3G5/SX	Apr	Low. Not observed
Dwarf germander	*Teucrium cubense ssp. depressum*	__/__/2B.2/__/G4G5T3T4/S2	Mar-Nov	Low. Not observed
Jackass clover	*Wislizenia refracta ssp. refracta*	__/__/2B.2/__/G5T5?/S1	Apr-Nov	Moderate. Not observed
Palmer's jackass clover	*Wislizenia refracta ssp. palmeri*	__/__/2B.2/__/G5T2T4/S1	Jan-Dec	Moderate. Not observed
"Palen Lake atriplex"	*Atriplex sp. nov. J. Andre (Atriplex canescens ssp.)*	__/_/_/BLM Sensitive_/_/	May-Jun	Low. Recorded offsite

Federal FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range

FT = Federally listed, threatened: species likely to become endangered within the foreseeable future

California Rare Plant Rank (CRPR)

CRPR 1A = Presumed extinct

CRPR 1B = Rare, threatened, or endangered in California and elsewhere

CRPR 2 = Rare, threatened, or endangered in California but more common elsewhere

CRPR 3 = Plants which need more information

CRPR 4 = Limited distribution – a watch list

CBR = Considered But Rejected

.1 = Seriously endangered in California (high degree/immediacy of threat; over 80% of occurrences threatened)

.2 = Fairly endangered in California (moderate degree/immediacy of threat; 20%-80% of occurrences threatened)

.3 = Not very endangered in California (low degree/immediacy of threats or no current threats known; <20% of occurrences threatened or no current threats known)

Bureau of Land Management

BLM Sensitive = BLM Manual §6840 defines sensitive species as"those species that are (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats. BLM, 2001

Global Rank/State Rank

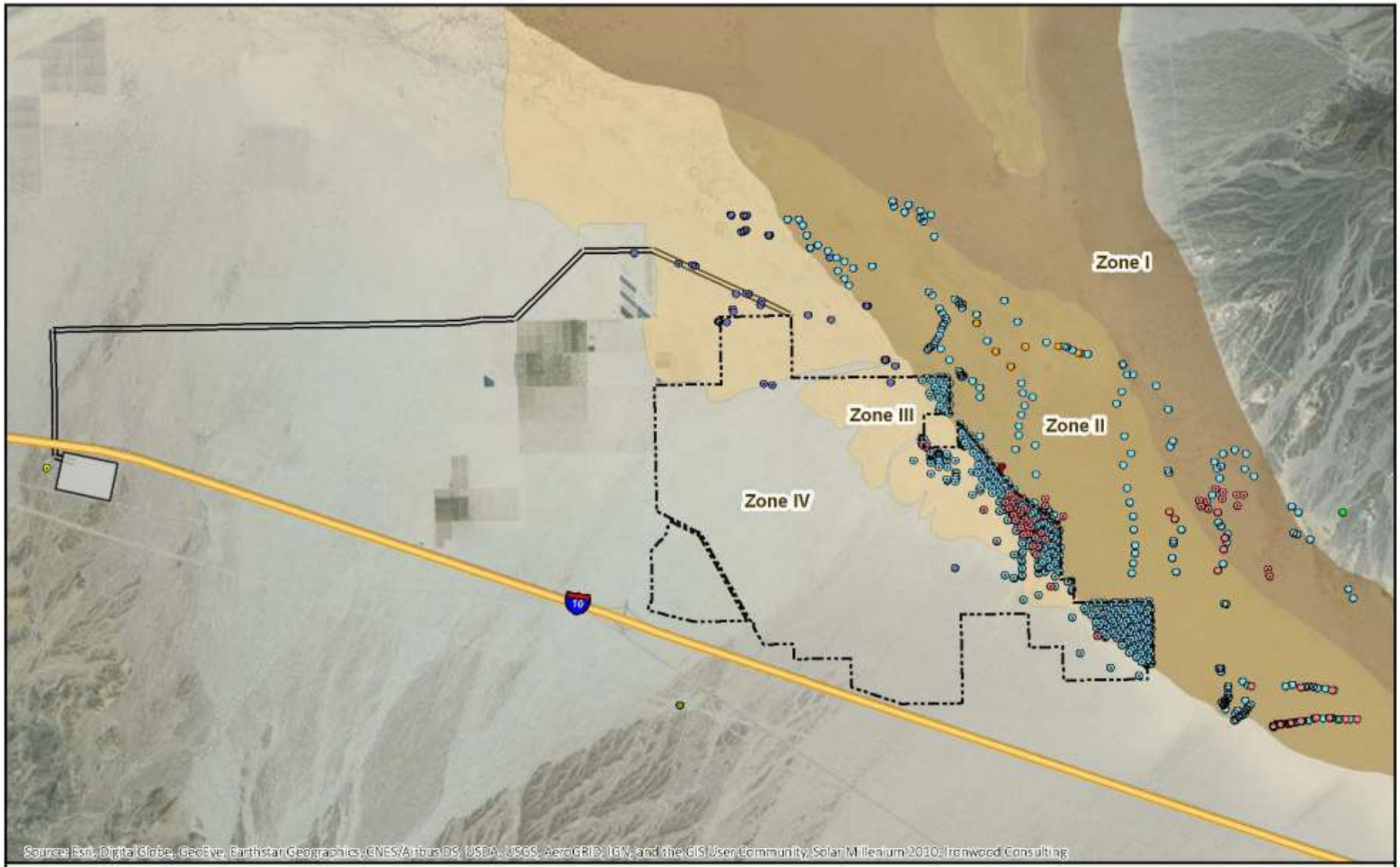
Global rank (G-rank) is a reflection of the overall condition of an element throughout its global range. Subspecies are denoted by a T-Rank; multiple rankings indicate a range of values

G1 = Critically Imperiled.

G2 = Imperiled.

G3 = Vulnerable.

G4 = Apparently secure. This rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Secure. Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
State rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. An H-rank indicates that all sites are historical.
SX = Presumed Extirpated
SH = Possibly Extirpated
S1 = Critically Imperiled
S2 = Imperiled
S3 = Vulnerable
.1 = undefined in new classification system; under old system, this meant very threatened in California
.2 = undefined in new classification system; under old system, this meant threatened in California
.3 = undefined in new classification system; under old system, this meant no current threats known in California



Ironwood Consulting

0 650 1,300
Meters

Project Boundary
SCE Red Bluff Substation
Gen-Tie Line

CRPR 1B and 2
- Harwood's eriastrum (2009-2010)
- Harwood's milkvetch (2009-2010)
- Harwood's eriastrum (2017)
- Harwood's milkvetch (2017)

CNPR List 4
- Four wing saltbush (2009-2010)
- Ribbed cryptantha (2009-2010)
- Utah milkvine (2009-2010)
- Ribbed cryptantha (2017)
- Spiny abrojo (2017)

BLM REQUESTED CACTUS SPECIES
- Cottontop cactus
- California barrel cactus

FIGURE 16

Special Status Plant Observations

2009-2017

Palen Solar PV Project

C:\Users\steven.hoerber\Documents\ArcGIS\Packages\BRTR Fig 16 - Special Status Plant Species_77BAF188-C45F-4FDA-86DE-9C9D0FDECF69\v10\BRTR Fig 16 - Special Status Plant Species.mxd | 4/12/2017

Floristic surveys conducted on the project site, buffers, and gen-tie from 2009 through 2016 identified a total number of 167 taxa. During the spring 2016 surveys, a combined total of 92 species of vascular plants were observed. Higher diversity along the gen-tie was a result of the presence of more varied habitat, topographical features, and possibly more localized precipitation and surface flow than the solar facility area. The solar facility supported 63 taxa and the gen-tie supported 73 taxa, including 16 new taxa not previously recorded. The original surveys from 2009 and 2010 reported 151 taxa. The variation in species richness between survey years is likely due to variations in winter rainfall (Section 2.4). Most of the taxa not observed in 2016 were common winter annuals, which likely did not receive enough precipitation to germinate this year. Additional species previously recorded in 2009 and 2010 were found within the 1-mile wide buffer, which included more varying habitats and associated species.

4.2.1 Harwood's Milkvetch

Harwood's milk-vetch (*Astragalus insularis* var. *harwoodii*) has a California Rare Plant Rank (CRPR) of 2B.2, is covered species under the NECO Plan, and has a NatureServe rank of G5T3/S2. This species is rare in California, but more common elsewhere. It is an annual herb that mainly occurs in Sonoran Desert scrub habitat throughout the Colorado Desert (BLM CDD 2002). This subspecies is found in desert dunes, sandy or gravelly areas, and ruderal swales throughout the Mojavean and Sonoran deserts covering portions of Imperial, Riverside, and San Diego counties (CNPS 2016). Historic and recent collections include Ogilby Road in Imperial County and three locales west of Blythe, the Pinto Basin, and Chuckwalla Basin in Riverside County. Harwood's milk-vetch has also been reported from Baja California, Sonora Mexico, and portions of Yuma County. There are several CNDDB records for this species within the Project vicinity (CNDDB 2016). Many new occurrences were documented in Chuckwalla Valley and the Palo Verde mesa during surveys for the Blythe Solar Power Project, the Genesis Solar Energy Project, the McCoy Solar Energy Project (Tetratech 2011) study areas. The Consortium of California Herbaria (CCH) lists 103 occurrences within California (CCH 2016).

The PSPP PA/FEIS (Section 3.18) asserted that Harwood's milk-vetch was present within the PSPP disturbance area. During the 2009 and 2010 surveys, a total of 146 Harwood's milk-vetch plants were documented in the survey area, 97% of which were located outside the Project site, and five records occurred within the Project site (Figure 16). Harwood's milkvetch was not observed during the March 2013 survey of the PSEGS' proposed natural gas line extension, distribution yard, and gen-tie line reroute (Karl 2013a). This species was observed in the 2017 surveys: a total of nine individual plants within the Project site and along the gen-tie. The potential for Harwood's milk-vetch to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.2 Ribbed Cryptantha

Ribbed cryptantha (*Cryptantha costata*) has a CRPR of 4.3 and a NatureServe rank of G4G5/S3.3, which suggested a limited distribution but it is not threatened in California. It typically occurs in loose friable soils, especially sand, in the eastern Mojave and Sonoran deserts in Imperial, Riverside, San Diego, and San Bernardino counties and into Arizona and south to Baja California, Mexico (CNPS 2016). It commonly occurs in stabilized and partially stabilized desert dunes and sandy areas of Sonoran and Mojave Desert creosote bush scrub. There are 258 records of this species from several locations throughout Riverside, Imperial, San Diego, and Imperial counties (CCH 2016). A large local population of ribbed cryptantha was identified during the 2010 surveys and ancillary surveys for other nearby projects (Tetratech 2011).

The PSPP PA/FEIS (Section 3.18) asserted that ribbed cryptantha was present within the PSPP disturbance area. Plant estimates of this species were made using sub-sampling methods and an estimate of 8,903 plants per acre was used (BLM 2011). Approximately 285 acres (18%) of occupied habitat were estimated to occur within the proposed PSPP disturbance area. The Project will likely avoid many of these previously recorded populations that occur off the boundary to the east. Ribbed cryptantha was not observed during a March 30, 2013 survey of the PSEGS' proposed natural gas line extension, distribution yard, and gen-tie line reroute (Karl 2013a). This species was not observed on the Project site during surveys performed in May 2016, although approximately 320 dried-up skeletons of ribbed cryptantha were identified approximately 1,500 meters east of the Project site during reference site visits in April 2016. Surveys performed in spring 2017 documented ribbed cryptantha within the eastern portions of the Project site, within Zone II, and occurredIII, occurring in densities similar to the estimates obtained through previous sampling. The potential for ribbed cryptantha to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.3 California Ditaxis

California ditaxis (*Ditaxis serrata* var. *californica*) has a CRPR of 3.2 and a NatureServe rank of G5T3T4/S2, which indicates more information is needed about the status of this species. California ditaxis may be a glabrous variety of the common *Ditaxis neomexicana* and appears to be a rare variety of the common species (CEC 2010). This species occupies Sonoran Desert scrub habitat, and prefers sandy washes and alluvial fans of the foothills and lower desert slopes, from 100 to 3,000 feet above mean sea level. Reports of this species are known from San Bernardino, Riverside, Imperial, San Diego, and Sonora, Mexico (CNPS 2016). There are 40 records of this species in California, primarily from Riverside County (CCH 2016).

The PSPP PA/FEIS (Section 3.18) asserted that California ditaxis was present within the PSPP disturbance area. A total of 22 California ditaxis plants were documented in the survey area

during the 2010 surveys: 11 of the observations were located over 7 miles west of the gen-tie and 11 observations were located within a tight cluster along the gen-tie line alignment (Figure 16). California ditaxis was not observed during a March 30, 2013 survey of the PSEGS' proposed natural gas line extension, distribution yard, and gen-tie line reroute (Karl 2013a). This species was not observed during surveys performed on the Project site in 2016 or 2017; however, *D. neomexicana* was observed occasionally across the Project site and gen-tie, in flowering and fruiting condition. It is notable that several California ditaxis reference populations recorded in 2009 and 2010 along the gen-tie were revisited in 2016, and none of them keyed clearly to *D. serrata* var. *californica*, but keyed instead to *D. neomexicana*. Assuming that perennial plants and a viable seedbank of California ditaxis persists near previously documented records in 2010, then this species is presumed present on the gen-tie consistent with the quantities previously recorded. The potential for California ditaxis to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.4 Harwood's Eriastrum

Harwood's eriastrum (*Eriastrum harwoodii*), also commonly known as Harwood's phlox or woollystar, has a CRPR of 1B.2, has a NatureServe rank of G2/S2, and is a BLM sensitive species. This species is a spring annual and a California endemic with a global range restricted to San Diego, Riverside, and San Bernardino counties, typically in dunes associated with the margins around dry lakes such as Dale, Cadiz, and Soda lakes (CNPS 2016). Reports of this species are known from San Bernardino, Riverside, Imperial, San Diego, and Sonora, Mexico (CNPS 2016). There are 98 records of this species in California (CCH 2016). Surveys conducted in spring of 2010 for the Blythe Solar Power Project located this species primarily in the sandy areas south of I-10, where 2,134 plants were located and mapped. All of these plants were identified in the general vicinity of the proposed Southern California Edison Colorado River substation.

The PSPP PA/FEIS (Section 3.18) asserted that Harwood's eriastrum was not recorded within the PSPP disturbance area. Stabilized and partially stabilized dunes within the Project site were considered to be suitable habitat for this species (CEC 2010). During spring 2010 field surveys, over 150 Harwood's eriastrum plants were observed in the partially stabilized dunes outside of the Project site (between 0.5 mile and 1.5 miles to the east) (Figure 16). Harwood's eriastrum was not observed during a March 30, 2013 survey of the PSEGS' proposed linear modifications (Karl 2013a). This species was not observed in the 2016 surveys likely because of the lack of preceding winter rainfall. Offsite reference populations were successfully revisited in 2017 to confirm phenology prior to conducting formal surveys. During the 2017 surveys, 46 records of Harwood's eriastrum, consisting of approximately 940 individual plants in total, were identified within the Project site primarily within Zone II (Figure 16). Additional observations of Harwood's eriastrum were recorded incidentally within Zone I and II outside of the Project site during the

2017 surveys: 16 records consisting of approximately 867 individual plants in total. Suitable habitat for Harwood's eriastrum occurs within the un-surveyed portions of Zones I and II outside the Project site, where this species likely occurs in similar densities. Optimal growing conditions resulting from the above-average winter rainfall likely contributed to the number of observations in 2017.

In summary, stabilized and partially stabilized dune habitat, which is suitable for Harwood's eriastrum, was previously identified as occurring within the Project site as described in the PSPP PA/FEIS; however, Harwood's eriastrum was not observed within the Project site prior to 2017. In spring 2017, Harwood's eriastrum was found occupying approximately 50 acres of the Project site. Observations were located within and adjacent to mapped stabilized and partially stabilized dunes, primarily within Zone II; thus, the documented presence of Harwood's eriastrum within the Project site has changed from the description in the PSPP PA/FEIS.

4.2.5 Utah Milkvine

Utah milkvine (*Cynanchum utahense* [=*Funastrum utahense*]) has a CRPR of 4.2 and a NatureServe rank of G4/S4. This species occurs in San Diego, Imperial, Riverside, and San Bernardino counties and portions of Arizona, Nevada, and Utah (CNPS 2016). Utah milkvine is a twining perennial that occurs in sandy or gravelly soils in Mojavean and Sonoran desert scrub habitats or washes from approximately 500 feet to 4,300 feet in elevation (CNPS 2016). This species was documented on the Palo Verde Mesa (CEC 2010). There are 140 records of this species from the Consortium of California Herbaria database primarily from San Bernardino and San Diego counties; there is one record from the Big Maria Mountains from wash and stabilized dune habitat at approximately 1,200 feet elevation (CCH 2016).

