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Soda Mountain Solar Project Biological Resources Technical Report, San Bernardino County, California

JANUARY 2025

PREPARED FOR

Soda Mountain Solar, LLC

PREPARED BY

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SODA MOUNTAIN SOLAR PROJECT
BIOLOGICAL RESOURCES TECHNICAL REPORT, SAN BERNARDINO COUNTY, CALIFORNIA

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EXECUTIVE SUMMARY

On December 14, 2007, the project applicant, Soda Mountain Solar, LLC, filed a right-of-way (ROW) grant application with the federal Bureau of Land Management (BLM) to construct, operate, maintain, and decommission the Soda Mountain Solar Project (project) (BLM Case File Number CACA-049584). The BLM issued a Record of Decision (ROD) to approve a revised configuration of the application and associated amendment to the California Desert Conservation Area Plan in March 2016. Despite the project receiving a ROD from BLM and recommendation from the County planning staff to approve the project, the San Bernardino County Board of Supervisors declined to certify the project Environmental Impact Report (EIR).

The applicant is pursuing completion of project review pursuant to the California Environmental Quality Control Act (CEQA based on a revised project). The project proposes to construct, operate, maintain, and decommission a proposed 300-MW photovoltaic solar facility located on approximately 2,670 acres. The disturbance area for the project would be up to 2,670 acres.

This Biological Resources Technical Report (report) was prepared by SWCA Environmental Consultants (SWCA) to analyze the project. This report describes how biological resources surveys were performed, and how, based on the results of the surveys, biological resources may be potentially affected by the construction, operation, maintenance, and decommissioning of the project. Desert bighorn sheep (*Ovis canadensis nelsoni*) information and analysis is not covered in this report. Survey data for desert bighorn sheep near the study area will be provided separately by CDFW and included in the EIR. Analyses will be based on CDFW-specific methodologies designed to understand how to reach the CDFW's long-term management goals.

A comprehensive literature and database search was performed to identify biological resources that may occur in the study area. Following the desktop review, field surveys were performed to assess existing habitat conditions in the study area. The field surveys included surveys for special-status species, and were performed according to existing protocols, guidelines, and methodologies, and in coordination with CDFW. Five native vegetation communities were identified on-site, including two sensitive vegetation communities. These vegetation communities include Creosote Bush – White Bursage Scrub (*Ambrosia dumosa*), Creosote Bush Scrub, Rigid Spineflower – Hairy Desert Sunflower, Cheesebush – Sweetbrush Scrub, and California Joint Fir -Longleaf Joint-fir Scrub. Rare plant surveys confirmed the presence of one special-status plant species—Utah vine milkweed (*Funastrum utahense*). A potential new *Muilla* taxon was also documented.

The project is not located within a wildlife connectivity area as mapped by the California Essential Habitat Connectivity Project (Spencer et al. 2010). Washes present in the study area are landscape features that are the most likely to represent wildlife movement corridors locally; however, there is no evidence that they provide avenues for concentrations of wildlife. Further, there is no riparian vegetation to support concentrations of wildlife. However, the project is located within the known range of desert bighorn sheep. Thus, it is possible that desert bighorn sheep utilize habitat within the project area as movement corridors.

Six special-status animals and/or their diagnostic sign were observed during the surveys: desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), desert kit fox (*Vulpes macrotis arsipus*), American badger (*Taxidea taxus*), and desert bighorn sheep. Impacts to desert tortoise, burrowing owl, loggerhead shrike, desert kit fox, and American badger will be reduced to less than significant through the implementation of the mitigation measures described here. Impacts to these species—with the exclusion of an analysis of bighorn sheep—will be reduced to less than significant through the implementation of the mitigation measures described herein.

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CONTENTS

1 Introduction 1
1.1 Project Background 1
1.2 Project Description 2
1.2.1 Project Location 2
1.2.2 Existing Conditions 5
1.2.3 Summary of Project Components 5
1.3 Regional Overview 5
1.4 Regional Climate and Weather 6
2 Regulatory Overview 6
2.1 Federal Regulations 6
2.1.1 National Environmental Policy Act 6
2.1.2 Federal Land Policy and Management Act of 1976 7
2.1.3 Endangered Species Act 7
2.1.4 Migratory Bird Treaty Act 8
2.1.5 Bald and Golden Eagle Protection Act 8
2.1.6 California Desert Conservation Area Plan 9
2.1.7 Bureau of Land Management Sensitive Species 10
2.1.8 Noxious Weed Act of 1974 10
2.1.9 Executive Order 13112 10
2.2 State Regulations 10
2.2.1 California Environmental Quality Act 10
2.2.2 California Endangered Species Act 11
2.2.3 California Fish and Game Code 12
2.2.4 California Desert Native Plants Act 12
2.3 Local Regulations 13
2.3.1 San Bernardino County Policy Plan 13
2.3.2 San Bernardino County Development Code 14
3 Methods 14
3.1 Database and Literature Review 15
3.1.1 Vegetation and Habitat Mapping 18
3.1.2 Special-Status Species Potential for Occurrence 18
3.2 Field Surveys 19
3.2.1 Reconnaissance-level Survey 20
3.2.2 Rare Plant Survey and Vegetation Mapping 21
3.2.3 Crotch's Bumble Bee Survey 21
3.2.4 Desert Tortoise Survey 22
3.2.5 Mojave Fringe-toed Lizard Survey 24
3.2.6 Avian Use Surveys 24
3.2.7 Burrowing Owl, Desert Kit Fox, American Badger Survey 27
3.2.8 Bat Survey 27
3.2.9 Raptor Surveys 28
4 Results 30
4.1 Site Conditions 30

4.2 Vegetation Communities 30
4.2.1 Creosote Bush – White Bursage Scrub (Larrea tridentata – Ambrosia dumosa Shrubland Alliance) 35
4.2.2 Creosote Bush Scrub (Larrea tridentata Shrubland Alliance) 35
4.2.3 Rigid Spineflower – Hairy Desert Sunflower (Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance [Chorizanthe rigida – Geraea canescens Desert Pavement Association]) 35
4.2.4 Cheesebush – Sweetbush Scrub (Ambrosia salsola – Bebbia juncea Shrubland Alliance) 35
4.2.5 California Joint Fir – Longleaf Joint-fir Scrub (Ephedra californica – Ephedra trifurca Shrubland Alliance [Ephedra californica – Ambrosia salsola Association]) 36
4.2.6 Disturbed/Developed 36
4.3 Plants 36
4.3.1 Special-Status Plants 36
4.4 Wildlife 47
4.4.1 Wildlife Movement and Migratory Corridors 47
4.4.2 Special-Status Wildlife 49

5 Potential Impacts and Recommendations 74
5.1 Applicant-Proposed Measures 74
5.1.1 Vegetation 74
5.1.2 Special-Status Plants 75
5.1.3 Special-Status Wildlife 75
5.2 Environmental Impact Analysis 80
5.2.1 Special-Status Plants and Wildlife 81
5.2.2 Sensitive Natural Communities 95
5.2.3 Wildlife Movement 96
5.2.4 Local Policies and Ordinances 97
5.2.5 Adopted or Approved Plans 97
5.2.6 Cumulative Impacts 98
5.3 Mitigation Measures 99

6 Literature Cited 124

Appendices

Appendix A 2013 Panorama Environmental, Inc. Biological Resources Technical Report
Appendix B IPaC Search Results
Appendix C California Natural Diversity Database 10-Mile Search 1:6,000 Scale
Appendix D Soda Mountain Solar Site Visit
Appendix E Rare Plant Survey and Vegetation Mapping Report for the Soda Mountain Solar Project
Appendix F Crotch's Bumble Bee Focused Survey Report for the Soda Mountain Solar Project
Appendix G Desert Tortoise Survey Report for the Soda Mountain Solar Project
Appendix H Mojave Fringe-Toed Lizard Survey Report for the Soda Mountain Solar Project
Appendix I Winter Avian Use Survey Report for the Soda Mountain Solar Project
Appendix J Spring Avian Use Survey Report for the Soda Mountain Solar Project
Appendix K Summer Avian Use Survey Report for the Soda Mountain Solar Project
Appendix L Fall Avian Use Survey Report for the Soda Mountain Solar Project

Appendix M Spring Avian Use and Raptor Survey Report for the Soda Mountain Solar Project
Appendix N Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project
Appendix O Bat Survey Report for the Soda Mountain Solar Project
Appendix P Site Photographs
Appendix Q Plant and Wildlife Species with the Potential to Occur within 10 Miles of the Project Area
Appendix R Floral and Faunal Compendia

Figures

Figure 1. Soda Mountain Solar Project vicinity map. 3
Figure 2. Soda Mountain Solar Project study area. 4
Figure 3. Results of 10-mile CNDDB occurrence query. 17
Figure 4. Potentially suitable Crotch's bumble bee foraging habitat based on the desktop assessment. 23
Figure 5. Mojave fringe-toed lizard suitable habitat. 25
Figure 6. Raptor and avian point-count locations, spring 2024. ..... **Error! Bookmark not defined.**
Figure 7. Locations of roost emergence and transect surveys within the Soda Mountain Solar Project study area. 29
Figure 8. Overview of vegetation community and land cover types. 33
Figure 9. Utah vine milkweed individuals found within and near the study area. 45
Figure 10. Muilla individuals found within the study area. 46
Figure 11. Least-cost corridors from *A Linkage Network for the California Deserts* (Penrod et al. 2012). Red star added to indicate the project location. 48
Figure 12. Desert tortoise burrows and scat in the study area. 56
Figure 13. Mojave fringe-toed lizard suitable habitat and live observations. ..... **Error! Bookmark not defined.**
Figure 14. Active bird nests and special-status avian species documented. 63
Figure 15. USFWS records of golden eagle nesting sites within 10 miles of the study area. 65
Figure 16. Location of potential burrowing owl and unknown mammal burrows, and desert kit fox and American badger dens identified within the study area. 67
Figure 17. Locations of bats observed in the study area. 69

Tables

Table 1. Field Survey Dates and Personnel 19
Table 2. Vegetation Communities and Land Cover Types 31
Table 3. Potential for Special-Status Plants to Occur based on Desktop Review and Survey Results within the Study Area 37
Table 4. Potential for Special-Status Wildlife to Occur based on Desktop Review and Survey Results within the Study Area 49
Table 5. Avian Point-Count Survey Results for the Study Area in 2009, 2023, and 2024 60
Table 6. Total Impacts to Vegetation Communities in the Study Area 80

ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
AMMP	Avian Monitoring and Mitigation Program
amsl	above mean sea level
APM	applicant-proposed measure
applicant	Soda Mountain Solar, LLC
BA	Biological Assessment
BBCS	bird and bat conservation strategy
BESS	battery energy storage system
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
bmsl	below mean sea level
BO	Biological Opinion
Caltrans	California Department of Transportation
CATEX	Categorical Exclusion
CBD	Center for Biological Diversity and the Mountain Lion Foundation
CDCA	California Desert Conservation Area
CDFW	California Department of Fish and Wildlife
CDNPA	California Desert Native Plants Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CMA	Conservation and Management Action
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
County	San Bernardino County
CRPR	California Rare Plant Rank
DFA	Development Focus Area
DRECP	Desert Renewable Energy Conservation Plan
DTTP	Desert Tortoise Translocation Plan
EA	Environmental Assessment
EIR	Environmental Impact Report

EIS	Environmental Impact Statement
ESA	Endangered Species Act
EPR	Eastern Peninsular Range
ESU	evolutionary significant unit
FGC	Fish and Game Code
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
I-15	Interstate 15
IPaC	Information for Planning and Consultation
ITP	Incidental Take Permit
IWMP	Integrated Weed Management Plan
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
LSAA	Lake and Streambed Alteration Agreement
LUPA	land use plan amendment
m	meter(s)
MBTA	Migratory Bird Treaty Act
MM	mitigation measure
mph	miles per hour
MW	megawatt(s)
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NMFS	National Marine Fisheries Service
NPPA	Native Plant Protection Act
OHV	off-highway vehicle
PAR	Property Analysis Record
project	Soda Mountain Solar Project
PV	photovoltaic
report	Biological Resources Technical Report
ROD	Record of Decision
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
SWCA	SWCA Environmental Consultants
USC	United States Code

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
VPL	Variance Process Land
WEAP	Worker Environmental Awareness Program

1 INTRODUCTION

This Biological Resources Technical Report (report) was prepared by SWCA Environmental Consultants (SWCA) in support of the proposed Soda Mountain Solar Project (project). SWCA was retained by Soda Mountain Solar, LLC (the applicant), to conduct field and desktop studies to provide the technical basis for the assessment of potential impacts to biological resources that may result from implementation of the project. In addition to a description of the existing conditions, this report describes how biological resources may be potentially affected by the construction, operation, and maintenance of the project. It provides the evidence upon which the required evaluation of feasibility, environmental analysis, and findings of fact in relation to biological resources can be made. This report may be used to support the environmental documentation and evaluation of the project pursuant to the California Environmental Quality Act (CEQA) and to inform relevant applications including the Lake and Streambed Alteration Agreement (LSAA) and Incidental Take Permit (ITP). This report examines biological resources only. Potentially regulated surface aquatic resources are evaluated in a separate aquatic resources delineation report for the project and are not covered in this report.

1.1 Project Background

Soda Mountain Solar, LLC, filed a right-of-way (ROW) grant application with the Bureau of Land Management (BLM) to construct, operate, maintain, and decommission the project (Case File Number CACA-049584) on December 14, 2007. The BLM considered the effects of granting the ROW as required by the National Environmental Policy Act (NEPA). The ROW grant triggered the need for a land use plan amendment (LUPA) to identify the site in the California Desert Conservation Area (CDCA) Plan of 1980 (CDCA Plan) as a suitable site for the solar project. The CDCA Plan Amendment also required analysis of potential impacts under NEPA.

As part of the original project proposal, Soda Mountain Solar, LLC, applied for groundwater well permits with the County of San Bernardino (County) on August 2, 2012. The groundwater well permit applications triggered the need for environmental analysis under CEQA. The BLM and the County jointly prepared a proposed amendment to the CDCA Plan and Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) under NEPA and CEQA.

The BLM also submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (USFWS) on December 10, 2013, as part of a request for formal consultation pursuant to Section 7 of the federal Endangered Species Act (ESA). The BA provided an analysis of the project's potential impacts to two ESA-listed species: Mohave tui chub (*Siphateles bicolor mohavensis*) and desert tortoise (*Gopherus agassizii*). The USFWS provided the BLM with a draft Biological Opinion (BO) on October 23, 2015, and issued a final BO on January 13, 2016. The USFWS concurred with the BLM's determination that the project may affect, but is not likely to adversely affect, the Mohave tui chub. The BO also indicated that the project would not jeopardize the continued existence of the desert tortoise. The USFWS estimated that a maximum of 10 large and 68 small desert tortoises could occur in the area. The BO authorized incidental take of desert tortoise up to this level and listed minimization measures and measures to offset adverse effects on the desert tortoise to be implemented.

The BLM and the County published the CDCA Plan Amendment and Final EIS/EIR document on June 12, 2015. The BLM issued a Record of Decision (ROD) to approve the agency-preferred alternative/selected alternative to the CDCA in March 2016. Compared with the original project analyzed in the EIS/EIR, the approved project as described in the ROD removed the North Solar Array, reduced ground disturbance by approximately 500 acres, reduced impacts to visual resources, and included future efforts to restore bighorn sheep (*Ovis canadensis nelsoni*) connectivity.

After publication of the CDCA Plan Amendment and Final EIS/EIR Soda Mountain Solar, LLC, also filed revised groundwater well permit applications with the County on May 12, 2016. The County held a hearing on adoption of the EIR and approval of the groundwater permits on August 23, 2016. Despite the project receiving a ROD from the BLM, and recommendation from the County planning staff to approve the project, the County Board of Supervisors declined to certify the EIR.

The applicant is pursuing completion of project review pursuant to CEQA based on a revised project with the California Energy Commission (CEC) acting as lead agency. This report covers the project as currently proposed and is intended to support environmental review under CEQA. The revised project is comparable to that approved in the ROD; solar arrays are only planned for installation south of Interstate 15 (I-15), and the boundary of the project south of I-15 matches the approved project in the ROD.

1.2 Project Description

1.2.1 Project Location

The project is located entirely on federally-owned land managed by the BLM. The approximate 2,670-acre project area is located approximately 7 miles southwest of the community of Baker in unincorporated San Bernardino County, California, approximately 50 miles northeast of Barstow (Figure 1). The project area is located in portions of Sections 1 and 11–14, Township 12 North, Range 7 East; Sections 25 and 36, Township 13 North, Range 7 East; Sections 6, 7, 8, and 18, Township 13 North, Range 8 East, San Bernardino Meridian, California. The project would occupy area in the alluvial valley dividing the northern and southern portions of the Soda Mountains in the Mojave Desert.

Primary access to the project area is from a northbound exit off I-15. The project area is bounded directly to the east by the Mojave National Preserve (administered by the National Park Service) and the Rasor Off-Highway Vehicle (OHV) recreation area (administered by BLM) at the southeast corner. I-15) the former Arrowhead Trail Highway, runs along the western boundary of the project area, with Rasor Road Services Shell Oil gas station located off I-15 southwest of the project area, along the access road to the project area (Figure 2). Two high-voltage electrical transmission lines are west of I-15. They include a 115-kilovolt (kV) sub-transmission line owned by Southern California Edison and the Marketplace-Adelanto 500-kV transmission line is owned by the Los Angeles Department of Water and Power (LADWP). Approximately six storm drain culverts cross under I-15 adjacent to the project area.

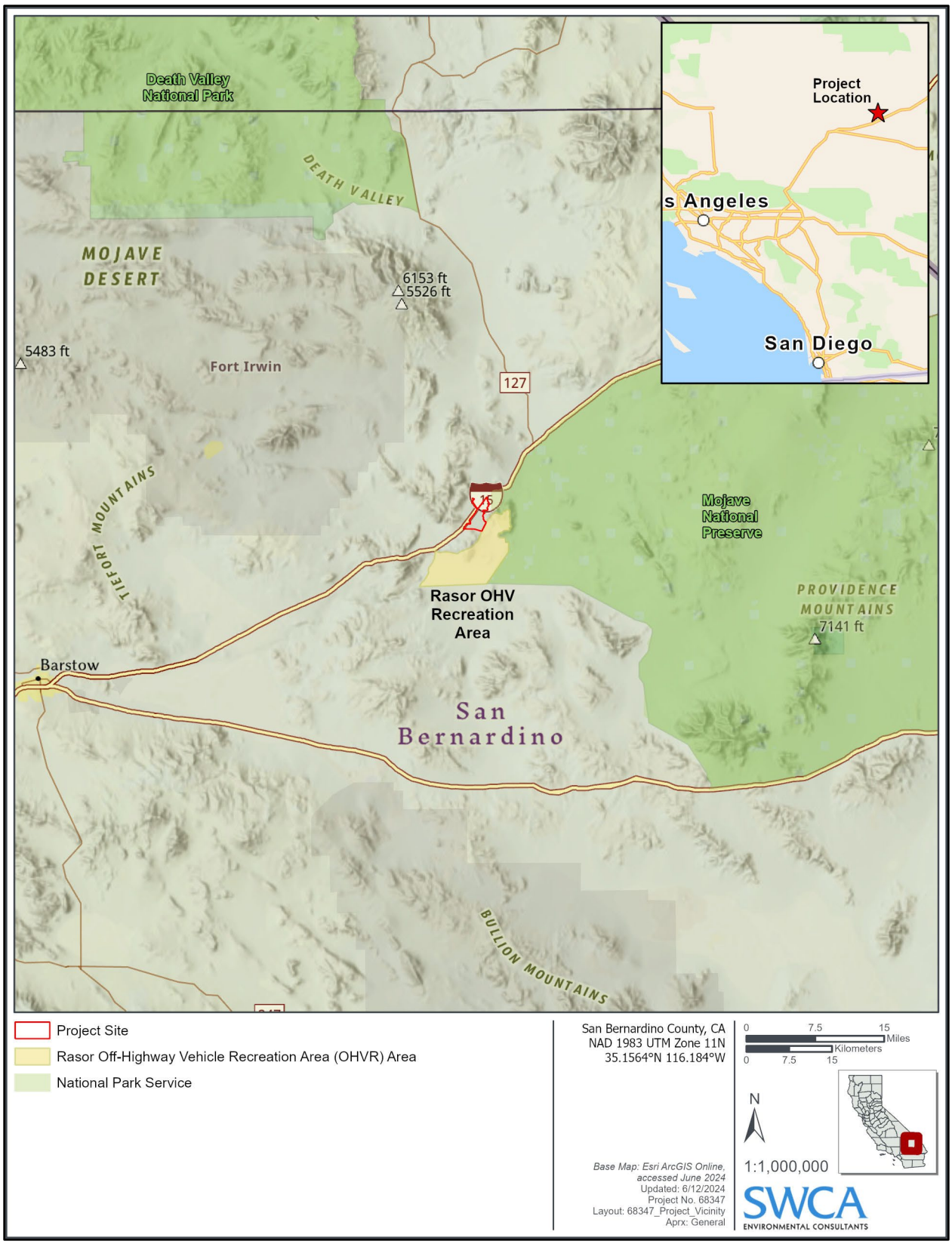

Figure 1. Soda Mountain Solar Project vicinity map.

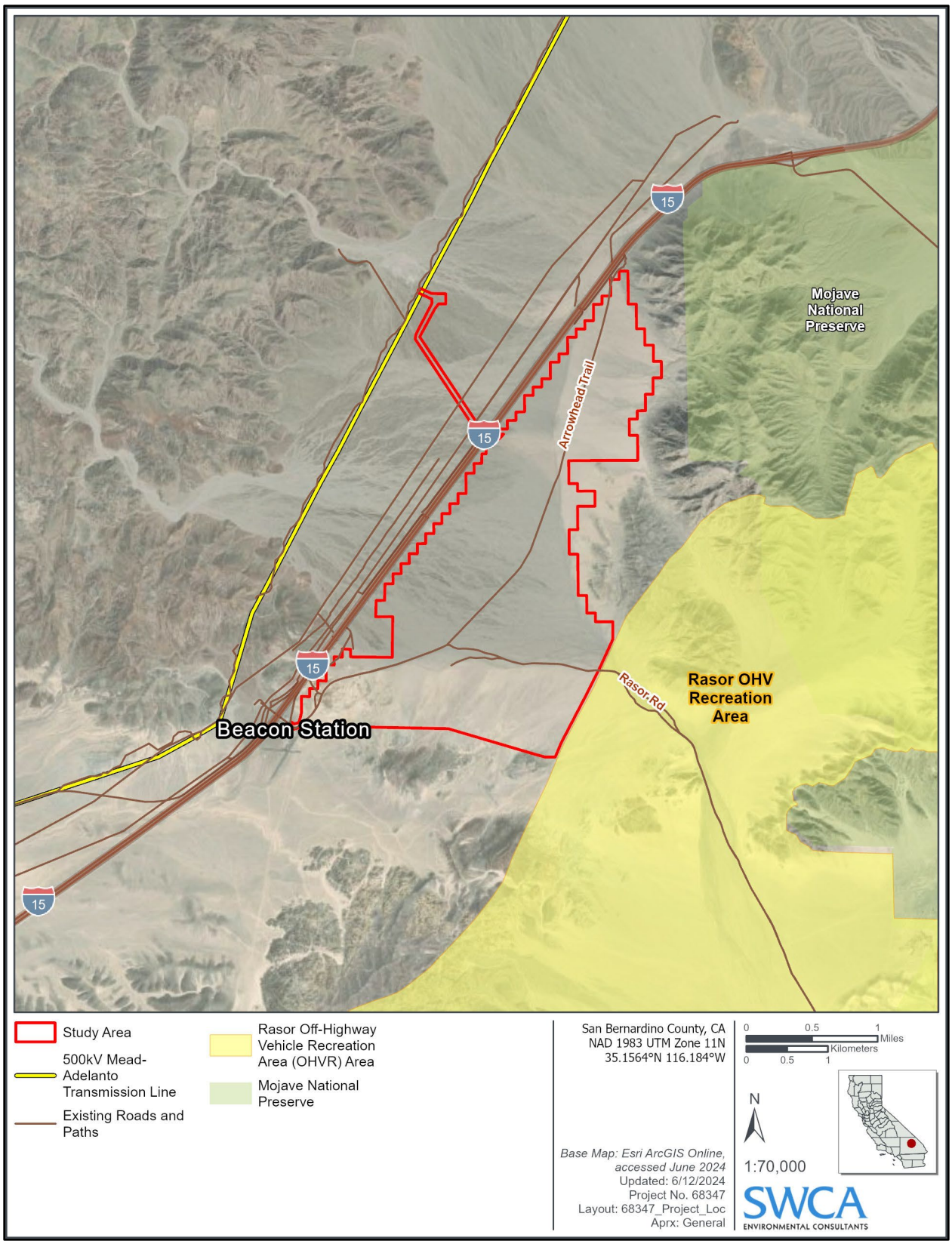

Figure 2. Soda Mountain Solar Project study area.

1.2.2 Existing Conditions

The project area is composed of rural desert land and is almost entirely undeveloped. Rasor Road, an unimproved BLM public access road, runs from the southwest corner of the site and forks to the north and east-southeast within the project area. One section of the road continues from west to east through the project to the Rasor Road OHV area, and the other fork runs north through the project area. Elevations within the project area fall between approximately 1,200 and 1,600 feet above mean sea level (amsl). The project is immediately surrounded by the Soda Mountains, with I-15 directly west; the southern portion of the project area is bounded by Rasor Road, including a gas station, and the Rasor OHV area (see Figure 1).

The project would occupy the alluvial valley dividing the northern and southern portions of the Soda Mountains in the Mojave Desert. The project is located in the Mojave Desert Air Basin and within a sub-basin of the Soda Lake Valley Groundwater Basin.

1.2.3 Summary of Project Components

The applicant proposes to construct, operate, maintain, and decommission a proposed 300-megawatt (MW) photovoltaic (PV) solar facility located on approximately 2,670 acres. The approximate disturbance acreage for the project would be up to 2,670 acres. The project components are as follows:

1. The solar plant site (i.e., all facilities that create a footprint in and around the field of solar panels, including the solar field consisting of solar power arrays identified as the East Array and South Arrays 1, 2, and 3), operation and maintenance buildings and structures, stormwater infrastructure, and related infrastructure and improvements.
2. A substation and switchyard for interconnection to the existing transmission system.
3. Approximately 300 MW of battery energy storage system (BESS) across 18 acres.

The project would operate 24 hours per day year-round and would generate electricity during daylight hours when the sun is shining. The project would generate and deliver solar-generated power to the regional electrical grid through an interconnection with the existing Marketplace-Adelanto 500-kV transmission line operated by LADWP.

1.3 Regional Overview

The project is located within the central Mojave Desert, a region that occurs between the southern, low-elevation, hot Sonoran Desert and the northern, high-elevation, relatively cool Great Basin. This approximately 25,000-square-mile region occurs in southeastern California and portions of Arizona, Nevada, and Utah. The Mojave Desert's western boundary is formed by the convergence of the Tehachapi and San Gabriel Mountains, and its southern boundary extends east of the San Bernardino Mountains to the Salton Sea, where it transitions into the Sonoran Desert. Most of the Mojave Desert lies at roughly 3,000 to 6,000 feet amsl, and it is therefore considered a high desert. However, the Mojave Desert encompasses a broad elevation range, including peaks that exceed 11,000 feet amsl and Death Valley, which has the lowest recorded elevation in North America, at 282 feet below mean sea level (bmsl).

Much of the Mojave Desert consists of typical mountain and basin topography where basin-to-mountain transition zones support high levels of biodiversity and endemic species. Flatter portions of the desert floor are characterized by expansive playas, dry lakes, and other ephemeral waters interspersed with dunes. This geomorphology is referred to as pan and dune complexes, which are characterized by yucca

species (*Yucca* spp.), saltbush species (*Atriplex* spp.), and Great Basin sagebrush (*Artemisia tridentata*). Fine wind-blown sand from dry lakebeds and river channels can create hummocks and dunes that support unique species of insects, plants, and reptiles. Slopes and bajadas in the region are covered with creosote bush (*Larrea tridentata*), saltbush, bursage (*Ambrosia* spp.), and bladdersage (*Salazaria mexicana*). In years with sufficient rainfall, the desert floor vegetation communities will include an abundance of annual wildflowers. Most cactus species are found in areas with coarse, sandy soils, and higher elevations support blackbrush (*Coleogyne ramosissima*), Mojave yucca (*Y. schidigera*), and banana yucca (*Y. baccata*).

1.4 Regional Climate and Weather

The Mojave Desert is characterized by hot summer temperatures (average daily highs above 100 degrees Fahrenheit) and low annual precipitation (approximately 5 inches). Daily temperature ranges of 40 degrees Fahrenheit can occur, with lows in the winter below or near freezing. Precipitation extremes are also common, with variations of 80% in annual precipitation and occasional high-volume storm events. Summer monsoons can drop more precipitation on a site in one event than the mean yearly precipitation for that location. High winds can occur, with velocities that regularly exceed 50 miles per hour (mph) in some areas and that can reach 100 mph on rare occasions (U.S. Geological Survey [USGS] 2004).

Deserts in general are defined by low levels of precipitation, and the Mojave Desert's latitude and location east of the southern Sierra Nevada and north of the Transverse Ranges result in a rain shadow on the desert side of the mountains where precipitation is far less than on the coastal side. During the summer, the western edge of the Mojave Desert is heavily influenced by the dry southwest airflows resulting in typically very dry weather. The influence of the southwest winds diminishes toward the eastern Mojave Desert, and the central portion of the Mojave Desert experiences a more continental influence and monsoon weather patterns (USGS 2004).

2 REGULATORY OVERVIEW

This report characterizes the biological resources that would potentially be affected by construction, operation, and maintenance of the project. The following discussion reviews these policies and how they pertain to project implementation.

2.1 Federal Regulations

2.1.1 National Environmental Policy Act

NEPA was enacted by the federal government in 1970 (42 United States Code [USC] 4321 et seq.). NEPA applies to most government actions that might affect natural resource management. NEPA requires the federal government to evaluate potential environmental impacts of proposed federal actions. Under NEPA, federal project proponents must consider reasonable alternatives to projects that may lessen the environmental impacts. Environmental review under NEPA can involve three levels of analysis: 1) Categorical Exclusion (CATEX) determination; 2) Environmental Assessment (EA)/Finding of No Significant Impact (FONSI); or 3) EIS.

A federal action may be categorically excluded from a detailed environmental analysis if the federal action does not "individually or cumulatively have a significant effect on the human environment" (40 Code of Federal Regulations [CFR] 1508.4). If a federal agency determines that a CATEX does not

apply to, or sufficiently address, a proposed action, that agency must then prepare an EA. The EA determines whether a federal action has the potential to cause significant environmental effects. An EA is typically brief and addresses the need for the project, describes project alternatives, evaluates impacts, and provides reference sources consulted. An EIS is the most rigorous and detailed level of project environmental review and is prepared for proposed major federal actions determined to significantly affect the quality of the human environment. The NEPA environmental review process provides opportunities for public comment, which is often required before decisions about natural resource use can be made.

The USFWS provided BLM with a draft BO on October 23, 2015, and issued a final BO on January 13, 2016. The BLM issued a ROW for the Soda Mountain Solar Project on March 25, 2016, as part of the ROD. The NEPA requirements for the environmental analysis of the project were completed through the preparation of an EIS (BLM 2016a).

2.1.2 Federal Land Policy and Management Act of 1976

The Federal Land Policy and Management Act (FLPMA) provides the BLM's overarching mandate to manage the lands and resources under its stewardship based on the principles of multiple use and sustained yield. Multiple use is a concept that directs management of lands and resource values in a way that best meets the present and future needs of Americans and is defined as "a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources" (FLPMA 03[c]). In processing a LUPA, BLM must also comply with the BLM planning regulations (43 CFR 1600) and the BLM's *Land Use Planning Handbook* (BLM 2005).

2.1.3 Endangered Species Act

The U.S. Congress passed the ESA in 1973 to identify and protect endangered species and species threatened with extinction (federally listed species). The ESA authorizes listing of entire species as threatened or endangered, as well as smaller taxonomic units: subspecies and distinct population segments (only for vertebrates); all are referred to herein as "species" for convenience. The ESA operates in conjunction with NEPA to help protect the ecosystems upon which endangered and threatened species depend.

Section 9 of the ESA prohibits the "take" of endangered or threatened wildlife species. The legal definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1532 [19]). Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 CFR 17.3). Harassment is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR 17.3). Actions that result in take can result in civil or criminal penalties. "Incidental take" is defined by the ESA as take that is incidental to, and not for the purpose of, carrying out an otherwise lawful activity.