The PSPP PA/FEIS (Section 3.18) asserted that Utah milkvine was not recorded within the PSPP disturbance area. Utah milkvine was not found during 2009 field surveys; however, this plant was observed incidentally at a single location east of Palen Lake and approximately 1.5 miles east of the Project site. Utah milkvine was not observed within the Project site or buffer area during 2009 or 2010 field surveys (Figure 16; Solar Millennium 2010d). Utah milkvine was not observed during March 2013 surveys of the PSEGS linear features (Karl 2013a). Due the absence of suitable habitat within the Project site and negative results of previous surveys, this species is not expected to occur within the Project site. The potential for Utah milkvine to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.6 Salton Saltbush (Palen Lake Saltbush)

During the 2010 botanical surveys, an undescribed variety of *Atriplex canescens* was found outside the Project site on the saline margins of Palen Lake. This taxon was provisionally named *Atriplex* sp. *nov*. This species has been observed in other saline (but non-playa) habitats on

remnants of the lower Colorado River flood plain (Andre, Silverman, pers. comm. 2010). It resembles the common four-wing saltbush (*Atriplex canescens* var. *linearis*), a common plant of dunes which has very linear leaves, but the new taxon has obovate leaves that distinguish it from all *Atriplex canescens* and its subspecies (Andre, pers. comm.). The "new" species was first collected in 2005 at the dry lake just northeast of the Interstate 15 and Highway 95 junction, approximately 35 miles east and northeast of Las Vegas, Nevada and the first voucher/observation of it in California was on the saline playa margins of Palen Dry Lake in 2009 by a botanist with the U.C. Reserve System (CEC 2010).

In 2012, a new edition of the *Jepson Manual of Vascular Plants of California* was published, which resurrected the taxon named *Atriplex canescens* var. *macilenta*, the Salton saltbush. These plants are distinguished by shorter stature, smaller fruits, and wider oblanceolate leaves, preference for saline habitat, polyploidy, and are probably of hybrid origin (Baldwin et al. 2012). The *Atriplex* sp. *nov*. plants observed outside the Project site appear to conform to this resurrected variety of *Atriplex canescens* var. *macilenta*. The California Consortium of Herbaria lists 20 occurrences of this taxon in Southern California (CCH 2016). Three occurrences are in Chuckwalla Valley including one that was collected on Palen Dry Lake in 2010 as part of the original surveys (D. Silverman, #7829, 24 March 2010 [UCR; CAS]). The plants observed during the spring 2016 survey also conform to this newly re-recognized variety. *Atriplex canescens* var. *macilenta* was first collected in California in 1912 near Calexico (CCH 2016). Since then it has been occasionally documented scattered across saline habitats in the Salton sink, Imperial Valley, Rice Valley, and Chuckwalla Valley (CCH 2016). There could be some taxonomic dispute about the accepted name of this saltbush; however, because the plants in the Chuckwalla Valley tend to conform to a recognized variety, *A. canescens* var. *macilenta*, this is likely the most parsimonious assignment of nomenclature. Given that a formal taxonomic analysis has yet to be performed, the conservative approach would be to consider this species as having special status, and the BLM State Botanist indicated in 2013 that potential new taxa may be treated as BLM Sensitive species (CEC 2010).

The PSPP PA/FEIS (Section 3.18) asserted that *Atriplex* sp. *nov.* was not recorded within the PSPP disturbance area. Several *Atriplex* sp. *nov.* plants were found within in the buffer area, northeast of the Project site during spring 2010 field surveys (Solar Millennium 2010d). No *Atriplex* sp. *nov.* were found within the Project site or gen-tie during the surveys conducted from 2009 through 2016. This species was relocated in April 2016, during reference site visits, where it was found flowering and fruiting, at the same locality as originally documented in 2010. It was not observed on the Project site during surveys performed in May 2016, likely due to lack of appropriate dry lakeshore habitat; therefore, this species is not expected to occur within the Project site. The potential for *Atriplex* sp. *nov.* to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.7 Spiny Abrojo

Spiny abrojo (*Condalia globosa* var. *pubescens*) has a CRPR rank of 4.2, a NatureServe rank of G5T4/S3, and is covered under NECO. This species is a spiny deciduous shrub in the buckthorn family known from gravelly soils in low elevations of Sonoran desert scrub. It is considered fairly endangered in California, but is apparently secure because of larger established populations in Arizona and Mexico. There are 24 CNDDB occurrence records for this shrub in California, most of which are in the Chocolate Mountains and Chuckwalla Bench of Imperial and Riverside counties. Scattered individuals have been documented elsewhere. The closest record to the project site is in the Corn Springs area south of I-10.

The PSPP PA/FEIS (Section 3.18) asserted that spiny abrojo was not recorded in the PSPP disturbance area. Spiny abrojo was not found during the 2009 to 2013 surveys. The majority of the Project site occurs below the elevation where this species typically occurs. A solitary shrub in the Rhamnaceae family about 1.75m tall, in sparsely leafing condition, was found in spring of 2016 in an open flat area about 0.3 miles inside the western site boundary Project site. Close reconnaissance of the surrounding area produced no additional occurrences, implying that this individual was probably a waif. This plant was not in identifiable condition during surveys in May 2016; it had barely leafed-out and held no flowers or fruits required for identification. Vegetative characters alone are insufficient for a clear determination. It was likely *Ziziphus obtusifolia* var. *canescens*, a more common low desert shrub with no rarity status. During the 2017 surveys, one location of spiny abrojo, consisting of three individual plants, was recorded along the gen-tie line approximately 800 feet west of the Red Bluff Substation, south of the I-10. The southern terminus of the gen-tie occurs at a higher elevation than all other project components and the isolated record of spiny abrojo likely occurs near the lower elevation limits of the species. The presence of this record indicates that the potential for spiny abrojo to occur within the Project site, specifically within the southernmost limits of the gen-tie, has changed from the description in the PSPP PA/FEIS.

4.2.8 Desert Unicorn Plant

Desert unicorn plant (*Proboscidea althaeifolia*) has a CRPR of 4.3 and a NatureServe rank of G5/S3.3. Its status indicates that it has limited distribution, but is not very threatened in California. This is a low-growing, perennial species that occurs in sandy washes within Sonoran desert scrub habitats in San Bernardino, Imperial, Riverside, and San Diego counties of California. There are 13 records known from the NECO planning area in Milpitas Wash, Chuckwalla Valley, and Chemehuevi Valley (BLM CDD 2002). This species has been identified in the region of other solar projects (CEC 2010). It is a late-season bloomer (May to August) but it has large and distinctive seed pods that can be detected during the spring season and fleshy root structure that can remain dormant in dry years (BLM 2011). There are 86 records in the

Consortium of California Herbaria, several of which are from the Chuckwalla Mountains and Desert Center area (CCH 2016).

The PSPP PA/FEIS (Section 3.18) asserted that desert unicorn plant was not recorded in the PSPP disturbance area. This species was not observed during 2009, 2010 (including late-season), 2016, or 2017 field surveys. The potential for desert unicorn plant to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.9 Abram's Spurge

Abram's spurge (*Chamaesyce abramsiana*) [=Euphorbia abramsiana] has a CRPR of 2B.2 and a NatureServe rank of G4/S2. It is not covered under the draft DRECP. This species is fairly rare in California but more common elsewhere (CNPS 2016). Abram's spurge is a late-season, ephemeral annual that responds to summer monsoonal rains, typically blooms from September through November following precipitation (greater than 0.10 inch), but dries quickly and cannot be detected during routine spring surveys (CEC 2010). Typical habitat consists of silty swales and flats in creosote bush scrub habitat from approximately 600 to 2,700 feet above mean sea level. This summer annual occurs in halophytic (saline-alkaline) scrub flats, playas, and along inlets and floodplains of playas and always seems to prefer the lower floodplain ecotone but can also extend higher up in the floodplain drainages (Silverman, pers. comm.). There are 121 records in the Consortium of California Herbaria from San Bernardino County to Imperial and eastern San Diego counties to Arizona, Nevada, Mexico, and Baja California (CCH 2016).

The PSPP PA/FEIS (Section 3.18) asserted that Abram's spurge was not recorded in the PSPP disturbance area. This species was not observed during 2009, 2010 (including late-season), 2016, or 2017 field surveys. The potential for Abram's spurge to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.10 Glandular Ditaxis

Glandular ditaxis (*Ditaxis claryana*) has a CRPR of 2B.2 and a NatureServe rank of G3G4/S2. It is rare in California, but more common elsewhere. This plant species grows from sea level to approximately 1,400 feet above mean sea level in Mojavean and Sonoran desert scrub habitat, in the sandy soils of dry washes and rocky hillsides. Glandular ditaxis (an annual or short-lived perennial) blooms from October through March (CNPS 2016); while it can be detected during spring surveys, it is easier to detect in fall following the start of the rainy season (Silverman pers. comm.). There are 43 occurrences in the Consortium of California Herbaria (CCH 2016), the nearest from the Arica Mountains, about 28 miles from the project site. CNDDB lists 26 occurrence elements, two within the general vicinity of the project (Corn Springs and Sidewinder Well quads).

The PSPP PA/FEIS (Section 3.18) asserted that glandular ditaxis was not recorded in the PSPP disturbance area. This species was not observed during 2009, 2010 (including late-season), 2016, or 2017 field surveys. The potential for glandular ditaxis to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.11 Lobed Ground Cherry

Lobed ground cherry (*Physalis lobata*) has a CRPR of 2B.3 and a NatureServe rank of G5/S1S2. It is a late season perennial that blooms from September to January (CNPS 2016). This species occurs in Mojavean desert scrub on decomposed granite soils, playas, and alkaline dry lake beds. This species occurs from approximately 1,500 feet to 2,400 feet above mean sea level. There are 36 occurrences in the Consortium of California Herbaria (CCH 2016), all to the north in Mojavean habitat. The nearest collection is approximately 29 miles northwest of the project site.

The PSPP PA/FEIS (Section 3.18) asserted that lobed ground cherry was not recorded in the PSPP disturbance area. This species was not observed during 2009, 2010 (including late-season), 2016, or 2017 field surveys. The potential for lobed ground cherry to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.12 Jackass Clover

Jackass clover (*Wislizenia refracta* ssp. *refracta*) has a CRPR of 2B.2 and a NatureServe rank of G5T5/S1. It is rare in California, but more common elsewhere. This species occurs in desert dunes, Mojavean desert scrub, playas, or Sonoran desert scrub and is commonly associated with sandy washes, roadsides, or alkaline flats, of elevations from 425 to 2,630 feet (CNDDB 2016). There are 29 occurrences in the Consortium of California Herbaria (CCH 2016). Jackass clover was also documented at several locations from the northern to southern end of Palen Lake in dune habitats during a detailed vegetation mapping and classification project conducted by CNPS Vegetation Program for BLM (Evens & Hartman 2007). The populations of jackass clover at Palen Lake are considered to be unique stands and are included in this analysis as a sensitive natural community (PSPP PA/FEIS 2010).

The PSPP PA/FEIS (Section 3.18) asserted that jackass clover was not recorded in the PSPP disturbance area. Jackass clover was not observed during spring 2009 or 2010 botanical surveys, or during fall surveys completed in October 2010 (CEC 2010; AECOM 2010). A reference population was observed flowering in Twentynine Palms in October 2010, but this locality is 50 miles northwest of the Project site, with different habitat and climatic characteristics. The potential for jackass clover to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

4.2.13 Palmer's Jackass Clover

Palmer's jackass clover (*Wislizenia refracta* ssp. *palmeri*) has a CRPR of 2B.2 and a NatureServe rank of G5T2T4/S1. Its status indicates that global populations of *Wislizenia refracta* are secure, but ssp. *palmeri* varies from imperiled to secure based on location and is considered critically imperiled in California. Palmer's jackass clover is a perennial herb that occupies sandy washes, and Sonoran desert scrub habitat from sea level to 650 feet. There are 29 occurrences in the Consortium of California Herbaria (CCH 2016).

The PSPP PA/FEIS (Section 3.18) asserted that Palmer's jackass clover was not recorded in the PSPP disturbance area. Palmer's jackass clover was not observed during spring 2009 or 2010 botanical surveys, or during fall surveys completed in October 2010; although the reference population on the Palen Sand Dunes near the BLM Desert Lily Sanctuary was observed flowering in October 2010 (CEC 2010; AECOM 2010). This species was not observed during 2009, 2010 (including late-season), and 2016 field surveys. The potential for Palmer's jackass clover to occur within the Project site has not changed from the description in the PSPP PA/FEIS.

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APPENDIX A

Special Status Wildlife Species

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
REPTILES						
Agassiz's desert tortoise *Gopherus agassizii*	ST	FT	-	This species is widely distributed in the Mojave, Sonoran and Colorado deserts from below sea level to 2200 m (7220 ft) (Grover and DeFalco 1995). Most common in desert scrub, desert wash, and Joshua tree habitats, but occurs in almost every desert habitat except those on the most precipitous slopes. Desert tortoises occur in a wide variety of habitats in arid and semiarid regions. They require friable soil for burrow and nest construction. Highest densities are achieved in creosote bush communities with extensive annual wildflower blooms, such as occur in the western Mojave. However, tortoises can be found in areas of extensive lava formations, alkali flats and most other desert habitats.	Low to Moderate	Recent sign of desert tortoise was not detected (no live tortoises) within the proposed solar facility during 2016 surveys, where prior surveys detected only historical sign. The western extent of gen-tie likely supports occupied habitat based on the presence of recent, active sign in the vicinity.
Mojave fringe-toed lizard *Uma scoparia*	SSC	BLMS	-	It is restricted to fine, loose, wind-blown deposits in sand dunes, dry lakebeds, riverbanks, desert washes, sparse alkali scrub and desert shrub habitats. The CNDDB indicate 4 historic and 26 recent occurrences in Riverside County (CNDDB 2016).	High	Detected on site, with high potential to occur. There is suitable sand habitat with vegetative cover, which is typical of this species. Live individuals were observed on Project site, ranging from less dense in the mid-alluvial fan to denser in lower alluvial fan. Also present within the eastern extent of gen-tie.
AMPHIBIANS						
Couch's spadefoot toad *Scaphiopus couchii*	SSC	BLMS	-	This species frequents arid and semi-arid habitats of the southwest, occurring along desert washes, in desert riparian, palm oasis, desert succulent shrub, and desert scrub habitats. It is also found in cultivated cropland areas. It breeds in temporary pools within rocky streambeds, washes, at the edges of agricultural fields, in depressions adjacent to roads and railroad tracks, and cattle tanks. Pools of water need to persist for at least 7 to 8 days to facilitate eggs hatching and larvae fully transform. The CNDDB indicate 1 historic and 2 recent occurrences in Riverside County, all greater than 10 miles from the Project, near the Salton Sea and Colorado River (CNDDB 2016).	Low	Not expected to occur due to absence of essential breeding habitat and geographical distance from existing records. The Project site lacks potential for standing water. Washes onsite have high sand content and low silt and clay content, resulting in high percolation rates.

Species	Status State	Federal	WBWG	Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
MAMMALS						
Colorado Valley woodrat *Neotoma albigula venusta*	-	-	-	Variety of habitats including low desert, pinyon-juniper woodlands, and desert-transition chaparral. Suitable habitat elements for this species include washes where organic debris gathers, areas of prickly pear cactus and mesquite, rocky areas, and crevices in boulders which are used for cover and nest sites. The CNDDB indicate 7 historic and 1 recent occurrence in Riverside Co. The nearest CNDDB occurrence is a 2001 record near Corn Springs campground, located approximately 5.1 miles south of the project and another on Pilot Mountain (CNDDB 2016).	Low	Not detected on site, with low potential to occur. Project site does not support typical rocky wash habitat.
Burro deer *Odocoileus hemionus eremicus*	CPGS	-	-	Occur in early to intermediate successional stages of most forest, woodland, and brush habitats. Prefer a mosaic of various-aged vegetation that provides woody cover, meadow and shrubby openings, and free water.	High	Detected on site, with high potential to occur. There is suitable foraging habitat on site. Scat and tracks observed primarily within dry wash woodland.
Desert bighorn sheep *Ovis canadensis nelsoni*	CFP	BLMS	-	Habitats used include alpine dwarf-shrub, low sage, sagebrush, bitterbrush, pinyon-juniper, palm oasis, desert riparian, desert succulent shrub, desert scrub, subalpine conifer, perennial grassland, montane chaparral, and montane riparian (DeForge 1980, Monson and Sumner 1980, Wehausen 1980). Use rocky, steep terrain for escape and bedding. Remain near rugged terrain while feeding in open habitat. The CNDDB indicate 8 historical, and 0 recent record in Riverside Co. (CNDDB 2016).	Low	Not detected on site, with low potential to occur. Project site greater than 3 miles from suitable mountainous habitat. Project site provides low intact value.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Yuma mountain lion *Puma concolor browni*	SSC	-	-	In the NECO planning area, mountain lions primarily inhabit the low mountains and extensive wash systems in and around Chuckwalla Bench, Chuckwalla Mountains, Chocolate Mountains, Picacho Mountains, Milpitas Wash, Vinagre Wash, and other washes in that area. Mountain lions typically occur in habitat areas with extensive, well-developed riparian or shrubby vegetation interspersed with irregular terrain, rocky outcrops, and community edges. Mountain lions are restricted to the southern Colorado Desert from Joshua Tree National Park south and east to the Colorado River. Burro deer, the primary prey item, are known to spend the hot summer and fall in riparian areas along the Colorado River and in dense microphyll woodlands near the Coachella Canal.	Low to Moderate	Not detected on site, with low - moderate potential to occur. Project site provides suitable habitat and burrow deer (prey source) present on the Project site.
American badger *Taxidea taxus*	SSC	-	-	Suitable habitat for badgers is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils. The CNDDB indicate 13 historic and 4 recent occurrences in Riverside Co. (CNDDB 2016).	High	Detected on site, with high potential to occur. There is suitable foraging habitat, and burrowing habitat on site.
Desert kit fox *Vulpes macrotis arsipus*	CPF	-	-	Lives in annual grasslands or grassy open stages of vegetation dominated by scattered brush, shrubs, and scrub. Cover provided by dens they dig in open, level areas with loose-textured, sandy and loamy soils.	High	Detected on site, with high potential to occur. Active dens/complexes with sign observed.
BATS						
Pallid bat *Antrozous pallidus*	SSC	BLMS	H	Inhabit low elevation (less than 6,000 feet) rocky, arid deserts and canyonlands, shrub/steppe grasslands. Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees with exfoliating bark, and various human structures (WBWG, 2005). The CNDDB indicates there are 13 historical, and 2 recent records for this species in Riverside Co. The nearest CNDDB record is approximately 4.2 miles southeast of the project site (CNDDB 2016).	Foraging - Moderate Roosting - Low	Detected during Project acoustic sampling. Typical roosting habitat is not present within the Project site; however, roosting opportunities may exist outside the site in the Project vicinity.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Townsend's big-eared bat *Corynorhinus townsendii*	SSC	BLMS	H	This species has been reported in a wide variety of habitat types ranging from sea level to approximately 9,000 feet above MSL. Habitat associations include coniferous forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Foraging associations include edge habitats along streams, adjacent to and within a variety of wooded habitats. The CNDDB indicate there are 9 historical, and 4 recent records in Riverside Co. (CNDDB 2016).	Foraging - Moderate Roosting - Low	Not detected during Project acoustic surveys; however, this species is difficult to detect with acoustic surveys due to low intensity echolocation signals. Typical roosting habitat is not present within the Project site.
Big brown bat *Eptesicus fuscus*	-	-	L	This widespread and abundant species has been recorded in virtually every North American vegetation type. Common to abundant in most of its range, the big brown bat is uncommon in hot desert habitats, and is absent only from the highest alpine meadows and talus slopes. Vagrant individuals may be seen in any habitat. Uses buildings and other human-made structures for roosting to such an extent that natural roosting habits are under documented.	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Spotted bat *Euderma maculatum*	SSC	BLMS	H	Arid, low desert habitats to high elevation conifer forests and prominent rock features appear to be a necessary feature for roosting.	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Western mastiff bat *Eumops perotis*	SSC	BLMS	H	Variety of habitats, from desert scrub to chaparral to oak woodland and into the ponderosa pine belt and high elevation meadows of mixed conifer forests. The nearest CNDDB record is approximately 4.2 miles southwest of the Project site (CNDDB 2016).	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Hoary bat *Lasiurus cinereus*	-	-	M	Highly associated with forested habitats in the west. Hoary bat roosts usually are located at the edge of a clearing, although more unusual roosting sites have been reported in caves, beneath rock ledges, woodpecker holes, squirrel nests, building sides, and in dried palm fronds on palm trees. The CNDDB indicate 5 historic, and 0 recent occurrences in Riverside Co. The closest CNDDB record is a historical 1919 occurrence approximately 23.6 miles east of the project area in the town of Neighbors. (CNDDB 2016).	Foraging - Moderate Roosting - Low	Not confirmed during Project acoustic surveys; several call sequences were associated with either hoary or pocketed free-tailed bats but lacked features for confirmation of species. Typical roosting habitat is not present within the Project site.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Western yellow bat *Lasiurus xanthinus*	SSC	-	H	Recorded below 600 m (2000 ft) in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. This species occurs year-round in California. The CNDDB indicate 22 historic and 2 recent occurrences in Riverside Co. (CNDDB 2016).	Moderate	Detected during Project acoustic surveys at the artificial pond located near the date palm farm outside the northwestern boundary of the Project site. The Project site lacks typical foraging and roosting habitat; however, this species may be found on the Project site due to the proximity of the existing offsite date palm farm.
California leaf-nosed bat *Macrotus californicus*	SSC	BLMS	H	Deserts of California, southern Nevada, Arizona and south to northwestern Mexico. This species depends on either caves or mines for roosting habitat. All major maternity, mating, and overwintering sites are in mines or caves (BLM CDD, 2002). Radio-telemetry studies of *Macrotus* in the California desert show that the California leaf-nosed bat forage almost exclusively among desert wash vegetation within 10 km of their roost (WBWG, 2005). The CNDDB indicate 13 historic and 4 recent occurrences in Riverside Co. The nearest record is from 1993 near the McCoy Mountains area approximately 14.0 miles northwest of the project, in creosote bush scrub habitat where approximately 300 adults were observed roosting in 1993 and 100 were observed during in flight in 1997 (CNDDB 2016).	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
California myotis *Myotis californicus*	-	-	L	Optimal habitats for this species include all desert, chaparral, woodland, and forest from sea level up through ponderosa pine, mixed conifer, and Jeffrey pine.	Foraging - Moderate Roosting - Low	Detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Arizona myotis *Myotis occultus*	SSC	-	-	Commonly known from conifer forests from 6,000 to 9,000 feet in elevation, although maternity roosts are known from much lower elevations including areas along the Colorado River in California. The CNDDB indicate 2 historic and 0 recent occurrence in Riverside Co. The closest record is a historical occurrence from 1945 approximately ten miles south of the Study Area near the town of Ripley.	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Cave myotis *Myotis velifer*	SSC	BLMS	M	Found primarily at lower elevations (the Sonoran and Transition life zones) of the arid southwest in areas dominated by creosote bush, palo verde, and cactus. This species is a "cave dweller" and caves are the main roosts although this species may also use mines, buildings, and bridges for roosts. The CNDDB indicate 3 historic and 4 recent occurrences in Riverside Co. The nearest CNDDB record for this species is from 2002 near the I-15 bridge over the Colorado River in Blythe where individual bats of this species were detected acoustically during April 2002 (CNDDB 2016).	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Yuma myotis *Myotis yumanensis*	-	BLMS	LM	Associated with permanent sources of water, typically rivers and streams, feeding primarily on aquatic emergent insects, but Yuma myotis also use tinajas (small pools in bedrock) in the arid west. It occurs in a variety of habitats including riparian, arid scrublands and deserts, and forests. The species roosts in bridges, buildings, cliff crevices, caves, mines, and trees. The CNDDB indicate 0 historic and 5 recent occurrences in Riverside Co. The nearest CNDDB record is from 2002 near the Blythe bridge over the Colorado River where individual bats of this species were detected acoustically during April 2002 (CNDDB 2016).	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	-	M	Known to occur in the desert from March through August, when they then migrate out of the area. In California, they are found primarily in creosote bush and chaparral habitats in proximity to granite boulders, cliffs, or rocky canyons. The CNDDB indicate 7 historic and 2 recent occurrence in Riverside Co. The nearest CNDDB record for this species is from 2002 near the I-15 bridge over the Colorado River in Blythe. Individual bats of this species were detected acoustically during April 2002 (CNDDB 2016).	Low	Not detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Big free-tailed bat *Nyctinomops macrotis*	SSC	-	MH	Found generally sea level to 8,000 feet in elevation. This species occurs in desert shrub, woodlands, and coniferous forests. It roosts mostly in the crevices of rocks although big free-tailed bats may roost in buildings, caves, and tree cavities. The CNDDB indicate 2 historic and 0 recent occurrence in Riverside Co. The nearest occurrences for this species in Riverside County are from the vicinity of Palm Springs and Joshua Tree National Park (CNDDB 2016).	Foraging - Moderate Roosting - Low	Detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Canyon bat *Parastrellus hesperus*	-	-	L	The canyon bat (once known as the western pipistrelle) is a common to abundant resident of deserts, arid grasslands, and woodlands. Occupies all desert, brush, grassland, and woodland habitats up through mixed conifer forests. The most abundant bat in desert regions. Common in arid brushlands, grasslands, and woodlands, and uncommon in conifer forests. This species is a yearlong resident in California.	Foraging - Moderate Roosting - Low	Detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Mexican free-tailed bat *Tadarida brasiliensis*	-	-	L	Overall, this species is common in California and may be locally abundant. All habitats up through mixed conifer forests are used, but open habitats such as woodlands, shrublands, and grasslands are preferred.	Foraging - Moderate Roosting - Low	Detected during Project acoustic surveys. Typical roosting habitat is not present within the Project site.
Birds						
Golden eagle (Nesting and wintering) *Aquila chrysaetos*	CFP, WL	BCC, BLMS	-	Typically rolling foothills, mountain areas, sage-juniper flats, desert. Nests on cliffs of all heights and in large trees in open areas. Rugged, open habitats with canyons and escarpments used most frequently for nesting. The CNDDB indicates there are 10 historical, and 6 recent detections within Riverside County, all greater than 10 miles from the Project site (CNDDB 2016).	Nesting/Wintering – Absent Foraging - Low	Surveys conducted in 5 separate years from 2010 to 2015 indicated no active nests within 10 miles of the Project site. The nearest suitable nesting habitat is approximately 3 miles from the proposed solar facility in the Palen Mts. The site may provide suitable foraging habitat; however, surveys indicate relatively few golden eagle observations near the Project and prey sources are limited. Eight eagle flight paths were recorded during the fall 2013 BUC surveys; one additional eagle was spotted incidentally, but no flight path was recorded; one (3rd year) eagle observation over the site was recorded during the spring 2013 eagle nest surveys; no other eagle observations were recorded at the site.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Short-eared owl (Nesting) *Asio flammeus*	SSC	-	-	Year-round residents in Northern California and may be found in other portions of California during wintering. Require open country that supports small mammal populations, and that also provides adequate vegetation to provide cover for nests. This includes salt- and freshwater marshes, irrigated alfalfa or grain fields, and ungrazed grasslands and old pastures. The CNDDB contained no records within Riverside County (CNDDB 2016).	Low	Detected in Project vicinity during avian surveys (3 observations in fall 2013). The Project site is not located within the geographic range for nesting habitat for this species. Short-eared owl is likely an uncommon migrant within the Project vicinity during the non-breeding season.
Western burrowing owl *Athene cunicularia hypugaea*	SSC	BCC, BLMS	-	A yearlong resident of open, dry grassland and desert habitats. Uses rodent or other burrows for roosting and nesting cover. In the Colorado Desert, western burrowing owls generally occur at low densities in scattered populations (BLM 2013).	High	Detected on site during wildlife and avian surveys. Western burrowing owl is likely a resident, in relatively low densities, within the Project vicinity. The Project site supports suitable foraging and nesting habitat. Focused surveys and subsequent habitat assessments indicate approximately 4 burrowing owls may occupy the proposed solar facility footprint. Suitable habitat is also found along the gen-tie line.
Redhead (Nesting) *Aythya americana*	SSC	-	-	During breeding season may be found along the Colorado River and Salton Sea. Also breeds locally in the Central Valley, coastal Southern California, eastern Kern County, and the Salton Sea. Nests in fresh emergent wetland bordering open water. The CNDDB contained no records within Riverside County (CNDDB 2016).	Low	Detected in Project vicinity during avian surveys (total of 16 observations in fall 2013); however, the Project site does not support typical foraging or nesting habitat. Occurrences are expected to be of migrants only.
Ferruginous hawk (Wintering) *Buteo regalis*	WL	BCC	-	Most common in grassland and agricultural areas in the southwest. Ferruginous hawks are found in open terrain from grasslands to deserts, and are usually associated with concentrations of small mammals. There are 3 historical and 9 recent CNDDB records for this species in Riverside County, and the nearest CNDDB record was more than 90 miles west of the project area (CNDDB 2016).	Moderate	Detected in Project vicinity during avian surveys (11 observations in fall 2013 and 3 in spring 2015). The DRECP species distribution model indicates low probability of suitable habitat within the Project site. The Project site does not support typical nesting habitat, is outside its typical nesting geographic range, and prey sources are limited. The site is within the non-breeding (wintering) range of this species.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Swainson's hawk *Buteo swainsoni*	ST	BCC	-	Require large areas of open landscape for foraging, including grasslands and agricultural lands that provide low-growing vegetation for hunting and high rodent prey populations. Swainson's hawks typically nest in large native trees such as valley oak, cottonwood, walnut, and willow, and occasionally in nonnative trees, such as eucalyptus within riparian woodlands, roadside trees, trees along field borders, isolated trees, small groves, and on the edges of remnant oak woodlands. The CNDDB indicates there are 3 historical and 0 recent records for Riverside Co (CNDDB 2016).	Nesting - Low Migration - High	Regularly detected in groups during migration over the Project vicinity during avian surveys. The Project site is outside the current geographic range for nesting. The DRECP species distribution model indicates low probability of suitable habitat within the Project site.
Costa's hummingbird (Nesting) *Calypte costae*	-	BCC	-	Primary habitats are desert wash, edges of desert riparian and valley foothill riparian, coastal scrub, desert scrub, desert succulent shrub, lower-elevation chaparral, and palm oasis.	Moderate	Detected in the Project vicinity during avian surveys (total of 8 observations from 2013 to 2015). The Project site supports suitable foraging habitat and nesting habitat within desert scrub and microphyll woodlands.
Vaux's swift (Nesting) *Chaetura vauxi*	SSC	-	-	This species is not known to breed in Riverside County or elsewhere in Southern California. Vaux's swifts prefer to nest in the hollows formed naturally inside of large old conifer trees, especially snags, which are entirely lacking from the project site.	Nesting - Low Migration - High	Regularly detected during migration in the Project vicinity during avian surveys. The Project site is outside the current geographic range for nesting. Occurrences are expected to be of migrants only.
Mountain plover (Wintering) *Charadrius montanus*	SSC	BCC, BLMS	-	Mountain plover habitat includes short-grass prairie or their equivalents, and in southern California deserts are associated primarily with agricultural areas. The CNDDB indicate 1 historical, and 1 recent occurrence in Riverside Co (CNDDB 2016). The closest CNDDB (2016) record for this species is in Imperial County at the southern end of the Salton Sea.	Nesting - Low Migration - Moderate	Detected in the Project vicinity during avian surveys (6 observations in fall 2013). The Project site is outside the geographical range for nesting. This species may use the dry lakebed and nearby agricultural areas as winter habitat. The DRECP species distribution model indicates no suitable habitat within the Project site and depicts the agricultural land within Chuckwalla Valley as potential wintering habitat.
Black tern *Chlidonias niger*	SSC	-	-	Although restricted to freshwater habitats while breeding, can be fairly common on bays, salt ponds, river mouths, and pelagic waters in spring and fall migration (Grinnell and Miller 1944, Cogswell 1977).	Low	Detected in the Project vicinity during avian surveys (2 observations in fall 2013 and 1 in spring 2014). The Project site is outside the geographical range for nesting. Black tern is likely an uncommon migrant within the Project vicinity during the non-breeding season.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Northern harrier (Nesting) *Circus cyaneus*	SSC	-	-	This species does not commonly breed in desert regions of California, where suitable habitat is limited, but winters broadly throughout California in areas with suitable habitat. Northern harriers forage in open habitats including deserts, pasturelands, grasslands, and old fields. The CNDDB indicate there is 1 historical, and 2 recent occurrence for this species in Riverside Co (CNDDB 2016). .	Nesting - Low Wintering/Migration - High	Regularly detected in the Project vicinity during avian surveys. Project site is outside the geographical range for nesting. The Project site supports suitable foraging habitat during wintering and migration.
Gilded flicker *Colaptes chrysoides*	SE	BCC, BLMS	-	Stands of giant cactus, Joshua tree, and riparian groves of cottonwoods and tree willows in warm desert lowlands and foothills. This species nests primarily in cactus, but also will use cottonwoods and willows of riparian woodlands. This species may be nearly extinct in California. The CNDDB indicate 5 historical, and 1 recent record from 2012 in Riverside Co (CNDDB 2016). The closest CNDDB records for this species are along the Colorado River.	Low	Not detected in the Project vicinity during avian surveys. Previous records are in close proximity to the Colorado River. Project site does not support typical foraging or nesting habitat.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	SE	FT, BCC, BLMS	-	Breeds along the major river valleys in southern and western New Mexico, and central and southern Arizona. In California, the western yellow-billed cuckoo's breeding distribution is now thought to be restricted to isolated sites in the Sacramento, Amargosa, Kern, Santa Ana, and Colorado River valleys.	Low	Not detected in the Project vicinity during avian surveys. The closest suitable habitat for this species is along the Colorado River approximately 35 miles to the east of the Project. Project site does not support suitable breeding or wintering habitat.
Black swift (Nesting) *Cypseloides niger*	SSC	BCC	-	Nests in moist crevice or cave on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons. Forages widely over many habitats. The CNDDB indicate there are 7 historical, and 0 recent records in Riverside Co (CNDDB 2016).	Low	Detected in the Project vicinity during avian surveys. The Project site is outside the geographical range for nesting. Black swift is likely an uncommon migrant within the Project vicinity during the non-breeding season.
Willow flycatcher (Nesting) *Empidonax traillii*	SE	-	-	All subspecies are State-listed and one subspecies (*E . t. extimus)* is Federal-listed. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows (Serena 1982). Common spring (mid-May to early June) and fall (mid-August to early September) migrant at lower elevations, primarily in riparian habitats throughout the state exclusive of the North Coast. The CNDDB indicate there are 3 historical, and 6 recent records in Riverside Co. all greater than 10 miles from the Project site (CNDDB 2016).	Low	Detected in the Project vicinity during avian surveys (6 observations in fall 2013). The Project site does not support typical foraging or nesting habitat. Occurrences are expected to be of migrants only.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
California horned lark *Eremophila alpestris actia*	WL	-	-	A common to abundant resident in a variety of open habitats, usually where trees and large shrubs are absent. Found from grasslands along the coast and deserts near sea level to alpine dwarf-shrub habitat above treeline. In winter, flocks in desert lowlands and other areas augmented by winter visitants, many migrating from outside the state (Garrett and Dunn 1981). The CNDDB indicate there are 2 historical, and 17 recent records in Riverside Co. (CNDDB 2016).	High	Regularly detected in the Project vicinity during avian and wildlife surveys. The Project supports suitable foraging and nesting habitat for this species.
Prairie falcon (Nesting) *Falco mexicanus*	WL	BCC	-	Occurs in annual grasslands to alpine meadows, but associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. Typically nests cliffs and bluffs. The CNDDB indicates 30 historical occurrences in Riverside Co. (CNDDB 2016).	Nesting - Low Foraging - High	Regularly detected in the Project vicinity during avian surveys. The Project supports suitable foraging but lacks nesting habitat for this species. The DRECP species distribution model indicates low to moderate probability of suitable habitat within the Project site.
American peregrine falcon (Nesting) *Falco peregrinus anatum*	CFP	BCC	-	Rare in the arid southeast, but they occur and are suspected to breed in the lower Colorado River Valley. Peregrine falcons require open habitat for foraging, and prefer breeding sites near water. Nesting habitat includes cliffs, steep banks, dunes, mounds, and some human-made structures. There are no CNDDB records for Riverside County (CNDDB 2016).	Nesting - Low Foraging - Moderate	Detected in the Project vicinity during avian surveys (3 observations in fall 2013 and 2 in spring 2015). The Project supports suitable foraging but lacks nesting habitat for peregrine falcon.
Sandhill crane (Wintering) *Grus canadensis*	SSC	-	-	Breeds in open wetland habitats surrounded by shrubs or trees. They nest in marshes, bogs, wet meadows, prairies, burned-over aspen stands, and other moist habitats, preferring those with standing water. Outside of known wintering grounds, extremely rare except during migration over much of interior California.	Nesting - Low Migration - Moderate	Detected in the Project vicinity during avian surveys (6 groups of 57 observations in fall 2013); however, the Project site does not support typical foraging or nesting habitat. Occurrences are expected to be of migrants only.
Yellow-breasted chat (Nesting) *Icteria virens*	SSC	-	-	This species occupies shrubby riparian habitat with an open canopy, and will nest in non-native species, including tamarisk. The CNDDB indicate 7 historic, and 5 recent occurrences in Riverside Co., associated with the Salton Sea or the Colorado River (CNDDB 2016). The closest CNDDB records for this species are two 1986 records east of the project site at the Colorado River.	Low	Detected in the Project vicinity during avian surveys (1 observation in fall 2013). The Project site does not support typical foraging or nesting habitat. Occurrences are expected to be of migrants only.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Loggerhead shrike (Nesting) *Lanius ludovicianus*	SSC	BCC	.	Open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. The CNDDB indicate 2 historic, and 32 recent occurrences in Riverside Co. (CNDDB 2016).	High	Regularly detected on site during wildlife and avian surveys. The Project site supports suitable foraging and nesting habitat.
Gila woodpecker *Melanerpes uropygialis*	SE	BCC, BLMS	.	In California, this species is found primarily along the Colorado River and in small numbers in Imperial County. In southeastern California, Gila woodpeckers formerly were associated with desert washes extending up to 1 mile from the Colorado River; however, their range may be expanding. The CNDDB indicate 12 historic and 1 recent occurrence (2008) in Riverside County (CNDDB 2016). The closest CNDDB record for this species is a 1986 record approximately 30 miles east of the project site at the Colorado River (CNDDB 2016). Another individual was documented by the USFWS at the Rio Mesa project site near the Colorado River in 2012.	Low	Not detected on site during focused suitability surveys for Gila woodpecker or within numerous small bird count stations within microphyll woodland. One observation was recorded greater than 1 mile from the Project site during avian surveys (fall 2013). The Project site does not support typical foraging or nesting habitat.
Elf owl *Micrathene whitneyi*	SE	BCC, BLMS	.	A very rarely seen spring and summer resident of the Colorado River Valley. West of the Colorado River, there are records at the oases of Cottonwood Springs and Corn Springs over 6 miles from the Project site. Nests in desert riparian habitat with cottonwood, sycamore, willow or mesquite; absent from desert riparian habitat dominated by saltcedar. The CNDDB indicates 5 historic and 2 recent occurrence in Riverside County (CNDDB 2016).	Low	Not detected on site, or in the Project vicinity, during focused suitability surveys for elf owl or within numerous small bird count stations within microphyll woodland. The Project site does not support typical foraging or nesting habitat.
Long-billed curlew (Nesting) *Numenius americanus*	WL	BCC	.	Preferred breeding and winter habitats include large coastal estuaries, upland herbaceous areas, and croplands. On estuaries, feeding occurs mostly on intertidal mudflats.	Nesting - Low Migration - Moderate	Detected in the Project vicinity during avian surveys (15 observations from 2013 to 2015); however, the Project site does not support typical foraging or nesting habitat. Occurrences are expected to be of migrants only.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Lucy's warbler (Nesting) *Oreothlypis luciae*	SSC	BCC, BLMS	-	An uncommon to common, summer resident and breeder along the Colorado River, fairly common locally in a few other desert areas, and rare near Salton Sea. It occurs in desert wash and desert riparian habitats, especially those dominated by mesquite; also ranges into saltcedar and other thickets. May use abandoned verdin nests.	Moderate	Detected in the Project vicinity during avian surveys (2 observations in fall 2013). The Project site does not support typical nesting habitat (mesquite thickets), but the microphyll woodland may have a moderate potential to serve as nesting habitat.
American white pelican (Nesting colony) *Pelecanus erythrorhynchos*	SSC	-	-	Common spring and fall migrant at Salton Sea and Colorado River. Migrant flocks pass overhead almost any month, but mainly in spring and fall throughout the state, especially in southern California (Cogswell 1977, McCaskie et al. 1979, Garrett and Dunn 1981).	Nesting/Wintering – Low Migration - Moderate	Detected in the Project vicinity during avian surveys (42 observations from 2013 to 2015); however, the Project site does not support typical foraging, wintering, or nesting habitat. Occurrences are expected to be of migrants only.
Black-tailed gnatcatcher *Polioptila melanura*	WL	-	-	A year-round resident in southwestern United States and central and northern Mexico, in California the black-tailed gnatcatcher is found in the southeast desert wash habitat from Palm Springs and Joshua Tree National Park south, and along the Colorado River. It is now rare in eastern Mojave Desert north to the Amargosa River, Inyo County. This species nests primarily in wooded desert wash habitat, but also occurs in creosote scrub habitat during the non-breeding season. The CNDDB indicate 14 historic and 4 recent occurrences in Riverside County (CNDDB 20176).	High	Detected in the Project vicinity during avian surveys (174 observations from 2013 to 2015). The Project site supports suitable foraging and nesting habitat. Black-tailed gnatcatchers have beedn recorded nesting within the site, primarily associated with larger trees within microphyll woodlands.
Vesper sparrow *Pooecetes gramineus*	SSC	-	-	Fairly common locally in southern deserts in winter and during migration. Occupies grasslands, croplands, and open brushlands in winter.	Low	One observation was incidentally recorded in spring 2013 approximately 1,200 feet north of the Project site. The Project site does not support typical wintering or nesting habitat.
Purple martin *Progne subis*	SSC	-	-	The historical breeding range of the purple martin includes southern California, though populations have shrunk dramatically. Neither the historical or current breeding range, however, includes the Colorado Desert. Purple martins habitat requirements include adequate nest sites and availability of large aerial insects, and therefore are most abundant near wetlands and other water sources. The CNDDB indicate 6 historic and 0 recent occurrence in Riverside County (CNDDB 2016). .	Low	One observation was recorded in fall 2013. The Project site does not support typical wintering or nesting habitat. Occurrences are expected to be of migrants only.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Vermilion flycatcher (Nesting) *Pyrocephalus rubinus*	SSC	-	-	They are usually found near water in arid scrub, farmlands, parks, golf courses, desert, savanna, cultivated lands, and riparian woodlands; nesting substrate includes cottonwood, willow, and mesquite. The CNDDB indicate 7 historic and 0 recent occurrence in Riverside County (CNDDB 2016). The closest record includes a 1983 record from the Blythe golf course.	Low	Not detected on site during wildlife or avian surveys. The Project site does not support typical habitat for this species. Occurrences are expected to be of migrants only.
Ridgway's clapper rail *Rallus obsoletus yumanensis*	ST, CFP	FE	-	Formerly Yuma clapper rail, it occurs in inland areas in the southwestern United States. This subspecies is partially migratory, with many birds wintering in brackish marshes along the Gulf of California. Some remain on their breeding grounds throughout the year; for example, the Salton Sea (south) Christmas Bird Count frequently records this species in the fresh-water marshes in and around the Imperial Wildlife Area (Wister Unit). Nesting and foraging habitat occurs only along the Lower Colorado River (from Topock Marsh southward) and around the Salton Sea.	Low	Not detected on site during wildlife or avian surveys. There is no suitable foraging habitat, and no nesting habitat on site. Nearest records are associated with the Salton Sea and Colorado River, both approximately 35 miles from the Project site. A clapper rail was detected at the Desert Sunlight Solar Farm, approximately 10 miles northwest of the Project site.
Bank swallow (Nesting) *Riparia riparia*	ST	BLMS	-	A neotropical migrant found primarily in riparian and other lowland habitats in California west of the deserts during the spring-fall period. Uses holes dug in cliffs and river banks for cover. Will also roost on logs, shoreline vegetation, and telephone wires.	Nesting/Wintering – Low Migration - Moderate	Detected in the Project vicinity during avian surveys (52 observations from 2013 to 2015). The Project site is outside the geographical range for nesting. Bank swallow is likely a relatively common migrant within the Project vicinity during the non-breeding season.
Sonora Yellow warbler (Nesting) *Setophaga petechia*	SSC	BCC	-	In southeastern California, this species is known only from the lower Colorado River Valley from the middle of San Bernardino County through Riverside and Imperial Counties. This species commonly uses wet, deciduous thickets for breeding, and seeks a variety of wooded, scrubby habitats in winter. The CNDDB indicate 2 historic and 0 recent occurrence in Riverside County (CNDDB 2016). The closest extant CNDDB records for this species are two 1986 records 35 miles east of the project site at the Colorado River.	Nesting - Low Migration - Moderate	Detected in the Project vicinity during avian surveys (7 observations from 2013 to 2015). The Project site is outside the typical geographical range for nesting, which is primarily associated with the Colorado River. Occurrences are expected to be of migrants only.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Lawrence's goldfinch (Nesting) *Spinus lawrencei*	-	BCC	-	Highly erratic and localized in occurrence. Rather common along western edge of southern deserts. Breeds in open oak or other arid woodland and chaparral, near water. Typical habitats in southern California include desert riparian, palm oasis, pinyon-juniper, and lower montane habitats. The CNDDB indicate 0 historic and 2 recent occurrences in Riverside County, both greater than 10 miles from the Project site.	Low	One observation was recorded in fall 2013. The Project site does not support typical wintering or nesting habitat. Occurrences are expected to be of migrants only.
Bendire's thrasher *Toxostoma bendirei*	SSC	BCC, BLMS	-	Favors open grassland, shrubland, or woodland with scattered shrubs, primarily in areas that contain large cholla, Joshua tree, Spanish bayonet, Mojave yucca, palo verde, mesquite, catclaw, desert-thorn, or agave. The CNDDB indicate 14 historical, and 3 recent record in Riverside County, two records are located within 7 miles of the site near Desert Center (CNDDB 2016).	Low	Not detected on site during wildlife or avian surveys. The Project site does not support typical habitat for this species. Occurrences are expected to be of migrants only.
Crissal thrasher *Toxostoma crissale*	SSC	-	-	This species prefers habitats characterized by dense, low scrubby vegetation, which, at lower elevations, includes desert and foothill scrub and riparian brush. The CNDDB indicate 14 historic and 22 recent occurrences in Riverside County (CNDDB 2016). The closest occurrence based on the CNDDB is from 1977 and is approximately 14.2 miles south of the project site.	Low	One observation was recorded in fall 2013. The Project site does not support typical wintering or nesting habitat. Occurrences are expected to be of migrants only.
Le Conte's thrasher *Toxostoma lecontei*	SSC	-	-	Occurs primarily in open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats; also occurs in Joshua tree habitat with scattered shrubs. The CNDDB indicate 16 historic and 34 recent occurrences in Riverside County (CNDDB 2016).	High	Detected in the Project vicinity during avian surveys (57 observations from 2013 to 2015). The Project site supports suitable foraging and nesting habitat. Le Conte's thrashers have been recorded nesting within the site, primarily associated with larger trees within microphyll woodlands.