Under ESA Section 7, all federal agencies must ensure that any actions they carry out, fund, or authorize through permits or regulatory approval are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat. The ESA defines critical habitat as habitat deemed essential to the survival of a federally listed species, and the federal government is required to designate "critical habitat" for any species it lists under the ESA regulations. A critical habitat designation does not set up a preserve or refuge, and applies only when federal funding, permits, or projects are involved. Critical habitat requirements do not apply to activities on private land and those that do not involve a federal agency.

The USFWS and National Marine Fisheries Service (NMFS) can authorize take of listed species under Sections 7 and 10 of the ESA.

Section 7 mandates that all federal agencies consult with the USFWS for terrestrial species and/or NMFS for marine species to ensure that federal agency actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species. Any anticipated adverse effects must be assessed to determine potential effects of the project on listed species and critical habitat. If the project may adversely affect a listed species or its habitat, the USFWS or NMFS would need to prepare a BO as part of the ITP process. The BO may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat, including "take" limits.

Section 10(a)(1)(B) of the ESA authorizes issuance of permits to allow "incidental take" of listed species. Non-federal entities that may incidentally take ESA-listed species can follow this process to obtain take authorization. To obtain an ITP, an applicant must submit a habitat conservation plan and conduct an assessment on the impacts of the action, outlining steps to minimize and mitigate permitted take impacts to listed species.

In some instances, non-federal entities may obtain take authorization under the Section 7 when a federal nexus, such as federal funding or permitting (e.g., through the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act), is available. In such cases, the federal agency taking action consults with the USFWS as described above.

2.1.4 Migratory Bird Treaty Act

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA), which provides federal protection to all migratory birds, including nests and eggs on all lands (public or private). The MBTA prohibits anyone without a permit "to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof." The Migratory Bird Treaty Reform Act of 2004 further defined species protected under the act and excluded all non-native species. The list of protected migratory birds includes nearly all bird species native to the United States.

If birds, nests, or eggs are present at the project area and cannot be avoided, they must be relocated before construction begins, which would require an MBTA permit from the USFWS. However, Section 1 of the Interim Empty Nest Policy of the USFWS, Region 2, states that if the nest is completely inactive at the time of destruction or movement, a permit is not required to comply with the MBTA. If an active nest is observed before or during construction, measures should be taken to protect the nest from destruction and to avoid a possible violation of the MBTA.

2.1.5 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668–668c), enacted in 1940 and amended several times since, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles (*Haliaeetus leucocephalus*), including their parts, nests, or eggs. In 1962, Congress amended the act to cover golden eagles (*Aquila chrysaetos*).

The act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Under USFWS rules (16 USC 22.3; *Federal Register* 72:31132, June 5, 2007), "disturb" means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

2.1.6 California Desert Conservation Area Plan

The CDCA encompasses 25 million acres in southern California and was designated by Congress in 1976 through the FLPMA. BLM manages approximately 10 million of the 25 million acres in the CDCA. Congress directed BLM to prepare and implement a comprehensive long-range plan for the management, use, development, and protection of public lands within the CDCA. The CDCA Plan is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The CDCA Plan provides overall regional guidance for BLM-administered lands in the CDCA and establishes long-term goals for protection and use of the California desert.

2.1.6.1 DESERT RENEWABLE ENERGY CONSERVATION PLAN

In September 2016, BLM adopted the Desert Renewable Energy Conservation Plan (DRECP) LUPA to the CDCA Plan, Bishop Resource Management Plan, and Bakersfield Resource Management Plan (BLM 2016b). The DRECP LUPA addresses solar, wind, geothermal energy generation, and transmission projects on 10.8 million acres of BLM-administered lands in the desert regions of southern California.

The BLM DRECP LUPA establishes several land use classifications, including Development Focus Areas (DFAs), Variance Process Lands (VPLs), Recreation Management Areas, General Public Lands, and various conservation land use designations. In DFAs, renewable energy projects are incentivized and permitting is streamlined. VPLs are carried over from the Western Solar Plan[1] designations and have moderate to low ecological value and uncertain renewable energy potential. Renewable energy projects may be implemented on VPLs, but they must first be evaluated under a variance process and then approved by BLM to proceed through NEPA environmental review. BLM Conservation Areas include National Landscape Conservation System lands, Areas of Critical Environmental Concern (ACECs), and Wildlife Allocations. Recreation Management Areas are designated for recreation actions. This designation includes Extensive Recreation Management Areas, which entail management specifically to address recreation use and demand; and Special Recreation Management Areas, which are high-priority areas for recreation and have unique value and importance for recreation. General Public Lands are BLM-administered lands that do not have any of the above designations.

The DRECP LUPA includes a list of over 200 Conservation and Management Actions (CMAs) that prescribe avoidance, minimization, and compensatory mitigation actions that are applicable to new projects on BLM-administered lands in the DRECP plan area. The CMAs address siting, design,

[1] The BLM's 2012 Approved Resource Management Plan Amendment/ROD for Solar Energy Development in Six Southwestern States.

preconstruction, construction, maintenance, implementation, operation, and decommissioning activities of renewable energy projects. The applicability of each CMA to a particular project depends on the BLM land designation(s) at the project area, project type, and resources present at the site.

The majority of the project area is located on DRECP General Public Lands, and the gen-tie route is within an ACEC. The project ROD was issued before the DRECP was adopted, and mitigation requirements for the project as described in the ROD are written as project-specific mitigation measures (MMs) rather than CMAs.

2.1.7 Bureau of Land Management Sensitive Species

BLM sensitive species are species designated by the BLM State Director. This list includes species that may be federally listed, proposed, or candidate species, or state-listed species. The BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered" (BLM 2014). Several BLM offices maintain a list of sensitive plant and wildlife species that are to be considered as part of the management activities carried out by BLM on the lands that it administers.

2.1.8 Noxious Weed Act of 1974

The Noxious Weed Act of 1974 (7 USC 2801 et seq.), under the authority of the Secretary of Agriculture, establishes a federal program to control the spread of noxious weeds. The Noxious Weed Act gives the Secretary of Agriculture authorization to work with other federal, state, and local agencies; agricultural organizations; and private individuals to implement measures to control, eradicate, and/or prevent the spread of noxious weeds.

2.1.9 Executive Order 13112

Executive Order 13112, issued by President Clinton on February 3, 1999, promotes the prevention and introduction of invasive species and provides for their control and minimizes the economic, ecological, and human health impacts that invasive species cause through the creation of the Invasive Species Council and Invasive Species Management Plan.

2.2 State Regulations

2.2.1 California Environmental Quality Act

CEQA was adopted in 1970 and applies to discretionary actions directly undertaken, financed, or permitted by state or local government lead agencies. CEQA requires that a project's effects on environmental resources must be analyzed and assessed using criteria determined by the lead agency. CEQA defines a rare species in a broader sense than the definitions of threatened, endangered, or California species of concern. Under this definition, the California Department of Fish and Wildlife (CDFW) can request additional consideration of species not otherwise protected.

2.2.1.1 CEQA SIGNIFICANCE CRITERIA

Section 15064.7 of the State CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency will use in determining the significance of environmental effects caused by projects or actions under its review. Appendix G of the State CEQA Guidelines provides thresholds to

evaluate impacts that would normally be considered significant. Based on these guidelines, impacts to biological resources would normally be considered significant if the project would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by CDFW or USFWS;

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;[2]

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites;

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

An evaluation of whether an impact to biological resources would be significant must consider both the resource itself and how that resource fits into a regional or local context. Significant impacts would be those that would diminish or result in the loss of an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. The evaluation of impacts considers direct impacts, indirect impacts, and cumulative impacts, as well as temporary and permanent impacts.

2.2.2 California Endangered Species Act

The CDFW administers the California Endangered Species Act (CESA), which prohibits the "taking" of listed species except as otherwise provided by state law. Section 86 of the California Fish and Game Code (FGC) defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under certain circumstances, the CESA applies these take prohibitions to species accepted as candidates for listing. Pursuant to the requirements of the CESA, state lead agencies (as defined under CEQA Public Resources Code 21067) are required to consult with CDFW to ensure that any action or project is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

Additionally, CDFW encourages informal consultation on any proposed project that may impact a candidate species because they are temporarily assigned the same protections as a state-listed endangered or threatened species. CDFW also designates certain vertebrate species as "Species of Special Concern" due to declining populations, limited ranges, and/or continuing threats making them more vulnerable to extinction (CDFW 2024a).

[2] Threshold c. is not included in the impacts analysis section of this report because it pertains to state and federal wetlands. Waters and wetlands of the U.S. and the state are addressed in a separate jurisdictional delineation report.

2.2.3 California Fish and Game Code

2.2.3.1 FULLY PROTECTED SPECIES

Several sections of the California FGC provide protection from take for a variety of species, referred to as fully protected species. Section 5050 lists protected amphibians and reptiles, and Section 3515 prohibits take of fully protected fish species. Eggs and nests of fully protected birds are under Section 3511. Migratory nongame birds are protected under Section 3800, and mammals are protected under Section 4700.

Senate Bill No. 147, effective as of July 10, 2023, amends Sections 395, 3511, 4700, 5050, and 5515 of the Fish and Game Code and adds Section 2081.15. This legislation allows the CDFW to issue Incidental Take Permits (ITPs) for fully protected species under specific and limited circumstances, including for photovoltaic (PV) solar projects and related infrastructure (California Legislative Information 2023).

2.2.3.2 NESTING BIRDS AND RAPTORS

Section 3503 of the California FGC states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 provides protection for all birds of prey, including their eggs and nests.

2.2.3.3 MIGRATORY BIRD PROTECTION

Take or possession any migratory non-game bird as designated in the MBTA is prohibited by Section 3513 of the California FGC.

2.2.3.4 DESERT KIT FOX

Under Section 460 of the California FGC, desert kit fox (*Vulpes macrotis arsipus*) may not be taken at any time. Under Sections 4000-4003 of the California FGC, it is unlawful to conduct activities that would result in the taking, possessing, or destroying of any fur-bearing mammals, including kit foxes, without prior authorization from CDFW.

2.2.3.5 NATIVE PLANT PROTECTION ACT

The Native Plant Protection Act (NPPA) of 1977 (California FGC Section 1900-1913) directed the California FGC to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. The NPPA thus includes measures to preserve, protect, and enhance rare and endangered native plants.

CESA has largely superseded NPPA for all plants designated as endangered by the NPPA. The NPPA nevertheless provides limitations on take of rare and endangered species as follows: "no person will import into this state, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the CESA. Individual landowners are required to notify CDFW at least 10 days in advance of changing land uses to allow CDFW to salvage any rare or endangered native plant material.

2.2.4 California Desert Native Plants Act

The California Desert Native Plants Act (CDNPA) protects non-listed California desert native plants from unlawful harvesting on public and private lands in the Counties of Imperial, Inyo, Kern, Los Angeles,

Mono, Riverside, San Bernardino, and San Diego (California Food and Agriculture Code, Sections 80001-80006, Division 23). Several desert plants are protected under this act, including all species in the agave and cactus families.

2.3 Local Regulations

2.3.1 San Bernardino County Policy Plan

The San Bernardino County Policy Plan contains the long-term goals and policies that will guide County decisions, investments, and improvements toward achieving the countywide vision. The plan represents a unique approach to county planning. It serves as the County's General Plan for the unincorporated areas, which is mandated by state law, but it also includes policy direction for adult and child supportive services, healthcare, public safety, and other regional services the County administers in both incorporated and unincorporated areas. The following policies identified in the Natural Resources element of the San Bernardino Policy Plan are relevant to this analysis (San Bernardino County 2020).

Goal NR-5 Biological Resources – An interconnected landscape of open spaces and habitat areas that promotes biodiversity and healthy ecosystems, both for their intrinsic value and for the value placed on them by residents and visitors.

> **Policy NR-5.1 Coordinated habitat planning**. [The County will participate] in landscape-scale habitat conservation planning and coordinate with existing or proposed habitat conservation and natural resource management plans for private and public lands to increase certainty for both the conservation of species, habitats, wildlife corridors, and other important biological resources and functions; and for land development and infrastructure permitting.
>
> **Policy NR-5.2 Capacity for resource protection and management**. [The County will coordinate] with public and nongovernmental agencies to seek funding and other resources to protect, restore, and maintain open space, habitat, and wildlife corridors for threatened, endangered, and other sensitive species.
>
> **Policy NR-5.3 Multiple-resource benefits**. [The County will prioritize] conservation actions that demonstrate multiple resource preservation benefits, such as biology, climate change adaptation and resiliency, hydrology, cultural, scenic, and community character.
>
> **Policy NR-5.4 Off-base recovery efforts**. [The County will coordinate] with military installations to facilitate off-base recovery of threatened and endangered species and landscape-scale conservation.
>
> **Policy NR-5.5 Mitigation and future responsibilities**. [The County will require] that new development satisfy habitat conservation responsibilities without shifting conservation responsibilities onto military property.
>
> **Policy NR-5.6 Mitigation banking**. [The County will support] the proactive assemblage of lands to protect biological resources and facilitate development through private or public mitigation banking. We require public and private conservation lands or mitigation banks to ensure that easement and fee title agreements provide funding methods sufficient to manage the land in perpetuity.
>
> **Policy NR-5.7 Development review, entitlement, and mitigation**. [The County will comply] with state and federal regulations regarding protected species of animals and vegetation through the development review, entitlement, and environmental clearance processes.

Policy NR-5.8 Invasive species. [The County will require] the use of non-invasive plant species with new development and encourage the management of existing invasive plant species that degrade ecological function.

2.3.2 San Bernardino County Development Code

Division 8 (Resource Management and Conservation) provides regulations and guidelines for the management and conservation of natural resources in the unincorporated areas of the County on property or combinations of property under private or public ownership.

Section 88.01.060 (Native Desert Plant Protection) provides regulations for the removal of specified native desert plants to preserve and protect the plants and to provide for the conservation and wise use of desert resources. This section requires a Tree or Plant Removal Permit to remove the following plants:

- Smoketrees (*Psorothamnus spinosus*) and mesquites (*Prosopis* spp.) with a stem measuring 2 inches or more in diameter, or 6 feet or more in height
- All species of the family Agavaceae
- Creosote rings (*Larrea tridentata*) with diameters of 10 feet or more
- All Joshua trees (*Yucca brevifolia*)
- Any part, living or dead, of desert ironwood (*Olneya* spp.), mesquites, or palo verdes (*Parkinsonia* spp.)

Section 88.01.080 (Regulated Riparian Plants) provides for the protection of riparian plants and habitats. San Bernardino County defines riparian vegetation as vegetation within 200 feet of the bank of a stream. Any removal of riparian vegetation requires a Tree or Plant Removal Permit and is subject to environmental review.

3 METHODS

This section of the report describes the methodologies and information sources used to target, describe, and evaluate the biological resources observed in the study area and project vicinity. For this report, the study area is defined as the 2,670-acre proposed project area and the proposed gen-tie route (approximately 35.75 acres) (see Figure 2). A comprehensive literature and database search was performed to identify biological resources that may occur in the study area and/or within 10-miles of the project. These sources included species records from wildlife studies completed at or near the project, published literature, databases, coordination with CDFW, and SWCA biologists' professional judgment based on past work in the Mojave Desert. Following the desktop review, field surveys were performed to assess existing habitat conditions in the study area. The field surveys included surveys for special-status species, and were performed according to existing protocols, guidelines, and methodologies, and in coordination with CDFW. SWCA biologists worked cooperatively with CDFW to draft the *Biological and Aquatic Resources Work Plan* (SWCA 2022) for the project. The work plan described the scope, methods, and schedule for determining biological and aquatic resources associated with the current site conditions, project design, and relevant regulatory requirements, which are included in the following sections. Species and resources survey methods described in the work plan included:

- Mojave fringe-toed lizard, Coachella Valley Fringe-toed Lizard Survey Protocol (USFWS 2007).
- Desert tortoise, *Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*)* (USFWS 2019a).

- Burrowing owl (*Athene cunicularia*), desert kit fox, and American badger (*Taxidea taxus*), *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).
- Rare and invasive plants*, Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018).
- Avian use survey protocol adapted from the 2013 Panorama Environmental, Inc., *Biological Resources Technical Report for the Soda Mountain Solar Project* (Appendix A).

Certain species may occur in and around the project area but were not included in the work plan:

- Crotch's bumble bee (*Bombus crotchii*) and bat surveys were not included in the November 2022 work plan. However, In February 2023, CDFW recommended bat surveys and stated that focused bumble bee surveys would be required to determine the presence or absence of Crotch's bumble bee.
- Desert bighorn sheep surveys were conducted by CDFW as part of a separate effort. CDFW desert bighorn sheep monitoring results relevant to populations near the project area will be reviewed in coordination with the CDFW project environmental specialist.
- Surveys for golden eagle were not conducted due to the potential for the aircraft used in aerial surveys to disrupt desert bighorn sheep behavior and the relatively low potential for the project to impact golden eagle. The on-site avian use surveys afforded an opportunity to document golden eagle use of the project area and planned ground-based raptor surveys will provide additional opportunities to observe and document golden eagle use of the project area. Local data on golden eagles was obtained from the USFWS.

3.1 Database and Literature Review

A desktop-based review was conducted to identify biological resources of interest near the study area. Species occurrences from the CDFW California Natural Diversity Database (CNDDB) RareFind 5 and the California Native Plant Society's (CNPS's) Rare Plant Inventory were queried to identify special-status plant and wildlife species requiring analysis (CDFW 2024b; CNPS 2023a). The CNDDB data search extended 10 miles from the project boundary (Figure 3). The CNPS data search centered on the nine USGS 7.5-minute quadrangles containing and surrounding the study area: West of Soda Lake (study area), West of Baker, Red Pass Lake, Baker, Cronese Lakes, Soda Lake North, Crucero Hill, Soda Lake South, and Cave Mountain. The following list includes all the resources considered in the desktop review.

- 2013 Panorama Environmental, Inc. *Biological Resources Technical Report for the Soda Mountain Solar Project* (see Appendix A)
- Calflora: Information on California plants for education, research and conservation (Calflora 2024)
- California Herps: A Guide to the Amphibians and Reptiles of California (Nafis 2023).
- CNPS Rare Plant Inventory (CNPS 2023a)
- *Caltrans Bat Mitigation: A Guide to Developing Feasible and Effective Solutions* (H.T. Harvey and Associates 2019)
- *Caltrans Log of Bridges on State Highways, District 8* (California Department of Transportation [Caltrans] 2018)
- CDFW CNDDB – accessed 10/26/22, 9/20/23, 10/12/23 and 5/14/24 (CDFW 2024b)
- CDFW Vegetation Maps and Data (CDFW 2023a)

- California Wildlife Habitat Relationships data and maps (CDFW 2023b)
- Consortium of California Herbaria Database (Consortium of California Herbaria 2023)
- *Birds of the World* (Billerman et al. 2022)
- DRECP Gateway (Conservation Biology Institute 2023)
- eBird's web-based bird database (eBird 2024)
- iNaturalist Mojave National Preserve (iNaturalist 2024)
- National Park Service, Mojave National Preserve species checklists (National Park Service 2022)
- *Soda Mountain Solar Project Proposed Plan Amendment/Final Environmental Impact Statement/Environmental Impact Report* (BLM 2015)
- *Special Animals Including California Species of Special Concern* (CDFW 2023c)
- *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2023d)
- BLM Designation of Sensitive Species (BLM 2019)
- USFWS Information for Planning and Consultation (IPaC) species list (USFWS 2023a) (Appendix B)
- USFWS Critical Habitat Portal (USFWS 2023b)
- USFWS Environmental Conservation Online System (USFWS 2023c)
- USGS soils data (Natural Resources Conservation Service 2024)

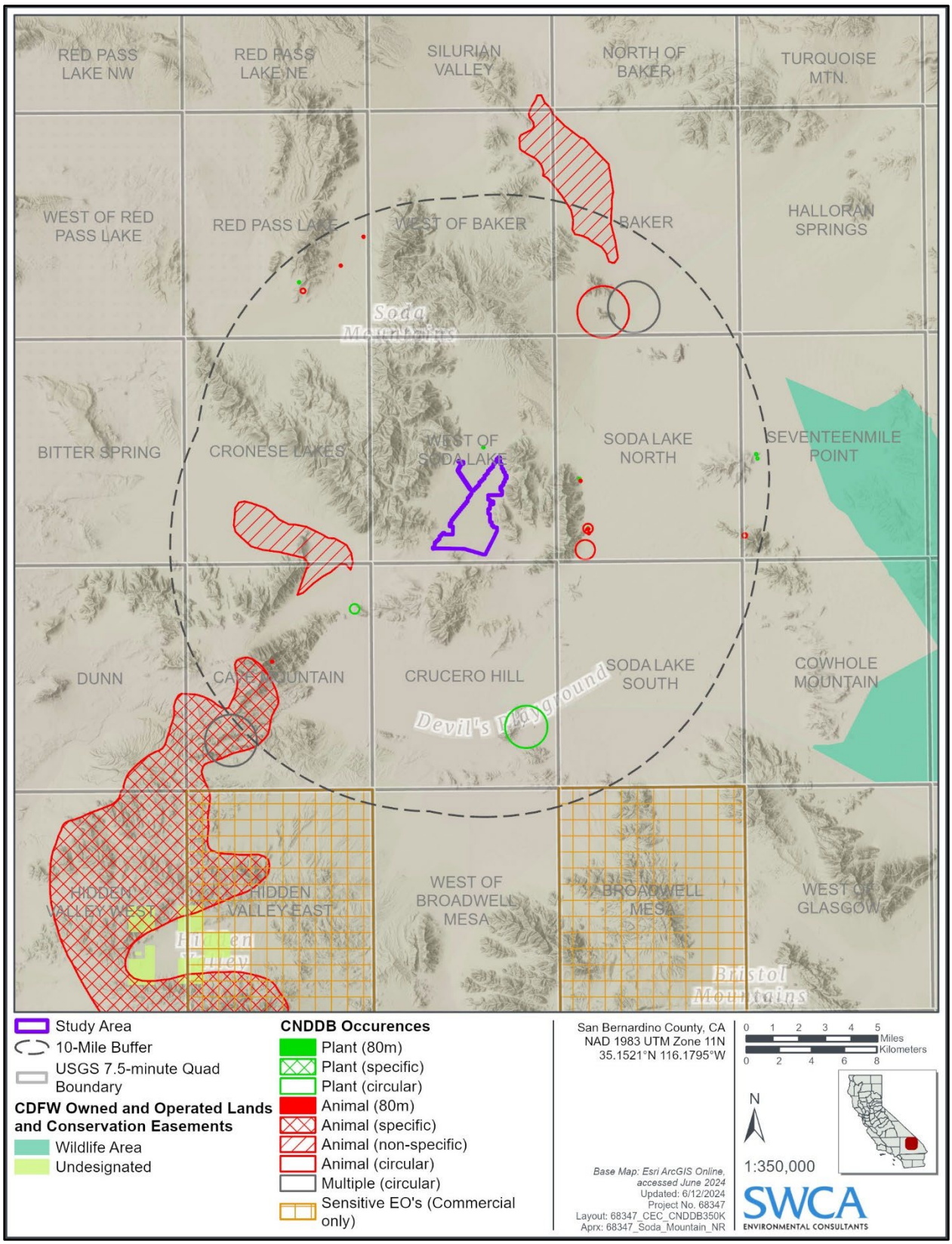

Figure 3. Results of 10-mile CNDDB occurrence query.

3.1.1 Vegetation and Habitat Mapping

Desktop vegetation and existing habitat maps were reviewed prior to the field verification during the rare plant survey. Vegetation communities within the study area were classified using *A Manual of California Vegetation Online* (CNPS 2023b). Sensitive vegetation communities are defined by CDFW as those "communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of Projects" (CDFW 2018). Vegetation communities with a State Rank of 1, 2, or 3 are considered sensitive by CDFW. Also, SWCA biologists surveyed for DRECP Special Vegetation Features which include yucca clones, creosote rings, saguaro cactus, Joshua tree woodland, microphyll woodland, and crucifixion thorn stands (BLM 2016c).

The vegetation community map of the study area and gen-tie route was refined during a focused rare plant survey performed in April and May 2023. Vegetation types within a 10-mile buffer around the survey area were mapped using the vegetation layer for the DRECP. Potential to occur for special-status species within the 10-mile buffer were analyzed based on the results of the CNDDB inquiry and the DRECP vegetation communities. Field surveys were not conducted within the 1000-foot buffer. A mapbook at a scale of 1:6,000 showing sensitive biological resource location(s) in relation to the project area is included as Appendix C.

3.1.2 Special-Status Species Potential for Occurrence

Special-status species evaluated in this study include plants and animals included in one or more of the following categories:

- Species designated as Sensitive Species by the BLM (BLM 2019)
- Species listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the *Federal Register* [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (*Federal Register* 67:40657, June 13, 2002).
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 California Code of Regulations 670.5).
- Species that meet the definitions of rare or endangered under the CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California FGC Section 1900 et seq.).
- Plants assigned a California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3, or 4 by the CNPS (2023b).
- Animal species of special concern as listed by CDFW (2024a).
- Animals fully protected in California (FGC Sections 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Invertebrates listed on the California Special Animals List (CDFW 2023c).
- DRECP LUPA Focus Species, microphyll woodland, crucifixion thorn stands (BLM 2016c)

Potential for occurrence of special-status species within the study area and the immediate vicinity was assessed following the database searches and field survey based on on-site habitat conditions. During the pre-field desktop assessment, each species was assigned to one of the categories listed below:

- **Present**: Species has been documented within the study area by a reliable observer. The presence of bird species was distinguished further into those that 1) nest in the study area, 2) forage in the study area, and/or 3) occur in the study area only as transients during migration or other dispersal events.
- **High Potential**: The species has been documented in the vicinity (within 5 miles of the study area based on recent [within 20 years] CNDDB or other records or based on professional expertise specific to the area or species), and there is suitable habitat within the study area that makes the probability of the species occurring there high. Alternatively, high-quality suitable habitat is present within the study area, and the study area is within the known range of the species. Bird species in this category were differentiated based on their occurrence within the study area as breeding, foraging only, and/or transients.
- **Moderate Potential**: Species is known to occur within the study area based on CNDDB or other records within 40 years, or based on professional expertise specific to the area or species, and there is moderate quality habitat at the study area. Alternatively, there is moderate-quality habitat in the part of the study area that falls within the known range of the species.
- **Low Potential**: The study area is within the species' currently known range, but vegetation communities, soils, etc., do not resemble those known to be used by the species; or conditions appear suitable, but the study area is beyond the species' currently known range; or the species was recorded more than 40 years ago within the study area.
- **Not likely to Occur**: There is no suitable habitat for the species within the study area, or the area is located well outside the known range of the species. Alternatively, a species survey was conducted during the appropriate season for species occurrence and was not observed.

Following the completion of the 2023 field surveys, the potential for occurrence was further refined to present or not likely to occur for species that were the target of a focused presence/absence survey.

3.2 Field Surveys

Following the initial database and literature review, field surveys were performed during the 2023 season. The surveys encompassed vegetation mapping, habitat suitability assessments, focused surveys for special -status animals and plants, and avian and bat use. Each survey was performed during the appropriate survey season for the relevant biological resource. Species-specific surveys were performed using methodologies based on the most current guidelines published by CDFW and/or USFWS, or using methodologies specifically adapted to the project in collaboration with CDFW. CDFW will provide species analysis for desert bighorn sheep. Table 1 details the field surveys included in this report.

Table 1. Field Survey Dates and Personnel

Field Survey	Date	Personnel
Reconnaissance-level survey	December 30, 2021	Pauline Roberts and Maisie Borg
Rare plant survey	April 10– May 2, 2023	Ryan Myers, Paris Krause, Lauren Strong, Minerva Lara, Luis Aguilar, Tamara Kramer, and Chennie Castanon
Crotch's bumble bee survey 1	May 22–26, 2023	Sharif Durzi, Christina Torres, Nate Kolberg and Rebecca Wang

Field Survey	Date	Personnel
Crotch's bumble bee survey 2	June 14–16, 2023	Sharif Durzi, Christina Torres, Lee BenVau, and Marisol Sanchez
Crotch's bumble bee survey 3	July 16–18, 2023	Sharif Durzi, Christina Torres, Lee BenVau, and Marisol Sanchez
Crotch's bumble bee survey 4	August 14–16, 2023	Sharif Durzi, Lee BenVau, and Marisol Sanchez
Desert tortoise survey	April 5– May 5, 2023	SWCA biologists: Gigi Wagnon, Bridget Manjarrez, Lauren Strong, Amy Parlette, Minerva Lara, Alex Jamal, Chennie Castanon, Tamara Kramer, and Danielle Parsons
Desert tortoise survey (continued)	May 22– May 26, 2023	Aardvark Biological Services LLC biologists: Chip Cochran, Jeremy Wright, Youssef Attallah, Alexandria Hamilton, Marty Lewis, Matt Martin, Ben Delancey, Miguel Moutsis, Thomas Nhu, Dalton Stanfield, Sarah Mendez, Karyn Seruka, and Gary Thorunbrugh
Mojave fringe-toed lizard survey 1	March 26, 2023	Danny Cuellar and Par Singhaseni
Mojave fringe-toed lizard survey 2	July 11, 2023	Danny Cuellar and Par Singhaseni
Avian use survey – winter	January 24–26, 2023	Gigi Wagnon
Avian use survey – spring	March 23–24, 2023	Gigi Wagnon and Bridget Manjarrez
Avian use survey – summer	July 12–14, 2023	Lauren Strong
Avian use survey – fall	TBD	Gigi Wagnon
Burrowing owl, desert kit fox, and American badger burrow survey	March 27– April 5, 2023	Bridget Manjarrez, Par Singhaseni, Lauren Strong, Gigi Wagnon, and Amy Parlette
Burrowing owl, desert kit fox, and American badger burrow survey (continued)	May 8–12, 2023	Gigi Wagnon and Bridget Manjarrez
Burrowing owl, desert kit fox, and American badger burrow survey (continued)	May 22–25, 2023	Parker Richardson and Kristen Burgess
Burrowing owl follow-up survey 1	June 5–6, 2023	Omar Moquit and Marcus Goncalves
Burrowing owl follow-up survey 2	July 6, 2023	Gigi Wagnon and Parker Richardson
Burrowing owl follow-up survey 3	July 24, 2023	Omar Moquit and Marisol Sanchez
Bat survey habitat assessment	June 27–28, 2023	Mason Townley and Omar Moquit
Bat survey nighttime acoustic survey 1	July 23–26, 2023	Mason Townley, Minerva Lara, Tamara Kramer, and Bridget Manjarrez
Bat survey nighttime acoustic survey 2	August 14–17, 2023	Mason Townley, Minerva Lara, Gigi Wagnon, and Bridget Manjarrez
Bat survey nighttime acoustic survey 3	August 28–31, 2023	Mason Townley, Minerva Lara, Tamara Kramer, and Marisol Sanchez

3.2.1 Reconnaissance-level Survey

A reconnaissance-level survey was performed by SWCA biologists Pauline Roberts and Maisie Borg on December 30, 2021. The purpose of the survey was to document current habitat conditions in comparison with the site conditions documented in the 2013 Panorama Environmental, Inc., *Biological Resources Technical Report for the Soda Mountain Solar Project* (see Appendix A). A combined windshield and pedestrian survey was conducted; the windshield survey was conducted by driving slowly (between 5 to 10 mph) along Rasor Road and the unnamed road that runs north-south within the study area.
The biologists documented plant and wildlife species observations, including tracks, scat, remains, and burrows or dens. Additional details can be found in *Soda Mountain Solar Site Visit* (Appendix D).

3.2.2 Rare Plant Survey and Vegetation Mapping

Focused pedestrian surveys for special-status plants with potential to occur in the study area were performed consistent with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). Point and polygon data were recorded using GPS equipment with submeter accuracy. Confirmation of current year germination and/or life cycle stage (e.g., blooming or fruiting) was obtained by visiting local reference populations prior to conducting field surveys. Reference populations are known locations of rare plant species, typically visited during the blooming period when characteristics for identification are present. Based on the habitat conditions observed during the December 2021 reconnaissance visit and a preliminary desktop review performed by SWCA in December 2022, one spring survey was deemed sufficient to fulfill survey requirements because all the special-status plants that might potentially occur would be detectable and identifiable during that time.