Species	Status			Habitat Requirements, Geographic Range, Regional Occurrence Records	Potential to Occur on Project Site	Comments
	State	Federal	WBWG			
Bell's vireo *Vireo bellii* Arizona bell's vireo *V. b. arizonae* least Bell's vireo *V. b. pusillus*	 SE SE	 BCC, BLMS FE	 - -	Subspecies *V. b. pusillus* (endemic to California and northern Baja California and state-listed and federal-listed) and subspecies *V. b. arizonae* are State-listed. Bell's vireo is now a rare, local, summer resident below about 600 m (2000 ft) in willows and other low, dense valley foothill riparian habitat and lower portions of canyons mostly in San Benito and Monterey cos.; in coastal southern California from Santa Barbara Co. south; and along the western edge of the deserts in desert riparian habitat. The CNDDB indicate 14 historic and 92 recent occurrences in Riverside County, all greater than 30 miles from the Project site (CNDDB 2016).	Low	One observation was recorded in fall 2013 during avian surveys. The Project site does not support typical wintering or nesting habitat. Occurrences are expected to be of migrants only.
Yellow-headed blackbird (Nesting) *Xanthocephalus xanthocephalus*	SSC	-	-	Nests in fresh emergent wetland with dense vegetation and deep water, often along borders of lakes or ponds. Forages in emergent wetland and moist, open areas, especially cropland and muddy shores of lacustrine habitat. Occurs as a migrant and local breeder in deserts. The CNDDB indicate 1 historic and 2 recent occurrences in Riverside County, over 30 miles from the Project site (CNDDB 2016).	Low	Detected in the Project vicinity during avian surveys (6 observations from 2013 to 2015). The Project site does not support typical wintering or nesting habitat. Occurrences are expected to be of migrants only.