A team of seven SWCA biologists surveyed the entire study area from April 10 to May 2, 2023, to search for special-status plants throughout the entire study area (see Figure 2). SWCA performed focused rare plant surveys for the following eight species: small-flowered androstephium (*Androstephium breviflorum*), Borrego milkvetch (*Astragalus lentiginosus* var. *borreganus*), Emory's crucifixion-thorn (*Castela emoryi*), Harwood's eriastrum (*Eriastrum harwoodii*), Utah vine milkweed (*Funastrum utahense*), ribbed cryptantha (*Johnstonella costata*), winged cryptantha (*Johnstonella holoptera*), and desert winged rockcress (*Sibara deserti*). SWCA biologists also surveyed for DRECP Special Vegetation Features which include yucca clones, creosote rings, saguaro cactus, Joshua tree woodland, microphyll woodland, crucifixion thorn stands (BLM 2016c). The survey was timed to coincide with the appropriate blooming species for the rare plants that might occur, specifically April and May. Alkaline meadows and seeps were determined not present. Therefore, a summer or fall rare plant survey was not performed for alkali marsh aster (*Almutaster pauciflorus*).

In addition to the rare plant survey, the biologists mapped vegetation communities and documented all native and non-native plants identified in the study area (see Appendix C, Table C-1). Vegetation communities were mapped to the alliance level as described in *A Manual of California Vegetation Online* (CNPS 2023b). Vegetation communities were mapped to the association level for sensitive vegetation communities. Additional details pertaining to the rare plant survey can be found in *Rare Plant Survey and Vegetation Mapping Report for the Soda Mountain Solar Project* (Appendix E).

3.2.3 Crotch's Bumble Bee Survey

The study area is outside of the known current and historic range for this species, as published in recent CDFW survey guidelines (CDFW 2023e). Per recently published range maps from CDFW, an isolated portion of the historic range for Crotch’s bumble bee occurs approximately 25 miles north of the study area. Outside of this isolated area, the study area occurs more than 50 miles east of the current range of the Crotch’s bumble bee. Additionally, results of a desktop database and literature review showed the closest known historical occurrence of Crotch’s bumble bee is approximately 21 miles north of the study area and was recorded in 1995 (CDFW 2023c). This occurrence is an isolated record that is significantly detached in distance and ecological context from the usual known species’ habitat of coastal and central California. Therefore, SWCA did not initially include Crotch’s bumble bee as a species requiring surveys to assess potential impacts. However, during project coordination, CDFW requested Crotch’s bumble bee surveys. Subsequently, SWCA and CDFW coordinated until a methodology was established.
The duration of the request and coordination period resulted in an initial survey date of May 22, 2024, which is past the Crotch’s bumble bee earliest flight season and earliest forage plant blooming periods.

Prior to the field surveys, a desktop assessment for Crotch's bumble bee was performed, which included a review of the nesting, foraging, and overwintering requirements for the species. In addition, data collected from the earlier spring 2023 surveys were used to assess areas that were likely to contain suitable habitat for Crotch's bumble bee and co-occurring pollinator species. The methods for focused surveys for Crotch's bumble bee was developed in coordination with CDFW and were based on the USFWS's *Survey Protocols for the Rusty Patched Bumble Bee (*Bombus affinis*)*, Version 2.2 (USFWS 2019b). On June 6, 2023, CDFW published new survey guidance for Crotch's bumble bee, *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW 2023e). However, SWCA maintained use of the CDFW-approved in-progress methods for consistency. The purpose of the surveys was to identify the availability of nesting, foraging, and overwintering habitat, and to search for Crotch's bumble bee within the study area.

Teams of three to four SWCA biologists performed four focused surveys during the colony active period (April–August) to allow for the highest probability of detection. Surveys were performed May 22–26, June 14–16, July 16–18, and August 14–26, 2023 (see Table 1). The surveys were focused in areas with the highest abundance of plants that may provide nectar for foraging bumble bees, specifically along the largest washes (Figure 4). Nectar plants were recorded using a handheld GPS unit. No bumble bees were captured or handled during survey efforts. See *Crotch's Bumble Bee Focused Survey Report for the Soda Mountain Solar Project* (Appendix F) for additional details.

3.2.4 Desert Tortoise Survey

Qualified SWCA and Aardvark Biological Services, LLC, biologists performed protocol desert tortoise surveys between April 5 and May 26, 2023 (see Table 1). The surveys were performed in accordance with the USFWS's *Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii)* (USFWS 2019a). The purpose of the surveys was to determine the presence of desert tortoise, assess the habitat quality and conditions, and identify potential burrows on-site.

A team of four biologists walked parallel transects spaced approximately 10 m apart throughout the entire study area (see Figure 2). Live desert tortoise and sign, including carcasses, scat, burrows, pallets, and drinking depressions, were recorded using handheld GPS units. Surveys were performed during the spring and when temperatures were below 95 degrees Fahrenheit, when tortoises were most likely to be observed aboveground. Each potential desert tortoise burrow was assigned a condition class as described in the *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009). The condition classifications are as follows:

- Class 1: currently active, with desert tortoise or recent desert tortoise sign
- Class 2: good condition, definitely desert tortoise; no evidence of recent use
- Class 3: deteriorated condition that includes collapsed burrows; definitely desert tortoise
- Class 4: good condition; possibly desert tortoise
- Class 5: deteriorated condition that includes collapsed burrows; possibly desert tortoise

Additional details for the desert tortoise surveys can be found in *Desert Tortoise Survey Report for the Soda Mountain Solar Project* (Appendix G).

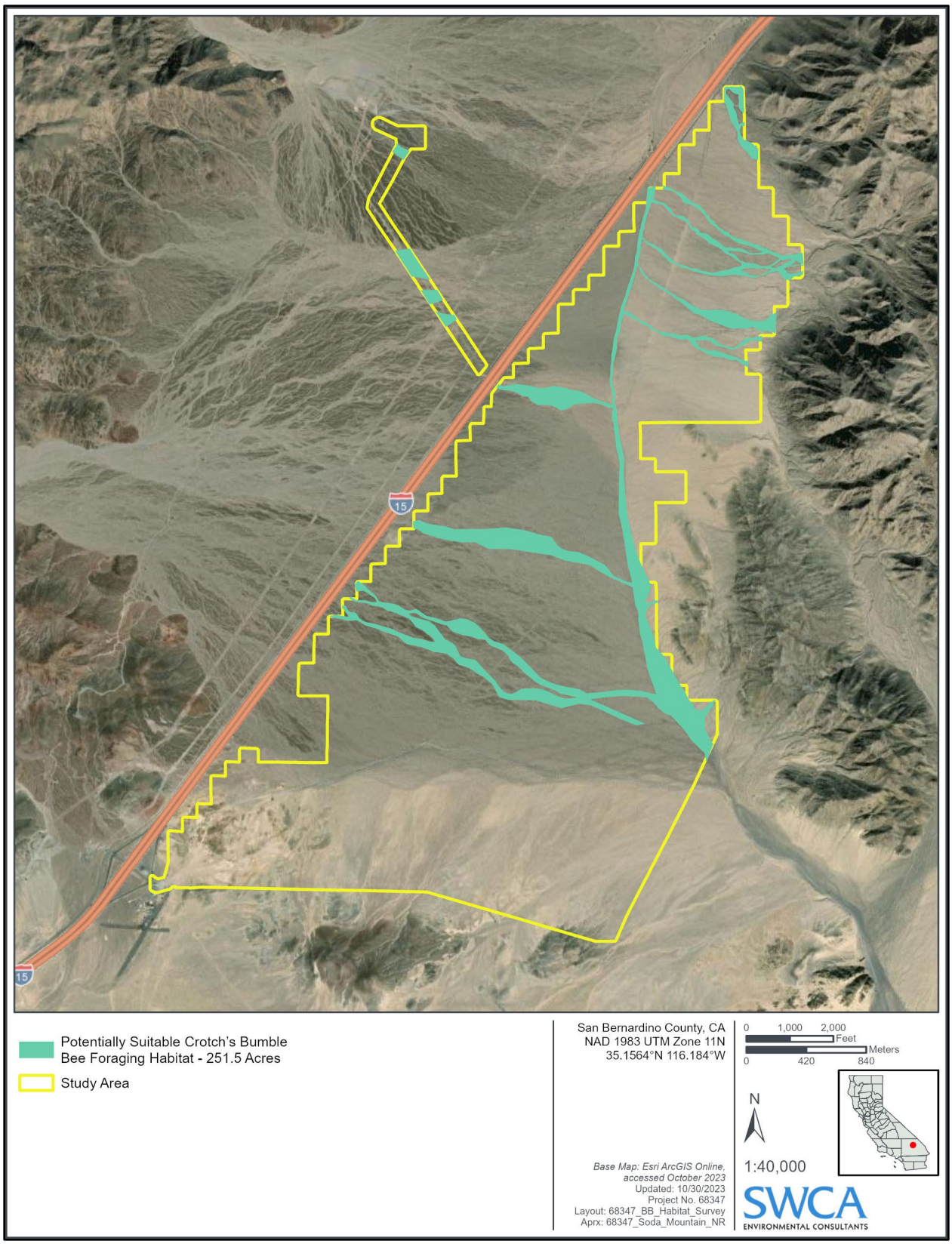

Figure 4. Potentially suitable Crotch's bumble bee foraging habitat based on the desktop assessment.

3.2.5 Mojave Fringe-toed Lizard Survey

The desktop review of the 2013 Biological Resources Technical Report shows that surveys were performed for Mojave fringe-toed lizard (*Uma scoparia*) in 2009 and 2012. Areas with suitable habitat were mapped in the report along a wash that is outside and to the southeast of the current project study area. There is currently no survey protocol for Mojave fringe-toed lizard; therefore, the survey methodology was based on a combination of the *Coachella Valley Fringe-toed Lizard (*Uma inornata*) Survey Protocol* (USFWS 2007) and the BLM-recommended methods used during the 2009 and 2012 surveys for the project. This survey protocol was established for the federally and state-endangered Coachella Valley fringe-toed lizard, which occurs in similar habitat conditions but in a geographically distinct area.

Based on the vegetation mapping and data from the rare plant survey, the project area remained largely unchanged since the surveys in 2009 and 2012. SWCA mapped two relatively small areas of aeolian sand deposits (2.1 acres and 4.8 acres) within washes in the southern portion of the project area that were not included in the 2013 Biological Resources Technical Report (see Appendix D). These areas were not included in the focused surveys for Mojave fringe-toed lizard in March and July 2023. Based on the lack of connectivity to known populations and small habitat areas, Mojave fringe-toed lizard populations are unlikely to persist in these locations. Although focused Mojave fringe-toed lizard surveys were not conducted in the small sand deposits, surveys for additional special-status species and vegetation did cover these areas. These efforts included concentrated visual encounter surveys in which Mojave fringe-toed lizards, if present, may have been observed incidentally.

Two survey replicates were performed in 2023 during the Mojave fringe-toed lizard active season (March–October) during appropriate weather conditions (see Table 1). Ideal weather conditions include little to no wind, and non-shade ground temperatures between 82.4- and 122.0-degrees Fahrenheit (28–50 degrees Celsius). The surveys were focused outside of the study area where suitable habitat was previously mapped in the 2013 Biological Resources Technical Report. In addition, the biologists also surveyed the wash south of the study area where a population of Mojave fringe-toed lizards had been previously documented (Figure 5). The biologists walked 10-meter (m) transects throughout areas with suitable habitat. Binoculars were used to observe lizards at a distance to confirm the species. Detections of Mojave fringe-toed lizard were recorded using a GPS unit.

Additional details for the Mojave fringe-toed lizard survey can be found in *Mojave Fringe-Toed Lizard Survey Report for the Soda Mountain Solar Project* (Appendix H).

3.2.6 Avian Use Surveys

SWCA biologists conducted four replicate avian avian use surveys during each quarter in 2023. The avian use surveys used point-count methodology to tally all birds detected by sight and sound by a single observer at a fixed position, which can be used to evaluate avian use and diversity in an area. The surveys were conducted solo or in pairs by Gigi Wagnon, Bridget Manjarrez, and Lauren Strong. Winter avian use surveys were performed January 14–26 during the non-breeding season. Spring avian use surveys were performed March 23 and 24, 2023, during spring migration. Summer avian use surveys were performed July 12, 13, and 14, 2023, during the breeding season. Fall avian use surveys were performed October 9, 10, and 11, 2023, during fall migration. Survey methods were developed in coordination with CDFW. In total, 24 point-count locations within the study area were selected along existing roads in 2023 (Figure 6). Each survey consisted of a 20-minute unlimited-radius point count at each point-count location. Pursuant to coordination with CDFW in early 2024, 22 new point-count locations were surveyed in the spring of 2024 to cover more representative habitat within the study area and the gen-tie (see Figure 6). The methods for the 22 new point count locations included two replicate 10-minute unlimited-radius surveys at each location on April 29–30, 2024 and May 20–21, 2024.

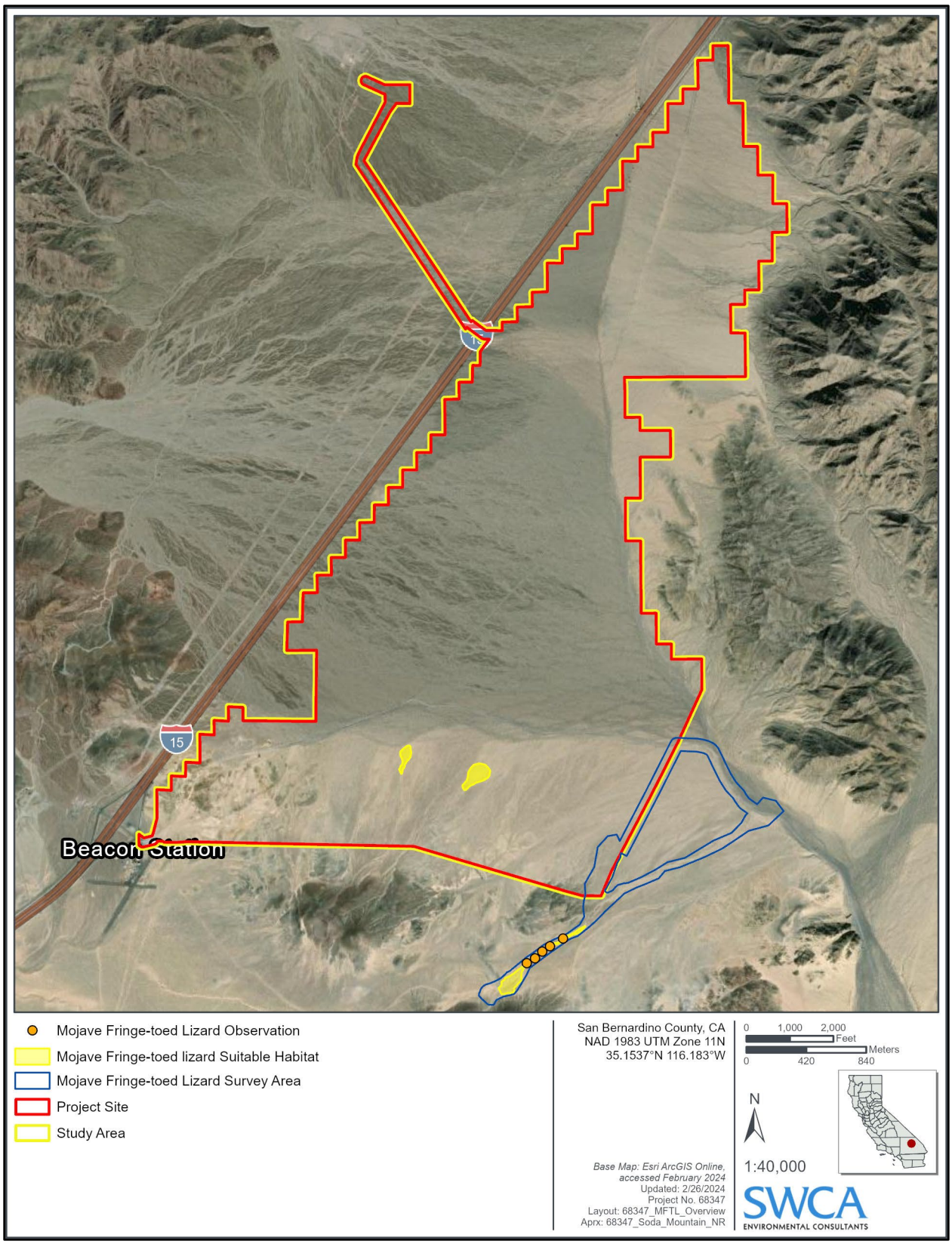

Figure 5. Mojave fringe-toed lizard suitable habitat.

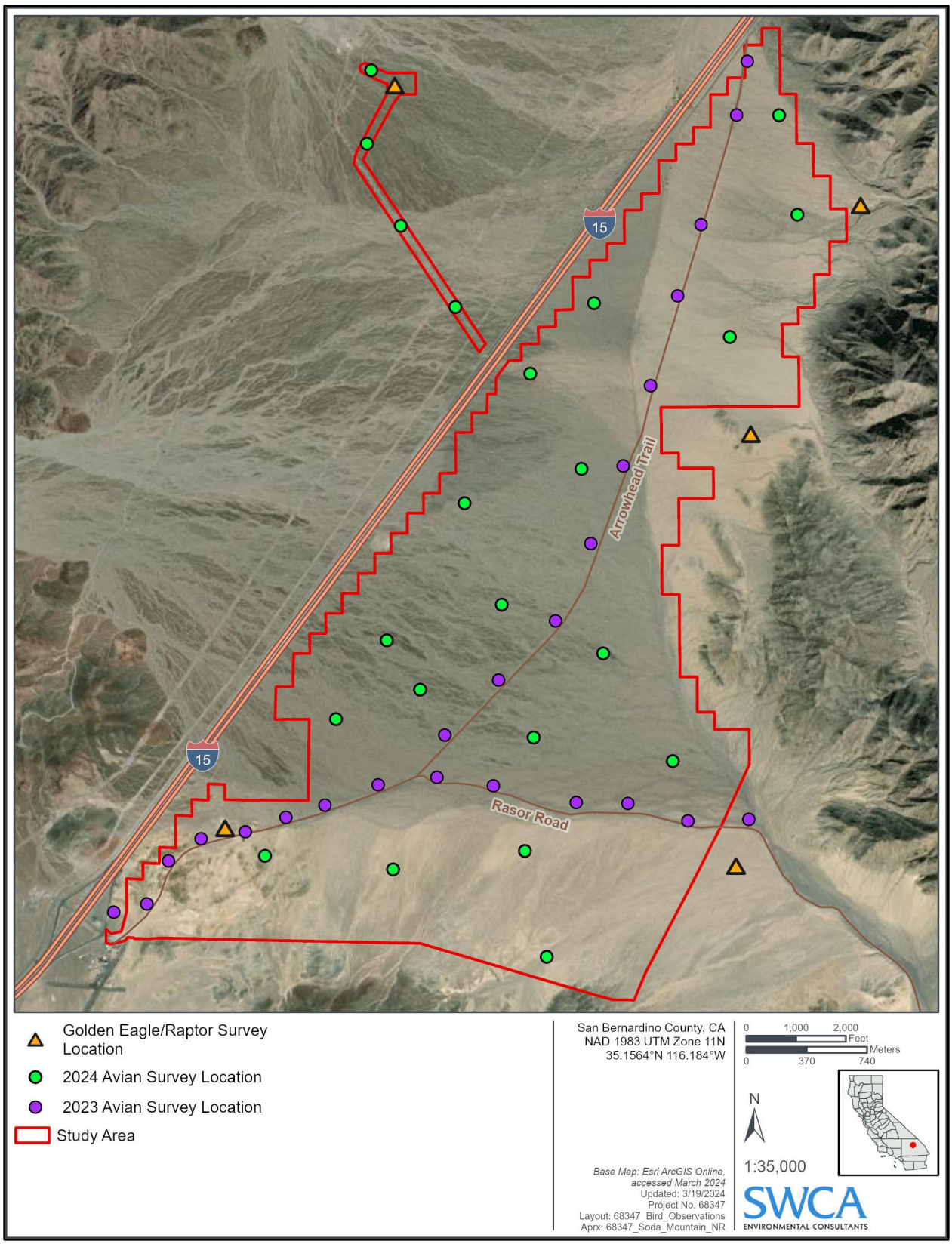

Figure 6. Raptor and avian point-count locations, spring 2024.

Incidental observations of birds and other wildlife outside the formal survey periods were documented to supplement the comprehensive species list for the project area. Patterns of use that may be relevant to the project, such as large flocks or concentrated movement around specific landscape features, will also be recorded during the spring 2024 surveys. For additional details, please see the following reports:

- *Winter Avian Use Survey Report for the Soda Mountain Solar Project* (Appendix I),
- *Spring Avian Use Survey Report for the Soda Mountain Solar Project* (Appendix J),
- *Summer Avian Use Survey Report for the Soda Mountain Solar Project* (Appendix K),
- *Fall Avian Use Survey Report for the Soda Mountain Solar Project* (Appendix L), and
- *Spring Avian Use and Raptor Survey Report for the Soda Mountain Solar Project* (Appendix M).

3.2.7 Burrowing Owl, Desert Kit Fox, American Badger Survey

SWCA biologists conducted surveys for burrowing owl, desert kit fox, and American badger burrows in the study area in three survey efforts from March 27 to April 5, May 8 to May 12, and May 22 to May 25, 2023 (see Table 1). The study area included the 2,670-acre project area and the gen-tie route (approximately 35.75 acres) including a 150-m buffer around the study area. A burrow survey and subsequent burrowing owl breeding season surveys consisted of a total of six visits.

The purpose of the burrow survey was to determine suitable areas capable of supporting burrowing owl and record all potentially suitable burrows within the entire study area. In addition, the burrow survey also focused on identifying burrows of other fossorial species, specifically desert kit fox and American badger. The survey methodology followed that outlined in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). During the survey, a team of two to four biologists walked parallel transects spaced approximately 20 m apart through the entire study area. All burrows and dens were thoroughly examined, photographed, and recorded using a handheld GPS unit.

Following the burrow surveys, three burrowing owl breeding season surveys were performed during peak breeding season for burrowing owls, between April 15 and July 24. The purpose of the breeding season surveys was to determine the occupancy status of each potential burrowing owl burrow. The occupancy status for desert kit fox and American badger potential burrows or dens was also evaluated. Each burrow identified during the burrow survey was revisited during the breeding-season surveys. Biologists documented signs of occupancy, such as fresh signs of digging, feathers, whitewash, pellets, prey remains, and other signs that would indicate the presence of these species. Burrows and dens that were collapsed or had extensive debris and dirty cobwebs in the entrance after repeated visits were determined to be inactive. Additional details on the methods can be found in *Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project* (Appendix N).

3.2.8 Bat Survey

The purpose of this survey was to document the suitability, potential habitat use, and suitability of areas within and near the study area and the surrounding landscape of structures, both natural and constructed, as potential maternity, hibernacula, and/or nocturnal roost sites for bats. The survey was performed in accordance with *Caltrans Bat Mitigation: A Guide to Developing Feasible and Effective Solutions* (H.T. Harvey and Associates 2019), *A Plan for the North American Bat Monitoring Program* (*NABat*) (Loeb et al. 2015), and *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins 2016).
The surveys consisted of an initial daytime habitat assessment survey and three subsequent rounds of nighttime acoustic surveys consisting of dusk roost emergence and activity transect surveys. In addition, acoustic bat surveys were conducted in 2012 within the study area and surrounding areas (see Appendix A).

A team of two SWCA biologists performed a daytime habitat assessment survey on July 27 and 28, 2023. The primary objective was to identify structures or environmental features within and immediately beyond the study area that could serve as suitable roosting, foraging, or commuting habitat for bats. In addition, the survey aimed to identify suitable locations for conducting nighttime transect surveys, focusing on areas that would account for all representative habitat types within the study area. Attention was focused on rock crevices, tree cavities, and human-made structures, where the biologists searched for specific signs indicating the presence of bats such as guano, insect carapaces, urine staining, or deceased specimens to determine the status of potential roost locations.

Following the daytime habitat assessment survey, a team of four SWCA biologists performed three nighttime acoustic surveys with the primary objective to confirm roost status, determine roost size, capture entry and exit roosts, and determine the use of the study area by bats. Surveys were performed from July 23 through August 31, 2023 (see Table 1). Nighttime acoustic surveys took place at four potential roosting locations within stormwater culverts passing underneath I-15 directly outside the study area, and along five transects within the study area (Figure 7). Transects were distributed along areas that encompassed characteristics important for bat foraging and roosting, including rocky crevices, tree cavities, and human-made structures known to harbor suitable roosting features. Bat calls were recorded using acoustic monitoring equipment including two Wildlife Acoustics Echo Meter Touch units with

built-in species identifiers (connected to Android Galaxy tablets), a Pettersson u384 Ultrasonic Microphone (connected to a Lenovo IdeaPad laptop running BatSound), and an Anabat Scout standalone unit. Calls were analyzed to species level. All potential roost locations were recorded using a GPS unit. The *Bat Survey Report for the Soda Mountain Solar Project* (Appendix O) provides additional details.

3.2.9 Raptor Surveys

Following technical document review for the project in early 2024, CDFW requested raptor observation surveys to detect golden eagles and other large birds within and adjacent to the project area. Accordingly, a qualified biologist visited five raptor observation points no earlier than 10:00 a.m. for 1-hour observation periods (see Figure 6). All large birds (raptors, ravens, etc.) detected within 800 m of the biologist were documented, along with their flight paths and behavior consistent with the methodological recommendations of the CDFW and the USFWS *Eagle Conservation Plan Guidance* (USFWS 2013). The raptor observation points were selected to afford a clear view of the mountains surrounding and the open valley/location of the project. The raptor survey point locations were visited twice for 1 hour each, concurrent with the point counts.

Incidental observations of birds and other wildlife outside the formal survey periods were documented to supplement the comprehensive species list for the project area. Patterns of use that may be relevant to the project, such as large flocks or concentrated movement around specific landscape features, were also recorded. The *Spring Avian and Raptor Survey Report for the Soda Mountain Solar Project* (see Appendix M) provides additional details.

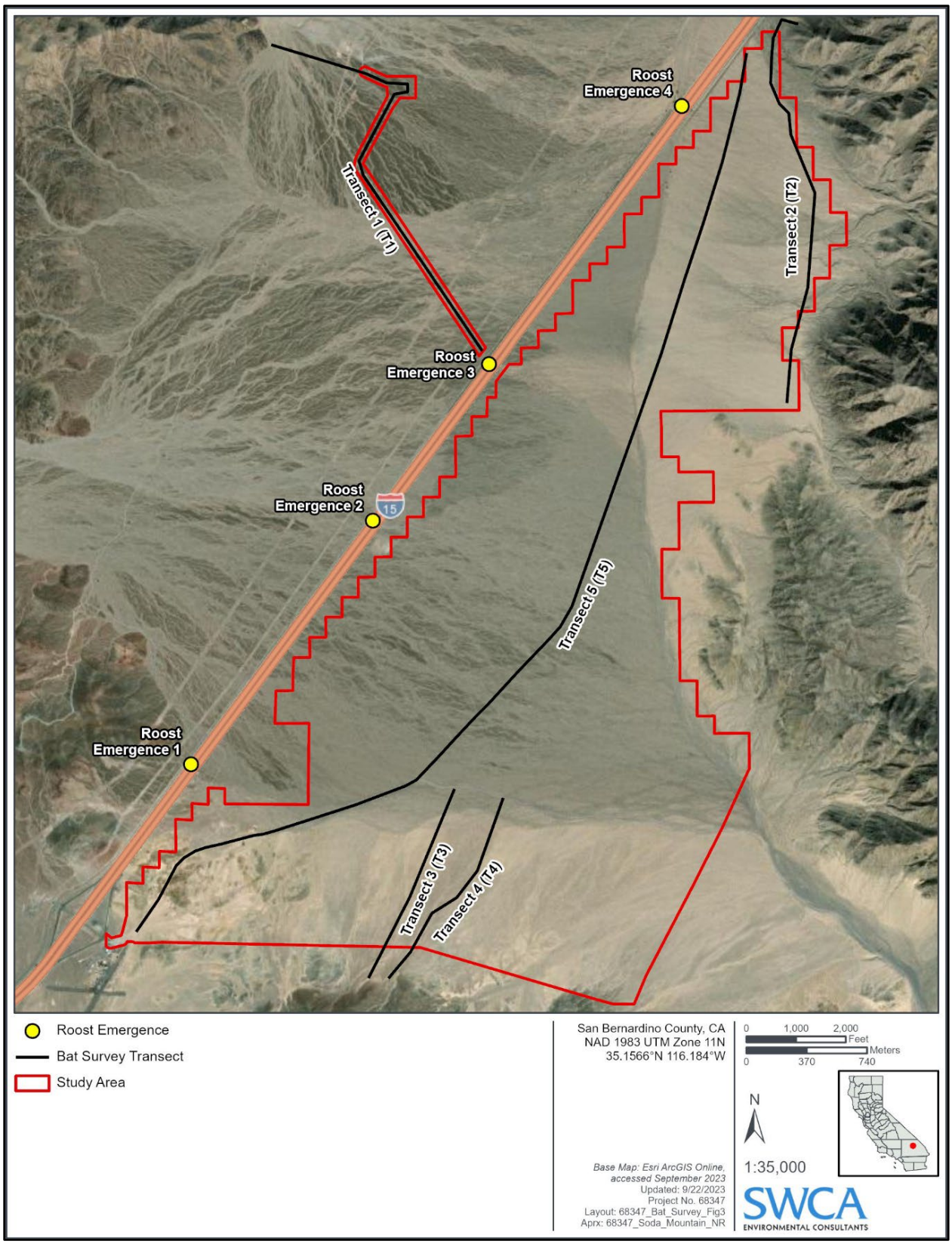

Figure 7. Locations of roost emergence and transect surveys within the Soda Mountain Solar Project study area.

4 RESULTS

This section describes the results of the biological surveys led by SWCA in 2023 for vegetation communities, burrowing owl, desert kit fox, American badger, Mojave desert tortoise, Mojave fringe-toed lizard, rare plants, Crotch's bumble bee, avian use, and bats. The detailed methods, results, and species observed can be found in each respective technical memorandum. Monitoring data for desert bighorn sheep will be provided separately by CDFW.

4.1 Site Conditions

The habitat types within the study area were best described as Mojavean desert scrub and desert wash scrub. Soils were mostly composed of sand interspersed with gravel and cobble. One major unpaved road, Rasor Road, bisects the study area. Although the project area is not within an OHV area, vehicle tracks and disturbance were observed in many parts of the study area. Trash dumps were present, mostly along the road edges and near I-15. In addition, non-native and invasive plant species were prevalent throughout the study area. Non-native and invasive species observed included Mediterranean grass (*Schismus arabicus*), foxtail barley (*Hordeum murinum*), and red brome (*Bromus madritensis* ssp. *rubens*). Non-native and invasive plant species often outcompete native plants and can increase fire risk in the desert.

A loose dog (*Canis lupus familiaris*) was observed at the entrance to the study area, close to the Shell gas station (Appendix P, Photograph P-5). Free-roaming dogs are known to injure and kill native wildlife such as kit fox and can reduce densities of birds and small mammals (e.g., Banks and Bryant 2007; Lenth et al. 2008; Woodroffe 1999; reviewed by Young et al. 2011). Representative site photographs are provided in Appendix P. A list of biological resources with the potential to occur within 10-miles of the project is included in Appendix Q.

4.2 Vegetation Communities

Vegetation in the study area and along the gen-tie options consists of intermittent native shrubs. Five vegetation communities were identified on-site as defined in *A Manual of California Vegetation Online* (CNPS 2023b): Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance), California Joint Fir – Longleaf Joint-fir Scrub (*Ephedra californica – Ephedra trifurca* Shrubland Alliance), Cheesebush – Sweetbush Scrub (*Ambrosia salsola – Bebbia juncea* Shrubland Alliance), Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance), and Creosote Bush – White Bursage Scrub (*Larrea tridentata – Ambrosia salsola* Shrubland Alliance) (Table 2; Figure 8). Additionally, maintained dirt roads and other disturbed sites were mapped as Developed/Disturbed landcover type.

Sensitive vegetation communities are defined by CDFW as those “communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of Projects” (CDFW 2010). Vegetation communities with a State Rank of 1, 2, or 3 are considered sensitive by CDFW. No sensitive alliance-level vegetation communities were mapped on-site. However, two sensitive associations were identified on-site: Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens* Desert Pavement Association) and California Joint Fir – Longleaf Joint-fir Scrub (*Ephedra californica – Ephedra trifurca* Shrubland Alliance). Neither of these associations mapped on-site have a state rank rarity (see Table 2). No DRECP Special Vegetation Features were observed.

Table 2. Vegetation Communities and Land Cover Types

Vegetation Community	Global Rank*	State Rank†	Acres within the Study Area‡
Creosote Bush – White Bursage Scrub Larrea tridentata – Ambrosia dumosa Shrubland Alliance	G5	S5	2,459
Creosote Bush Scrub Larrea tridentata Shrubland Alliance	G5	S5	145
Rigid Spineflower – Hairy Desert Sunflower Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance, (Chorizanthe rigida – Geraea canescens Desert Pavement Association)	G4	S4 (Sensitive Association)	32
Cheesebush – Sweetbush Scrub Ambrosia salsola – Bebbia juncea Shrubland Alliance	G4	S4	8.2
California Joint Fir – Longleaf Joint-fir Ephedra californica – Ephedra trifurca Shrubland Alliance, (Ephedra californica – Ambrosia salsola Association)	G5	S4 (Sensitive Association)	1.2
Developed/Disturbed	N/A	N/A	25

*Global Rank (NatureServe 2024):

G4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres
G5 = Demonstrably secure because of its worldwide/statewide abundance

†State Rank (NatureServe 2024):

S4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres
S5 = Demonstrably secure because of its worldwide/statewide abundance

Many ephemeral washes flow through the study area and are generally dominated by Creosote Bush – White Bursage Scrub, Cheesebush – Sweetbush Scrub, and California Joint Fir – Longleaf Joint-fir Scrub. See Photographs P-7 through P-11 in Appendix P for representative photographs of each vegetation community.

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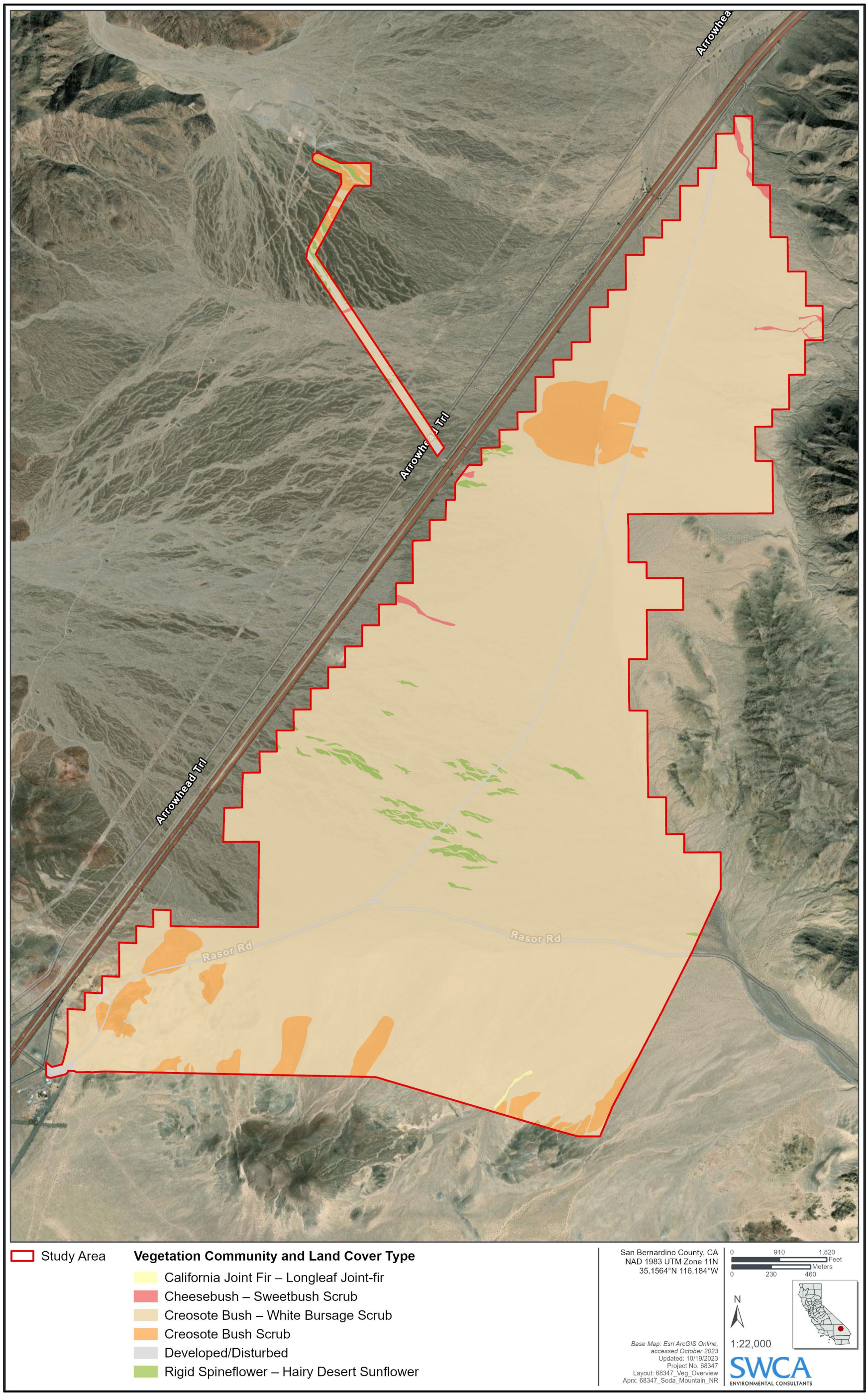

Figure 8. Overview of vegetation community and land cover types.

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4.2.1 *Creosote Bush – White Bursage Scrub (*Larrea tridentata – Ambrosia dumosa *Shrubland Alliance)*

Creosote Bush – White Bursage Scrub is characterized by an open to intermittent canopy that may be two-tiered. The herbaceous layer is open to intermittent, with seasonal annuals. The alliance is typically found in the minor washes and rills, alluvial fans, bajadas, and upland slopes. The soils may be well-drained, alluvial, colluvial, and sandy. Creosote bush and white bursage (*Ambrosia dumosa*) are codominant in the shrub canopy with allscale saltbush (*Atriplex polycarpa*), desert holly (*Atriplex hymenelytra*), silky dalea (*Dalea mollissima*), silver cholla (*Cylindropuntia echinocarpa*), branched pencil cholla (*Cylindropuntia ramosissima*), and cottontop cactus (*Echinocactus polycephalus*). Creosote Bush – White Bursage Scrub was the dominant vegetation community found in the study area and characterized the majority of the upland habitat. Approximately 2,459 acres of the study area are classified as Creosote Bush – White Bursage Scrub.

4.2.2 *Creosote Bush Scrub (*Larrea tridentata *Shrubland Alliance)*

Creosote Bush Scrub is characterized by an open to intermittent canopy with an herbaceous layer that includes seasonal annuals and perennial grasses. The alliance is typically found on alluvial fans, bajadas, upland slopes, and along minor intermittent washes. Soils typically are well-drained. Creosote bush is dominant or codominant in the shrub canopy with white bursage scrub, cheesebush (*Ambrosia salsola*), desert holly, and allscale saltbush. Creosote Bush Scrub characterized upland habitat in the northwestern and southern portions of the study area. Approximately 145 acres of the study area are classified as Creosote Bush Scrub.

4.2.3 *Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens *Desert Pavement Sparsely Vegetated Alliance [*Chorizanthe rigida – Geraea canescens *Desert Pavement Association])*

Rigid Spineflower – Hairy Desert Sunflower is characterized by a sparse to intermittent herbaceous layer with an open to spare shrub layer with less than 5% perennial cover. The association is typically found in broad alluvial fans and lower slopes in the desert. Soils may be sandy and gravelly, with various rocks and gravel along with interstitial fine sediments. Devil's spineflower (*Chorizanthe rigida*) is dominant or codominant in the shrub canopy with hairy desert sunflower (*Geraea canescens*) with sparse herbs including trailing windmills (*Allionia incarnata*), pincushions (*Chaenactis* spp.), desert plantain (*Plantago ovata*), brittle spineflower (*Chorizanthe brevicornu* var. *brevicornu*), beavertail cactus (*Opuntia basilaris* var. *basilaris*), and spare shrubs including creosote bush. Approximately 32 acres of the study area were classified as Rigid Spineflower – Hairy Desert Sunflower.

4.2.4 *Cheesebush – Sweetbush Scrub (*Ambrosia salsola – Bebbia juncea *Shrubland Alliance)*

Cheesebush – Sweetbush Scrub is characterized by an open or intermittent canopy with an herbaceous layer that is sparse or seasonally present. The alliance is typically found on intermittently flooded channels, arroyos, and washes in valleys, flats, and rarely flooded low-gradient deposits. Soils are alluvial, sandy, and gravely. Cheesebush is dominant or codominant in the shrub canopy with sweetbush scrub (*Bebbia juncea*), woolly brickellia (*Brickellia incana*), desert senna (*Senna armata*), brittlebush (*Encelia farinosa*), little leaved ratany (*Krameria erecta*), and Thurber's sandpaper plant (*Petalonyx thurberi* ssp. *thurberi*). Cheesebush – Sweetbush Scrub was found occasionally in the major ephemeral

washes in the eastern portion of the study area. Approximately 8.2 acres of the study area are classified as Cheesebush – Sweetbush Scrub.

4.2.5 California Joint Fir – Longleaf Joint-fir Scrub (Ephedra californica – Ephedra trifurca Shrubland Alliance [Ephedra californica – Ambrosia salsola Association])

California Joint Fir – Longleaf Joint-fir Scrub is characterized by an open to intermittent canopy with an herbaceous layer that is spare to intermittent with seasonal annuals and perennial grasses. The association is typically found on intermittently flooded arroyos, washes, and adjacent alluvial fans in transmontane settings. Soils may be course to medium sands, loamy sands, and sandy clay loams. California joint fir (*Ephedra californica*) is either dominant or codominant in the shrub canopy with white bursage scrub and creosote bush. California Joint Fir – Longleaf Joint-fir Scrub was occasionally found associated within an ephemeral wash in the southeastern portion of the study area. Approximately 1.2 acres of the study area are classified as California Joint Fir – Longleaf Joint-fir Scrub.

4.2.6 Disturbed/Developed

This land cover type is not a vegetation community but rather a descriptor for areas mostly devoid of vegetation due to anthropogenic activities and that have little to no potential to support native species. Disturbed/developed areas included maintained dirt roads and other disturbed sites. Approximately 25 acres of the study area have been classified as Disturbed/Developed.

4.3 Plants

Plant growth was good in spring 2023 due to substantial rainfall in winter-spring 2022-2023. Common native shrubs frequently encountered were white bursage, burrobrush, desert holly, allscale saltbush, wooly brickellia, rayless encelia (*Encelia frutescens*), California joint fir, little leaved ratany, and creosote bush. Common herbaceous species included pincushions, devil's spineflower, desert dodder (*Cuscuta denticulata*), Booth's desert primrose (*Eremothera boothii* ssp. *desertorum*), desert lily (*Hesperocallis undulata*), snake's-head (*Malacothrix coulteri*), desert dandelion (*Malacothrix glabrata*), distant phacelia (*Phacelia distans*), desert plantain, desert nest straw (*Stylocline micropoides*), and other non-native herbs and grasses. All of the plant taxa identified during the spring rare plant survey can be found in the rare plant technical memorandum (see Appendix F). A fully updated list of plant taxa observed, including those documented incidentally, is included in Appendix R.

4.3.1 Special-Status Plants

Queries of the databases and lists, along with a literature review, identified a total of 12 special-status plant taxa that have been documented within the 9-quad records search area (CDFW 2024b). Eight special-status plants were determined to have a low, moderate, or high potential to occur based on the desktop review. Four species do not have habitat within the study area, or the study area is not within the known range for the species and were not considered to have potential to occur.

The results of the field surveys were used to inform the presence/absence determinations of each species that had been identified as having potential to occur (Table 3). Given the good rainfall, it was assumed that all plants with seedbank on site germinated and bloomed within the typical period. Therefore, it was also assumed that the survey detected all species which, if present, would have been identifiable during the spring period when the survey was conducted (April 10–May 2). Finally, it was therefore inferred that

all spring-blooming or spring-identifiable plants not found during the survey were not likely to occur (see Table 3).

The survey confirmed the presence of one rare plant species, Utah vine milkweed (Figure 9). The preliminary (pre-field) potential for occurrence determinations and additional detailed information can be found in *Rare Plant Survey and Vegetation Mapping Results for the Soda Mountain Solar Project* (see Appendix E). Table 3 shows the final determination based on the findings of the field survey.

Table 3. Potential for Special-Status Plants to Occur based on Desktop Review and Survey Results within the Study Area

Species	Status*	Life Form and Habitat Description†	Blooming Period	Habitat Suitability
Alkali marsh aster (*Almutaster pauciflorus*)	CRPR 2B.2	Perennial herb. Occurs in alkaline meadows and seeps. Elevational range: 239 to 800 m amsl.	June–October	Not likely to occur. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.
Small-flowered androstephium (*Androstephium breviflorum*)	CRPR 2B.2	Perennial bulbiferous herb. Occurs in desert dunes and sandy to rocky soil in Mojavean desert scrub. Elevational range: 219 to 800 m amsl.	March–April	Not likely to occur. Some aeolian sand habitat is present in the southern portion of the study area. The species was not observed during the spring 2023 surveys. The nearest CNDDB record of this species is 4 miles southwest of the study area.
Borrego milkvetch (*Astragalus lentiginosus var. borreganus*)	CRPR 4.3	Annual herb. Occurs in sandy soils within Mojavean desert scrub and Sonoran desert scrub. Elevational range: 30 to 895 m amsl.	February–May	Not likely to occur. Suitable habitat is present in the study area. No milkvetch (*Astragalus* sp.) species were found during the spring 2023 surveys. The nearest recent record is 3 miles to the west of the study area.
Black grama (*Bouteloua eriopoda*)	CRPR 4.2	Perennial stoloniferous herb. Occurs in Joshua tree woodland and pinyon-juniper woodland. Elevational range: 900 to 1,900 m amsl.	May–August	Not likely to occur. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.
Emory's crucifixion-thorn (*Castela emoryi*)	CRPR 2B.2	Perennial deciduous shrub. Occurs in gravelly soils within Mojavean desert scrub, washes, playas, and Sonoran desert scrub. Elevational range: 90 to 725 m amsl.	(April) June–July (September–October)	Not likely to occur. There is suitable habitat in gravelly washes throughout the study area. The species was not observed on-site during the April 2023 surveys. Species is a distinct perennial shrub and is identifiable outside of the blooming period. The nearest CNDDB record is located 1 mile northeast of the proposed gen-tie route (within 1,000 feet of the study area), originally documented during the botanical surveys in 2009 and 2012.
Harwood's eriastrum (*Eriastrum harwoodii*)	CRPR 1B.2, BLMS	Annual herb. Occurs in desert dunes. Elevational range: 124 to 914 m amsl.	March–June	Not likely to occur. Marginally suitable aeolian sand habitat is located in the southern portion of the study area. The species was not observed on-site during the April 2023 surveys. The nearest CNDDB occurrence is located 6 miles southeast of the study area.

Species	Status*	Life Form and Habitat Description†	Blooming Period	Habitat Suitability
Muilla (*Muilla* sp.)	Not Applicable	Perennial bulbiferous herb	Likely March-April (May)	Present. Five individuals were observed in sandy soil with volcanic cobble with *Larrea tridentata* and *Ambrosia dumosa*.
Utah vine milkweed (*Funastrum utahense*)	CRPR 4.2	Perennial herb. Occurs in gravelly (sometimes) and occasionally sandy soils within Mojavean desert scrub and Sonoran desert scrub. Elevational range: 100 to 1,435 m amsl.	(March) April–June (September–October)	Present. Several individuals were found in and adjacent to the study area along the margins of ephemeral washes.
Wright's jaffueliobryum moss (*Jaffueliobryum wrightii*)	CRPR 2B.3	Moss. Occurs in dry openings, rock crevices, and carbonate substrates within alpine dwarf scrub, Mojavean desert scrub, and pinyon-juniper woodland. Elevational range: 160 to 2,500 m amsl.	n/a	Not likely to occur. Suitable habitat is not present within the study area. The nearest records are 3 miles from the study area.
Ribbed cryptantha (*Johnstonella costata*)	CRPR 4.3	Annual herb. Occurs in sandy soils within desert dunes, Mojavean desert scrub, and Sonoran desert scrub. Elevational range: 28 m bmsl to 500 m amsl.	February–May	Not likely to occur. Suitable habitat is present throughout the study area. The species was not observed during the spring 2023 surveys. The nearest record is 4.5 miles west of the study area.
Winged cryptantha (*Johnstonella holoptera*)	CRPR 4.3	Annual herb. Occurs in gravelly to rocky soils, washes, slopes, ridges Mojavean desert scrub, and Sonoran desert scrub. Elevational range: 100 to 1,690 m amsl.	March–April	Not likely to occur. Suitable habitat is present throughout the study area. The species was not observed during the spring 2023 surveys. The nearest record is 7 miles northeast of the study area.
Cooper's rush (*Juncus cooperi*)	CRPR 4.3	Perennial herb. Occurs in meadows and seeps. Elevational range: 100 m bmsl to 1,769 m amsl.	April–May (August)	Not likely to occur. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.
Desert winged rockcress (*Sibara deserti*)	CRPR 4.3	Annual herb. Occurs in washes, steep hillsides, dry flats, scree, calcareous rubble, rocky bluffs, and exposed crevices in Mojavean desert scrub. Elevational range: 344 to 1,300 m amsl.	March–April	Not likely to occur. Suitable habitat is present in the study area. The species was not observed during the spring 2023 surveys. The nearest record is 7 miles northeast of the study area.

* Ranks for the species included in this list are sourced from CNDDB. Impacts to plants with CRPR 1 and 2 must be considered pursuant to CEQA and are treated as sensitive.

CRPR Ranking:

1B: Rare, threatened, or endangered in California and elsewhere.
2B: Rare, threatened, or endangered in California, but more common elsewhere.
4: Watch List Plants of limited distribution.
  0.2: Fairly threatened in California.
  0.3: Not very threatened in California

BLMS: Bureau of Land Management sensitive.

† Habitat descriptions are adapted from the CNPS Rare Plant Inventory Ecology and Life History notes, and consist of the general and microhabitat descriptions of the corresponding element.

4.3.1.1 ALKALI MARSH ASTER

Alkali marsh aster is a CRPR 2B.2 perennial herb that flowers between June and October. CRPR 2B.2 species are rare, threatened, or endangered in California, but more commonly found elsewhere, and are fairly threatened in California. Alkali marsh aster is known to occur in alkaline meadows and seeps at elevations between 239 and 800 m amsl. This species is threatened by road and trail work and hydrology changes. The nearest CNDDB record is from 2012 and is 3.6 miles to the east of the project within an isolated pond along Zzyzx Field Station.

Based on the desktop review and lack of habitat suitability on the project, the initial potential for this species to occur was determined not likely to occur. Alkali marsh aster was not observed during the 2023 rare plant survey. The survey was performed in April and May 2023, which is outside of the blooming period of this species. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.2 SMALL-FLOWERED ANDROSTEPHIUM

Small-flowered androstephium is a CRPR 2B.2 perennial bulbiferous herb that flowers between March and April. CRPR 2B.2 species are rare, threatened, or endangered in California, but more commonly found elsewhere, and are fairly threatened in California. Small-flowered androstephium occurs in desert dunes and sandy to rocky soil in Mojavean desert scrub, at elevations between 219 and 800 m amsl. This species is threatened by development, habitat alteration, military operations, non-native plants, solar and wind energy projects, and vehicles. The nearest record was documented in 1998 approximately 4 miles southwest of the project off Basin Road in Crucero. At the nearest CNDDB record, approximately 10 individuals of the target species were found on a west-facing slope with a sparse coverage of creosote bush, white bursage, and desert lily. The substrate included mostly aeolian sands interspersed with gravel. Only one plant was found to be flowering; the remaining were in bud or in a vegetative state. There is high-quality habitat located in aeolian sands present in the southern portion of the project.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be high. Small-flowered androstephium was not observed during the 2023 rare plant survey. The survey was performed in April and May 2023, which was an appropriate blooming period for this species. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.3 BORREGO MILKVETCH

Borrego milkvetch is a CRPR 4.3 annual herb that flowers between February and May. CRPR 4.3 species are watch-list plants of limited distribution and are not very threatened in California. Borrego milkvetch occurs in sandy soils within Mojavean desert scrub and Sonoran desert scrub, at elevations between 30 and 895 m amsl. The nearest record, less than 40 years old, was documented in 2011 approximately 3.0 miles west of the project. There is moderate-quality habitat located in southern portion of the project.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be moderate. Neither Borrego milkvetch nor any *Astragalus* species was observed during the 2023 rare plant survey. The survey was performed in April and May 2023, which is at the end of the average blooming period for Borrego milkvetch. This species would have been identifiable by flowering parts and/or fruit or leaflet morphology. Considering both the habitat assessment and rare plant survey results, and the determination of moderate habitat suitability, this species is considered not likely to occur from the study area.

4.3.1.4 BLACK GRAMA

Black grama (*Bouteloua eriopoda*) is a CRPR 4.3 perennial stoloniferous herb that flowers between May and August. CRPR 4.3 species are watch-list plants of limited distribution and are not very threatened in California. Black grama occurs in Joshua tree woodland and pinyon-juniper woodland, at elevations between 900 and 1,900 m amsl. There is not suitable habitat in the study area, and the project is below the known elevational range. The nearest record was documented in 1998, approximately 11 miles to the southwest.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined not likely to occur. Black grama was not observed during the 2023 rare plant survey. The survey was performed in April and May 2023, which was an appropriate blooming period for this species. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.5 EMORY'S CRUCIFIXION-THORN

Emory's crucifixion-thorn is a CRPR 2B.2 perennial deciduous shrub that flowers between June and July, and sometimes between April and October. CRPR 2B.2 species are rare, threatened, or endangered in California, but more commonly found elsewhere, and are fairly threatened in California. Emory's crucifixion-thorn is known to occur in gravelly soils within Mojavean desert scrub, washes, playas, and Sonoran desert scrub, at elevations between 90 and 725 m amsl. This species is threatened by development, habitat alteration, military operations, non-native plants, solar and wind energy projects, and vehicles. There is some high-quality habitat located within the gen-tie route. The nearest record from 2012 is located less than 1 mile east of the gen-tie. At the Emory's crucifixion-thorn reference site, approximately five individual shrubs of the target species were found along the margins of a drainage growing with creosote bush and white bursage. None of the plants were blooming; however, the distinct shrub is identifiable at any phenological stage. Suitable habitat occurs in the study area, and individuals were found during rare plant surveys performed in 2009 and 2012 (see Appendix A).

Based on the desktop review and habitat suitability and previous occurrence records for the original north array, the initial potential for this species to occur was determined to be high. Emory's crucifixion-thorn was not observed during the 2023 rare plant survey. The survey was performed in April and May 2023, which is within the average blooming period of this species. Furthermore, this species is easily identifiable based on life form, unique morphology (e.g., thorns), and lack of co-occurrence of other plants of the same genus. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.6 HARWOOD'S ERIASTRUM

Harwood's eriastrum is a CRPR 1B.2 annual herb that flowers between March and June. CRPR 1B.2 species are rare, threatened, or endangered in California and elsewhere, and are fairly threatened in California. In addition, this species is ranked as sensitive by the BLM. Harwood's eriastrum is found in desert dunes at elevations between 124 to 914 m amsl. This species is threatened by development, habitat alteration, military operations, non-native plants, solar and wind energy projects, and vehicles. There is marginally suitable habitat located in aeolian sands present in the southern portion of the project. The nearest CNDDB record of this species is from 2008, approximately 8 miles to the south.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be low. Harwood's eriastrum was not observed during the 2023 rare plant survey. The survey was performed in April and May 2023, which was an appropriate blooming period for this

species. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.7 UTAH VINE MILKWEED

Utah vine milkweed is a CRPR 4.3 perennial herb that flowers between April and June, and sometimes between March and October. CRPR 4.3 species are watch-list plants of limited distribution and are not very threatened in California. Utah vine milkweed occurs in gravelly and occasionally sandy soils within Mojavean desert scrub and Sonoran desert scrub at elevations between 100 and 1,435 m amsl. Suitable habitat occurs in the northern portion of the project area along ephemeral washes, and individuals were found during rare plant surveys performed in 2009 and 2012 (see Appendix A).

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be high. Utah vine milkweed was observed flowering during the 2023 rare plant survey within the study area. The survey was performed in April and May 2023, which was an appropriate blooming period for this species. Considering both the habitat assessment and rare plant survey results, this species is considered present in the study area. Three individuals were documented to occur within the study area along the gen-tie route.

Three Utah vine milkweed individuals were near the proposed gen-tie route northwest of the study area (see Figure 9; Appendix P: Photograph P-6). These locations are consistent with the locations of the observations made during the 2009 and 2012 surveys. The plants were generally found at the interface of Creosote Bush – White Bursage Scrub (*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance) and Cheesebush – Sweetbush Scrub (*Ambrosia salsola – Bebbia juncea* Shrubland Alliance), along the margins of an ephemeral wash. Additional individuals were found outside of the study area.

4.3.1.8 WRIGHT'S JAFFUELIOBRYUM MOSS

Wright's jaffueliobryum moss (*Jaffueliobryum wrightii*) is a CRPR 2B.3 moss that reproduces via spores, given sufficient precipitation. CRPR 2B.3 species are rare, threatened, or endangered in California, but more commonly found elsewhere, and not very threatened in California. Wright's jaffueliobryum moss occurs in dry openings, rock crevices, and carbonate substrates within alpine dwarf scrub, Mojavean desert scrub, and pinyon-juniper woodland at elevations between 160 and 2,500 m amsl. There is not suitable habitat in the study area. The nearest record of this species is from 2003, approximately 3 miles to the east.

Based on the desktop review and lack of habitat suitability, the initial potential for this species to occur was determined not likely to occur. Wright's jaffueliobryum moss was not observed during the 2023 rare plant survey. This species can be identified year-round. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.9 RIBBED CRYPTANTHA

Ribbed cryptantha is a CRPR 4.3 annual herb that flowers between February and May. CRPR 4.3 species are watch-list plants of limited distribution and are not very threatened in California. Ribbed cryptantha occurs in sandy soils within desert dunes, Mojavean desert scrub, and Sonoran desert scrub at elevations between 28 m bmsl to 500 m amsl. There is suitable habitat in the study area. The nearest record of this species is from 2011, approximately 4.5 miles to the west.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be high. Ribbed cryptantha was not observed during the 2023 rare plant survey.

Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.10 WINGED CRYPTANTHA

Winged cryptantha is a CRPR 4.3 annual herb that flowers between March and April. CRPR 4.3 species are watch list plants of limited distribution and are not very threatened in California. This species occurs in gravelly to rocky soils, washes, slopes, ridges Mojavean desert scrub, and Sonoran desert scrub at elevations between 100 to 1,690 m amsl. There is suitable habitat present throughout the study area. The nearest record of this species is 7 miles northeast of the study area.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be moderate. Winged cryptantha was not observed during the 2023 rare plant survey. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.11 COOPER'S RUSH

Cooper's rush (*Juncus cooperi*) is a CRPR 4.3 perennial herb that flowers between April and May, and sometimes until August. CRPR 4.3 species are watch-list plants of limited distribution and are not very threatened in California. Cooper's rush occurs in meadows and seeps, at elevations between 100 m bmsl and 1,769 m amsl. There is no suitable habitat for this species in the study area. The nearest CNDDB record of this species is from 2006, approximately 3 miles to the east.

Based on the desktop review and lack of habitat suitability, the initial potential for this species to occur was determined to be not likely to occur. Cooper's rush was not observed during the 2023 rare plant survey. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.12 DESERT WINGED ROCKCRESS

Desert winged rockcress is a CRPR 4.3 annual herb that flowers between March and April. CRPR 4.3 species are watch-list plants of limited distribution and are not very threatened in California. Desert winged rockcress occurs in washes, steep hillsides, dry flats, scree, calcareous rubble, rocky bluffs, and exposed crevices in Mojavean desert scrub, at elevations between 344 and 1,300 m amsl. Suitable Mojavean desert scrub is present in the study area. The nearest record of this species is from 2008, approximately 7 miles to the northeast.

Based on the desktop review and habitat suitability, the initial potential for this species to occur was determined to be moderate. Desert winged rockcress was not observed during the 2023 rare plant survey. Considering both the habitat assessment and rare plant survey results, this species is considered not likely to occur in the study area.

4.3.1.13 MUILLA SPECIES

Four individual muilla (*Muilla* sp.) only identifiable to genus were documented within the study area (Figure 10; Appendix P: Photographs P-30-P-33). No taxa in the species *Muilla* were included in the results of the original desktop review (CNDDB 9-quad search) for special-status plants. The muilla documented within the study area is taxonomically similar to the special-status crowned muilla (*M. coronata*), which is known to occur within 10-miles of the study area. However, the scape (peduncle) of the muilla observed in the study area was greater than five centimeters, which does not key out to

crowned muilla. Great Basin muilla (*M. transmontana*), the only other muilla with occurrences within 10 miles of the study area., tends to be larger and has of white flowers. The observed muilla on-site was much more diminutive and had green flowers. Thus, it is likely a new taxon, as supported by an iNaturalist observation reported by James (Jim) Andre, Director of the University of California, Riverside Sweeney Granite Mountains Desert Research Center. Jim Andre noted that a number of iNaturalist observations have been posted of this newly described taxon in Kelso Dunes (approximately 30 miles from the project) and Soda Lake Basin sands (approximately 215 miles from the project), past collectors have placed under *M. transmontana* (Andre 2023). He also stated that he and Tasha La Doux were in the process of compiling background information and conducting morphological and genetic research leading up to the publishing of this as a new taxon (Andre 2023).

Regarding rarity, this species is currently considered a likely new taxon under research, with little known information regarding distribution, population density, or habitat requirements. Thus, in the absence of lawful regulatory review, only assumptions can be made regarding the species' rarity, and potential to ultimately be listed as a special-status species. Notably, the CNPS maintains a collection of species included as California Rare Plant Rank 3, defined as plants that "lack the necessary information to assign them to one of the other ranks or to reject them. Nearly all of the plants constituting California Rare Plant Rank 3 are taxonomically problematic…" (CNPS 2023a). However, many of the plants included as CRPR 3 meet the definition of the California Endangered Species Act and are eligible for state listing. Thus, impacts to these species and habitat should be assessed further as these generally meet the definition of Rare or Endangered under CEQA guidelines (§15125 (c) and/or §15380).

The four muilla individuals documented within the study area—one in the southeast, and four in the northeast portions of the study area—were found in Creosote Bush – White Bursage Scrub (*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance) and Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) (See Figure 10; Appendix P: Photographs P-30-P-33).

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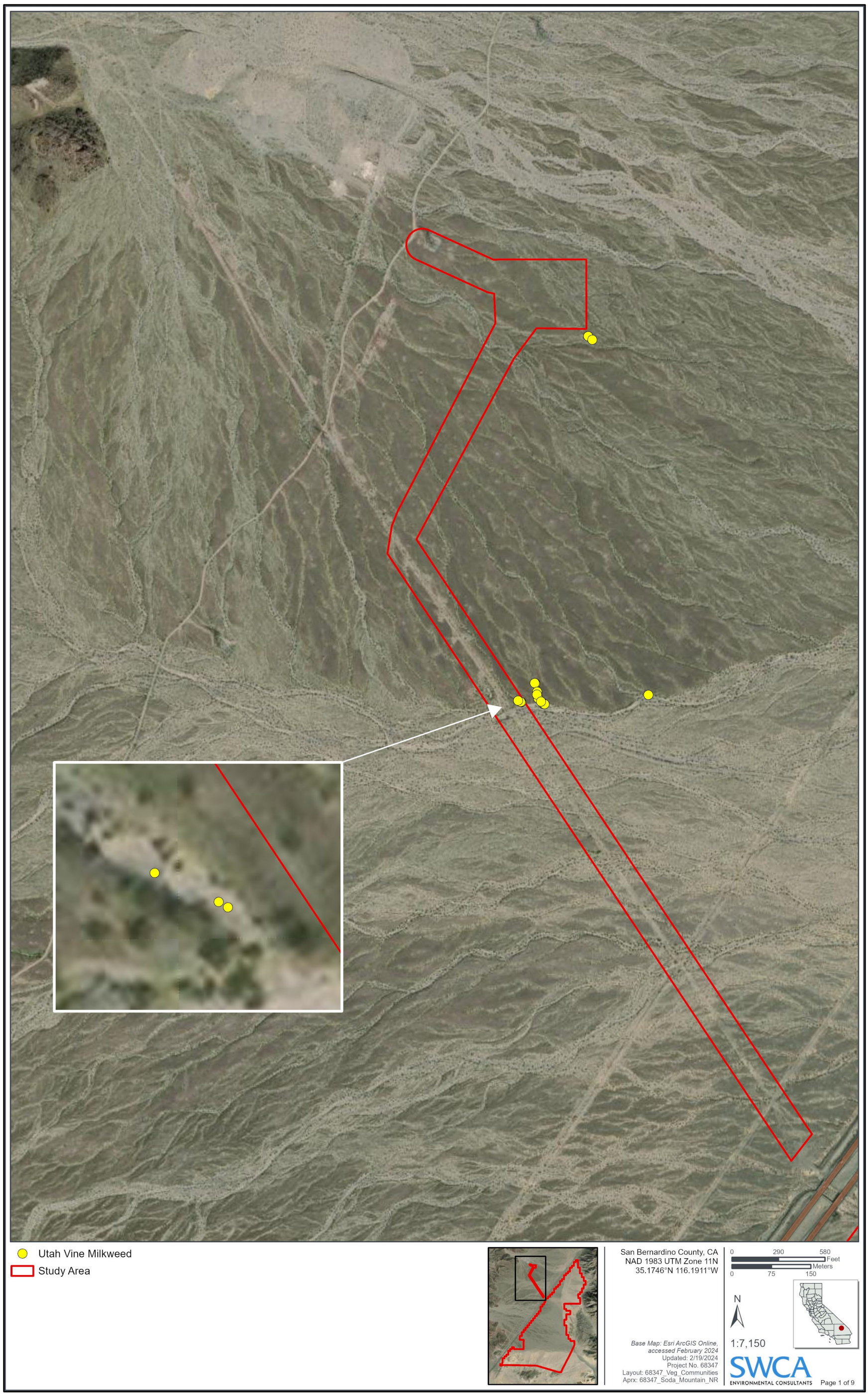

Figure 9. Utah vine milkweed individuals found within and near the study area.