APPENDIX B

Cumulative Wildlife Compendium

2009 to 2016

Common Name	*Scientific Name*
Avian	
American avocet	*Recurvirostra americana*
American coot	*Fulica americana*
American goldfinch	*Spinus tristis*
American kestrel	*Falco sparverius*
American pipit	*Anthus rubescens*
American white pelican	*Pelecanus erythrorhynchos*
American wigeon	*Anas americana*
Anna's hummingbird	*Calypte anna*
Ash-throated flycatcher	*Myiarchus cinerascens*
Audobon's cottontail	*Sylvilagus audubonii*
Bank swallow	*Riparia riparia*
Barn swallow	*Hirundo rustica*
Bell's sparrow	*Artemisiospiza belli*
Bell's vireo	*Vireo bellii*
Belted kingfisher	*Ceryle alcyon*
Bewick's wren	*Thryomanes bewickii*
Black phoebe	*Sayornis nigricans*
Black tern	*Chlidonias niger*
Black-bellied plover	*Pluvialis squatarola*
Black-capped gnatcatcher	*Polioptila nigriceps*
Black-chinned hummingbird	*Archilochus alexandri*
Black-headed grosbeak	*Pheucticus melanocephalus*
Black-necked stilt	*Himantopus mexicanus*
Black-tailed gnatcatcher	*Polioptila melanura*
Black-throated gray warbler	*Setophaga nigrescens*
Black-throated sparrow	*Amphispiza bilineata*
Blue grosbeak	*Guiraca caerulea*
Blue-gray gnatcatcher	*Polioptila caerulea*
Blue-winged teal	*Anas discors*
Bonaparte's gull	*Chroicocephalus philadelphia*
Brewer's sparrow	*Spizella breweri*
Brewer's blackbird	*Euphagus cyanocephalus*
Brown-headed cowbird	*Molothrus ater*
Bufflehead	*Bucephala albeola*
Bullock's oriole	*Icterus bullockii*
Burrowing owl	*Athene cunicularia*
Cactus wren	*Campylorhynchus brunneicapillus*
California gull	*Larus californicus*

Common Name	***Scientific Name***
California horned lark	*Eremophila alpestris*
California quail	*Callipepla californica*
Canvasback	*Aythya valisineria*
Cassin's Finch	*Haemorhous cassinii*
Cassin's kingbird	*Tyrannus vociferans*
Cassin's vireo	*Vireo cassinii*
Cattle egret	*Bubulcus ibis*
Chipping sparrow	*Spizella passerina*
Cinnamon teal	*Anas cyanoptera*
Clark's grebe	*Aechmophorus clarkii*
Cliff swallow	*Petrocheliodon pyrrhonota*
Common goldeneye	*Bucephala clangula*
Common Raven	*Corvus corax*
Common yellowthroat	*Geothlypis trichas*
Cooper's hawk	*Accipiter cooperii*
Costa's Hummingbird	*Calypte costae*
Crissal thrasher	*Toxostoma crissale*
Dark-eyed junco	*Junco hyemalis*
Double-crested cormorant	*Phalacrocorax auritus*
Dunlin	*Calidris alpina*
Eared grebe	*Podiceps nigricollis*
Eurasian collared-dove	*Streptopelia decaocto*
European starling	*Sturnus vulgaris*
Ferruginous hawk	*Buteo regalis*
Forster's tern	*Sterna forsteri*
Gadwall	*Anas strepera*
Gambel’s quail	*Callipepla gambelii*
Gila woodpecker	*Melanerpes uropygialis*
Golden eagle	*Aquila chrysaetos*
Gray flycatcher	*Empidonax wrightii*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Greater roadrunner	*Geococcyx californianus*
Greater scaup	*Aythya marila*
Greater yellowlegs	*Tringa melanoleuca*
Great-tailed grackle	*Quiscalus mexicanus*
Green heron	*Butorides virescens*
Green-winged teal	*Anas crecca*
Hammond's flycatcher	*Empidonax hammondii*
Hermit thrush	*Catharus guttatus*

Common Name	***Scientific Name***
Hermit warbler	*Dendroica occidentalis*
Herring gull	*Larus argentatus*
Hooded merganser	*Lophodytes cucullatus*
Hooded oriole	*Icterus cucullatus*
Horned lark	*Eremophila alpestris*
House finch	*Haemorhous mexicanus*
House sparrow	*Passer domesticus*
House wren	*Troglodytes aedon*
Killdeer	*Charadrius vociferus*
Ladder-backed woodpecker	*Picoides scalaris*
Lark sparrow	*Chondestes grammacus*
Laughing gull	*Leucophaeus atricilla*
Lawrence's goldfinch	*Spinus lawrencei*
Lazuli bunting	*Passerina amoena*
Le Conte’s thrasher	*Toxostoma lecontei*
Least sandpiper	*Calidris minutilla*
Lesser goldfinch	*Spinus psaltria*
Lesser nighthawk	*Chordeiles acutipennis*
Lesser scaup	*Aythya affinis*
Lesser yellowlegs	*Tringa flavipes*
Lincoln's sparrow	*Melospiza lincolnii*
Little gull	*Hydrocoloeus minutus*
Loggerhead shrike	*Lanius ludovicianus*
Long-billed curlew	*Numenius americanus*
Long-billed dowitcher	*Limnodromus scholopaceus*
Long-eared owl	*Asio otus*
Long-tailed duck	*Clangula hyemalis*
Lucy's warbler	*Oreothlypis luciae*
MacGillivray's warbler	*Geothlypis tolmiei*
Mallard	*Anas platyrhynchos*
Marbled godwit	*Limosa fedoa*
Merlin	*Falco columbarius*
Mew gull	*Larus canus*
Mexican duck	*Anas diuzi*
Mountain plover	*Charadrius montanus*
Mourning dove	*Zenaida macroura*
Mule deer	*Odocoileus hemionus*
Nashville warbler	*Oreothlypis ruficapilla*
Northern flicker	*Colaptes auratus*
Northern harrier	*Circus cyaneus*

Common Name	***Scientific Name***
Northern mockingbird	*Mimus polyglottos*
Northern pintail	*Anas acuta*
Northern roughwinged swallow	*Stelgidopteryx serripennis*
Northern shoveler	*Anas clypeata*
Northern waterthrush	*Parkesia noveboracensis*
Olive-sided flycatcher	*Contopus cooperi*
Orange-crowned warbler	*Oreothlypis celata*
Osprey	*Pandion haliaetus*
Pacific-slope flycatcher	*Empidonax difficilis*
Painted bunting	*Passerina ciris*
Pectoral sandpiper	*Calidris melanotos*
Peregrine falcon	*Falco peregrinus*
Phainopepla	*Phainopepla nitens*
Pied-billed grebe	*Podilymbus podiceps*
Pine siskin	*Spinus pinus*
Prairie falcon	*Falco mexicanus*
Purple martin	*Progne subis*
Raven	*Corvus corax*
Red tailed hawk	*Buteo jamaicensis*
Red-breasted merganser	*Mergus serrator*
Redhead	*Aythya americana*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-billed gull	*Larus delawarensis*
Ring-necked duck	*Aythya collaris*
Rock wren	*Salpinctes obsoletus*
Rose-breasted grosbeak	*Pheucticus ludovicianus*
Ross' goose	*Chen rossii*
Ruby-crowned kinglet	*Regulus calendula*
Ruddy duck	*Oxyura jamaicensis*
Rufous hummingbird	*Selasphorus rufus*
Sage thrasher	*Oreoscoptes montanus*
Savannah sparrow	*Passerculus sandwichensis*
Say's phoebe	*Sayornis saya*
Semipalmated plover	*Charadrius semipalmatus*
Semipalmated sandpiper	*Calidris pusilla*
Sharp-shinned hawk	*Accipiter striatus*
Short-billed dowitcher	*Limnodromus griseus*
Short-eared owl	*Asio flammeus*

Common Name	***Scientific Name***
Snow goose	*Chen caerulescens*
Snowy egret	*Egretta thula*
Snowy plover	*Charadrius nivosus*
Solitary sandpiper	*Tringa solitaria*
Song sparrow	*Melospiza melodia*
Spotted sandpiper	*Actitis macularius*
Swainson’s hawk	*Buteo swainsoni*[2]
Swainson's thrush	*Catharus ustulatus*
Swamp sparrow	*Melospiza georgiana*
Townsend's warbler	*Setophaga townsendi*
Tree swallow	*Tachycineta bicolor*
Turkey vulture	*Cathartes aura*
Vaux's swift	*Chaetura vauxi*
Verdin	*Auriparus flaviceps*
Violet green swallow	*Tachycineta thalassina*
Warbling vireo	*Vireo gilvus*
Western grebe	*Aechmophorus occidentalis*
Western kingbird	*Tyrannus verticalis*
Western meadowlark	*Sturnella neglecta*
Western sandpiper	*Calidris mauri*
Western tanager	*Piranga ludoviciana*
Western wood-pewee	*Contopus sordidulus*
Whimbrel	*Numenius phaeopus*
White-crowned sparrow	*Zonotrichia leucophrys*
White-faced Ibis	*Plegadis chihi*
White-tailed kite	*Elanus leucurus*
White-throated swift	*Aeronautes saxatalis*
White-winged dove	*Zenaida asiatica*
Willet	*Tringa semipalmata*
Willow flycatcher	*Empidonax traillii*
Wilson’s warbler	*Wilsonia pusilla*
Wilson's phalarope	*Phalaropus tricolor*
Wilson's snipe	*Gallinago delicata*
Wilson's warbler	*Cardellina pusilla*
Yellow rumped warbler	*Setophaga coronata*
Yellow warbler	*Dendroica petechia*
Yellow-breasted chat	*Icteria virens*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Yellow-rumped warbler	*Dendroica coronata*
Zone-tailed hawk	*Buteo albonotatus*

Common Name	*Scientific Name*
Invertebrate	
Ant lion	*Myrmeleontidae sp.*
Black harvester ant	*Messor pergandei*
California harvester ant	*Pogonomyrmex californicus*
Checkered white	*Pontia protodice*
Dainty sulphur	*Nathalis iole*
Darkling beetle	*Eleodes sp.*
Desert ironclad beetle	*Asbolus verrucosus*
Desert leafcutter ant	*Acromyrmex versicolor*
Forelius ant	*Forelius sp.*
Formica ant	*Formica sp.*
Giant sand treader cricket	*Macrobaenetes sp.*
Green lacewing	*Chrysopa sp.*
Honey bee	*Apis mellifera*
Marine blue butterfly	*Leptotes marina*
Painted lady	*Vanessa cardui*
Palo verde beetle	*Derobrachus geminatus*
Pigmy blue	*Brephidium exilis*
Red harvester ant	*Pogonomyrmex sp.*
Tarantula hawk	*Pepsis chrysothemis*
Thread-waisted wasp	*Ammophila sp.*
Velvet ant	*Dasymutilla sp.*
Virginia lady	*Vanessa virginiensis*
White-lined sphinx moth	*Hyles lineata*
Wind scorpion	*Solifugae sp.*
Mammal	
American badger	*Taxidea taxus*
Antelope ground squirrel	*Ammospermophilus leucurcus*
Big free-tailed bat	*Nyctinomops macrotis*
Black-tailed jackrabbit	*Lepus californica*
Bobcat	*Lynx rufus*
Burro deer	*Odocoileus hemionus*
California myotis	*Myotis californicus*
Canyon bat	*Parastrellus hesperus*
Coyote	*Canis latrans*
Desert kangaroo rat	*Dipodomys deserti*
Desert kit fox	*Vulpes macrotis*
Domestic dog	*Canis familiaris*
Merriam's kangaroo rat	*Dipodomys merriami*
Mexican free-tailed bat	*Tadarida brasiliensis*

Common Name	***Scientific Name***
Pallid bat	*Antrozous pallidus*
Pocket mouse species	*Perognathus longimembris*
Pocket mouse species	*Chaetodipus sp.*
Round tailed ground squirrel	*Xerospermophilus tereticaudus*
Western mastiff bat	*Eumops perotis*
Western yellow bat	*Lasiurus xanthinus*
Western yellow bat	*Lasiurus xanthinus*
Reptile	
Desert horned lizard	*Phrynosoma platyrhinos*
Desert iguana	*Dipsosaurus dorsalis*
Desert spiny lizard	*Sceloporus magister*
Desert tortoise	*Gopherus agassizii*
Glossy snake	*Arizona elegans*
Long-nosed leopard lizard	*Gambelia wislizenii*
Long-tailed brush lizard	*Urosaurus graciosus*
Mojave fringe toed lizard	*Uma scoparia*
Ornate tree lizard	*Urosaurus ornatus*
Patch-nosed snake	*Salvadora hexalepis*
Side blotched lizard	*Uta stansburyana*
Sidewinder	*Crotalus cerastes*
Western banded gecko	*Coleonyx variegates*
Western shovel-nosed snake	*Chionactis occipitalis*
Western whiptail lizard	*Aspidoscelis tigris*
Zebra tail lizard	*Callisaurus draconoides*

APPENDIX C

Special Status Plant Species

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Angel trumpets	*Acleisanthes longiflora*	This species occurs in Sonoran desert scrub on carbonate soils from approximately 200 to 300 feet above MSL. There is only 1 CNDDB element occurrence from the Palo Verde area, approximately 35 miles east of the project (CNPS 2016). There are 5 records from the Consortium of California Herbaria from the Colorado Desert, the closest two are likewise from the Palo Verde area (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. The elevation range of the project site is appropriate for this species, but the BRSA does not support carbonate/limestone derived soils.
Argus (=Darlington's) blazing star	*Mentzelia puberula*	This species occurs in desert scrub and desert woodlands with limestone and granitic slopes above 2,000 feet in elevation, with 11 CNDDB occurrences (CNPS 2016). Based on 49 Consortium of California Herbaria database records, this species has been collected from Riverside, San Bernardino, and Imperial Counties, the nearest record from the Coxcomb Mountains northwest of the project site (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species is not expected to occur in the BRSA due to lack of limestone and granitic slopes, which are soil types and terrain preferred by this species. The project site is located at approximately 130 to 200 feet above MSL, which is well below the typical elevation where this species typically occurs.
Arizona spurge	*Euphorbia (Chamaesyce) arizonica*	This species occupies sandy areas in Sonoran desert scrub and has been reported from Imperial, Riverside, and San Diego Counties and portions of Arizona and Baja California (CNPS 2016) from approximately 150 feet to 1,200 feet above MSL. There are 12 database records from the Consortium of California Herbaria primarily from San Diego County but also from Riverside County often from sandy areas and transition areas between chaparral and desert habitats. The closest record is from the Salton sea, approximately 34 miles southwest of the project (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species has a low potential to occur within Sonoran creosote bush scrub habitats and sandy area within the project area.
Flat-seeded spurge	*Euphorbia (Chamaesyce) platysperma*	This species occurs in desert dunes and Sonoran desert scrub habitat types, in sandy places or shifting dunes, at elevations from approximately 200 to 300 feet. This ephemeral summer annual blooms February through September (CNPS 2016). There are 4 records in the Consortium of California Herbaria from San Bernardino County to Imperial and eastern San Diego counties to Arizona, Nevada, Mexico, and Baja California (CCH 2016), all of them "historical" (i.e., pre-1964). There are five CNDDB and Consortium of California Herbaria records of this species for the entire state of California, only one of which is from Riverside County; the closest occurrences are approximately 50 miles away. Of the total five occurrences in California, one of these are protected under State Park ownership and three are historical records and none of these occurrences have documented threats (CEC 2010).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Although there are no documented nearby occurrences, the Project site occurs within its range, suitable habitat is present, and as an ephemeral summer annual it may be under-surveyed (LaDoux pers. comm.). Potential of occurrence on the project site and gen-tie remains low, but recommendation is to resurvey in fall 2016 after sufficient summer monsoonal rainfall, emphasizing sandy habitats.

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Bitter hymenoxys	*Hymenoxys odorata*	Bitter hymenoxys grows in riparian scrub and Sonoran desert scrub from 150 feet to 500 feet above MSL. This species blooms from February through November (CNPS 2016). Based on 37 records from the Consortium of California Herbaria, this species has been collected from Riverside, San Bernardino, and Imperial Counties. Riverside records are from the Palo Verde Valley, and from locales surrounding Blythe (CCH 2016). There are six CNDDB records for this species for the entire State of California, two of which occur in Riverside County; the nearest CNDDB occurrence is a historical record approximately 28.7 miles southeast of the Project Area from sandy slope, low bottom lands and overflow flats (CNPS 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species prefers mesic situations near seasonal watercourses, but has a low potential to occur within desert dry wash woodland, unvegetated washes, and Sonoran creosote bush scrub habitats within the project area.
California ayenia	*Ayenia compacta*	This species occurs in Mojavean and Sonoran desert scrub from approximately 500 to 3,300 feet above MSL. This species blooms from March through April. There are 123 records from the Consortium of California Herbaria database, the closest being about 7 miles distant (CCH 2016). The nearest CNDDB occurrence is a historical record from 1976 approximately 7.4 miles southwest of the project area in the Chuckwalla Mountains (CNPS 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species has a low potential to occur within Sonoran creosote bush scrub and desert wash habitats within the project area, but prefers higher elevations and rockier terrain.
California satintail	*Imperata brevifolia*	This species occurs in grassy areas found near chaparral, desert scrub, riparian scrubs, coastal scrub, wet springs, meadows, stream sides and floodplains from sea level to approximately 1,500 feet above MSL. The nearest CNDDB occurrence is from agriculture fields near Blythe (CNPS 2016). There are 107 records from the Consortium of California Herbaria database scattered across California in many different habitats. Records from Riverside County are from the Palm Springs, San Jacinto Mountains, and San Bernardino Mountains area along irrigation ditches or streams (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. California satintail has a low potential to occur within the PSEGS BRSA due to the lack of suitable habitat (mesic situations).

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Chaparral sand verbena	*Abronia villosa var. aurita*	This species occupies sandy soil areas of chaparral, coastal sage scrub, and sandy desert dunes (CNPS 2016) from approximately 240 feet to approximately 4,800 feet above MSL. The nearest CNDDB occurrence is located approximately 5.4 miles north of the project, where approximately 100 plants were observed in 2012 in stabilized sand dune habitat (CNPS 2016). There are 226 records in the Consortium of California Herbaria database, many of which are from Riverside County in the San Jacinto Mountains area. Most of these specimens were collected from the north Palm Springs Mecca Hills and Temescal Canyon Road areas, with one collection from the Palen sand dunes (CCH 2016). The 2012 Palen sand dunes specimen collection is likely the 2012 CNDDB occurrence record.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Although this species was documented nearby, and suitable habitat exists onsite, only the more common *Abronia villosa* var. *villosa* was seen.
Coachella Valley milkvetch	*Astragalus lentiginosus var. coachellae*	The Coachella Valley Multiple Species Habitat Conservation Plan states that this species occurs on "dunes and sandy flats, along the disturbed margins of sandy washes, and in sandy soils along roadsides and in areas formerly occupied by undisturbed sand dunes. Within the sand dunes and sand fields, this milkvetch tends to occur in the coarser sands at the margins of dunes, not in the most active blows and areas. As this species is strongly affiliated with sandy substrates, it may occur in localized pockets where sand has been deposited by wind or by active washes. It may also occur in sandy substrates in creosote bush scrub, not directly associated with sand dune habitat (BLM 2011, p. 3.18-24). This plant species blooms from February to May, producing pink to deep magenta-colored flowers. This species occurs on aeolian deposits with fewer than 25 occurrences in the Coachella Valley. Coachella Valley milkvetch depends on natural disturbances from fluvial and aeolian processes for seedling establishment (BLM 2002).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. The distribution of Coachella Valley milkvetch is restricted to the Coachella Valley in Riverside County, between Cabazon and Indio. CVAG identifies six outlying occurrences within a 5-mile area along Rice Road in the Chuckwalla Valley north of Desert Center, California (BLM 2011, p. 3.18-24); however, USFWS staff has indicated that these occurrences are not of the listed taxon (BLM, 2011).
Cove's cassia	*Senna covesii*	This species occurs on dry, sandy desert washes and slopes of the Sonoran Desert between 1,600 to 2,000 feet above MSL (CNPS 2016). The CNDDB has several records in Riverside County southwest of the project area, with the nearest occurrence recorded in 2011 approximately 5.0 miles south of the project in the Chuckwalla Mountains. California herbaria document 87 occurrences, the nearest from Corn Springs, about 5 miles southwest of the project (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Cove's cassia has a low potential to occur within the PSEGS BRSA due to the lack of suitable habitat and the project site being located below the typical elevation range where this species is known from.

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Crucifixion thorn	*Castela emoryi*	This species occurs in Sonoran Desert and Mojavean Desert in scrub and playas with dry, gravelly washes, slopes, and plains from approximately 300 to 2,100 feet above MSL. There are 125 records in the Consortium of California Herbaria database, with the nearest occurrence 4.5 mile west of the project site (CCH 2016). The CNDDB contains 50 records for the species, many in Riverside County west of the project area and some scattered northeast and southeast of the project (CNPS 2016); the nearest CNDDB occurrence was recorded in 2011 and is located 0.8 mile north of the project's gen-tie corridor.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Although there is appropriate habitat in the study area, and potential for a waif or two, *Castela* is a well-marked perennial plant, and would be difficult to miss during surveys.
Desert portulaca	*Portulaca halimoides*	This species occurs in Joshua tree woodlands and has been reported from Riverside, San Bernardino, and portions of Arizona and Baja, California from 3,000 feet to 3,600 feet above MSL). There are 13 CNDDB records for this species, all far to the north (CNPS 2016). There are 71 records in the Consortium of California Herbaria database (CCH 2016), the nearest being about 54 miles northwest of the site in Joshua Tree National Park.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. It is not expected to occur within the project site due to lack of typical habitat associations and the project site being located well below the elevation range.
Desert sand parsley	*Ammoselinum giganteum*	This species occupies Sonoran creosote bush scrub and has been reported from Riverside County, California and portions of Arizona (CNPS 2016) at approximately 1,200 feet elevation. There is only one CNDDB record for the species in California (CNPS, 2016), and 2 very old historic records from the Consortium of California Herbaria database from the Hayfields area of western Chuckwalla Valley at 500 feet above MSL (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Desert sand parsley has not been collected in California since 1928, and has a low potential to occur within the PSEGS BRSA due to the lack of suitable habitat on the project site.

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Desert spike moss	*Selaginella eremophila*	This is a dense, mat forming, non-flowering plant. This species occurs in Sonoran creosote bush scrub in gravelly or rocky soils from approximately 600 to 2,700 feet above MSL. There are 40 records in the CNDDB, with 2 from Riverside County south and southwest of the project area from 1922 and 1964; the nearest occurrence is the 1922 record located approximately 4.2 miles south of the project (CNPS 2016), There are 115 records in the Consortium of California Herbaria database from mostly Riverside and San Diego Counties with several records from Anza-Borrego Desert State Park, Palm Springs, Palm Canyon, and San Jacinto Mountain Range. One collection from Riverside County is from the vicinity of the Chocolate-Chuckwalla Mountain region near the north side of the Orocopia Mountains from sloped rocky, shady surfaces in gravelly soils (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species has a low potential to occur within the PSEGS BRSA due to the lack of shaded rocky habitat, and the low elevation of the project site.
Dwarf germander	*Teucrium cubense ssp. depressum*	This species occurs in desert dune, playa margins, and Sonoran desert scrub from approximately 100 feet to 1,200 feet above MSL. This species typically blooms from March to May but may also bloom from September through November. This species typically occurs in sandy soils and wash habitats and is known from fewer than 10 occurrences in California (CNPS 2016). There are 16 records from Consortium of California Herbaria database from Riverside and Imperial Counties (CCH 2016); there are records from the Chuckwalla Valley in the Hayfield area and Palo Verde Valley. There is a 1979 CNDDB record from Wiley's Well Road (400 feet elevation) (CNDDB 2016) approximately 16.5 miles southeast of the project; the nearest CNDDB occurrence is a CDFW, 2001 record from subsaline flat habitat along the Colorado River aqueduct, located approximately 15.6 miles southwest of the project (CNDDB 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. The BRSA site offers marginally appropriate habitat for this species, but dry sandy site conditions reduce the probability of occurrence.

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Foxtail cactus	*Coryphantha alversonii*	This species occurs on rocky, granitic soils in Sonoran and Mojavean desert scrub from 200 feet to 4,600 feet above MSL. Prior to conducting spring 2009 field surveys, a reference population was observed on April 9, 2009 at a gravel pit northwest of Blythe along State Route 95 and several individuals were observed in relatively undisturbed Sonoran creosote bush scrub on granitic rock, a preferred habitat type of this species (CNPS 2016). There are 47 records of this species from the Consortium of California Herbaria database mostly from Riverside and San Bernardino Counties, including from the Chuckwalla Valley west of Desert Center (CCH 2016). The CNDDB contains 55 records for the species, most of them from Riverside County (CNDDB 2016). The nearest occurrence was documented in 1982, located 1.3 miles west of the project's gen-tie corridor along Interstate 10 (CNDDB 2016).	**LOW**. Although well-marked in its habit and vestiture, this species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Foxtail cactus has a low potential to occur within the PSEGS BRSA due to the lack of rocky desert scrub habitat.
Las Animas colubrina	*Colubrina californica*	Las Animas colubrina is an evergreen to semi-evergreen shrub that occurs in rocky Mojavean and Sonoran desert scrub (creosote bush series) and occurs at elevations from approximately 30 to 3,000 feet (CNPS 2106). It primarily occurs in dry canyons or headwater reaches of desert washes with gravelly, sandy soils. The distribution of this species includes San Diego, Imperial, and Riverside counties; portions of Arizona; Baja California; and Sonora, Mexico. This species has been reported from isolated desert locales in Joshua Tree National Monument, the Eagle Mountains, and Chuckwalla Mountains (BLM 2011). Las Animas colubrina has been identified in the Project region during surveys performed for other solar projects (BLM 2011). There are 75 records of this species in the Consortium of California Herbaria database including eleven historical records from between 1930 and 1966, four recent records found in the Colorado Desert (including several occurrences in the mountains and foothills surrounding Chuckwalla Valley (CCH 2016).	**LOW**. Colubrina was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys, and has a low potential to occur due to the absence of appropriate rocky wash margin and hillside habitat on the Project site.
Mesquite nest straw	*Stylocline sonorensis*	This species is presumed extirpated in California (CNPS 2016). It previously occupied Sonoran desert scrub around 1,300 feet elevation and has been reported from Riverside County and portions of Arizona and Sonora, Mexico. There are 2 CNDDB records from Hayfields in western Chuckwalla valley, but these are presumed extirpated (CNPS 2016). These correspond to the 2 records from the Consortium of California Herbaria database from 1930 (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Mesquite nest straw has not been seen in California since 1930, and has a low potential to occur within the PSEGS BRSA .

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Orocopia sage	*Salvia greatae*	This species occurs in the southeastern Sonoran Desert and is associated with the Orocopia and Chocolate Mountains on alluvial slopes between 100 and 800 feet above MSL. There are 79 records from the Consortium of California Herbaria database, mostly from the Chocolate, Chuckwalla, and Orocopia mountain areas (CCH 2016). There are 25 records in the CNDDB, many from southwestern Riverside County (CNDDB 2016); the nearest documented occurrence is located approximately 21.8 miles southwest of the project.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Although the project site has marginally appropriate habitat and elevation range, this well-marked species has a low potential of occurrence, because its distribution is restricted to areas south of the Chuckwalla mountains.
Pink fairyduster	*Calliandra eriophylla*	This species occurs in the Sonoran Desert in sandy washes, slopes and mesas from 350 to 5,000 feet above MSL. There are 116 records from the Consortium of California Herbaria database, several from the Chocolate-Chuckwalla Mountains area in Imperial and San Diego Counties (CCH 2016). There are 50 records in the CNDDB, mostly from other counties; however, the nearest documented Riverside County occurrence is a 1964 record along Interstate 10 approximately 6.3 miles east of the project (CNPS 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Marginally appropriate habitat and elevation range exists on the site for this well-marked species, but the aridity of the site and paucity of collections in the Chuckwalla valley render its potential of occurrence at low.
Pink velvet mallow	*Horsfordia alata*	This species occurs in the Sonoran Desert in California, Arizona, and Mexico. It occurs in rocky Sonoran desert scrub from approximately 300 to 1,500 feet above MSL. There are no CNDDB records for this species for the entire state of California (CNDDB, 2016). The Consortium of California Herbaria database contains 29 records from Riverside, Imperial, and San Diego Counties (CCH 2016). The nearest collection is from Palm Desert, 60 miles west of the project.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Rocky scrub habitat does not exist on site, and there have been no historical collections in the Chuckwalla valley.
Sand evening-primrose	*Camissonia arenaria*	This species occupies sandy and gravelly areas of Sonoran desert scrub and has been reported from Imperial and Riverside Counties and areas of Arizona and Mexico from 200 feet to 2,700 feet above MSL (CNPS 2016). There are 31 records of this species in the Consortium of California Herbaria database, several from the Chocolate-Chuckwalla Mountains, Palo Verde Valley, and Ogilby Pass area (CCH 2016). There are 16 CNDDB records for this species (CNPS 2016), the closest in the Chuckwalla bench area 15 miles south from the project.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Although marginal habitat and elevation exist on the site, this species has a low potential to occur because it is out of range, and has never been recorded in the Chuckwalla valley

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Slender woolly-heads	*Nemacaulis denudata var. gracilis*	This species occupies desert sand dunes, coastal dunes, and Sonoran desert scrub (CNPS 2016) from 150 to 1,200 feet above MSL. There are 99 records in the Consortium of California Herbaria database, the closest approximately 30 miles northeast of the project in the Arica mountains (CCH 2016). There are 24 records in the CNDDB, with a few in western Riverside County (CNPS 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. Slender woolly-heads has never been documented in the Chuckwalla valley, and has a low potential to occur within the PSEGS BRSA, although marginally suitable habitat and appropriate elevation range exists.
Small-flowered androstephium	*Androstephium breviflorum*	This species occurs in desert dune and Mojavean desert scrub from approximately 700 feet to 2,000 feet above MSL. This species blooms from March through April and often occurs on desert bajadas. The nearest CNDDB record for this species is from Cadiz Valley approximately 24.2 miles north of the project (CNPS 2016). There are 32 records in the Consortium of California Herbaria database, the closest from the Arica mountains approximately 30 miles northeast of the project site.	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species has a low potential to occur within the site. Appropriate habitat exists, but *Androstephium* has never been documented this far south.
Spearleaf	*Matelea parvifolia*	This species occurs in rocky Mojavean and Sonoran desert scrub from 1,320 feet to approximately 3,300 feet above MSL. This species blooms from March through May (CNPS 2016). The nearest extant CNDDB record for this species is from the Chuckwalla Bench area during 1986 from desert dry wash woodland and creosote bush scrub habitats (CNDDB 2016). There are 28 records in the Consortium of California Herbaria database, the closest from Corn Springs, about 6 miles southwest of the project site (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys. This species has a low potential to occur within the Project Disturbance Area because the site is located below the typical elevation range of this species, and contains no rocky habitat.
Wiggins' cholla	*Cylindropuntia (=Opuntia) wigginsii*	Wiggins' cholla is not recognized as a species, but is considered a hybrid of silver cholla (*C. echinocarpa*) and pencil cholla (*C. ramosissima*). Wiggins' cholla is not found as a separate species in The Jepson Manual (1993; 2012) nor in Munz et al A California Flora and Supplement (1973); however, the BLM's Proposed Northern and Eastern Colorado Desert Coordinated Management Plan identifies Wiggins' cholla as a special-status species (BLM 2002). CNDDB and CNPS recognizes Wiggins' cholla as a CRPR 3.3 species meaning more information is needed about this species and it is not considered very endangered in California. CNPS also considers this species a sporadic hybrid of the two *Cylindropuntia* species mentioned above, and identifies occurrences in Riverside, Imperial, San Bernardino, and San Diego Counties (CNPS 2016). There are no records in the Consortium of California Herbaria database (CCH 2016).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys, and probably does not deserve recognition as a distinct taxon.

Species	Latin Name	Habitat Requirements, Geographic Range, Occurrence Records	Potential to Occur on Project Site
Winged cryptantha	*Cryptantha holoptera*	Winged cryptantha has a limited distribution in California. This is a spring-blooming annual that occurs in Mojavean and Sonoran desert scrub habitats from 300 feet to approximately 5,000 feet above mean sea level within California, Arizona, and Nevada (CNPS 2016). There are 173 records of this species in the Consortium of California Herbaria database from Riverside, Imperial, San Bernardino, and San Diego counties (CCH 2016). Winged cryptantha was observed near the Colorado Substation at the southeastern end of Chuckwalla Valley, approximately 22 miles east (Solar Millennium 2010d).	**LOW**. This species was not observed during the 2009, 2010 (spring and fall), 2013, or 2016 surveys.

APPENDIX D

Cumulative Floristic Compendium

2009 to 2017

SCIENTIFIC NAME	COMMON NAME
Abronia villosa var. *villosa*	desert sand verbena
Achyronchia cooperi	onyx flower
Acmispon strigosus	strigose lotus
Allionia incarnata	windmills
Ambrosia dumosa	white bursage
Ambrosia salsola	cheesebush
Amsinckia mensiesii var. *menziesii*	rancher's fireweed
Amsinckia tessellata	devil's lettuce
Aristida adscencionis	sixweeks three-awn
Aristida purpurea	purple three-awn
Asclepias albicans	whitestem milkweed
Asclepias erosa	desert milkweed
Asclepias subulata	skeleton milkweed
Astragalus aridus	annual desert milkvetch
Astragalus didymocarpus	dwarf white milkvetch
Astragalus insularis* var. *harwoodii	**Harwood's milkvetch**
Atrichoseris platyphylla	parachute plant
Atriplex canescens	four-wing saltbush
Atriplex canescens var. *macilenta*	salton saltbush
Atriplex polycarpa	allscale saltbush
Baileya pauciradiata	desert marigold
Baileya pleniradiata	woolly desert marigold
Bebbia juncea var. *aspera*	rush sweetbush
Boerhavia triquetra var. *intermedia*	slender spiderling
Bouteloua aristidoides	needle gramma
Bouteloua barbata var. *barbata*	six-weeks gramma
Brandegia bigelovii	desert starvine
**Brassica tournefortii*	Sahara mustard
Calycoseris wrightii	white tackstem
Caulanthus lasiophyllus	California mustard
Chaenactis carphoclinia	pebble pincushion
Chaenactis fremontii	Fremont's pincushion
Chaenactis stevioides	desert pincushion
Chorizanthe brevicornu	brittle spineflower
Chorizanthe corrugata	wrinkled spineflower
Chorizanthe rigida	spiny herb
Chylismia brevipes ssp. *brevipes*	golden suncup
Chylismia claviformis	browneyes
Cisthanthe ambigua	desert calandrinia
Condalia globosa* var. *pubescens	**spiny abajo**

SCIENTIFIC NAME	COMMON NAME
Croton californicus	California croton
Cryptantha angustifolia	narrow leaved cryptantha
Cryptantha barbigera	bearded cryptantha
Cryptantha costata	**ribbed cryptantha**
Cryptantha maritima	Guadalupe cryptantha
Cryptantha micrantha	redroot cryptantha
Cryptantha nevadensis	Nevada cryptantha
Cryptantha pterocarya var. *cycloptera*	wingnut cryptantha
Cryptantha pterocarya var. *pterocarya*	wingnut cryptantha
Cucurbita palmata	coyote melon
Cuscuta sp.	dodder
Cylindropuntia bigelovii	teddybear cholla
Cylindropuntia echinocarpa	silver cholla
Cylindropuntia ramosissima	pencil cholla
Dalea mollis	hairy prairie clover
Dalea mollissima	silky dalea
Datura discolor	jimson weed
Dicoria canescens	dicoria
Ditaxis lanceolata	narrowleaf ditaxis
Ditaxis neomexicana	New Mexico ditaxis
Ditaxis serrata* var. *californica	**California ditaxis**
Dithyrea californica	spectacle pod
Echinocactus polycephalus var. polycephalus	cottontop cactus
Echinocereus engelmannii	hedgehog cactus
Emmenanthe pendulifera	whispering bells
Encelia farinosa	brittlebush
Encelia fructescens	button brittlebush
Eremalche exilis	white mallow
Eremalche rotundifolia	desert fivespot
Eremothera boothii ssp. desertorum	desert suncup
Eriastrum harwoodii	**Harwood's woolystar**
Eriastrum sparsiflorum	Great Basin woolystar
**Erodium cicutarium*	red stem filaree
Erodium texanum	desert heron's bill
Eriogonum inflatum	desert trumpet
Eriogonum thomasii	Thomas' buckwheat
Eschscholzia glyptosperma	desert golden poppy
Eschscholzia minutiflora	pygmy poppy
Eschscholzia parishii	Parish's poppy
Eucrypta micrantha	desert hideseed