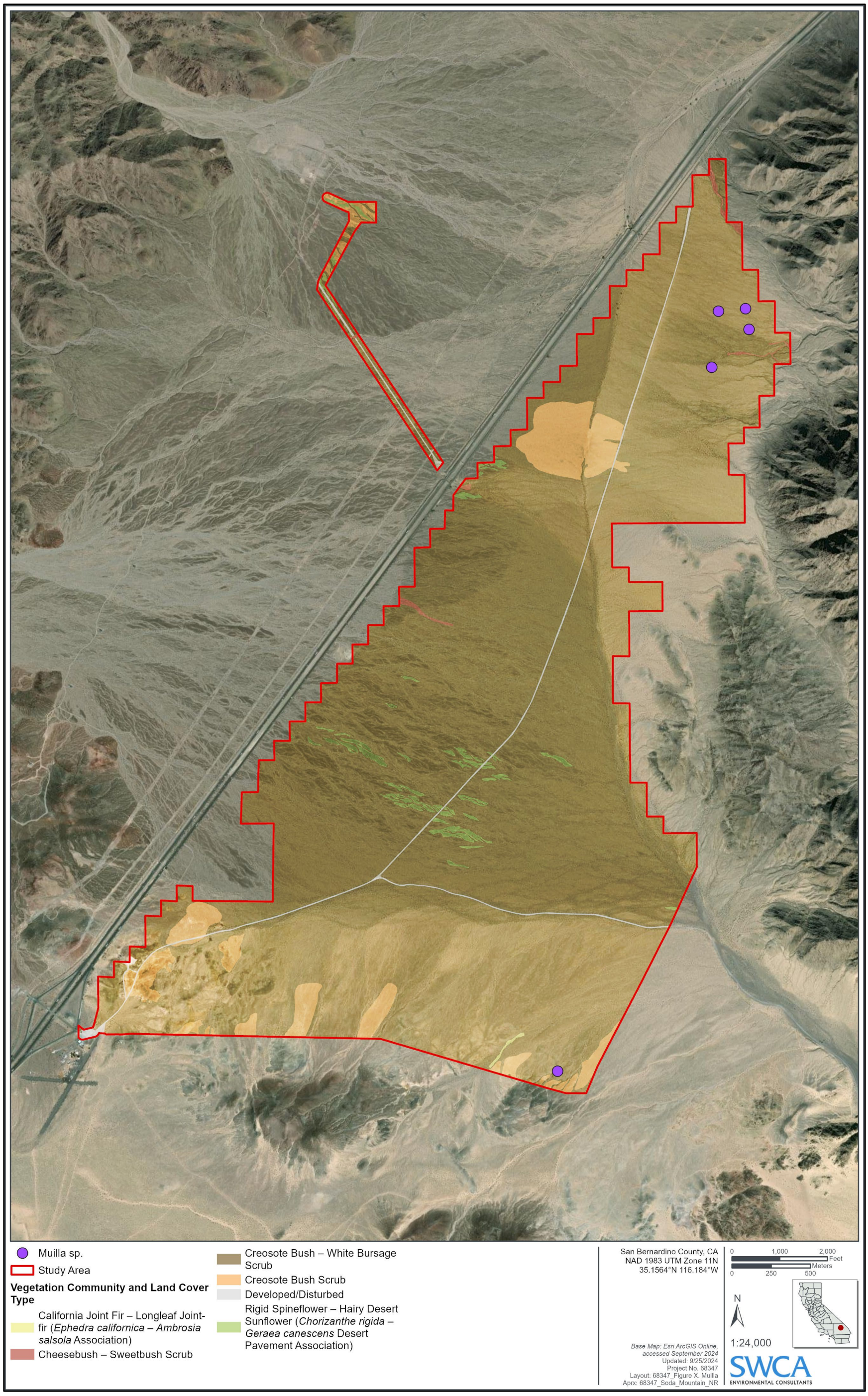

Figure 10. Muilla individuals found within the study area.

4.4 Wildlife

Wildlife observations during the surveys were sparse, though more wildlife was observed after April when activity levels increase for many mammals and reptiles, and spring bird migration occurred. The birds most frequently encountered were typical of the Mojave Desert: common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), black-throated sparrow (*Amphispiza bilineata*) and Brewer's sparrow (*Spizella breweri*). Six species of mammals were observed directly: white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed jackrabbit (*Lepus californicus*), kangaroo rat (*Dipodomys* spp.), coyote (*Canis latrans*), desert kit fox, and feral dog. The reptiles most commonly encountered were western side-blotched lizard (*Uta stansburiana elegans*), desert horned lizard (*Phrynosoma platyrhinos calidiarum*), desert iguana (*Dipsosaurus dorsalis dorsalis*), and western zebra-tailed lizard (*Callisaurus draconoides*). A list of wildlife species observed during field surveys can be found in Appendix R.

4.4.1 Wildlife Movement and Migratory Corridors

Wildlife movement corridors are defined on both a regional and local basis. Regionally, the study area lies between the northern and southern portion of the Soda Mountains within the Mojave Desert. The Wildlands Conservancy and BLM drafted *A Linkage Network for the California Deserts* to present an analysis of potential threats and impacts to wildlife mobility from development on public lands, including industrial-scale renewable energy development. Least-cost modeling evaluates the relative cost for a species to move between targeted “Landscape Blocks” (more specifically, potential cores and patches of breeding habitat within each block) based on how each species is affected by various landscape characteristics (Penrod et al. 2012). In *A Linkage Network for the California Deserts*, the Wildlands Conservancy and BLM identified a least-cost corridor for desert tortoise to the north, east, and west, and a low-cost corridor for American badger to the east and west (Figure 11) (Penrod et al. 2012). The project is centrally located among these corridors but is not within or adjacent to any of them. I-15 runs directly north and west of the project, which creates barriers to wildlife movement for some species that have limited home ranges or low dispersal ability and may reduce the movement of wide-ranging species such as American badger, desert kit fox, and coyote. There are no terrain features such as canyons to concentrate wildlife movement.

Caltrans and CDFW commissioned the California Essential Habitat Connectivity Project because these agencies consider a functional network of connected wildlands to be essential to the continued support of California’s diverse natural communities in the face of human development and climate change (Spencer et. al 2010).

On a local basis, the study area currently provides unrestricted wildlife movement, as there are no fences or other obstructions to wildlife passage. Migratory birds may utilize the study area and vicinity for breeding, nesting, and foraging, or as transient rest sites during migration flights. Desert kit fox, American badger, and coyote may travel across the study area in search of prey opportunities, and to access higher-quality habitat in the area for both prey and cover. Desert bighorn sheep may traverse the study area to travel between the southern and northern Soda Mountains.

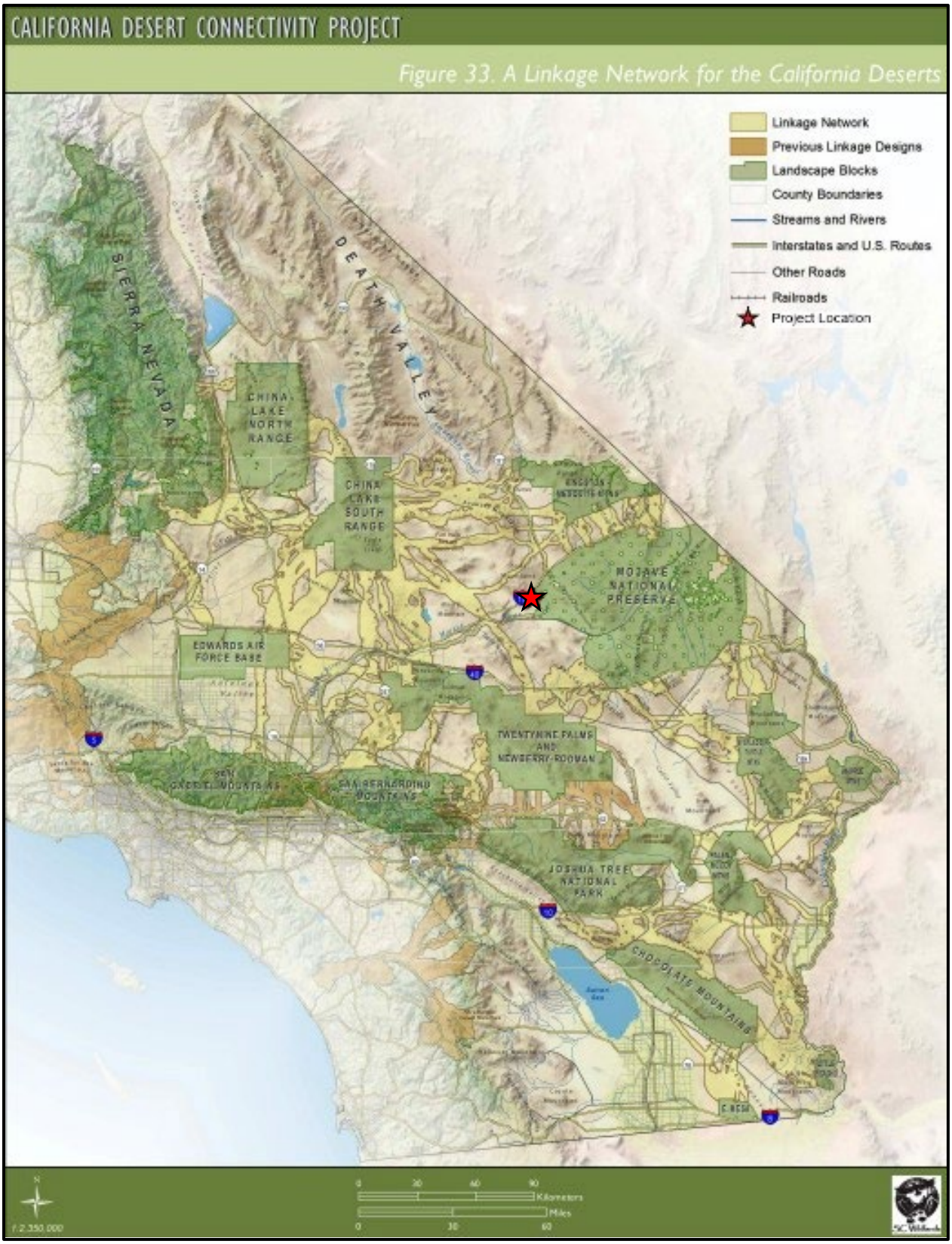

Figure 11. Least-cost corridors from *A Linkage Network for the California Deserts* (Penrod et al. 2012). Red star added to indicate the project location.

4.4.2 Special-Status Wildlife

Based on the results of the literature and database review, 22 species of special-status wildlife were found to have occurrences within the literature and records query area. These species were evaluated for their potential to occur in the study area based on considerations of local records, habitat conditions, and environmental requirements, and a presence/absence determination was made for most based on field survey results (Table 4) (CDFW 2024b). After this assessment, eight species were considered to have the potential to occur at the project area, each of which is discussed in detail below. Six special-status animals and/or their diagnostic sign were observed during the surveys: desert tortoise, burrowing owl, loggerhead shrike (*Lanius ludovicianus*), desert kit fox, American badger, and desert bighorn sheep (Appendix P: Photograph P-29). Individuals of burrowing owl, desert kit fox, and loggerhead shrike were observed directly.

Table 4. Potential for Special-Status Wildlife to Occur based on Desktop Review and Survey Results within the Study Area

Common Name (Species Name)	Special-Status *	Range or Habitat Requirements	Presence in the Study Area
Invertebrates			
Crotch's bumble bee (*Bombus crotchii*)	SCE	Found in coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	Low. Suitable foraging and nesting habitat is present within the study area. The nearest CNDDB record is approximately 21 miles north and almost 30 years old. The study area is outside of the known range for this species. Although Crotch's bumble bee was not detected during focused surveys for this species within the study area, two unidentifiable bumble bee individuals were incidentally observed outside of the study area. Thus, there is low potential for this species to occur within the study area.
Monarch butterfly – California overwintering population (*Danaus plexippus* pop. 1)	FC	This population of monarch butterfly roosts along the coast of California to Mexico. Roosts are located in wind-protected tree groves, typically eucalyptus (*Eucalyptus* spp.), Monterey pine (*Pinus radiata*), or cypress (*Cupressus* spp.), near nectar and water sources.	Not likely to occur. There are no CNDDB records for monarchs within the search query. However, this species was included in the results of an IPaC search query (Appendix B). The study area is outside of the known wintering range for this species; thus, focused surveys were not conducted for this monarch population.
Baker's desertsnail (*Eremarionta rowelli bakerensis*)	SA	Inhabits the north slope of a small range of limestone hills approximately 0.5 mile south of Baker, San Bernardino County. Found in rockslides.	Not likely to occur. Suitable habitat is not present within the study area and does not fall within the known range for this species.
Fish			
Saratoga Springs pupfish (*Cyprinodon nevadensis nevadensis*)	SSC	Inhabits a wide variety of habitats; prefers marshes with grassy bottom and substrate consisting of mud and sand. Tends to avoid temperatures exceeding 35˚C. Active late January through late November.	Not likely to occur. Suitable habitat is not present within the study area. The nearest CNDDB record is 3.4 miles east of the study area, associated with an isolated natural spring.
Mohave tui chub (*Siphateles bicolor mohavensis*)	FE, SE	Formerly found in deep pools and slough-like areas of the Mojave River, this species now occurs only in highly modified refuge sites in San Bernardino County.	Not likely to occur. Suitable habitat is not present within the study area. The nearest CNDDB record is 3.4 miles east of the study area, associated with an isolated natural spring.

Common Name (Species Name)	Special-Status *	Range or Habitat Requirements	Presence in the Study Area
Reptiles			
Southwestern pond turtle (*Actinemys pallida*)	Proposed FT, SSC, BLMS	Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking. May enter brackish water and even seawater. Active February through November and during warm periods of winter in warmer climates.	Not likely to occur. Suitable habitat is not present within the study area. The nearest CNDDB record is over 12 miles from the study area.
Desert tortoise (*Gopherus agassizii*)	FT, SE	Mojave population of desert tortoise lives in a variety of environments from sandy flats to rocky foothills, including alluvial fans, washes, and canyons. Arid land with usually sparse vegetation.	Present. Suitable habitat is present within the study area. The study area is more than 9 miles from the nearest CNDDB record and 7 miles from critical habitat. Fresh scat and potential burrows were observed on-site during protocol surveys for the species; no live tortoises were observed.
Mojave fringe-toed lizard (*Uma scoparia*)	SSC, BLMS	Prefers sparsely vegetated arid areas with fine wind-blown sand, including dunes, flats with sandy hummocks formed around the bases of vegetation, washes, and the banks of rivers. Needs fine, loose sand for burrowing. Active February through November.	Low in majority of study area; moderate in southern portion. The nearest CNDDB record is approximately 3.8 miles west of the study area. Suitable habitat is located just outside the southeastern edge of the study area, where this species was observed during focused surveys. Two areas (2.1 and 4.8 acres) containing aeolian sands are located within the project area. These areas are considered suitable habitat for Mojave fringe-toed lizard. However, there is no connectivity to the known population. Focused surveys were not completed for these areas in 2009, 2012, and 2023. Due to the small size of the areas, and lack of connectivity to known populations, it has been determined that Mojave fringe-toed lizard has a low potential to occur within the study area with moderate potential to occur in the southernmost portion of the study area.
Birds			
Golden eagle (*Aquila chrysaetos*)	BGEPA, FP, BLMS	Nests in a wide variety of habitats from near sea level to 3,630 feet. Nesting habitat includes tundra, shrublands, grasslands, woodland-brushlands, and coniferous forests. Nesting habitat is often associated with either cliffs or trees, although some nests are built on the ground.	Low. Suitable nesting habitat is not present within the study area; however, suitable foraging habitat is present. The nearest CNDDB record is approximately 8 miles southwest of the study area, which documented a nesting pair in 2011. There is low potential for golden eagle to forage in the study area.

Common Name (Species Name)	Special-Status *	Range or Habitat Requirements	Presence in the Study Area
Burrowing owl (*Athene cunicularia*)	SC, BLMS	Found in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent on burrowing mammals, most notably the California ground squirrel (*Otospermophilus beecheyi*).	Present. Suitable foraging and nesting habitat occur within the study area. No CNDDB records occur within 20 miles of the study area. However, the nearest eBird record of this species is approximately 3.5 miles west of the study area. One individual and multiple potential burrows were observed on-site during focused surveys for the species.
Yellow-breasted chat (*Icteria virens*)	SSC	Found in a variety of dense, shrubby, open habitats, ranging from second-growth old fields in eastern North America, to arid riparian and shrubland in western North America. Nests are usually placed near the ground in dense shrubs.	Not likely to occur. Suitable habitat is not present within the study area. The nearest CNDDB record is 7 miles northeast of the study area. This species was not observed during focused avian use surveys.
Loggerhead shrike (*Lanius ludovicianus*)	SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Present. Suitable habitat is present within the study area. The nearest CNDDB record is 14 miles northeast of the study area. There are multiple eBird records of this species within 5 miles of the study area. Multiple individuals were observed on-site.
Summer tanager (*Piranga rubra*)	SSC	Western populations nest in riparian woodlands dominated by willows (Salix spp.) and cottonwoods (*Populus* spp.) at lower elevations; at higher elevations, the species inhabits mesquite (*Prosopis* spp.) and saltcedar (*Tamarix ramosissima*) habitats.	Not likely to occur. The nearest CNDDB record is 45 years old and 11.5 miles southwest of the study area. The nearest eBird record is 3.5 miles east of the study area. However, potential habitat is not present within the study area. This species was not observed during focused avian use surveys.
Vermilion flycatcher (*Pyrocephalus rubinus*)	SSC	Nests in arid scrub, desert, savanna, farmlands, parks, golf courses, cultivated lands, and riparian woodland; usually found near water. Nests typically in trees that line riparian corridors; water may be nearby but is not required.	Not likely to occur. The nearest CNDDB record is over 45 years old and 7 miles northeast of the study area. The nearest eBird record is 3.5 miles east of the study area; however, potential habitat is not present within the study area. This species was not observed during focused avian use surveys.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Inhabits riparian woodlands but benefits from using both riparian and adjacent non-riparian habitat. In arid regions, surface water appears to be an important element of habitat, and it is commonly listed as an obligate or preferential riparian nesting species, especially in bottomland riparian scrub. Most critical structural component of its habitat in California is a dense shrub layer 0.6–3.0 m aboveground.	Not likely to occur. Suitable habitat is not present within the study area. The nearest CNDDB record is over 45 years old and 10 miles southwest of the study area. The nearest eBird record is nearly 50 miles southwest of the study area.
Mammals			
Pallid bat (*Antrozous pallidus*)	SSC, BLMS	Roosts in a variety of places but favors rocky outcrops and favor desert habitats. Also occurs in oak (*Quercus* spp.) and pine (*Pinus* spp.) forested areas and open farmland. Roosting sites are variable, depending on what is available. The species can be found roosting in caves, rock crevices, mines, hollow trees, and buildings.	Low. Suitable foraging habitat is present, but suitable habitat for roosting is not present within the study area. The nearest CNDDB record is over 12 miles from the study area. This species was not detected during the 2023 nighttime acoustic surveys. There is low potential for this species to forage on-site.

Common Name (Species Name)	Special-Status *	Range or Habitat Requirements	Presence in the Study Area
Townsend's big-eared bat (*Corynorhinus townsendii*)	SSC, BLMS	Typical roosting habitat is located in mines, caves, old buildings, and tree hollows. The species requires moths and beetles for feeding, with moths being its primary food source.	Low. Suitable habitat for roosting is not present within the study area. The nearest CNDDB record, from 2006, is 3.5 miles east of the study area. This species was not detected during the 2023 nighttime acoustic surveys. There is a low potential for this species to forage on-site.
Southern California ringtail (*Bassariscus astutus octovus*)	FP	Exploit a variety of habitats such as dry, rocky, brush-covered hillsides or riparian areas, typically not far from an open water source. Dens most often in rock crevices, boulder piles, or talus, but also tree hollows, root cavities, and rural buildings.	Not likely to occur. Suitable habitat is not present within the study area. There are no nearby CNDDB records for this species. Furthermore, no sign indicating presence or habitat use by this species was observed.
Mountain lion (*Puma concolor*)	SSC, SCE	Low elevations in the Colorado River Valley of California. Live in dense bottomland vegetation, also found in adjacent, rocky uplands.	Not likely to occur. Suitable habitat is present within the study area. There are no nearby CNDDB records for this species.
Desert bighorn sheep (*Ovis canadensis nelsoni*)	FP, BLMS	Prefers areas with high visibility and avoids habitat with dense vegetation, often in steep rugged mountainous terrain. Also uses canyon bottoms, alluvial fans, and sandy washes to find water and forage.	Present. Suitable habitat is present within the study area. The nearest CNDDB record is 3.0 miles east of the study area in the adjacent mountain range. Research Grade iNaturalist records are in the mountains south of the study area, and a desert bighorn sheep skull was observed on-site. Additional analysis for desert bighorn sheep will be provided by CDFW.
American badger (*Taxidea taxus)*	SSC, BLMS	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Present. Suitable habitat is present within the study area. This species did not show up in CNDDB or IPaC search queries and was not observed during surveys. However, this species is widespread throughout the Mojave Desert. Multiple burrows were observed on-site.
Desert kit fox (*Vulpes macrotis arsipus*)	CPF	Desert kit fox occurs in a wide range of desert habitats consisting of desert scrub and washes, and may also occur in grasslands or ruderal habitats.	Present. CNDDB does not track occurrence data for this species. However, desert kit fox is widespread throughout the Mojave Desert. An individual, burrows, and scat were observed on-site.

Sources: Habitat and range descriptions were taken directly from the CNDDB (CDFW 2024b). The potential for special-status bird species to occur within the study area was assessed using the eBird database (eBird 2024).

*Status Codes:

Federal Status: FE = Federally Listed Endangered; FT = Federally Listed Threatened; FC = Federal Candidate for Listing; BGEPA = Bald and Golden Eagle Protection Act; BLMS = Bureau of Land Management: Sensitive

California State Status: SE = California State-Listed Endangered; ST = California State-Listed Threatened; SC = California Candidate Species; SCE = California Candidate Endangered; SCT = California Candidate Threatened; FP = CDFW Fully Protected; SA = Special Animal; SSC = CDFW Species of Special Concern; CPF = California Protected Furbearer

4.4.2.1 INVERTEBRATES

4.4.2.1.1 Crotch's Bumble Bee

Crotch’s bumble bee is a candidate for listing as endangered under CESA. This species occurs primarily within California throughout southern coastal areas, western desert, Central Valley, and neighboring foothills around most of the southwestern part of the state. Crotch's bumble bee was previously common

throughout the Central Valley but has since significantly declined due to conversion of suitable habitat into agricultural lands (Hatfield et al. 2018).

Crotch's bumble bee inhabits warm, dry scrub and open grassland habitat. It is a generalist forager typically associated with specific plant families including Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, Hydrophyllaceae, and Boraginaceae (Hatfield et al. 2018). Crotch's bumble bee has a relatively short tongue; therefore, their nectar sources are usually open flowers with short corollas such as from plant genera *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia*, and *Salvia* (Williams et al. 2014). This species prefers to nest underground and will utilize abandoned rodent burrows; however, it does occasionally nest aboveground and have been recorded using abandoned bird nests, undisturbed bunch grasses, rock piles, or dead tree cavities as nesting sites (ForestWatch 2013). Little is currently known regarding the overwintering habitat used by this species, but it is speculated based on the habits of other bumble bee species that the Crotch's bumble bee uses soft disturbed soils or leaf litter as overwintering habitat. Like other bumble bee species, Crotch's bumble bee has seen recent population declines. While specific causes for this decline are unknown, several threats have been identified: habitat loss, climate change, pesticide use, pathogen infection, and competition with nonnative bee species (Hatfield and Jepsen 2021).

Potentially suitable foraging and nesting habitat for Crotch's bumble bee is present within the study area, though the project does not occur within the known current and historic range for this species (CDFW 2023e). Although the project is outside the known range of the species, recent occurrences suggest this species is being detected in previously undocumented areas throughout California. A recent iNaturalist record has documented this species as far east as Bennett Peak, which is bordered by Death Valley to the east (Castagnoli 2024). However, it should be noted that this observation was recorded within the Panamint Range at an elevation of approximately 9,900 feet and occurs within an area that experiences cooler temperatures and higher precipitation levels compared to climatic conditions present within the surrounding Mojave Desert. Similarly, the nearest CNDDB occurrence in relation to the study area is a historic occurrence located approximately 21 miles to the north and within the Avawatz Mountain range at an approximate elevation of 6,000 feet.

The Crotch’s bumble bee was not detected during focused surveys within the study area; however, two unidentifiable bumble bee individuals were incidentally observed within large ephemeral washes located outside of the study area. Although preferred floral resources for the Crotch’s bumble bee were documented throughout the study area during early spring botanical surveys, there was a low abundance of blooming floral resources for the duration of the Colony Active Period in the summer months. Potentially suitable foraging habitat was restricted to areas of flowering nectar sources, which were largely concentrated along the larger ephemeral riparian systems present throughout the study area. While flowering nectar sources were documented throughout each survey effort, the abundance of flowering plants diminished as the conditions became drier in the later summer months. A higher abundance of blooming species documented during the spring botanical surveys suggests the project potentially serves as a source of floral resources during the onset of the Colony Active Period for bumble bee species in the area. However, the absence of bumble bee activity documented within the survey area during focused surveys, along with extreme temperature conditions and decreased abundance of blooming floral resources within the summer months, suggests that the site may provide lower-quality foraging habitat during the latter portion of the Colony Active Period. This may indicate the project does not support a consistent availability of pollen and/or nectar sources for the entire duration of the foraging and nesting period for Crotch’s bumble bee. Based on this evidence, Crotch's bumble bee is considered to have a low potential of occurrence in the study area. The detailed methods, results, and species observations can be found in *Crotch’s Bumble Bee Focused Survey Report for the Soda Mountain Solar Project* (Appendix F).

4.4.2.2 REPTILES

4.4.2.2.1 Desert Tortoise

The desert tortoise is a federally and state threatened species, as well as a CESA candidate for endangered. Desert tortoise is typically found below 5,000 feet in elevation. This species occurs in almost every desert habitat but is most common in desert scrub, desert wash, and Joshua tree habitats. These habitats are typically dominated by creosote bush and white bursage but may also be dominated by cacti (*Opuntia* spp.) and saltbush (*Atriplex* spp.). Desert tortoise requires friable soil for burrowing and nest construction and prefers creosote bush habitat with large annual wildflower blooms. Desert tortoise is most active during spring and early summer, and then again during fall. During the hot summer months, the species is usually found within burrows or other shelter sites but may emerge after a rain event. Desert tortoises enter a state of torpor and remain in their burrows during the coldest months, typically November to February. In addition to burrows within soil, tortoises may also shelter in other structures, including caliche caves, lava tubes, rock caves, rodent or other mammal burrows, shrubs, and human-made structures (USFWS 2009). This species is long-lived and site-faithful, with lifespans of up to 80 years.

Evidence of anthropogenic disturbance such as off-road vehicle use is present throughout the study area. Other evidence of disturbance includes trash from illegal dumping and bullet casings. During the survey, the biologists observed several trucks, dirt bikes, and all-terrain vehicles being driven off-road within or near the study area. Off-road vehicle use can alter the native vegetation and soil composition, leading to a shift in perennial plant cover and annual food plant potential. Off-road vehicles may also run over tortoises and collapse burrows. The major highway (I-15) passes directly through the project location, reducing connectivity and exacerbating fragmentation of desert habitat.

Several known predators of desert tortoise were observed during the survey, including feral dogs. Free-roaming dogs are known to injure or kill native wildlife, including desert tortoise, and are considered by USFWS in the evaluation of habitat quality (USFWS 2019a; Young et al. 2011). Ravens are another predator, primarily of juvenile desert tortoise, that have benefited from human development. Ravens were the most commonly encountered avian species on-site.

Expansion of the human-built environment has led to a dramatic increase in the raven population in the Mojave Desert in the last 50 years, which has subsequently led to a significant decline in the desert tortoise population (USFWS 2008). Numerous suitable nesting structures for ravens in the form of electrical and telephone poles occur just outside the study area. Proximity to the gas station on Rasor Road and widespread trash dumping may also provide resources for a local large raven population. The cumulative effects of these disturbances and habitat conditions have likely negatively impacted desert tortoise populations in and near the study area.

The nearest CNDDB occurrence of the desert tortoise is over 9 miles from the study area, and the study area is 7 miles from critical habitat for this species. The study area consisted of the appropriate vegetation composition, soils, and topography to support desert tortoise, and was located within the species' geographic range. While the western and northeastern portion of the site contain suitable habitat, the site had little indication of recent tortoise use. The majority of the gen-tie route was found to be unsuitable habitat for desert tortoise due to rocky outcrops. Conditions during the survey were good for detecting desert tortoise, with appropriate temperatures and conditions. Daily weather conditions can be found in *Desert Tortoise Survey Results for the Soda Mountain Solar Project* (Appendix G).

No live tortoises or carcasses were found during the survey. While not all tortoises are expected to be visible at any given time, daily surveys coincided with the highest likelihood of live, aboveground observations both seasonally and thermally. Additionally, all open burrows were visually searched and did not yield any live tortoises or carcasses.

Across the entire study area, 182 burrows were identified as potential tortoise burrows, meaning that they may have been originally excavated by desert tortoise, whether they were currently suitable for occupancy (Figure 12). All burrows were identified as Classes 2–5 (Photographs B-15–B-18), and no burrows were classified as Class 1. The eastern and northeastern portions of the study area, where there is less rocky substrate in the landscape, contained the highest concentration of burrows (see Figure 12). The entire study area was identified as habitat currently suitable for desert tortoise occupation. However, some areas, including the gen-tie and the central portion of the project area consist of very rocky substrate which limit burrowing, and reduces habitat suitability for desert tortoise.

Burrows observed during the burrowing owl, kit fox, and American badger surveys were not included in the desert tortoise data (see Figure 12) because the surveys were conducted at different times and separate biological teams. Some burrows may overlap between the two surveys. Each survey focused on species-specific habitat assessments using slightly different methods (i.e., 10 m transects for desert tortoise vs. 20 m transects for burrowing owl, etc.). However, it is important to note that desert tortoise can use burrows made by burrowing owl, kit fox, and American badger (and vice versa), and the large number of burrows observed in the survey for these species are a consideration when assessing the potential for desert tortoise to occur in the project area.

Fresh scat (less than 1 day old) from a subadult was found within the northeast corner of the study area (Photograph D-13; see Figure 12). The scat was classified as recent due to the retention of dark coloration, intact state, and retention of moisture. The scat was not in the vicinity of any suitable desert tortoise burrows and was exposed to the typical desert elements. Additional scat (less than 1 month old) from a juvenile was found on the northwest side of the study area 900 m (0.5 mile) west of the fresh scat, and within 250 m south of multiple Class 4 burrows (Photograph D-14; see Figure 12). This scat retained dark coloration and was intact but lacked moisture.

Based on the 2019 USFWS survey protocol, desert tortoise is considered present at the site based on observations of sign, and scat was detected on-site. All tortoise burrows showed no recent sign of use, and some were collapsed. No other tortoise sign, such as carcasses, pallets, tracks, drinking depressions, courtship rings, or signs of ephemeral plant herbivory, was observed on-site. Desert tortoise is considered present at the study area due to the observations of scat and Class 2 and 3 burrows. However, no desert tortoise individuals or other signs were directly observed, and the desert tortoise population within and near the project is likely very low. The detailed methods, results, and species observations are provided in *Desert Tortoise Survey Report for the Soda Mountain Solar Project* (Appendix G).