SCIENTIFIC NAME	COMMON NAME
Euphorbia micromeria	Sonoran sandmat
Euphorbia polycarpa	smallseed sandmat
Euphorbia setiloba	Yuma sandmat
Fagonia laevis	California fagonia
Ferocactus cylindraceus var. *cylindraceus*	barrel cactus
Festuca octoflora	sixweeks fescue
**Festuca sp.*	fescue
Fouquieria splendens	ocotillo
Funastrum hirtellum	hairy milkweed
Funastrum utahense	**Utah vine milkweed**
Geraea canescens	desert sunflower
Gilia scopulorum	rock gilia
Gilia stellata	star gilia
Heliotropium convolvulaceum var. *californicum*	bindweed heliotrope
Hesperocallis undulata	desert lily
Hibiscus denudatus	paleface
Hilaria rigida	big galleta grass
Hyptis emoryi	desert lavendar
Isocoma acradenia	alkali goldenbush
Justicia californica	chuparosa
Kallstroemia californica	California caltrop
Krameria bicolor	white rhatany
Langloisia setosissima ssp. *setosissima*	bristly langloisia
Larrea tridentata	creosote bush
Lepidium lasiocarpum	pepperweed
Linanthus jonesii	Jones' lananthus
Loeseliastrum matthewsii	Desert calico
Loeseliastrum schottii	Schott's calico
Lupinus arizonicus	Arizona lupine
Lupinus concinnus	bajada lupine
Lycium andersonii	Anderson's desert thorn
Malacothrix glabrata	desert dandelion
Mammillaria tetrancistra	fishook cactus
Marina parryi	Parry's false prairie clover
Mentzelia affinis	yellowcomet
Mentzelia albicaulis	white stemmed stickleaf
Mentzelia involucrata	whitebract blazingstar
Mentzelia multiflora var. *longiloba*	yerba amarilla
Mirabilis laevis var. *retrorsa*	wishbone bush
Monolepis nuttalliana	poverty weed

SCIENTIFIC NAME	COMMON NAME
Monoptilon bellioides	Mojave desertstar
Nama demissum var. *demissum*	purplemat
Nama pusillum	small leaved nama
Nemacladus glanduliferus	glandular threadplant
Nicotiana obtusifolia	desert tobacco
Oenothera deltoides ssp. *deltoides*	birdcage desert primrose
Oenothera primiveris ssp. *bufonius*	desert evening primrose
Oligomeris linifolia	lineleaf whitepuff
Olneya tesota	desert ironwood
Opuntia basilaris	prickly pear cactus
Orobanche cooperi	desert broomrape
Palafoxia arida var. arida	spanish needles
Parkinsonia florida	blue palo verde
Pectis papposa var. papposa	chinch weed
Pectocarya heterocarpa	combseed
Pectocarya platycarpa	broadfruit combseed
Perityle emoryi	Emory's rockdaisy
Petalonyx thurberi	sandpaper plant
Petunia parviflora	wild petunia
Phacelia crenulata var. *ambigua*	purplestem phacelia
Phacelia crenulata var. *minutiflora*	cleftleaf phacelia
Phacelia distans	common phacelia
Phacelia neglecta	alkali phacelia
**Phalaris minor*	little-seed canary grass
Phoradendron californicum	desert mistletoe
Physalis crassifolia	ground cherry
Plantago ovata	wooly plantain
Prosopis glandulosa	honey mesquite
Psathyrotes ramosissima	turtleback
Psorothamnus emoryi	indigo bush
Psorothamnus schottii	Schott's indigo bush
Psorothamnus spinosus	smoke tree
Rafinesquia neomexicana	desert chicory
**Salsola tragus*	russian thistle
Salvia columbariae	chia
**Schismus arabicus*	Mediterranean grass
Senegalia greggii	catclaw acacia
Sesuvium verrucosum	western sea-purslane
**Sisymbrium irio*	London rocket
Sphaeralcea ambigua	desert globemallow

SCIENTIFIC NAME	COMMON NAME
Stephanomeria pauciflora var. *pauciflora*	wire lettuce
Stillingia spinulosa	broad leaved stillingia
Stipa hymenoides	indian rice grass
Streptanthella longirostris	longbeak fiddle mustard
Stylocline gnaphaloides	nest straw
Suaeda nigra	bush seepweed
**Tamarix sp.*	tamarisk
Tidestromia suffruticosa var. *oblongifolia*	Arizona honeysweet
Tiquilia plicata	fanleaf crinklemat
Trianthema portulacastrum	horse purslane
Trichoptilium incisum	yellowhead
Ziziphus obtusifolia var. *canescens*	graythorn

* Nonnative species

Bold face indicates special status species

APPENDIX E

Memorandum: Potential Impacts to Federal ESA-Listed Bird Species

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April 17, 2017

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SUBJECT: Potential Impacts to Federal ESA-Listed Bird Species - Palen Solar Photovoltaic Project

Mr. De La Garza:

This memorandum provides an assessment of impacts to bird species listed as threatened or endangered under the Federal Endangered Species Act (ESA) that may result from the Palen Solar PV Project (Project). While no suitable breeding or wintering habitat for ESA-listed bird species occurs within or near the Project, incidental records of ESA-listed bird species at other utility-scale solar projects in California suggest that analyzing the potential effects to such species may be warranted. This memorandum addresses the following four ESA-listed species:

- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) – Threatened;
- Southwestern willow flycatcher (*Empidonax traillii extimus*) – Endangered;
- Least Bell's vireo (*Vireo bellii pusillus*) – Endangered; and
- Ridgeway's [Yuma Ridgway's] rail (*Rallus obsoletus yumanensis* [*R. longirostris y*]) – Endangered.

Baseline avian data and analysis of potential effects to these listed species have been partly described in the *Bird and Bat Conservation Strategy for the Palen Photovoltaic Solar Project* (BBCS, Western EcoSystems Technology [WEST] 2017a), *Biological Resources Technical Report for the Palen Solar PV Project* (Ironwood Consulting 2017), and *Biological Opinion on the Proposed Land Use Plan Amendment* (LUPA) *under the Desert Renewable Energy Plan* (DRECP) (U.S. Fish and Wildlife Service [USFWS] 2016). The Project's BLM right-of-way application predates the DRECP and is therefore not subject to the provisions of the LUPA Biological Opinion; however, the effects analysis regarding ESA-listed bird species in the LUPA Biological Opinion is relevant because the Project is located within a development focus area (DFA) per the LUPA. This memorandum summarizes key elements of these documents to support the preparation of the Project's Supplemental Environmental Impact Statement / Report (SEIS/EIR).

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Status of ESA-Listed Species

Western yellow-billed cuckoos, southwestern willow flycatchers, and least Bell's vireos are alike in that they breed in riparian habitats in California, winter south of the United States-Mexico border, and migrate though the Colorado Desert between breeding and wintering habitats. It should be noted that the riparian habitat associated with these listed species is different than the xeric, microphyll riparian scrub woodland found on and near the Project site. Yuma Ridgway's rail nests in freshwater marshes and is distinct from the other listed bird species in that they are not known to regularly migrate between areas of breeding habitat. The descriptions below include information on the species' listing status, habitat preferences, distribution, population status, migration potential, and records associated with existing solar facilities is described separately below.

Western Yellow-Billed Cuckoo

The western yellow-billed cuckoo was listed as threatened on 3 November 2014 (79 Federal Register [FR] 59991) because the number of western yellow-billed cuckoos in the western United States had declined substantially over the past 100 years. This species is known to currently breed in portions of California, Nevada, Arizona, and New Mexico that support extensive riparian areas. The USFWS estimated the current breeding population at 680 to 1,025 pairs, with 350 to 495 pairs north of the Mexican border and the remainder in Mexico (USFWS 2016). The winter range of the western yellow-billed cuckoo is relatively unknown (USFWS 2016).

The closest known breeding habitat to the Project site is located approximately 35 miles away along the Colorado River (USFWS 2016). There have been no documented sightings of western yellow-billed cuckoos within the LUPA DFAs (USFWS 2016). Western yellow-billed cuckoos migrate across the desert and use scrub habitat during migration (USFWS 2016). Dead western yellow-billed cuckoos have been found in or adjacent to desert scrub habitat in the Ivanpah Valley and eastern Riverside County (Davis 2015; Beeler 2015 - as cited in USFWS 2016).

Two records of dead western yellow-billed cuckoos have been noted to date at concentrating solar power (CSP) facilities in California (USFWS 2016). These records occurred at Ivanpah Solar Electric Generating System, during construction in 2012, and Genesis Solar Project (Davis 2015; Beeler 2015; WEST 2016a - as cited in USFWS 2016). The causes of death were unknown. There is limited information regarding mortalities of western yellow-billed cuckoos at renewable energy facilities outside California (USFWS 2016). No mortalities of western yellow-billed cuckoos have been reported from renewable energy facilities in Nevada (Nicolai 2015 as cited in USFWS 2016). No mortalities of western yellow-billed cuckoos have been reported from solar photovoltaic (PV) facilities (Althouse and Meade 2014 [Topaz]; H. T. Harvey and Associates 2014 [CVSR]; and WEST 2016b).

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Southwestern Willow Flycatcher

The southwestern willow flycatcher was listed endangered on 27 February 1995 (60 FR 10694) because of threats related to large-scale loss of habitat and nest parasitism by the brown-headed cowbird (*Molothrus ator*). This species breeds in dense riparian habitats in the southwestern United States, and winters in southern Mexico, Central America, and northern South America (USFWS 2002). Over the past decade, survey data from various breeding sites in California suggest that the number of territories has declined (USFWS 2016).

The closest known breeding habitat to the Project site is approximately 35 miles away along the Colorado River and adjacent to the Salton Sea (USFWS 2016). Southwestern willow flycatchers migrate through the Colorado Desert (USFWS 2016). Migrating willow flycatchers may use a wider range of habitats during migration than during breeding (Craig and Williams 1998 - as cited in USFWS 2016).

Willow flycatchers have been found dead at solar facilities and overhead powerlines in the California desert; however, none of the dead birds were identified as the ESA-listed southwestern willow flycatcher (Guigliano 2015; Dietsch 2015a; Dietsch 2015b; EDM International 2016 - as cited in USFWS 2016). There is limited information regarding mortalities of southwestern willow flycatchers at renewable energy facilities outside California (USFWS 2016). No mortalities of southwestern willow flycatchers have been reported from renewable energy facilities in Nevada (Nicolai 2015 as cited in USFWS 2016).

Least Bell's Vireo

The least Bell's vireo was listed as endangered on 2 May 1986 (51 FR 16474) because of similar threats to that of the southwestern willow flycatcher as mentioned above. This species breeds in structurally diverse riparian habitats in Southern California and portions of northern Baja California, Mexico and winters in southern Baja California, Mexico (USFWS 1998). The distribution of this species has likely increased since its listing, although it remains absent from large parts of its former range (USFWS 2016). The closest known breeding habitat to the Project site is over 70 miles to the northwest in the Big Morongo Canyon (USFWS 2016). Least Bell's vireos are also uncommon breeders at the Anza Borrego Desert State Park, located approximately 70 miles southwest of the Project site (USFWS 2016). The subspecies Arizona Bell's vireo (*V. b. arizonae*) is not ESA-listed, but is State-listed as endangered, and is known to occur along the lower Colorado River, approximately 35 miles east of the Project site.

Least Bell's vireos likely migrate through the Colorado Desert; however, there is little information on this species' migration behavior (USFWS 2016). It is presumed that this species may utilize patches of riparian habitat varying in size and possibly upland scrub habitat during migration (USFWS 2016).

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There have been no reports of least Bell's vireos found dead or injured at renewable energy facilities (USFWS 2016).

Yuma Ridgway's Rail

The Yuma Ridgway's rail was listed as endangered on 11 March 1967 (32 FR 4001). Until recently, Ridgway's rail (*Rallus obsoletus yumanensis*) was considered three different sub-species (BirdLife International 2014; Chesser et al. 2014), including Yuma clapper rail (*Rallus obsoletus yumanensis*, formerly *R. longirostris yumanensis*), light-footed clapper rail (*R.o. levipes*), and California rail (*R.o. obsoletus*). The revision of the name of the species did not affect the taxon with regard to its listing as endangered. Because of this separation, population data were divided between the different subspecies. For the purposes of this analysis and based on the USFWS's identification of the Yuma clapper rail as the likely sub-species present in the Project vicinity (USFWS 2009), population trends, life histories, and migration and dispersal behaviors for only Yuma clapper rail as identified in the literature, in agency profiles and abstracts and other specified sources area discussed herein.

The current known range of Yuma Ridgway's rail includes portions of Arizona, California, Nevada, and Colorado River delta regions in Mexico (Arizona Game and Fish Department [AZGFD] 2001; USFWS 2009; BirdLife International 2014). This species is found along the lower Colorado River southward to its terminus at the Sea of Cortez, along the Gila River drainage in Arizona, at Lake Mead (and the Overton Arm) and its local tributaries, along the Virgin River in Nevada and Utah, and at the Salton Sea/Imperial Valley areas of California (California Energy Commission [CEC] et. al 2014; USFWS 2014). In these areas, the species nests and feeds primarily on invertebrates in freshwater marsh habitats from which most individuals do not migrate (USFWS 2014). Many of the areas that support important habitat for Yuma Ridgway's rail are Federal or State-owned lands with existing management plans including the Cibola and Sonny Bono Salton Sea National Wildlife Refuges located approximately 35 miles from the Project site (USFWS 2016).

Estimates of population size have been difficult to ascertain for Yuma Ridgway's rail. Studies performed in the U.S. from 2006 to 2014 indicate that the number individuals declined steadily (USFWS 2016). Recent population estimates include 7,714 to 9,686 individuals along the Colorado River Delta in Mexico in 2010 and 2011 (Hinojosa-Huerta et al. 2013 - as cited in USFWS 2016). Yuma Ridgway's rails in Mexico have the potential to disperse into the United States (USFWS 2016).

The extent of dispersal or migration between the populations is not well known (USFWS 2009); however, outlier records across the desert suggest some level of movement may occur (USFWS 2016). Outlier observations of Yuma Ridgway's rails have been documented at Harper Dry Lake, East Cronese Dry Lake, and Desert Center at a great distance from known breeding areas (USFWS 2016). The triggers for movements appear to be the need to find suitable habitat, the need to find mates, and/or the need to locate food (Eddleman 1989 as cited in CEC et. al 2014). Eddleman (1989 as cited

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in USFWS 2009) suggested that availability of suitable habitat and food sources, specifically crayfish on the Lower Colorado River may influence the rail's need to migrate. Similar conditions and circumstances may be applicable to the population on the Salton Sea, where a large portion of a recent decline in the population from 2007 to 2014 appears to have been due largely to lack of sufficient water and routine maintenance to support suitable breeding conditions at the Imperial Wildlife Area (USFWS 2009; Riesz 2015). It is currently presumed that a majority of the Yuma Ridgway's rail on the Lower Colorado River and Salton Sea do not migrate but rather remain in the general area year-round (AZGFD 2001, USFWS 2009, CEC et. al 2014).

Two records of dead Yuma Ridgway's rails have been noted to date at solar facilities in California, one at the fixed PV Desert Sunlight Solar Project in Riverside County during construction in 2013 and one at the single axis tracker PV Solar Gen 2 Project in Imperial County in 2014 (USFWS 2016). The causes of death were unknown. A live Yuma Ridgway's rail, observed to be uninjured, was recorded at the Blythe Solar PV Project during construction in 2015 (USFWS 2016). There is limited information regarding mortalities of Yuma Ridgway's rails at renewable energy facilities outside California (USFWS 2016). No mortalities of Yuma Ridgway's rails have been reported from known renewable energy facilities in Arizona or Nevada (Fitzpatrick 2015b; Nicolai 2015 - as cited in USFWS 2016). No Ridgeway rails have been found during the two subsequent years of standardized monitoring at Desert Sunlight, or the first years of monitoring at the Blythe and McCoy projects.

Potential Effects to Listed Species

Loss of Habitat

Development of the Project would result in the removal of approximately 3,500 acres of desert habitat, which does not represent typical stopover habitat for ESA-listed bird species, but may be used during dispersal or migration. On a larger scale assessing all DFWs (over 38,000 acres) within the entire LUPA, the USFWS concluded that the loss of habitat would not likely adversely affect migration of these riparian-nesting species (USFWS 2016). This conclusion was reached based on several factors, including:

- The loss of habitat within all DFAs would comprise less than 1% of the total land within the LUPA;
- BLM-managed lands are intermixed with millions of acres of lands owned by other agencies and private parties, which provide habitat to for migrating birds;
- The BLM would avoid the majority of riparian areas within the LUPA and these areas will likely provide the highest quality resting and foraging habitat riparian-nesting species; and

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- The location and distribution of solar facilities within the DFAs would not impose a substantial barrier to individuals of the listed riparian-nesting species during migration or preclude their movement across the desert.