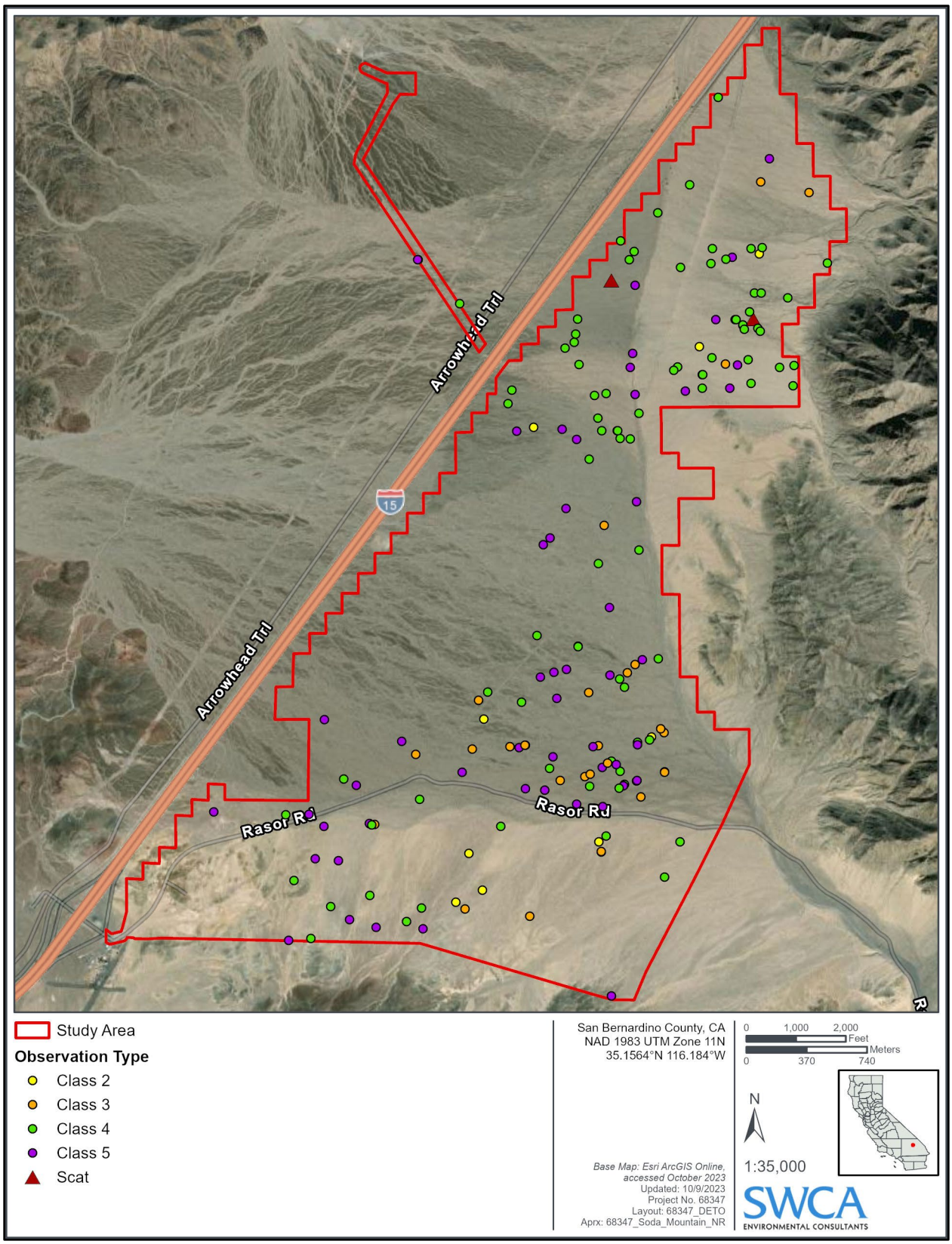

Figure 12. Desert tortoise burrows and scat in the study area.

4.4.2.2.2 Mojave Fringe-toed Lizard

The Mojave fringe-toed lizard is listed as a Species of Special Concern by CDFW and as sensitive by BLM. The Mojave fringe-toed lizard is restricted to habitats with loose windblown sand, particularly aeolian sand deposits, and the immediate surroundings (Norris 1958; USFWS 2011a). Dunes, dry washes, hillsides, dry lake edges, and sandy hummocks may contain suitable windblown sands (BLM 2015). Captures of individuals more than 150 feet from these types of habitat have not been documented (USFWS 2011a). The species has several physical adaptations for activity in loose sand, including a fringe of scales on the toes that provides traction, double eyelids, and smooth granular scales. When threatened, the Mojave fringe-toed lizard usually takes shelter under the sand and can move under the surface in a swimming motion (California Wildlife Habitat Relationships System 2000). The species is most active during the warmer seasons and typically hibernates between November and February (Norris 1958; USFWS 2011a). When not active, the species takes refuge in burrows or under the sand.

Historically, the species' range spanned parts of northern Los Angeles County, San Bernardino County, southern Inyo County, and eastern Riverside County (BLM 2015; CDFW 2014). The dune complexes where the species is found are associated with three main river complexes: the Amargosa, Mojave, and Colorado Rivers. A Mojave fringe-toed lizard population was previously documented in the 2013 Panorama Environmental, Inc., *Biological Resources Technical Report for the Soda Mountain Solar Project* (see Appendix A) just southeast of the project area.

Natural predators of Mojave fringe-toed lizard include larger lizards, snakes, greater roadrunner (*Geococcyx californianus*), burrowing owl, loggerhead shrike, hawks, American badger, and coyote (Jones and Lovich 2009). OHV activity may kill lizards directly and degrade the dune habitat; designated OHV recreation areas overlap three significant historic populations of Mojave fringe-toed lizard: El Mirage Dry Lake, Dumont Dunes, and Rasor Road. Habitat loss and disruption of natural windblown sand movement may also be a threat. Population declines for the closely related Coachella fringe-toed lizard (*Uma inornata*) are primarily attributed to habitat loss due to urban development and disruption of sand movement caused by associated roads and windbreaks (Beatley 1994; Weaver 1981). Establishment of non-native plants and the loss of native perennial plants may affect the lizards' insect food sources, shelter, and dune dynamics in ways that are not well understood.

The surveys conducted on April 26 and July 11, 2023, focused on areas in the southeastern portion of the project where a population and suitable habitat was previously documented in 2009 and 2012 (see Appendix A). The surveys conducted in 2009 and 2012 show approximately 5.82 acres of suitable habitat within an ephemeral wash overlapping the southeastern project boundary. The current project boundary does not overlap the ephemeral wash. During the 2023 surveys, the biologists confirmed that there is no suitable habitat present within the southeastern portion of the study area due to the lack of windblown sands. Furthermore, the windblown sands in the section of the ephemeral wash closest to the study area appear to have shifted since 2012 and is no longer suitable for Mojave fringe-toed lizard. The lack of windblown sands in this section of the wash limits the connectivity to other sand deposits in the vicinity. The soil composition in the wash transitions from sand to gravel approximately 750 feet south-southwest of the southeastern portion of the study area. The limits of suitable habitat for Mojave fringe-toed lizard were mapped in this area (Figure 13; Photograph D-19). During Mojave fringe-toed lizard surveys, five individuals were observed in the sandy areas of the wash (see Appendix P: Photograph P-20).

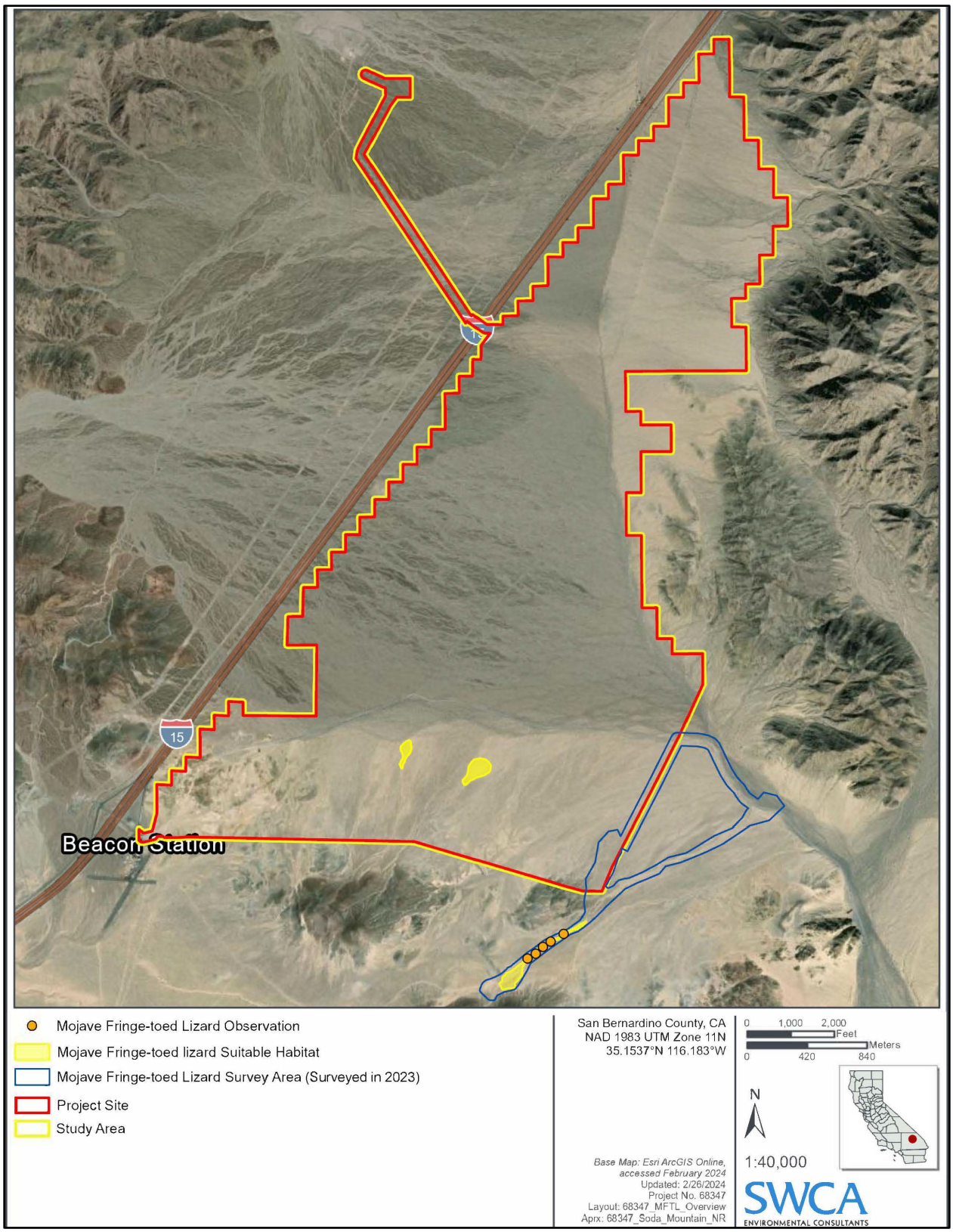

Figure 13. Mojave fringe-toed lizard suitable habitat and live observations.

In total, 6.9 acres of aeolian sands in two separate patches (2.1 and 4.8 acres) were documented during the rare plant survey in two ephemeral washes located within the southern portion of the study area (see Figure 13, Photograph D-12). In the absence of a habitat assessment by a qualified biologist and focused Mojave fringe-toed lizard surveys, this habitat is assumed to have suitable substrate for Mojave fringe-toed lizard. These areas are separated by approximately 429 m and lack connectivity to each other and to the known populations southeast of the study area. Further, the washes are separated from the known population by a rocky hill to the south, thus disrupting direct dispersal routes to and from these washes. Finally, no Mojave fringe-toed lizards were documented in these areas in 2009 and 2012. While a focused survey for Mojave fringe-toed lizard was not conducted in these areas in 2023, the areas were surveyed for rare plants, desert tortoise, and other fossorial wildlife during the active season for Mojave fringe-toed lizard. No Mojave fringe-toed lizards were observed incidentally during these surveys.

Based on all of the above information, the potential for occurrence for Mojave fringe-toed lizard is considered low within the majority of the study area with a moderate occurrence potential in the southernmost portion of the study area. Mojave fringe-toed lizard is not expected to be impacted by the project. Additional details can be found in *Mojave Fringe-Toed Lizard Survey Report for the Soda Mountain Solar Project* (see Appendix H).

4.4.2.3 BIRDS

4.4.2.3.1 Local Bird Use

In total, 16 avian species were detected by sight and/or sound within the study area (excluding the gen-tie) during the winter, spring, summer, and fall avian point-count surveys. Four additional species were detected in the spring 2024 avian point count surveys that took place at 22 new point count locations within the study area (including the gen-tie). An additional 13 species were detected incidentally during surveys for other biological resources, bringing the total number of bird species recorded within the study area to 33 (Table 5). Two CDFW Species of Special Concern were observed on-site during the surveys: loggerhead shrike and burrowing owl. Multiple loggerhead shrikes were detected on-site during the spring avian use survey, and an individual was observed incidentally southeast of Rasor Road in the eastern portion of the study area. A burrowing owl was observed during the burrowing owl breeding season survey in the southeastern portion of the study area. The bird species most frequently detected during the avian point-count surveys and incidentally were common raven, horned lark, verdin (*Auriparus flaviceps*), black-throated sparrow, and house finch (*Haemorhous mexicanus*).

Avian point count surveys within the study area conducted by Panorama in the spring and fall of 2009 detected 45 total avian species, 650 avian detections total (see Appendix A). Many of the same species detected in 2009 that are considered resident or nesting species in the project area were also observed in the 2023 and 2024 surveys (see Table 5). Avian point count locations in 2023 included 24 duplicate locations of the 2009 surveys, and an additional 22 point count locations were added in 2024. The project area in 2009 was 6,770 acres, and 80 point count locations were surveyed (Panorama 2013). Variations in species composition from 2009 to 2023-2024 may reflect the changes of project area and point count locations between survey years. In addition, some detected species such as warbling vireo (*Vireo gilvus*) are not likely to nest or utilize the site beyond foraging on migration and may not be detectable across years.

Table 5. Avian Point-Count Survey Results for the Study Area in 2009, 2023, and 2024

Species Group	Common Name	Scientific Name	Survey Detections
Passerines	common raven	*Corvus corax*	winter, spring 2023, summer, fall, and spring 2024 avian point count (APC), Panorama 2009
	bushtit	*Psaltriparus minimus*	winter APC
	American robin	*Turdis turdis*	Panorama 2009
	Bewick's wren	*Thryomanes bewickii*	Panorama 2009
	European starling*	*Sturnus vulgaris*	winter APC, Panorama 2009
	horned lark	*Eremophila alpestris*	winter, spring 2023, summer, fall APC, and spring 2024 APC, Panorama 2009
	house sparrow*	*Passer domesticus*	winter and fall APC, Panorama 2009
	Say's phoebe	*Sayornis saya*	winter, spring 2023, fall, and spring 2024 APC, Panorama 2009
	western kingbird	*Tyrannus verticalis*	Panorama 2009
	western meadowlark	*Sturnella neglecta*	Panorama 2009
	lesser goldfinch	*Spinus psaltria*	Panorama 2009
	verdin	*Auriparus flaviceps*	winter, spring 2023, and summer APC, Panorama 2009
	sage thrasher	*Oreoscoptes montanus*	spring 2023 APC
	cactus wren	*Campylorhynchus brunneicapillus*	spring 2023 APC, Panorama 2009
	rock wren	*Salpinctes obsoletus*	spring 2023, fall, and spring 2024 APC, Panorama 2009
	black-throated sparrow	*Amphispiza bilineata*	spring 2023, summer, and spring 2024 APC
	loggerhead shrike†	*Lanius ludovicianus*	spring 2023 and fall APC
	house finch	*Haemorhous mexicanus*	spring 2023, fall, and spring 2024 APC, Panorama 2009
	dark-eyed junco	*Junco hyemalis*	spring 2023 and summer APC
	gray-headed junco	*Junco hyemalis caniceps*	Panorama 2009
	white-crowned sparrow	*Zonotrichia leucophrys*	other, Panorama 2009
	Bell's sparrow	*Artemisiospiza belli*	other
	black-chinned sparrow	*Spizella atrogularis*	Panorama 2009
	Brewer's sparrow	*Spizella breweri*	fall APC
	chipping sparrow	*Spizella passerina*	Panorama 2009
	savannah sparrow	*Passerculus sandwichensis*	Panorama 2009
	blue-gray gnatcatcher	*Polioptila caerulea*	spring 2024, Panorama 2009
	black-tailed gnatcatcher	*Polioptila melanura*	Panorama 2009
	orange-crowned warbler	*Leiothlypis celata*	Panorama 2009
	Townsend's warbler	*Setophaga townsendi*	Panorama 2009
	Wilson's warbler	*Cardellina pusilla*	Panorama 2009
	yellow-rumped warbler	*Setophaga coronata*	Panorama 2009

Species Group	Common Name	Scientific Name	Survey Detections
	ruby-crowned kinglet	*Regulus calendula*	Panorama 2009
	tree swallow	*Tachycineta bicolor*	other
	Cassin's vireo	*Vireo cassinii*	other
	warbling vireo	*Vireo gilvus*	Panorama 2009
	ash-throated flycatcher	*Myiarchus cinerascens*	other
	western tanager	*Piranga ludoviciana*	spring 2024, Panorama 2009
	Hammond's flycatcher	*Empidonax hammondii*	spring 2024
	hooded oriole	*Icterus cucullatus*	Panorama 2009
	lazuli bunting	*Passerina amoena*	spring 2024
	northern mockingbird	*Mimus polyglottos*	Panorama 2009
	Costa's hummingbird	*Calypte costae*	spring 2024, Panorama 2009
Pigeons and Doves	mourning dove	*Zenaida macroura*	summer APC, Panorama 2009
Nightjars	lesser nighthawk	*Chordeiles acutipennis*	other, Panorama 2009
	common poorwill	*Phalaenoptilus nuttallii*	other, Panorama 2009
Owls	burrowing owl[1]	*Athene cunicularia*	other
Woodpeckers	northern flicker	*Colaptes auratus*	other, Panorama 2009
	ladder-backed woodpecker	*Dryobates scalaris*	Panorama 2009
	red-breasted sapsucker	*Sphyrapicus ruber*	Panorama 2009
Cuckoos	greater roadrunner	*Geococcyx californianus*	Panorama 2009
Falcons	American kestrel	*Falco sparverius*	other
Hawks and Vultures	red-tailed hawk	*Buteo jamaicensis*	other, Panorama 2009
	sharp-shinned hawk	*Accipiter striatus*	Panorama 2009
	turkey vulture	*Cathartes aura*	spring raptor survey, Panorama 2009

Note: Northern flicker primary and secondary feathers only in 2023;

Other = observations during other resource surveys in the study area.

* nonnative species

† CDFW Species of Special Concern

1 California Candidate Species under CESA

Avian data from 2009 comes from Panorama Environmental, Inc. Biological Resources Technical Report for the Soda Mountain Solar Project (see Appendix A)

Additional details can be found in *Winter Avian Use Survey Report for the Soda Mountain Solar Project* (see Appendix I), *Spring Avian Use Survey Report for the Soda Mountain Solar Project* (see Appendix J), *Summer Avian Use Survey Report for the Soda Mountain Solar Project* (see Appendix K), *Fall Avian Use Survey Report for the Soda Mountain Project* (see Appendix L), and *Spring Avian Use and Raptor Survey Report for the Soda Mountain Project* (see Appendix M).

4.4.2.3.2 Raptor Use

During the raptor survey, two turkey vulture individuals were observed soaring, circling, and gliding at point 5 during the first survey. An individual turkey vulture was observed circling over the mountains to the west at point 3 during the second survey. A red-tailed hawk pair was also observed incidentally outside of the 800-m survey range at point 1 during the first survey. Raptors and other large birds including turkey vulture, red-tailed hawk, burrowing owl (*Athene cunicularia*), American kestrel

(*Falco sparverius*) and common raven were observed on-site in the 2023 surveys and incidentally. No golden eagles were observed during the raptor survey.

Additional details can be found in *Spring Avian Use and Raptor Survey Report for the Soda Mountain Project* (see Appendix M).

4.4.2.3.3 Nesting Birds

The entirety of the survey area has suitable habitat for nesting birds. Bird nests were documented during the April and May 2023 desert tortoise and rare plant survey since the timing of the surveys coincided with the nesting season. Four bird nests were found during the survey, all of which were active (Figure 14). Of the active nests, three were black-throated sparrow nests and one was a horned lark nest (see Appendix P: Photographs P-21 and P-22). Multiple recently fledged horned larks were also observed on-site.

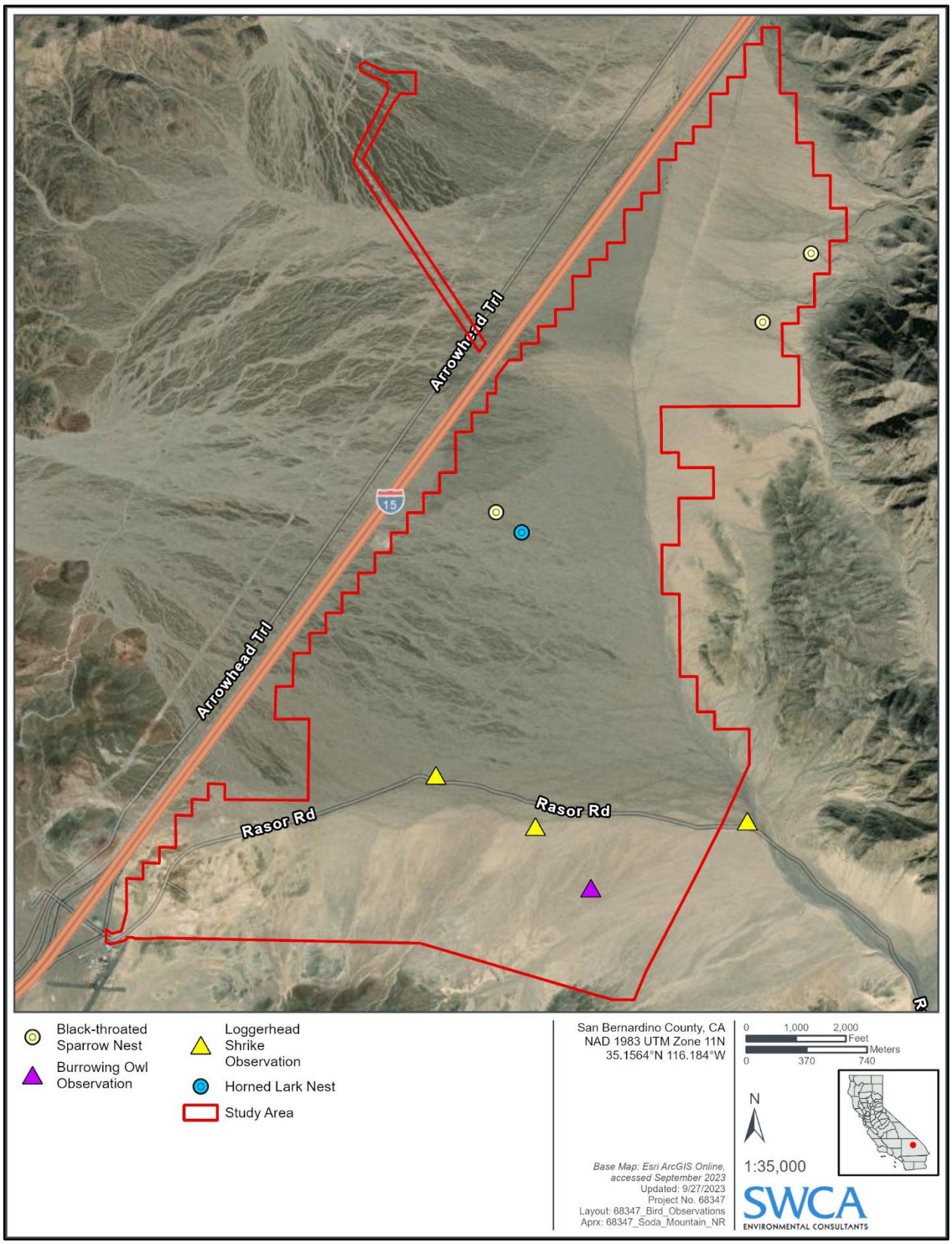

Figure 14. Active bird nests and special-status avian species documented.

4.4.2.3.4 Special-Status Avian Species

Golden Eagle

The golden eagle is a CDFW fully protected species, is protected pursuant to the federal BGEPA, and is considered sensitive by the BLM. This species has a global range that includes much of North America, Eurasia, and parts of northern Africa. The golden eagle is an uncommon but widespread resident in California and is known to nest in the Mojave Desert. Territories regularly span 5 to 10 miles depending on the availability of prey, nest sites, and wind resources. Breeding adults in desert settings may range up to 10 miles from the nest while foraging. Golden eagles nest on cliffs, rock outcrops, or in large trees, none of which are present in the study area. Foraging golden eagles require large amounts of open space for hunting, such as grasslands, deserts, and savannahs. The entire study area provides suitable foraging habitat and may support a suitable prey base. Mid-sized mammals such as rabbits and marmots are preferred, but prey may be as small as California ground squirrels (*Otospermophilus beecheyi*) or as large as deer (rarely), and golden eagles will consume carrion when it is available. The study area supports at least one mid-sized mammalian prey species: black-tailed jackrabbit.

No golden eagles were observed by SWCA biologists in the study area, and there are no cliffs, rocky outcrops, or other suitable nesting habitat within the study area. The Soda Mountains to the south and north of the project may provide suitable nesting habitat. The study area is suitable for foraging. The USFWS provided records of golden eagle nest sites within 10 miles of the study area (USFWS 2024) (Figure 15). There is potential for golden eagles to forage within the study area. No golden eagles were detected or observed during the 2024 spring raptor survey. All large bird data collected in 2024 can be found in *Spring Avian Use and Raptor Survey Report for the Soda Mountain Project* (see Appendix M).

Burrowing Owl

Burrowing owl is a candidate for listing under CESA, a Species of Special Concern by CDFW, and considered a sensitive species by the BLM. This species occurs in a wide range of mostly open habitats in California, including grasslands, shrub-steppe, deserts, pastures, and agricultural areas. Suitable habitat for burrowing owl includes short vegetation and, in the breeding season, the presence of small mammal burrows. The California range of this species extends from Redding south to San Diego, east through the Mojave Desert and west to San Francisco and Monterey. The key characteristics of suitable habitat are moderately low and sparse vegetation; a prey base of small mammals, reptiles, and/or large insects during nesting; and burrows or similar sites for shelter. Habitat loss, degradation, and fragmentation present the most significant threats to burrowing owls in California. The majority of burrowing owls in California are now found in wide, flat lowland valleys and basins like the Imperial Valley and Great Central Valley, where intense residential and commercial development is occurring (DeSante et al. 2007). The study area falls within the portion of the Mojave Desert where less than 1% of burrowing owl breeding pairs in California occur (Wilkerson and Siegel 2011). CDFW considers burrows occupied within the last 3 years to be occupied for the purposes of documenting burrowing owls at a project and evaluating potential impacts (CDFW 2012). There are no CNDDB records of this species within 20 miles of the project area.

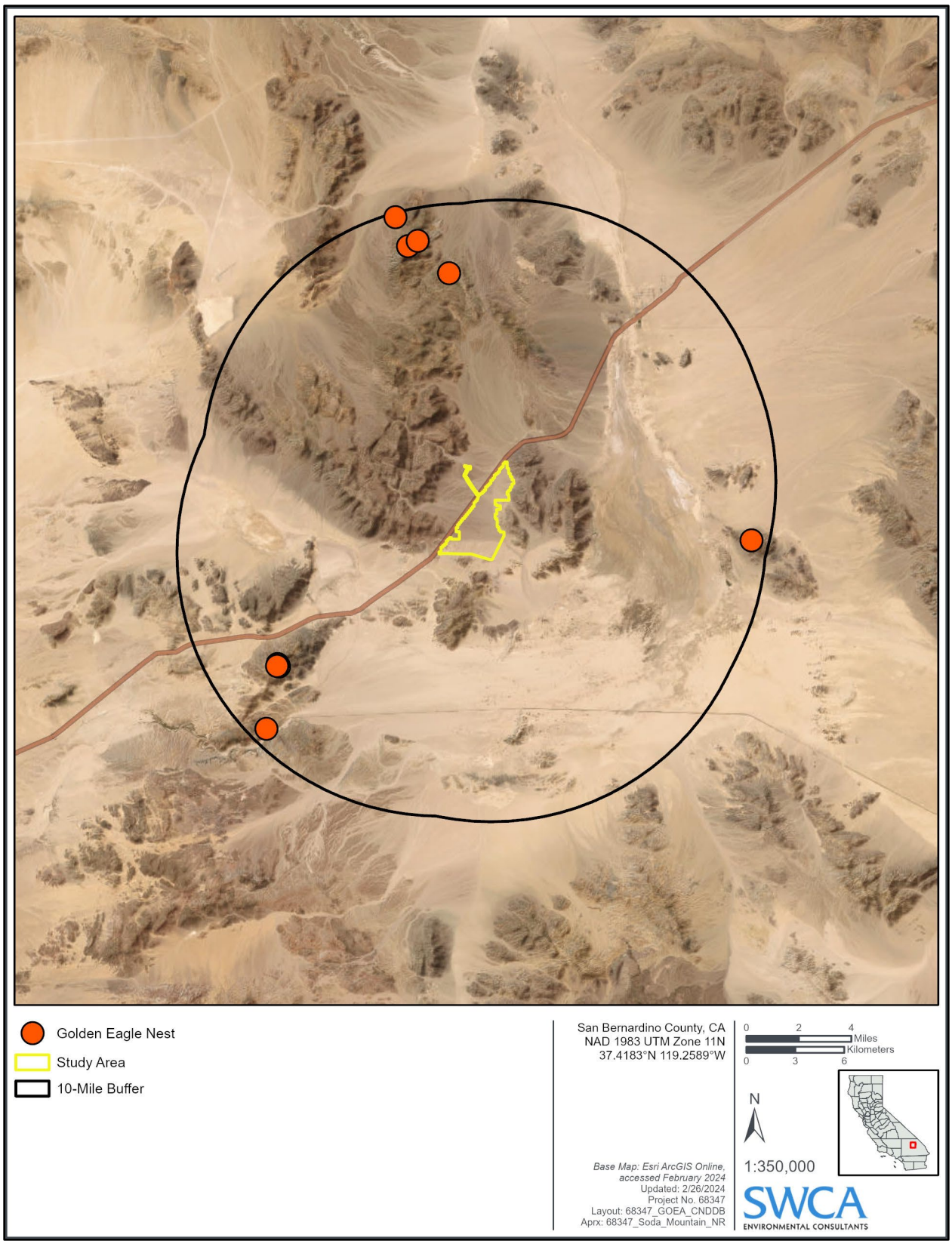

Figure 15. USFWS records of golden eagle nesting sites within 10 miles of the study area.

Habitat in the study area is generally suitable for this species due to the availability of burrows for roosting and nesting, as well as relatively short vegetation with sparse shrubs and taller vegetation. During the burrow survey, 50 burrows were identified as potential burrowing owl burrows (Figure 16). Following the habitat assessment, breeding season surveys were conducted for burrowing owl due to the observation of a live burrowing owl and presence of sign at several potential burrows. Upon close examination of each burrow, it was found that only one of the burrows exhibited definitive recent sign of potential burrowing owl activity, with whitewash staining around the entrance (see Appendix P: Photographs P-23 and P-24). A single burrowing owl was observed during the survey in the southern section of the study area just south of Rasor Road. No burrows were observed within the vicinity of the individual, and no reproductive or nesting behavior was observed. Subsequent follow-up visits to potentially active burrows were performed, and no burrows were determined to be active based on the lack of recent activity or sign at all 50 of the burrows. Burrowing owl may also utilize burrows observed in the desert tortoise survey, though they were not included in this analysis. Based on this evidence, burrowing owl is considered present with the potential to nest or forage on-site, though at low quantities. Additional details can be found in *Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project* (see Appendix N).

Loggerhead Shrike

Loggerhead shrike is listed as a CDFW Species of Special Concern. This species favors open country habitats with short vegetation, such as pastures with fence rows, agricultural fields, riparian areas, and open woodlands (Yosef 2020). In desert habitats, this species exhibits similar preferences for open areas with short vegetation, which may include grasslands, desert scrub, and low shrublands (Yosef 2020).

Loggerhead shrike preys on large insects, amphibians, reptiles, small mammals, birds, and carrion (Yosef 2020). It requires open areas for hunting and shrubs or low trees for perches and nest sites (Yosef 2020). The nearest CNDDB record for this species is 14 miles northeast of the study area, and there are multiple recent eBird records for loggerhead shrike within 5 miles of the study area.

Suitable habitat is present within the project, and many prey species for the loggerhead shrike are available on-site. This species was detected by sight and sound during the 2023 spring avian use survey and observed during other surveys. Loggerhead shrike has been confirmed to be present at the project area, and there is suitable habitat throughout the project area.

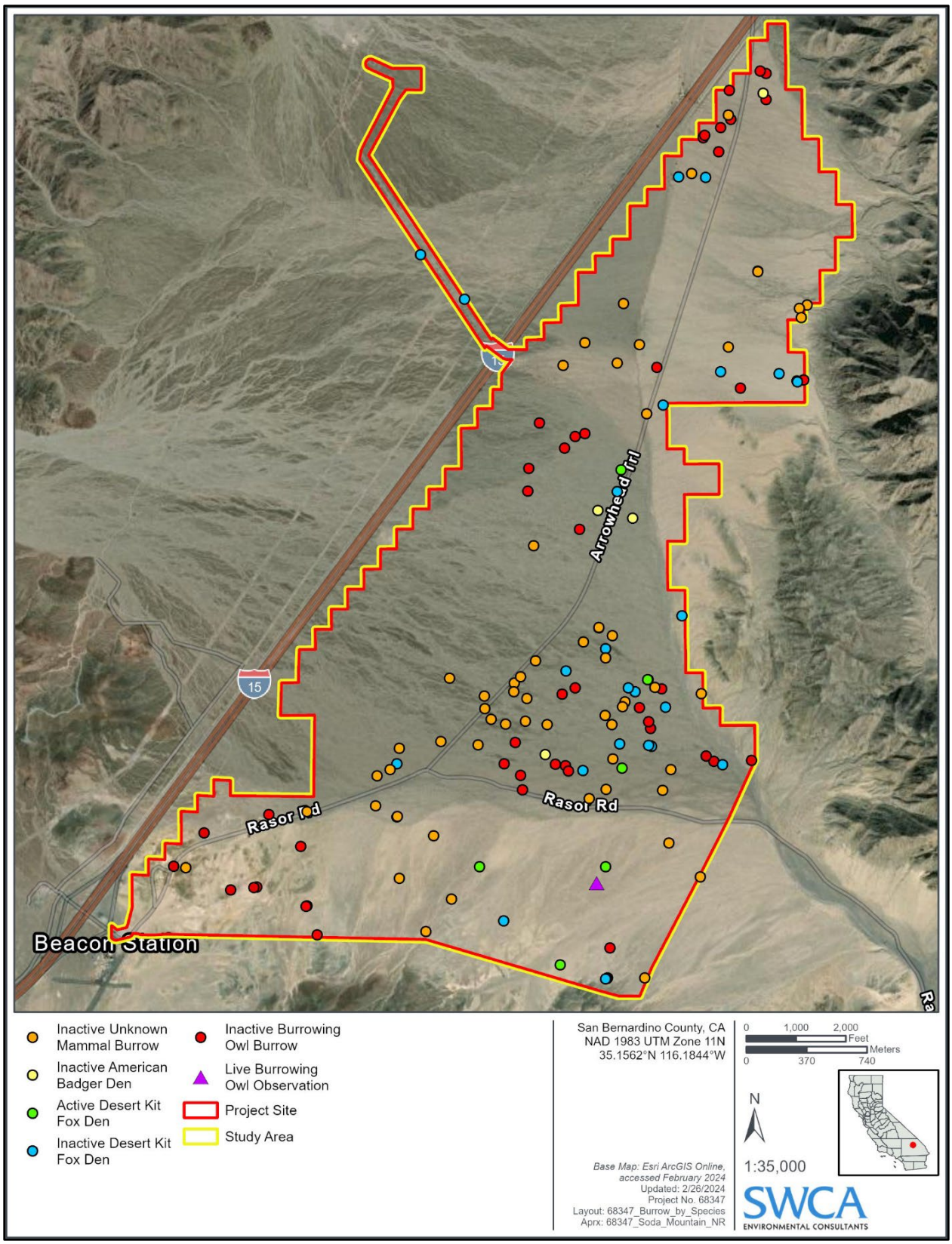

Figure 16. Location of potential burrowing owl and unknown mammal burrows, and desert kit fox and American badger dens identified within the study area.

4.4.2.4 MAMMALS

This section covers all special-status mammals that were determined to have potential to occur in the study area based on the results of the desktop review.

4.4.2.4.1 Bats

Two bat species were detected by sight and/or sound within the study area during the nighttime acoustic survey period: canyon bat (*Parastrellus hesperus*) and Mexican free-tailed bat (*Tadarida brasiliensis*). There were 18 detections total, all occurring between August 28 and August 31 at RE4, T2, and T5 (Figure 17). The four roost emergence locations were determined to be potentially suitable for roosting due to the presence of crevices within the culverts displaying suitable depth, width, and height above the ground for bat roosting (Keeley and Tuttle 1999). In addition, possible urine staining was observed at RE3.

No roost emergence behavior was observed. Bat behavior during all acoustic detections and visual observations were consistently categorized as either foraging or commuting. The potential roosting sites identified during the daytime habitat assessment survey and monitored acoustically during the nighttime surveys did not reveal any active roosting sites, as there were no evident bat emergences detected during the acoustic monitoring surveys. No other potential roosting locations were identified within the study area or immediate vicinity during the surveys.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a CDFW Species of Special Concern and a BLM sensitive species. This widespread, non-migratory species occurs as far south as Baja California and as far north as British Columbia. Populations of this species are severely fragmented but may be locally common. The pallid bat is typically found in a wide range of habitats including deserts, grasslands, shrublands, woodlands, and forests where they can be found year-round. They are most common in open, dry habitats for foraging with rocky areas for roosting. The pallid bat has been found to roost in mines, caves, and buildings. This species is sensitive to disturbance while roosting, and the main threats to the species include human activity such as vandalism, recreational activities, mine closures, and reclamation. The pallid bat is an insectivore that forages by gleaning insects off the ground. Habitat in the study area is suitable for foraging, but there is no potential roosting habitat for this species. The nearest CNDDB record from 2005 is approximately 12 miles west of the study area. Pallid bat was not detected or observed during the 2012 acoustic surveys conducted by Brown-Berry Biological Consulting (See Appendix A). Pallid bat was not detected or observed during the 2023 bat surveys, and is considered not likely to occur with regards to roosting with low potential to forage on-site. The detailed methods, results, and species observations can be found in *Bat Survey Report for the Soda Mountain Solar Project* (see Appendix O).

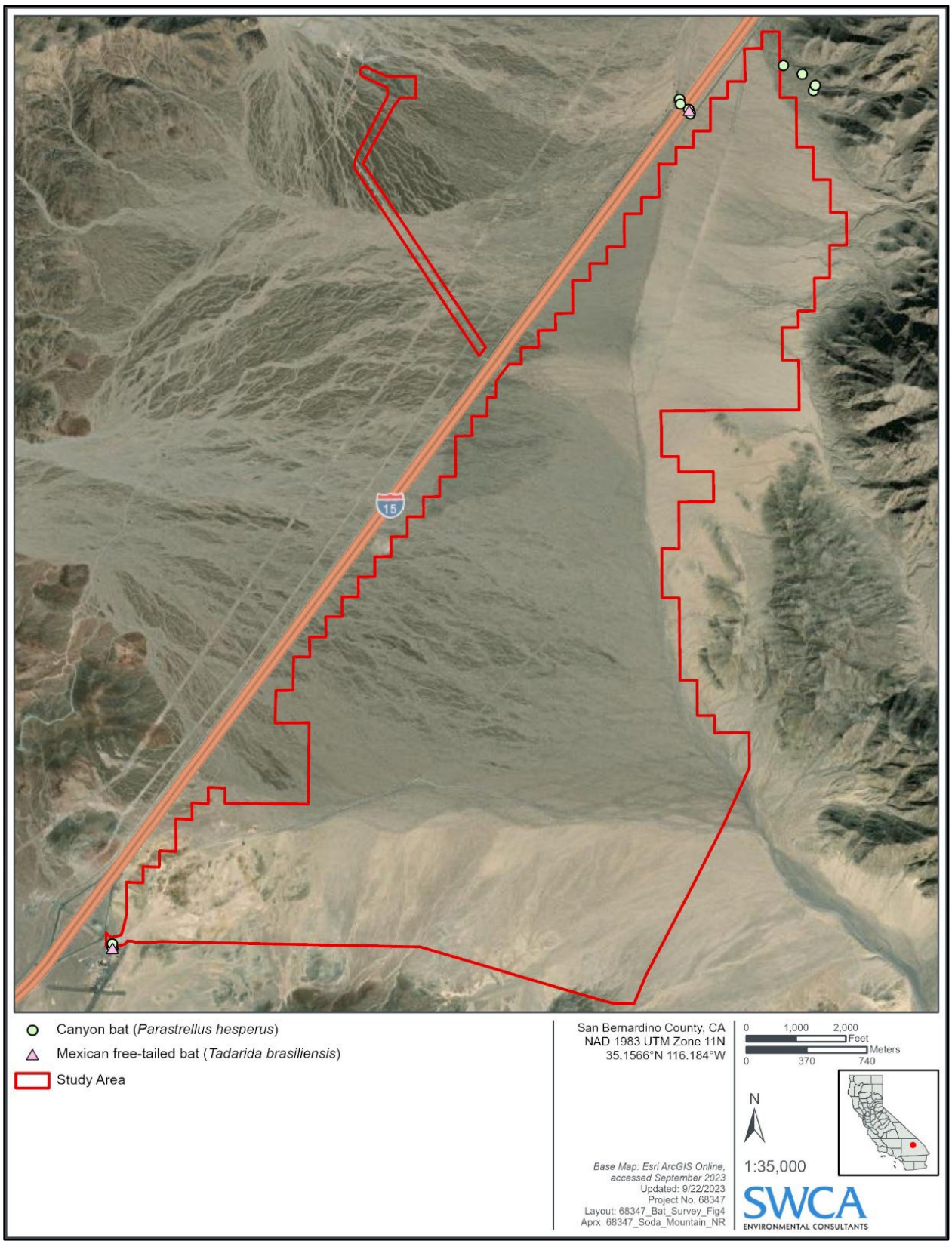

Figure 17. Locations of bats observed in the study area.

Townsend's Big-eared Bat

Townsend's big-eared bat (*Corynorhinus townsendii*) is a CDFW Species of Special Concern and a BLM sensitive species. Townsend's big-eared bat occurs throughout most of California, albeit with a patchy distribution. This species is non-migratory and can be found in the study area year-round. It is closely tied to caves and cave-like roost sites, which can include hollow trees and mines, and sometimes buildings or water diversion tunnels. This species is very sensitive to disturbance while roosting, and the main threats to the species are likely human impacts to roosts. In the Mojave Desert, Townsend's big-eared bat is mostly dependent on mining infrastructure for roost sites. Habitat in the study area is suitable for foraging, but there is no potential roosting habitat for this species. The nearest CNDDB record, which is from 2006, is approximately 3.5 miles east of the study area. Townsend's big-eared bat was not detected or observed during the 2012 acoustic surveys conducted by Brown-Berry Biological Consulting (see Appendix A). Townsend's big-eared bat was not detected or observed during the 2023 acoustic bat surveys, and is considered to have a low potential to forage on-site. The detailed methods, results, and species observations can be found in *Bat Survey Report for the Soda Mountain Solar Project* (see Appendix O).

California Leaf-nosed Bat

California leaf-nosed bat (*Macrotus californicus*) is a CDFW Species of Special Concern and a BLM sensitive species. California leaf-nosed bat occurs throughout southern California and into northern Mexico. Some individuals of this species are yearlong residents in California, while some migrate to Mexico in winter. This species typically roosts in deep mine tunnels, caves, and occasionally buildings or bridges. Night roosts may be in buildings, mines, bridges, rock shelters, or other sites with overhead protections and roost in large groups. Occupied habitats in the Mojave Desert include desert riparian, desert wash, scrublands, and palm oasis between 600 and 1300 m elevation. Habitat in the study area is suitable for foraging, but there is no potential roosting habitat for this species. There are no CNDDB records within a 50-mile radius and there were no individuals detected in the 2023 acoustic bat surveys. California leaf-nosed bat was not detected or observed during the 2023 bat surveys, and is considered not likely to occur with regards to roosting, with low potential to forage on-site. The detailed methods, results, and species observations can be found in *Bat Survey Report for the Soda Mountain Solar Project* (see Appendix O).

Western Mastiff Bat

Western mastiff bat (*Eumops perotis californicus*) is a CDFW Species of Special Concern and a BLM sensitive species. Western mastiff bat distribution occurs in the southeastern United States through central Mexico. This species is non-migratory, does not undergo prolonged hibernation and is periodically active through the winter season. Habitat can range from desert scrub to oak woodland and into the ponderosa pine belt. This species primarily dwells in crevices which are oftentimes made up of large exfoliating slabs of granite, sandstone slabs, on cliff faces or in large boulders. Typical foraging habitats include dry desert washes, flood plains, chaparral, oak woodlands, open ponderosa pine forests, grasslands, and agricultural areas. There are no CNDDB records within a 50-mile radius and there were no individuals detected in the 2023 acoustic bat surveys. Western mastiff bat was not detected or observed during the 2023 bat surveys, and is considered not likely to occur with regards to roosting, with low potential to forage on-site. The detailed methods, results, and species observations can be found in *Bat Survey Report for the Soda Mountain Solar Project* (see Appendix O).

4.4.2.4.2 Mountain Lion

Mountain lion is a candidate for listing as threatened or endangered under CESA. This status is applicable to the evolutionary significant units (ESUs) associated with the Southern California/Central Coast mountain lion subpopulations (CDFW 2020):

1. Santa Ana Mountains
2. Eastern Peninsular Range (EPR)
3. San Gabriel/San Bernardino Mountains
4. Central Coast South (Santa Monica Mountains)
5. Central Coast North (Santa Cruz Mountains)
6. Central Coast Central

The project study area is located within the outer range of the EPR ESU. This population of mountain lions inhabits mountain ranges in the Mojave Desert and the southernmost part of California, including inland areas in San Diego, Imperial, Riverside, and San Bernardino Counties. It does not occur within the Los Angeles Basin or Inland Empire, and its northward limit is slightly north of I-15. The EPR is described as occurring in mountain ranges, rather than flat valley or inter-mountain areas like the study area.

As described in the California Fish and Game Commission Notice of Receipt of Petition (California Fish and Game Commission 2019), mountain lions require large areas of relatively undisturbed habitats with adequate connectivity to allow for dispersal and gene flow. They have large home ranges which often consist of a mix of habitat types including coniferous forests, riparian and oak woodlands, streams, chaparral, grasslands, and desert (California Fish and Game Commission 2019). Gustafson et al. (2018) found that the EPR population exhibits evidence of a prior genetic bottleneck (Center for Biological Diversity and the Mountain Lion Foundation [CBD] 2019). Although the EPR was found to have a higher effective population size than other subpopulations, it was still below the standard to prevent inbreeding depression in the short-term and is insufficient for the long-term persistence of the population (CBD 2019). In addition, the EPR population was found to be largely disconnected from all the other California populations, with limited gene flow and low connectivity with the Santa Ana Mountains and San Gabriel/San Bernardino Mountains populations (Gustafson et al. 2018).

There are records of mountain lions outside of the core mountain ranges in Southern California, which are likely transients or residents of smaller populations (CBD 2019). For example, the Yuma mountain lion has been recognized by CDFW as a subspecies of special concern, and likely occurs in low density in the desert plains and low mountains of the Colorado River Valley (CBD 2019). In their Notice of Findings, the California Fish and Game Commission determined that based on that finding and the acceptance of the petition, the California Fish and Game Commission provided a notice that the Southern California/Central Coast ESU of mountain lions is a candidate species as defined by Section 2068 of the FGC (California Fish and Game Commission 2020).

Large ungulates are the preferred prey of mountain lions, especially deer (Currier 1983; Iriarte et al. 1990). Potential prey that may occur in the project vicinity include burros (*Equus asinus*), bighorn sheep, and mule deer (*Odocoileus hemionus*). All require access to drinking water, which is not available within the study area.

There are no nearby CNDDB records for mountain lion, and no evidence of mountain lion was detected during protocol surveys for other special-status plant and wildlife species. The study area may provide a connectivity corridor for mountain lion rather than home territory or denning habitat, as it is in a flat

valley as opposed mountains, lacks cover, and is not suitable permanent habitat for local prey species (bighorn sheep, mule deer, and burros). However, the study area is potentially suitable for transient use by both mountain lions and their potential prey, which may pass through the study area while moving between mountain ranges or between water sources, further supported by the nearest roadkill incident occurring approximately 40 miles southeast of the study area (Dudek 2024).

4.4.2.4.3 American Badger

American badger is a CDFW Species of Special Concern and is listed as sensitive by the BLM. This species is generally found in open areas, including open woodlands, desert scrub, and grasslands. This burrowing mammal uses friable soil to construct burrows for cover and protection. While they often reuse existing burrows, some individuals may create new dens nightly, particularly during the summer months (Messick and Hornocker 1981). Badger dens are distinctive due to their size and the presence of claw marks on the sides created when the den was dug. As obligate carnivores, American badgers primarily rely on a diet composed of fossorial (burrowing) rodents, including rats, mice, chipmunks, ground squirrels, and pocket gophers. Additionally, they consume reptiles, insects, earthworms, bird eggs, small birds, and carrion. The composition of their diet experiences seasonal and yearly variations, influenced by the availability and abundance of prey in their habitat. Recent trends for this species indicate a significant reduction in both range and abundance, particularly in areas where it was once common (Williams 1986).

The study area is considered suitable habitat for this species, which is widespread throughout North America. No badgers were observed during any of the surveys, likely due to their nocturnal habits, but five burrows were identified as potential American badger burrows (see Figure 16). These burrows were identified as American badger by the distinct claw marks and size and shape of den entrances, though they were determined to be inactive based on lack of recent sign (see Appendix P: Photograph P-25). A follow-up visit confirmed inactivity at all five burrows. American badger may also utilize burrows observed in the desert tortoise survey, though they were not included in this analysis. Based on this evidence, American badger is considered to be present on-site. The detailed methods, results, and species observations can be found in *Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project* (see Appendix N).

4.4.2.4.4 Desert Kit Fox

Desert kit fox is afforded protection from take under California FGC Sections 460 and 4000-4003. Much of the Mojave Desert provides habitat for this species, although its population status and trends are uncertain. Desert kit fox can be found in a wide range of habitat types, including desert scrub, washes, and arid grasslands. In the western Mojave Desert, desert kit fox dens are frequently located on west- and northwest-facing slopes on friable soils with an absence of stones, caliche, or hardpan. Kit foxes use multiple dens and switch dens frequently throughout the year. Breeding typically occurs in December and January, and pups have usually left the natal den by May. This species primarily exhibits carnivorous behavior, with its diet primarily consisting of black-tailed jackrabbit and desert cottontail (*Sylvilagus audubonii*), kangaroo rat, and ground squirrel (Sheldon 1992). Additionally, the species consumes insects, reptiles, some birds, bird eggs, and vegetation (Egoscue 1962; Laughrin 1970; Morrell 1971; Orloff et al. 1986). Potential threats to this species include habitat loss and fragmentation, disease, predation, and vehicle collisions (Kadaba 2014).

CNDDB does not maintain records for this species, so no location records are available for reference, although it is regularly encountered in desert habitats. The majority of the study area is suitable habitat for desert kit fox. One kit fox was observed on the access road leading to the proposed gen-tie during a bat survey. No other kit foxes were observed during other surveys, likely due to their nocturnal habits, but several dens with fresh scat were found throughout the study area. The initial burrowing owl survey

occurred concurrently with the fossorial mammal survey, during which six kit fox burrows were identified as active. Another 28 burrows were identified as inactive desert kit fox dens, and 59 were identified as unknown mammal/dig (see Figure 16). Several medium-sized mammal burrows could not be identified due to the lack of diagnostic characteristics, or due to burrows only being partially dug, and having shallow depth/collapsed and therefore were described as inactive unknown mammal burrow/dig. Kit fox may also utilize burrows observed in the desert tortoise survey, though they were not included in this analysis.

During three follow-up visits, the six burrows were confirmed active and occupied based on the presence of fresh or recent scat, evidence of recent digging or excavation, and well-maintained entrances (see Appendix P: Photographs P-26, P-27, and P-28). Based on this information, desert kit fox is considered to be present on-site. The detailed methods, results, and species observations can be found in *Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project* (see Appendix N).

4.4.2.4.5 Desert Bighorn Sheep

CDFW monitors desert bighorn populations at both the herd (local population) and metapopulation (regional population) levels (CDFW 2023f). CDFW monitors individual herd population size, recruitment, survival, movement, and health, whereas the metapopulation is monitored by documenting local population extinction and colonization events, range connectivity, and gene flow (CDFW 2023f). The overarching management goals for desert bighorn in California are outlined in CDFW's Desert Bighorn Management Plan, which is currently under review (CDFW 2023f).

Desert bighorn sheep occur in California's desert mountain ranges from the White Mountains of Mono and Inyo Counties south to the San Bernardino Mountains, and further southeast to the Mexican border (Zeiner et al. 1990). Bighorn sheep graze and browse on a variety of plant species, with a preference for green, succulent grasses and forbs (Zeiner et al. 1990). They prefer open areas of low-growing vegetation for feeding, with proximity to steep, rugged terrain for escape, lambing, and bedding, an adequate source of water, and travel routes linking these areas (Zeiner et al. 1990). Although focused surveys for desert bighorn sheep were not performed for the project, suitable grazing habitat was incidentally observed during the wildlife and plant surveys described previously. Also, a desert bighorn sheep skull was observed during burrowing owl surveys on March 29, 2023 (see Appendix P: Photograph P-29).

Survey data for desert bighorn sheep near the study area will be provided separately by CDFW and included in the EIR. Analyses will be based on CDFW-specific methodologies designed to understand how to reach their long-term management goals. Therefore, project-led data were not recorded and potential project impacts to desert bighorn sheep are not included in this report.

4.4.2.4.6 Southern California Ringtail

The southern California ringtail is a CDFW Fully Protected species. It typically occurs at elevations ranging from sea level to 4,500 feet amsl but may occur at elevations ranging from 6,500 to 9,500 feet amsl. Its primary habitat is oak, pinyon pine, and juniper woodlands, but it also occurs in conifer forests, chaparral, desert, and dry tropical habitats if rocky outcroppings, canyons, boulder piles, or talus slopes are present. It is dependent on open water and usually does not occur more than 0.6 mile from a permanent water source.

CNDDB does not maintain records for this species, so no location records are available for reference, although observations have been recorded at the nearby street of Zzyzx. The majority of the study area is not considered suitable habitat for ringtail, with little to no permanent water sources.

5 POTENTIAL IMPACTS AND RECOMMENDATIONS

5.1 Applicant-Proposed Measures

For purposes of this analysis, potential indirect, direct, temporary, and/or permanent and cumulative impacts are assessed according to the thresholds of significance included in Appendix G of the State CEQA Guidelines. The applicant identified and committed to implementing the following applicant-proposed measures (APMs) as part of the project to avoid or substantially lessen potentially significant impacts to biological resources, to the extent feasible. The APMs originated in the ROD issued by BLM in 2016 and have been updated to match the current project description and regulations. The APMs, where applicable, are discussed in the impact analysis section below. These measures include the following:

5.1.1 Vegetation

- **APM BIO-1:** The site shall be revegetated after decommissioning according to the Final Closure Plan described in MM BIO-24 and prepared in conformance with BLM requirements at the time of decommissioning.
- **APM BIO 2:** The applicant shall prepare and implement a Vegetation Resources Management Plan that contains the following components:

    a) Vegetation Salvage Plans that discuss the methods that will be used to transplant cacti present within the proposed disturbance areas. Salvage and transplant methods used will be approved by CEC. In addition, the Vegetation Salvage Plans will also include methods that will be used to transplant special-status plant species that occur within proposed disturbance areas.

    b) Restoration Plans discussing the methods that will be used to restore any of the four native plant community types (creosote bush-white bursage scrub, cheesebush scrub, and creosote bush scrub,) present within the project area that may be temporarily disturbed by construction activities. The applicant will obtain CEC approval for any seed mixtures used for restoration.

    c) Vegetation Salvage and Restoration Plans that will specify success criteria and performance standards. The applicant will be responsible for implementing the Vegetation Salvage and Restoration Plan according to CEC requirements.
- **APM BIO-3:** Herbicides shall not be applied systemically over the entire project area. Herbicides shall be applied in focused treatments in areas where invasive weed infestations have been identified, such as where there is a clump or monotypic stand of invasive weeds. Herbicides shall not be applied within 100 feet of a special-status plant.
- **APM BIO-4:** Only a State of California and federally certified contractor (i.e., Qualified Applicator), who is also approved by CDFW, and holds and maintains a Qualified Applicator License from California Department of Pesticide Regulation, shall be permitted to perform herbicide applications. Herbicides shall be applied in accordance with applicable laws, regulations, and permit stipulations. All herbicide applications must follow U.S. Environmental Protection Agency label instructions.

- **APM BIO-5:** Herbicides shall not be applied during rain events, within 48 hours of a forecasted rain event with a 50% or greater chance of precipitation, or when wind velocity exceeds 10 mph (for liquids) and 15 mph for granular herbicides.
- **APM BIO-6:** The applicant shall implement an Integrated Weed Management Plan (IWMP) to control weed infestations and the spread of noxious weeds in the study area.
- **APM BIO-7:** After project construction, areas of temporary disturbance shall be closed and the restoration measures in the Vegetation Resource Management Plan shall be implemented.
- **APM BIO-8:** Foundations shall be removed to a minimum of 3 feet below surrounding grade during decommissioning and covered with soil to allow adequate root penetration for native plants. Petroleum product leaks and chemical releases shall be remediated prior to completion of decommissioning.
- **APM BIO-9:** Decommissioning methods shall minimize new site disturbance and removal of native vegetation.

5.1.2 Special-Status Plants

- **APM BIO-10:** All special-status and rare plant (CRPR 1, 2, 3, and 4) occurrences within the project area will be documented during preconstruction surveys. The applicant will also provide a 100-foot buffer area surrounding each avoided occurrence in which no construction activities will take place, if feasible. If avoidance is not feasible, the applicant shall provide on-site mitigation (e.g., vegetation salvage) for impacts to special-status and rare plants.
- **APM BIO-11:** Before construction of a given phase begins, the applicant shall stake and flag the construction area boundaries, including the construction areas for the solar arrays and associated infrastructure; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A CEC-approved biologist shall then survey all areas of proposed ground disturbance for rare or special-status plant species and cacti during the appropriate period (blooming or otherwise identifiable) for those species having the potential to occur in the construction areas. All rare or special-status plant species and cacti observed shall be flagged for transplantation.

5.1.3 Special-Status Wildlife

- **APM BIO-12:** The applicant shall implement a Worker Environmental Awareness Program (WEAP) to educate workers about the environmental issues associated with the project and the MMs that will be implemented at the site, including nest awareness and non-disturbance exclusion zones.
- **APM BIO-13:** Preconstruction clearance surveys to identify active bird nests shall be conducted within 2 weeks of ground disturbance or vegetation removal in all active work areas during the breeding season (February 1–August 31). The work area will need to be resurveyed following periods of inactivity of 2 weeks or more. Active nests shall be avoided using non-disturbance buffer zones as shown below.

    1. Avian Awareness and Baseline Non-Disturbance Buffer Zones
    2. Starting Distance of Awareness or Type Non-Disturbance Exclusion Zones Passerines 300 feet from active nest Raptors 500 feet from active nest Golden Eagles 1 mile and line of sight from active nest Burrowing 250 feet from active burrows during nesting Owls1 season (February 1–August 31) 160 feet from active burrows during the wintering period (September 1–January 31)

3. Implementation Notes: A qualified biologist may reduce or increase the buffer distance if there is sufficient evidence based on species, habitat, and other factors, that applicant activity would not impact nesting activity. Buffers would be maintained until a qualified biologist has determined that the nest is no longer active.

- **APM BIO-14:** Monitoring of any active nests within or adjacent to the work areas shall be conducted until nestlings have fledged and dispersed. Ongoing breeding-season monitoring of work areas shall be conducted throughout the duration of construction. Nest monitoring results shall be recorded in a Nest Check Form. Typically, a nest check will have a minimum duration of 30 minutes, but it may be longer or shorter, or more frequent than one check per day, as determined by the Designated Biologist (see MM BIO-7 for Designated Biologist) based on the type of construction activity (duration, equipment being used, potential for construction-related disturbance) and other factors related to assessment of nest disturbance (weather variations, pair behavior, nest stage, nest type, species, etc.). The Designated Biologist shall record the construction activity occurring at the time of the nest check and note any work exclusion buffer in effect at the time of the nest check. Non-project activities in the area should also be recorded (e.g., adjacent construction sites, roads, commercial/industrial activities, recreational use, etc.). The Designated Biologist shall record any sign of disturbance to the active nest, including but not limited to parental alarm calls, agitated behavior, distraction displays, nest fleeing and returning, chicks falling out of the nest or chicks or eggs being predated as a result of parental abandonment of the nest. Should the Designated Biologist determine project activities are causing or contributing to nest disturbance that might lead to nest failure, the Designated Biologist shall coordinate with the Construction Manager to limit the duration or location of work, and/or set other limits related to use of project vehicles and/or heavy equipment. Nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports.
- **APM BIO-15:** Preconstruction surveys for burrows containing suitable bat roosting habitat that could be used as individual bat roosts shall be conducted in all project work areas.
- **APM BIO-16:** The connection from the substation to the transmission line shall be designed to meet the most recent Avian Power Line Interaction Committee guidelines to the extent practicable.
- **APM BIO-17:** Roads, power lines, fences, and other infrastructure associated with the project shall be minimized to reduce habitat loss. Fencing will use wildlife compatible design standards.
- **APM BIO-18:** Collector lines shall be placed underground to reduce avian collisions.
- **APM BIO-19:** Federal and state measures for handling toxic substances shall be followed to minimize danger from spills to water and wildlife resources. Facility operators shall maintain Hazardous Materials Spill Kits on-site. Personnel shall be trained to use the Hazardous Materials Spill Kits.
- **APM BIO-20:** The applicant shall clear vegetation outside of the bird breeding season to the maximum extent practicable. Preconstruction avian clearance surveys shall be conducted by a qualified biologist for vegetation clearing during the bird breeding season (February 1–August 31). If a nest(s) is identified in the preconstruction avian clearance surveys, a qualified monitor shall be on-site during vegetation removal in order to enforce non-disturbance buffers and stop activities as necessary should construction disturb nesting activity.
- **APM BIO-21:** Trash shall be disposed of in covered containers and regularly removed from the site.

- **APM BIO-22:** Surveys for burrowing owl shall be conducted in suitable burrowing owl habitat prior to construction and if construction is suspended for 2 weeks or more. Surveys shall be performed pursuant to the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). If active burrows are found, they shall be avoided using non-disturbance buffer zones. Passive relocation shall be used as described above once the burrow is determined to be inactive.
- **APM BIO-23:** A qualified biologist shall conduct a ground-based golden eagle clearance survey for active golden eagle nests in a 2-mile area surrounding the project, as accessible. Golden eagle clearance surveys shall be conducted annually for each year of construction during the golden eagle nesting season. If active nests are found in the study area, the applicant shall coordinate with CEC, BLM, USFWS, and CDFW to ensure that construction does not result in disturbance of the golden eagles.
- **APM BIO-24:** Project personnel shall remove and dispose of roadkill near the study area to avoid attracting raptors and other scavengers to the site and shall regularly remove vegetation around larger facilities (such as the substation) to reduce raptor foraging.
- **APM BIO-25:** The project shall minimize the use of lighting that could attract migrating birds and bats (that could feed on concentrations of insects at lights). Lighting will be kept to the minimum level necessary for safety and security. High-intensity, steady burning, bright lights such as sodium vapor or spotlights will not be used on project facilities.
- **APM BIO-26:** Project personnel and visitors shall be instructed to drive at low speeds (<15 mph) and be alert for wildlife, especially in low-visibility conditions.
- **APM BIO-27:** Fencing shall be removed at the completion of decommissioning.
- **APM BIO-28:** Desert tortoise exclusion fencing shall be installed at the perimeter of project construction areas (i.e., solar array areas, project buildings, substation/switchyard, earthen berms, and along the edge of access roads and collector line corridors). The fence locations will be determined during final design and will enclose areas of project activity. The fence line and a 30-foot-wide buffer shall be surveyed for desert tortoise before construction of the fence and according to USFWS protocol. Desert tortoise translocation will adhere to guidelines of the desert tortoise translocation plan for the project (see MM BIO-10). Tortoises found in the fence line study area or spotted within 50 m of the fence line study area shall be:
    1. Assigned a USFWS identification number.
    2. Given a health assessment.
    3. Fitted with a transmitter. Tortoises that are too small to accept a transmitter (i.e., no transmitter is available that is 10% or less of the tortoise's body weight) shall be treated as a translocatee and held in situ.
    4. Moved into habitat adjacent outside the fence line. The tortoise shall be moved into an empty burrow if clearance of the fence area takes place outside the tortoise active season (i.e., November–March and June–August).
    5. Any of the moved tortoises that return to the project area before completion of fence construction shall be treated as translocatees. Desert tortoises remaining outside the fence line prior to completion of the fence shall be deemed residents. The transmitter shall be removed from the resident tortoise, and no further action shall be taken for the resident tortoises. USFWS procedures shall be followed to clear and handle the desert tortoise.
- **APM BIO-29:** The project area desert tortoise preconstruction clearance survey shall be conducted during the desert tortoise active season (April–May and September–October) unless otherwise agreed to by CEC, USFWS, and CDFW. The survey shall be conducted according to

USFWS protocol and preferably during early morning hours to increase the chance juvenile tortoises are found, per the Guidelines. Any tortoise scat shall be collected on each pass of a transect, per the Guidelines. USFWS procedures shall be followed to clear and handle the desert tortoise.