Collision and Electrocution

The potential for individuals of the four ESA-listed species to collide with Project infrastructure is expected to be similar to that of other resident and migratory bird species if they are in the vicinity of the Project. Above-ground infrastructure that may add to collision risk includes solar panels, meteorological towers, power lines, fences, buildings, and large equipment. The Project would consist of PV technology and would not involve collision risks associated with turbines, heliostats, or power towers. Electrocution may occur if birds encounter aboveground, electrified powerlines including the gen-tie line; however, with regard to these ESA-listed species, electrocution potential is relatively low due to their narrow wing span.

Lighting

Southwestern willow flycatcher, least Bell's Vireo, and yellow-billed cuckoo are known to migrate at night. Yuma Ridgway's rail dispersal behavior is less understood, but this species is also thought to migrate at night. Artificial lighting may serve as an attractant when deployed on artificial structures (e.g., communication towers, offshore oil platforms), which can result in night-migrating birds colliding with these structures (Poot et al. 2008, Gehring et al. 2009, Kerlinger et al. 2010 – as cited in WEST 2017a). During construction, artificial lighting typically includes lights from construction vehicles when and if construction occurs during the overnight hours, lights on structures (e.g., office trailers), parking areas, site security facilities, and possible lighting associated with project roads. During operations, artificial lighting typically includes lights on buildings and site security facilities.

Indirect Effects

The presence of construction activities, personnel, equipment, and solar infrastructure may result in indirect effects to wildlife in general, including ESA-listed birds. Potential indirect effects that may that may occur over time include increase risk of fire, degradation of habitat due to spread of invasive weed species, and attraction of potential predators (e.g., common raven [*Corvus corax*]). Additionally, the hypothesis that bird species might interpret solar facilities as water has been proposed by Kagan et al. (2014), Walston et al. (2015), and Huso et al. (2016). Currently, the data are inconclusive with respect to supporting or refuting the lake effect hypothesis (WEST 2017b). Data from three publicly available studies at PV solar facilities suggest that avian fatalities were generally distributed across numerous species, typically passerines, doves, and pigeons (WEST 2017b). No water-associated bird fatalities were discovered at two of the three sites, California Valley Solar Ranch (CVSR) and Topaz (H. T. Harvey and Associates 2014; Althouse and Meade 2014). Water-associated bird fatalities were

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discovered at the fixed PV Desert Sunlight Solar Project; however, overall estimates of water-associated bird mortality did not differ significantly from estimates of non-water associated bird mortality among arrays (WEST 2016b). Further studies are needed, and have been recently proposed, to explore of the lake effect hypothesis in terms of the causal mechanisms and how birds perceive solar energy facilities (WEST 2017b). Additional discussion on the lake effect hypothesis is included in the technical memorandum prepared for the Project (WEST 2017b).

Effects Not Applicable to the Project

Other effects generally associated with solar facilities include evaporation ponds, entanglement with netting, and solar flux. Due to the proposed PV technology, the Project would not involve the use of evaporation ponds and thus entanglement with pond netting would not occur. The Project would also not create solar flux.

Minimization Measures

Measures for avoiding, minimizing, and mitigating potential adverse effects to resident and migratory bird species are included in the Project's adopted PSPP Mitigation Measures (MMs), Applicant Proposed Measures (APMs), and BBCS. A summary is provided below.

Project design would include several measures to avoid or minimize risk to birds during construction and operations. Utility lines would be designed to prevent bird injury and fatalities resulting from to electrocution. Utility lines would be built following Avian Power Line Interaction Committee (APLIC) Guidelines (APLIC 2012) to minimize electrocution risks. To further minimize effects to birds, structures would consist of monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities, as well as reduce the likelihood of bird collisions. The Project would minimize and control the use of external lighting per PSPP MM BIO-8 and VIS-3, which would reduce the potential for lighting to have a measurable effect on ESA-listed species.

The Project would implement additional measures to avoid or minimize potential effects to wildlife in general, including birds. PSPP MM BIO-8 would require implementation of APLIC guidelines to reduce the risk of electrocution of large birds, as well as the preparation of a Nesting Bird Management and Monitoring Plan. To minimize the likelihood of vehicle strikes to wildlife during construction vehicle speeds would be limited to under 25 miles per hour on all dirt Project access roads. Any instances of road-killed animals or other carcasses detected by personnel on roads associated with the Project would be reported and removed promptly. All trash and food-related waste would be contained in secure, closed lid containers to reduce the attractiveness of the site to opportunistic predators, such as common ravens and coyotes, and to prevent trash from being exposed or blown around the Project. Equipment and vehicle travel would be limited to existing roads or specific construction pathways during construction. A site-specific Worker Environmental

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Awareness Program (WEAP) per PSPP MM BIO-6 would be developed that would include information regarding sensitive biological resources, including listed bird species, and emphasize reporting all dead or alive bird observations to the Designated Biologist or Biological Monitor. The Project would use the minimal amount of water needed for dust abatement to prevent the formation of puddles, which could attract birds and other wildlife. To minimize the potential effects of habitat loss due to fire, fire prevention measures would be implemented per PSPP MM BIO-6 and PSPP MM WS-1 and 2. Indirect effects to adjacent lands from the potential spread of weeds would be controlled through the implementation of the Weed Management Plan per PSPP MM BIO-14. All unused material and equipment will be removed upon completion of construction and maintenance activities outside the permanently fenced site. The risk of attracting common ravens to the Project, which could result in increased predation on native species including migrating or dispersing listed birds, will be controlled through implementation of the Common Raven Monitoring, Management, and Control Plan per PSPP MM BIO-13.

A comprehensive list of minimization measures that directly or indirectly relate to the protection of birds are listed in APM-52 as Tier 1 Impact Avoidance Measures, as follows:

1) *The Project owner shall initiate consultation with USFWS and CDFW if there is a Project-attributed injury or mortality to any species regulated by BGEPA, ESA or CESA.*
2) *PSPP MM BIO-1: Designated Biologist Selection and Qualifications*
3) *PSPP MM BIO-2: Designated Biologist Duties*
4) *PSPP MM BIO-3: Biological Monitor Selection and Qualifications*
5) *PSPP MM BIO-4: Biological Monitor Duties*
6) *PSPP MM BIO-6: Worker Environmental Awareness Program (WEAP)*
7) *PSPP MM BIO-8: Impact Avoidance and Minimization Measures (e.g., 1. Limit disturbance areas; 2. Minimize road impacts; 3. Minimize traffic impacts; 4. Monitor during construction; 5. Minimize impacts of transmission/pipeline alignments, roads, and staging areas; 6. Avoid use of toxic substances; 7. Minimize lighting impacts; 8. Minimize noise impacts; 12. Minimize standing water; 13. Dispose of road-killed animals; 14. Minimize spills of hazardous materials; 15. Worker guidelines; 17. Monitor ground disturbing activities prior to pre-construction site mobilization; 18. Control unauthorized use of the project access roads; 20. Avoid spreading weeds)*
8) *PSPP MM BIO-12: Desert Tortoise Compensatory Mitigation*
9) *PSPP MM BIO-13: Raven Management Plan and Fee*
10) *PSPP MM BIO-14: Weed Management Plan*
11) *PSPP MM BIO-15: Pre-Construction Nest Surveys and Avoidance Measures*
12) *PSPP MM BIO-16: Avian Protection Plan*
13) *PSPP MM BIO-18: Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures*

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14) *PSPP MM BIO-19: Special-Status Plant Impact Avoidance, Minimization and Compensation*
15) *PSPP MM BIO-21: Mitigation for Impacts to State Waters (e.g., 1. Acquire off-site state waters)*
16) *PSPP MM BIO-25: Golden Eagle Inventory and Monitoring*
17) *PSPP MM BIO-26: Evaporation Pond Netting and Monitoring*
18) *PSPP MM VIS-03: Temporary and Permanent Exterior Lighting (e.g., minimize visibility, minimize glare, minimize illumination)*
19) *PSPP MM VIS-04: Project Design (e.g., minimize the number of structures, reduce the amount of disturbed area)*
20) *APM-1: Designated Biologist*
21) *APM-2: Worker Education Program*
22) *APM-4: Integrated Weed Management Actions*
23) *APM-6: Noise Controls for Special-Status Species*
24) *APM-7: Standard Practices to Protect Special Status Species (e.g., prohibition of domestic pets)*
25) *APM-16: Bendire's Thrasher Monitoring*
26) *APM-17: Passive Burrow Exclusion*
27) *APM-18: Golden Eagle Nest Avoidance*
28) *APM-19: Golden Eagle Compensation*
29) *APM-20: Contribution to Golden Eagle Monitoring Program*
30) *APM-42: Manage Visual Resources as VRM Class IV*
31) *APM-45: Visual Design Standards*
32) *APM-46: Required Visual Resource BMPs*

Avian Monitoring and Reporting

Specifications for avian fatality monitoring and reporting during construction and post-construction (operations) are also included in the Project's adopted PSPP MMs, APMs, and BBCS. Relevant measures are summarized below.

Site personnel would be required to report any injured or dead birds found within the Project limits and the applicant would report such sightings to the BLM. PSPP MM BIO-2 requires the Designated Biologist to notify the BLM, USFWS, and CDFW of any dead or injured listed species found on the Project. PSPP MM BIO-5 provides authorization to the Designated Biologist to immediately stop any Project activity to avoid take of an individual of a listed species.

The BBCS (Section 5.0) includes a post-construction monitoring program that provides a standardized approach to document known bird and bat fatalities and injuries, and to estimate seasonal and annual post-construction fatality rates associated with Project features. The monitoring program is

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founded on a statistically sound spatial and temporal sampling design, including protocols for independently estimating and correcting for quarterly searcher-efficiency and seasonal (i.e., at least quarterly) scavenger (avian and mammalian) removal rates. It describes specific data to be collected during scheduled carcass searches, protocols for handling any dead or injured birds and bats that are found, and procedures for reporting incidents to applicable government agencies. The monitoring program includes sampling of solar arrays and regular inspections of the perimeter fence and gen-tie line. The BBCS includes instructions and contact information for rehabilitation facilities that work with injured birds. The BBCS (Section 6.0) includes reporting requirements and conditions the applicant to report all documented bird and bat injuries and fatalities to the BLM, CDFW and USFWS using the USFWS Avian Injury and Mortality Reporting Form.

Adaptive Management

Adaptive management actions, which may be implemented during and/or following the post-construction monitoring program, are described in the BBCS (Section 7.0) and APM-52. Adaptive management would follow a data-driven approach whereby problems would be assessed in the context of other sources of anthropogenic impact (e.g., other solar facilities) to bird species. The guiding principles associated with adaptive management are:

- Recommendations will be made based on best available science and existing approvals and permits to address specific issues resulting from the Project;
- Recommendations will be assessed by all agencies involved, as well as representatives for the Project;
- Provide sufficient flexibility to adapt as more is learned about the Project as well as strategies to reduce avian impacts, if warranted;
- Review results of fatality monitoring;
- Review annual report on status of compliance with mitigation measures and permit conditions and provide recommendations to the BLM and the Riverside County equivalent, as necessary.
- Evaluate effectiveness of implemented adaptive management strategies and provide the BLM and the Riverside County equivalent with recommendations based on findings.

After at least two monitoring seasons have passed, data will be reviewed to determine if adjustments to the monitoring frequency are warranted based on carcass persistence trial results. The applicant and the agencies will also meet at the end of the second year of monitoring to determine if continued/focused monitoring is warranted. Continued, focused monitoring may be warranted if data indicate that bird mortality caused by solar facilities is substantial and is having potential adverse impacts on special-status bird populations or there are other special circumstances. Such monitoring will be designed to address specific concerns that are identified after review of the data.

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Furthermore, the BBCS directly references the stepwise adaptive management program described in APM-52 to reduce or offset fatalities caused by the Project. APM-52 provides the framework for adaptive management, including a definition of mitigation performance standards and two additional tiers of impact reduction measures, described as follows:

> *The Project owner shall implement a bird and bat adaptive management program that includes potential measures the Project owner can implement to adaptively respond to detected mortality and injuries attributable to the Project. Adaptive actions undertaken will be discussed and evaluated in survey reports prepared under the Project's BBCS. Any impact reduction measures must be commensurate (in terms of factors that include geographic scope, costs, and scale of effort) with the level of avian or bat mortality or injury that is specifically and clearly attributable to the Project facilities, consistent with the nexus and proportionality requirements of California statutory and constitutional law and of U.S. constitutional law.*
>
> a. *Performance Standards. Appropriate performance standards for mitigation of impacts to any species regulated by BGEPA [Bald and Golden Eagle Protection Act], ESA [Federal Endangered Species Act], and CESA [California Endangered Species Act] exist through required consultation with USFWS and CDFW under their respective regulatory and permitting frameworks, as specified in Tier 1 Measures, below. For impacts to all other special status avian and bat species, adaptive management measures must reduce or offset mortalities caused by the Project to a level that avoids a substantial, long-term reduction in the demographic viability of the population of the species in question, as estimated through implementation of the Project BBCS, which employs the structured approach set forth in the USFWS Land-Based Wind Energy Guidelines (USFWS 2012).*
>
> b. *Impact Reduction Measures.*
>
> i. *Tier 1 Measures. [noted in "Minimization Measures" above]*
>
> ii. *Tier 2 Measures. If Tier 1 measures do not achieve the performance standards described above, the monitoring results of the Project, as well as those of other PV projects and the results of their respective impact reduction efforts, will be analyzed to formulate additional impact reduction measures to achieve the performance standards. Such measures may include, but not be limited to:*
>
> 1) *Use of a secure cover or floating, high-density plastic balls to cover construction ponds, as recommended by the Federal Avian Administration's "Wildlife Hazard Management at Airports" manual.*
>
> 2) *Passive avian diverter installations along the perimeter or at other locations within the Project to reduce or minimize bird use of the site.*
>
> 3) *The use of sound, light or other means to discourage site use consistent with applicable legal requirements.*
>
> 4) *Onsite habitat management or prey control measures consistent with applicable legal requirements.*

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5) *Modifications to support structures or other facilities to exclude nesting birds (e.g., netting or shielding around framework; capping open pipes or tubing).*

iii. *Tier 3 Measures. In the event Tier 1 and Tier 2 avoidance and minimization measures do not meet the above performance standards, or upon election of the Project owner, the Project owner shall implement compensatory mitigation on terms and at ratios deemed appropriate by USFWS and/or CDFW to meet the performance standard applicable to the species in question. Such measures shall be approved by USFWS and/or CDFW and may include, but not be limited to:*

1) *Restoration of degraded off-site habitat with native vegetation.*
2) *Restoration of off-site agricultural fields to bird habitat.*
3) *Management of off-site agricultural fields to enhance bird populations.*
4) *Retrofitting of structures to minimize collisions.*
5) *Support for avian and bat research and/or management efforts conducted by entities approved by the USFWS and CDFW within the Project's mitigation lands or other approved locations.*
6) *Funding efforts to address avian diseases or depredation due to the expansion of predators in response to anthropomorphic subsidies that may adversely affect birds that use the mitigation lands or other approved locations.*
7) *Contributions to the Migratory Bird Conservation Fund managed by the Migratory Bird Conservation Commission.*

Summary and Conclusion

The western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo are riparian-nesting species that breed and winter mostly outside of the Colorado Desert. No suitable breeding or wintering habitat for these ESA-listed bird species occurs on or adjacent to the Project site. The nearest suitable habitat for the western yellow-billed cuckoo and southwestern willow flycatcher is located approximately 35 miles west of the Project site along the Colorado River. The nearest suitable habitat for the least Bell's vireo is located approximately 70 miles northwest of the Project site in Big Morongo Canyon. Individuals of these species migrate through the Colorado Desert between breeding or wintering habitat. During migration, these species may fly over the Project vicinity. There remains a potential for these species to occasionally stopover within the Project vicinity.

The Yuma Ridgway's rail nests in freshwater marshes and generally disperse or migrate to a lesser degree than the riparian-nesting ESA-listed species. The nearest suitable habitat for the Yuma Ridgway's rail is located approximately 35 miles from the Project site along the Colorado River and Salton Sea. Records of Yuma Ridgway's rail have been documented at outlying locations from known breeding habitat. This species may fly over or temporarily stopover within the Project vicinity.

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Overall, the potential for these ESA-listed bird species to occur within the Project vicinity is low. The existence of outlying records and documented dispersal or migration suggest that there is a remote possibility that transient individuals may occasionally occur in the Project vicinity during the 30-year lease period. If they were to occur, the potential effects may include loss of habitat, collision, electrocution, artificial lighting, increased fire risk, degradation of habitat due to invasive weed species, and increased predation threat. These potential effects would be avoided, minimized, or mitigated for through the Project's adopted PSPP MMs, APMs, and BBCS. The Project would involve PV technology and consequently would not include the use of evaporation ponds or netting and would not create solar flux; therefore, the effects associated with these features would not occur.

In conclusion, the Project is not expected to adversely affect populations of ESA-listed bird species with regard to breeding habitat, reproductive capacity, ability to disperse, or migration because occurrences of these species on the Project site are expected to be infrequent, at most, during the 30-year lease period and potential effects to these species would be reduced substantially through the implementation of a comprehensive set of avoidance, minimization, and mitigation measures.

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