- **APM BIO-30:** The linear facilities desert tortoise preconstruction clearance survey(s) can be conducted at any time throughout the year. Linear facilities for this project include the buried collector lines between arrays and connecting to the substation. Located desert tortoises shall be undisturbed and allowed to clear the site without assistance or interference. Tortoises shall be moved if necessary to reduce the potential for harm from construction activities but shall not be moved more than 500 m in such a scenario. USFWS procedures shall be followed to clear and handle the desert tortoise.
- **APM BIO-31:** Data shall be collected during desert tortoise clearance surveys as described in this section. The same data shall be collected again on tortoises held in the interim in situ on the day that the tortoise is translocated from the study area. The data include:
    1. Date
    2. Time
    3. Temperature (°C)
    4. Project name
    5. Site type (project/recipient/control)
    6. Landowner (BLM)
    7. Permit/BO #
    8. Coverage #
    9. Field crew vendor
    10. Surveyor (first and last name)
    11. ID#
    12. Midline carapace length (MCL) (millimeters)
    13. Sex
    14. Universal Transverse Mercator (UTM) (Easting)
    15. UTM (Northing)
    16. Location (e.g., burrow)
    17. Transmitter manufacturer
    18. Transmitter serial #
    19. Transmitter frequency
    20. Transmitter install date
    21. Battery life (months)
    22. Status (alive/dead/lost)
- **APM BIO-32:** Following installation of the desert tortoise exclusion fencing, the fencing shall be regularly inspected. Permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which

flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 72 hours between March 15 and October 31 and within 7 days between November 1 and March 14 of observing damage. Inspections of permanent site fencing shall occur while desert tortoise fencing is in place.

- **APM BIO-33:** No construction, operation, or decommissioning activities shall occur in unfenced areas without a USFWS-approved desert tortoise biologist present. These activities include the construction phase (construction, revegetation), decommissioning phase, and maintenance activities during the operations phase that require new surface disturbance. An adequate number of trained and experienced monitors must be present during all construction and decommissioning activities in unfenced areas, depending on the various construction tasks, locations, and season. A biologist shall be on-site from March 15 through October 31 (active season) during ground-disturbing activities in areas outside the exclusion fencing and shall be on-call from November 1 through March 14 (inactive season). The biologist shall check all construction areas immediately before construction activities begin. The biologist shall inspect construction pipes, culverts, or similar structures 1) with a diameter greater than 3 inches, 2) stored for one or more nights, 3) less than 8 inches aboveground, and 4) within desert tortoise habitat (i.e., outside the permanently fenced area), before the materials are moved, buried, or capped. Alternatively, such materials may be capped before storing outside the fenced area or placing on pipe racks.
- **APM BIO-34:** A Raven Monitoring and Control Plan shall be prepared consistent with the most current USFWS-approved raven management guidelines. The purpose of the plan is to avoid any project-related increases in raven numbers during construction, operation, and decommissioning. The Raven Monitoring and Control Plan shall be submitted to CEC, BLM, CDFW, and USFWS for approval at least 30 days prior to the start of construction.
- **APM BIO-35:** A Burrowing Owl Relocation Plan shall be prepared and submitted to CEC for approval. Burrowing owls occupying burrows on-site shall be passively relocated outside the nesting season (February 1–August 31) or after a qualified biologist determines that the burrow does not contain eggs or chicks and after consultation with CEC. Prior to construction and passive relocation, artificial burrows shall be installed in areas that would not be disturbed during construction at a ratio of 5:1 for each burrow that will be destroyed by project construction. Passive relocation shall be conducted prior to construction and according to guidelines from the California Burrowing Owl Consortium (1993).
- **APM BIO-36:** Compensatory habitat mitigation shall be provided at a 1:1 ratio for impacts to suitable desert tortoise habitat during construction. A Habitat Compensation Plan shall be prepared to the approval of CEC, CDFW, USFWS, and BLM.
- **APM BIO-37:** No pets shall be allowed on-site prior to or during construction, except kit fox scat detection dogs (with CEC approval) used for preconstruction surveys or postconstruction kit fox mortality monitoring.
- **APM BIO-38:** A preconstruction survey will be conducted by a qualified biologist to identify sign of recent mountain lion use of the area (e.g. tracks; scat). The survey will be conducted no more than three days prior to initiation of construction activities. If mountain lion are observed in the study area, the applicant shall coordinate with CEC to ensure that construction does not result in disturbance of mountain lion.
- **APM BIO-39:** A preconstruction survey will be conducted by a qualified biologist to identify sign of recent ringtail use of the area. The survey will be conducted no more than three days prior to initiation of construction activities. If ringtail activity is observed in the study area, the

applicant shall coordinate with CEC to ensure that construction activities do not result in disturbance of local ringtail populations.

5.2 Environmental Impact Analysis

This section describes the anticipated direct, indirect, temporary, permanent, and cumulative impacts to biological resources that may result from implementation of the project. This analysis was based on the results of the biological resources surveys performed within the defined study areas, information from literature and database resources, and the proposed project design and layout. Anticipated impacts would result from construction of the solar plant site (including panel arrays and mounting structures), gen-tie, operation and maintenance buildings and structures, stormwater infrastructure, the substation and switchyard, and the 300-MW BESS.

Project implementation would result in the direct, permanent removal of up to 2,645.4 acres of on-site plant communities and displacement of wildlife that depend on them for habitat (Table 6). When combined with non-vegetation community areas (e.g., developed areas), the total project area is 2,670 acres. The final project design is expected to have lesser impacts to vegetation communities. However, for the purposes of this report, and to ensure that all environmental impacts are considered, it is assumed that all vegetation communities in the study area will be directly and permanently impacted by construction of the project.

Table 6. Total Impacts to Vegetation Communities in the Study Area

Vegetation Community	Global Rank*	State Rank†	Acres within the Study Area‡
Creosote Bush – White Bursage Scrub *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance	G5	S5	2,459
Creosote Bush Scrub *Larrea tridentata* Shrubland Alliance	G5	S5	145
Rigid Spineflower – Hairy Desert Sunflower *Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (*Chorizanthe rigida – Geraea canescens* Desert Pavement Association)	G4	S4 (Sensitive Association)	32
Cheesebush – Sweetbush Scrub *Ambrosia salsola – Bebbia juncea* Shrubland Alliance	G4	S4	8.2
California Joint Fir – Longleaf Joint-fir *Ephedra californica – Ephedra trifurca* Shrubland Alliance (*Ephedra californica – Ambrosia salsola* Association)	G5	S4 (Sensitive Association)	1.2
Developed/Disturbed	N/A	N/A	25
Total	**N/A**	**N/A**	**2,670.4**

*Global Rank (NatureServe 2024):

G4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres
G5 = Demonstrably secure because of its worldwide/statewide abundance

†State Rank (NatureServe 2024):

S4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres
S5 = Demonstrably secure because of its worldwide/statewide abundance

‡ Vegetation Communities only. Does not include developed areas.

Potential direct, permanent impacts to special-status plant and/or wildlife species may include death, injury, or displacement; degradation or loss of habitat; and/or the destruction of or interference with local movement and migratory corridors. Many indirect, temporary, and permanent impacts to off-site biotic resources are possible during construction (e.g., from noise and dust) and after project completion

(e.g., from noise, night lighting, restriction of movement). The temporary deposition of dust on off-site vegetation communities during construction could adversely affect quality of the habitat. Additionally, permanent artificial night lighting could adversely affect the behavior of nocturnal wildlife, and increased trash produced by project activities could result in an increase of opportunistic predators to the area.

Under CEQA, a mitigation, monitoring, and reporting plan would be developed to avoid, minimize, and mitigate impacts associated with the implementation of the project. As the lead agency responsible for authorizing project implementation, CEC is responsible for ensuring that the measures for avoiding, minimizing, and reducing impacts are sufficient and compliant with CEQA and CESA requirements, and other applicable state, federal, and local regulations.

If impacts to state or federally listed species were to occur, permits from the applicable regulatory agencies would be required. Preconstruction surveys for special-status wildlife would avoid and minimize impacts to these resources by allowing them to be avoided or translocated off-site. The APMs described above observe the expected inclusion of avoidance and minimizations measures as described in the ROD. The potential impacts that may result from project implementation and recommended MMs pertinent to specific resource types are discussed below.

5.2.1 Special-Status Plants and Wildlife

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant with Mitigation Incorporated. Potential adverse effects to special-status plant and wildlife species could result from construction of the project, as well as from operation and maintenance. Future decommissioning of the project could also result in adverse effects on special-status plants, wildlife, and their habitats. Construction is anticipated to occur over 18 months, thus including construction in the spring. Therefore, grubbing, grading, and fill during site preparation could impact special-status plants and associated seed banks during the growing season through direct removal and/or destruction of habitat. Construction of the project components, including the substation and switchyard, could result in vehicles crushing special-status plants. Several special-status plant and wildlife species were observed or have the potential to occur within the study area.

5.2.1.2 SPECIAL-STATUS PLANTS

Special-status plants may be subject to direct and indirect impacts, including crushing and/or dust cover during operation and maintenance activities. Dust cover could inhibit vital physiological processes such as respiration or photosynthesis. Regular road maintenance could result in direct removal of plants and/or seed beds, as well as significant habitat modification through repeated grading, compaction, berm construction, or installation of best management practices (BMPs). Special-status plants could be adversely affected by the introduction of new and spread of existing invasive plant species via personnel or vehicles. Also, altered hydrology as a result of construction could flood or dehydrate special-status plants and their associated seed banks. Finally, reduced wildlife activity could result in adverse effects on special-status plant species pollination and/or seed dispersal through zoochory.

One special-status plant species, Utah vine milkweed (CRPR 4.3), was identified in the study area, along the gen-tie. Direct, permanent impacts to Utah vine milkweed could occur through removal of individuals through grubbing, grading, and/or filling during construction, operation and maintenance, or future decommissioning of the project.

Permanent, indirect impacts to Utah vine milkweed could include permanent habitat destruction in project component locations, permanent removal of seed beds, increase in invasive plant species, permanent removal of pollinator host and/or nectaring plants, and/or altered hydrology.

Temporary, direct impacts to Utah vine milkweed during construction could include deposition of fugitive dust raised by vehicles and equipment, leading to reduction in photosynthesis and other physiological processes.

Implementation of APM BIO-10, APM BIO-11, and APM-BIO 12 as part of the project would avoid or substantially lessen potentially significant impacts to special-status plants, to the extent feasible.

Impacts to Utah vine milkweed would be reduced to less than significant through the implementation of the MMs summarized below:

- **MM BIO-1: Best Management Practices**. MM BIO-1 will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM-BIO 2: Worker Environmental Awareness Program**. MM BIO-2 will ensure that workers are aware of where Utah vine milkweed is located, and how to identify Utah vine milkweed to avoid direct, indirect, temporary, permanent, and cumulative impacts to individuals or populations of the plant during construction.
- **MM BIO-3: Construction Impact Minimization**. To avoid and substantially lessen significant impacts to aquatic resources, vegetation communities, habitat for plant species, and habitat for wildlife species that may continue to access the site post-construction (e.g., birds, reptiles, insects), the applicant will employ novel grading practices that will reduce temporary and permanent grading volumes associated with the construction of the arrays before and during construction. Mass grading of the entire site will not occur during construction. Instead, project infrastructure compatible with advanced, less impactful construction methods that minimize grading and other ground disturbance at the project site will be constructed. The infrastructure and novel grading methods will also facilitate post-construction restoration and recovery at the site. The applicant will update the civil design plans to reflect the grading methodology.
- **MM BIO-4: Special-Status Plant Species and Cacti Impact Avoidance and Minimization**. MM BIO-4 will provide guidance on how project personnel can avoid direct, indirect, temporary, permanent, and cumulative impacts to special-status plants on the project area.

5.2.1.2.1 California Desert Native Plants Act

CDNPA-regulated plant species identified within the study area include desert holly, blue paloverde (*Parkinsonia florida*), beavertail cactus, cottontop cactus, common fishhook cactus (*Mammillaria tetrancistra*), branched pencil cholla, and silver cholla. Native desert plants that are declared to be rare, threatened, or endangered species by federal or state law are not included under the provisions of the CDNPA. Additional regulated plant species in the Agavaceae (century plant [*Agave americana*], nolina [*Nolina microcarpa*], yucca, desert lily) and Cactaceae (cacti) families may be identified on-site prior to construction. Potential impacts to CDNPA-regulated plants would be similar to the special-status plants described above. Direct, indirect, temporary, permanent, and cumulative impacts to CDNPA-regulated plants would be reduced to less than significant by implementation of *MM BIO-4: Special-Status Plant Species and Cacti Impact Avoidance and Minimization*. MM BIO-4 will provide guidance on how project personnel can avoid unintended direct, indirect, temporary, permanent, and cumulative impacts to special-status plants on the project area and provide for the salvage of CDNPA-protected cacti prior to construction.

5.2.1.3 WILDLIFE

Potential direct, indirect, temporary, permanent, and cumulative effects on special-status wildlife could result from construction of the project, as well as from operation and maintenance. Future decommissioning of the project could also result in impacts to special-status wildlife and their habitats. Construction is anticipated to occur in the spring. Thus, grubbing, grading, and filling during site preparation could impact habitat (e.g., burrows, vegetation cover) necessary for special-status wildlife during their reproductive phases. All phases of construction, operation and maintenance, and decommissioning could result in the direct mortality or injury of special-status wildlife through vehicles, equipment, and increased predation through exposure or increased access by predators (e.g., predatory bird perches such as fence posts). Finally, noise and lighting during construction could adversely and indirectly affect wildlife life cycles through disruption of foraging, breeding, and/or diurnal/nocturnal cycles.

Four special-status wildlife species—loggerhead shrike, Mojave fringe-toed lizard, burrowing owl, and desert kit fox—were directly observed during the field surveys. However, the Mojave fringe-toed lizard observations were located outside of the project area. Signs of other special-status wildlife observed during the field surveys include desert tortoise, American badger, and desert bighorn sheep. An additional three species have the potential to occur within the study area, including golden eagle (foraging only), pallid bat, and Townsend's big-eared bat.

5.2.1.3.1 Crotch's Bumble Bee

The area to be developed contains desert scrub habitats supporting small mammal burrows and potential floral host plants that would be considered suitable habitat for the Crotch's bumble bee. However, Crotch's bumble bee was not detected during focused surveys within the study area. The absence of bumble bee activity documented within the survey area during focused surveys, along with decreased abundance of blooming floral resources during the summer months, suggests that the project may not support a consistent availability of pollen and/or nectar sources for the duration of the Colony Active Period. Based on this evidence, Crotch's bumble bee is considered to have low potential for occurrence in the study area.

If the species is identified within the project area: project activities such as grubbing, grading, and/or filling during construction, operation and maintenance, or future decommissioning of the project could result in direct, permanent impacts. Direct impacts include mortality of individuals or direct injury by equipment, burrow collapse associated with earthwork resulting in entrapment, removal or disturbance of native habitat resulting in damage or elimination of active nests, vegetation removal, vehicle traffic, equipment laydown, ground disturbance, and placement of fill materials resulting in entombment, or crushing of individuals.

Indirect impacts to Crotch's bumble bee could include permanent habitat destruction in project component locations, increase in invasive plant species, removal of floral resources, reduced access to nectar sources and disruption of foraging areas due to construction activities, increased competition for floral resources, removal of burrows providing suitable nesting habitat and escape cover, displacement from nesting sites, increased exposure or stress from disorientation during periods of habitat disturbance, and decreased food supply through changes in composition of floral nectar resources. The project is not expected to create barriers to dispersal for Crotch's bumble bee, as individuals are capable of flying over the facility.

Impacts to Crotch's bumble bee would be reduced to less than significant by implementation of the MMs summarized below:

- **MM BIO-1: Best Management Practices** will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM BIO-2: Worker Environmental Awareness Program** will ensure that construction personnel are aware of the location of active Crotch's bumble bee nests, if present, and where the Crotch's bumble bee individuals are likely to forage.
- **MM BIO-3 Construction Impact Minimization**. To avoid and substantially lessen significant impacts to aquatic resources, vegetation communities, habitat for plant species, and habitat for wildlife species that may continue to access the site post-construction (e.g., birds, reptiles, insects), the applicant will employ novel grading practices that will reduce temporary and permanent grading volumes associated with the construction of the arrays before and during construction. Mass grading of the entire site will not occur during construction. Instead, project infrastructure compatible with advanced, less impactful construction methods that minimize grading and other ground disturbance at the project site will be constructed. The infrastructure and novel grading methods will also facilitate post-construction restoration and recovery at the site. The applicant will update the civil design plans to reflect the grading methodology.
- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the workday, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-6**: **Crotch's Bumble Bee Impact Avoidance and Minimization.** MM BIO-6 will provide guidance on how project personnel can avoid direct, indirect, temporary, permanent, and cumulative impacts to the Crotch's bumble bee if found to be present within the project area.
- **MM BIO-5: Designated Biologist** requires the applicant to assign at least one Designated Biologist to the project. The Designated Biologist must be approved by CEC, BLM, CDFW, and USFWS.
- **MM BIO-7: Compliance Monitoring by the Designated Biologist** will ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization, and project MMs. The Designated Biologist is responsible for providing notifications for ground-disturbing activities and noncompliance issues to CEC, USFWS and CDFW and ensure performance of compliance inspections during construction. The Designated Biologist will submit a monthly compliance report to CEC until construction is complete.

5.2.1.3.2 Desert Tortoise

Fresh scat (less than 1 day old) from a subadult desert tortoise was found within the northeast corner of the study area. The scat was classified as recent due to the retention of dark coloration, intact state, and retention of moisture. The scat was not in the vicinity of any suitable desert tortoise burrows and was exposed to the typical desert elements. Additional scat (less than 1 month old) from a juvenile was found in the northwestern portion of the study area 900 m (0.5 mile) west of the fresh scat and within 250 m south of multiple Class 4 burrows. This scat retained dark coloration and was intact but lacked moisture.

Across the entire study area, 182 burrows were identified as tortoise burrows, meaning that they had been originally excavated by desert tortoise, whether they were currently suitable for occupancy or not. All burrows were identified as Classes 2–5, and no burrows were classified as Class 1. The eastern and northeastern portions of the project contained the highest concentration of burrows, likely due to suitable vegetation communities at distances farther from human disturbances and impacts, and less rocky outcroppings in the landscape. These areas were identified as habitat currently suitable for desert tortoise occupation. No other tortoise signs, such as carcasses, pallets, tracks, drinking depressions, courtship rings, or signs of ephemeral plant herbivory, were observed on-site.

No live tortoises or carcasses were found during the survey. While not all tortoises are expected to be visible at any given time, daily surveys coincided with the highest likelihood of live, aboveground observations both seasonally and thermally. Additionally, open burrows were visually searched and did not yield any live tortoises or carcasses. Most of the gen-tie route was found to be unsuitable habitat for desert tortoise due to extensive rocky outcrops. However, two collapsed burrows (Class 4 and Class 5) were identified.

Construction of the project components and gen-tie may result in direct impacts to desert tortoise, including the direct, permanent removal of up to 2,645.4 acres of habitat (all of the study area that is covered by native plant communities). Desert tortoise may be crushed by vehicles and/or equipment. Trenches dug for construction purposes could trap tortoise. And ground disturbance could result in the destruction of desert tortoise habitat. Construction and maintenance of the project also could directly impact desert tortoise if present, killing or injuring tortoises by crushing tortoises or burrows containing tortoises or eggs. These effects would be most likely to occur when tortoises are most difficult to detect, during the initial clearing of vegetation.

Indirect impacts to desert tortoise could result from human activities that increase the prevalence of invasive plants and the population of common ravens. Non-native plant seeds may be transported into the area with equipment, especially in tire treads. Non-native vegetation often becomes established in areas where the native vegetation has been disturbed, which may occur in the project's areas of temporary impacts. Many invasive grasses and forbs are highly flammable, and increase the risk of wildfire if not controlled, and adjacent desert tortoise habitat may be further degraded by invasion of weeds. Common ravens may be encouraged at the study area by food refuse inappropriately disposed of by construction or maintenance workers, and the project infrastructure may provide additional nest sites. In addition, the project fences and heliostats would provide additional perching and roosting sites for common ravens. Increases in common ravens may lead to higher rates of raven predation on desert tortoise.

Implementation of APM-BIO 12, APM-BIO 17, APM-BIO 19, APM-BIO 21, APM-BIO 26, APM-BIO 27, APM BIO-28, APM BIO-29, APM BIO-30, APM-BIO-31, APM-BIO-32, APM-BIO-33, APM-BIO-34, APM-BIO-36, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to desert tortoise, to the extent feasible.

Impacts to desert tortoise would be reduced to less than significant by implementation of the MMs summarized below:

- **MM BIO-1: Best Management Practices** will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM BIO-2: Worker Environmental Awareness Program** will ensure that construction personnel are aware of where desert tortoise burrows are located and/or where desert tortoises are likely to take refuge or attempt movement during construction.

- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the work day, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-7: Designated Biologist** requires the applicant to assign at least one Designated Biologist to the project. The Designated Biologist must be approved by CEC, BLM, CDFW, and USFWS.
- **MM BIO-8: Fence Design and Site Permeability.** Permanent site fencing installed around the project—including perimeter desert tortoise exclusionary fencing—should be designed to direct wildlife toward the wildlife undercrossing to provide safe passage under the freeway and shall be regularly inspected and maintained for the life of the project. Alternate designs may also be constructed with prior written approval from CEC, CDFW and USFWS. Regardless, the project shall ensure that any such fence meets existing specifications that have been developed to preclude accidental entanglement of desert bighorn sheep, deer, and other animals.

  Fencing should be sufficient to prevent desert bighorn sheep passage (e.g., 2m-2.5m tall chain-link) – should be installed at the corridor entrances between (a) the East Array and South Array 1, (b) South Array 1 and South Array 2, and (c) South Array 2 and South Array 3 on the east side (Figure 2, Project Design). Additionally, the project shall extend a line of project fencing to the north to connect with the wildlife exclusion fencing associated with the I-15 overcrossing structure (Figure 13; Dudek 2024). Approximately 1,640 linear feet of this can be accomplished within the existing project boundary, but the additional approximately 300 linear feet will need to be coordinated with BLM and possibly Caltrans. The project will secure the necessary encroachment permits or other mechanism to continue fencing between the project boundary and the wildlife exclusion fencing associated with the I-15 overcrossing structure. Care should be taken when connecting the fences to make sure that they are physically connected or directly abut one another such that wildlife cannot pass through or get stuck between them. The ultimate fencing plans should be reviewed by CDFW for final approval prior to site disturbance activities.

- **MM BIO-9: Compliance Monitoring by the Designated Biologist** will ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization, and project MMs. The Designated Biologist is responsible for providing notifications for ground-disturbing activities and noncompliance issues to CEC, USFWS and CDFW and ensure performance of compliance inspections during construction. The Designated Biologist will submit a monthly compliance report to CEC until construction is complete.
- **MM BIO-10: Speed Limits** defines appropriate speed limits to prevent desert tortoise mortality during construction.
- **MM BIO-11: Desert Tortoise Protection** will instruct the applicant on how to undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize direct, indirect, temporary, permanent, and cumulative impacts to desert tortoise including protective fencing, exclusion fencing, clearance surveys, and monitoring.
- **MM BIO-12: Desert Tortoise Translocation Plan (DTTP)** mandates that the applicant develop a DTTP that will provide instruction on how to relocate all desert tortoise from the project area to nearby suitable habitat; minimize and avoid direct, indirect, temporary, permanent, and cumulative impacts to resident desert tortoise outside the project area; minimize stress, disturbance, and injuries to relocated/translocated tortoises; and assess the success of the translocation effort through monitoring.

- **MM BIO-13: Desert Tortoise Compliance Verification** requires that the applicant provide CEC, BLM, CDFW, and USFWS staff with unrestricted access to the project area and compensation lands to verify the applicant's compliance with, or the effectiveness of, adopted MMs.
- **MM BIO-14: Desert Tortoise Compensatory Mitigation** describes how the applicant will fully mitigate for habitat loss and potential take of desert tortoise through compensatory mitigation consistent with federal and state requirements.
- **MM BIO-15: Minimize Vehicle and Equipment Impacts During Operation and Maintenance** requires that the applicant implement measures to minimize the potential for desert tortoise and other wildlife species mortality along access and maintenance roads including speed limits, pedestrian access guidance and clear delineation of vehicle traffic, and parking and staging areas to avoid impacting habitat during operations.

5.2.1.3.3 Mojave Fringe-toed Lizard

There is a total of 6.9 acres of potentially suitable windblown sand habitat within the study area for Mojave fringe-toed lizard, and focused surveys for Mojave fringe-toed lizard were not conducted in these areas as they had not been identified as potential habitat in the desktop review (see Figure 13). The aeolian sand deposits located in these areas have no connectivity to larger sand deposits that support known existing populations. Mojave fringe-toed lizards were not observed in these areas during any of the surveys described in the 2013 Biological Resources Technical Report nor during the 2023 surveys for other types of biological resources, which occurred during the Mojave fringe-toed lizard active season.

The nearest known population of Mojave fringe-toed lizard is located outside of the project area in a sandy wash approximately 750 feet south-southwest of the study area. During focused surveys for Mojave fringe-toed lizard outside of the study area, five individuals were observed in this wash, the nearest of which was approximately 1,000 feet south of the project boundary. Based on the survey results, small area of potentially suitable habitat, and lack of connectivity to suitable habitat on-site, Mojave fringe-toed lizard is considered to have a low potential to occur within the study area.

Implementation of APM-BIO 12, APM-BIO 17, APM-BIO 19, APM-BIO 21, APM-BIO 26, APM-BIO 27, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to Mojave fringe-toed lizard, to the extent feasible.

Based on the presence of potentially-suitable windblown sand habitat within the project area, construction of the solar plant site (including panel arrays and mounting structures), operation and maintenance buildings and structures, stormwater infrastructure, the substation and switchyard, and the BESS may result in indirect impacts to Mojave fringe-toed lizard. Potential indirect impacts include increased predation by raptors, ravens, and other birds; the potential introduction and spread of exotic vegetation species into off-site dune areas; and increased human activity causing Mojave fringe-toed lizards to avoid the study area and/or adjacent suitable habitat. Indirect impacts to Mojave fringe-toed lizards would be reduced to less than significant through the implementation of the MM summarized below:

- **MM BIO-1: Best Management Practices**. MM BIO-1 will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM-BIO 2: Worker Environmental Awareness Program**. MM BIO-2 will ensure that workers are aware of where Utah vine milkweed is located, and how to identify Utah vine milkweed to avoid direct, indirect, temporary, permanent, and cumulative impacts to individuals or populations of the plant during construction.

- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the work day, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-7: Designated Biologist** requires the applicant to assign at least one Designated Biologist to the project. The Designated Biologist must be approved by CEC, BLM, CDFW, and USFWS.
- **MM BIO-9: Compliance Monitoring by the Designated Biologist** will ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization, and project MMs. The Designated Biologist is responsible for providing notifications for ground-disturbing activities and noncompliance issues to CEC, USFWS and CDFW, and ensure performance of compliance inspections during construction. The Designated Biologist will submit a monthly compliance report to CEC until construction is complete.
- **MM BIO-16: Mojave Fringe-toed Lizard Protection Measures.** A qualified biologist will conduct a focused survey for Mojave fringe-toed lizard prior to ground disturbance in suitable habitat (aeolian sand deposits) within all active work areas. Two survey replicates will be performed during the Mojave fringe-toed lizard active season (March–October) during appropriate weather conditions. Qualified biologists will walk transects spaced 10m apart throughout areas with suitable habitat within the study area. Detections of Mojave fringe-toed lizard will be recorded using a GPS unit. If Mojave fringe-toed lizards are not detected, then no further action is needed. If Mojave fringe-toed lizards are found, then a pre-construction survey should be conducted no more than one week before ground disturbance begins, and any Mojave fringe-toed lizards should be moved to suitable habitat south of the Project area where the species was confirmed to be present.

5.2.1.3.4 Burrowing Owl

Burrowing owls were confirmed to be present and were observed during the 2023 survey (see Appendix N). One individual and one unoccupied burrow with burrowing owl sign were identified. Burrowing owls may overwinter or nest on-site.

Construction of the solar plant site (including panel arrays and mounting structures) and gen-tie, operation and maintenance buildings and structures, stormwater infrastructure, the substation and switchyard, and the 300-MW BESS may result in direct impacts to burrowing owls, including the direct, permanent removal of up to 2,645.4 acres of habitat. Construction and maintenance of the project could directly impact burrowing owl through vehicle collisions, crushing overwintering burrows or active nests. Indirect impacts from noise, night lighting, and the increase in human activity could cause burrowing owls to avoid the study area.

Implementation of APM-BIO 12, APM-BIO 17, APM-BIO 19, APM-BIO 21, APM-BIO 22, APM-BIO 26, APM-BIO 27, APM-BIO 35, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to burrowing owl, to the extent feasible.

Impacts to burrowing owl would be reduced to less than significant through the implementation of the MM summarized below:

- **MM BIO-1: Best Management Practices**. MM BIO-1 will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM-BIO 2: Worker Environmental Awareness Program**. MM BIO-2 will ensure that workers are aware of where Utah vine milkweed is located, and how to identify Utah vine milkweed to avoid direct, indirect, temporary, permanent, and cumulative impacts to individuals or populations of the plant during construction.
- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the work day, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-7: Designated Biologist** requires the applicant to assign at least one Designated Biologist to the project. The Designated Biologist must be approved by CEC, BLM, CDFW, and USFWS.
- **MM BIO-9: Compliance Monitoring by the Designated Biologist** will ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization, and project MMs. The Designated Biologist is responsible for providing notifications for ground-disturbing activities and noncompliance issues to CEC, USFWS and CDFW, and ensure performance of compliance inspections during construction. The Designated Biologist will submit a monthly compliance report to CDFW until construction is complete.
- **MM BIO-20: Bird and Bat Conservation Strategy (BBCS)** requires that the applicant develop a BBCS to address potential direct, indirect, temporary, permanent, and cumulative impacts to special-status avian and bat species. The bird and bat conservation strategy (BBCS) will include an assessment of potential avian and bat impacts from lighting, noise, collision, electrocution, and attraction of ravens, as applicable, as well as measures to mitigate for the effects to birds. The BBCS will also include a description of the reporting requirements and reporting schedule and duration, and an adaptive management strategy.
- **MM BIO-21: Burrowing Owl Protection Measures** To fully mitigate for habitat loss and potential take of burrowing owl, the project owner shall provide compensatory mitigation consistent with CDFW requirements, adjusted to reflect the final project footprint. The acreage for mitigation of burrowing owl habitat will be at a 1:1 ratio. For the purposes of this condition, the project footprint means all lands disturbed in the construction and operation of the project, including all project linears, as well as undeveloped areas inside the project's boundaries that will no longer provide viable long-term habitat for burrowing owl.

  If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands must comply with the terms of incidental take authorizations issued by CEC. The compensation lands selected for acquisition in fee title or in easement shall comply with the terms of incidental take authorizations issued by CEC.

  No more than 14 days prior to the start of ground disturbance, a preconstruction survey for burrowing owls in conformance with the CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012) shall be completed within suitable habitat at every work area and within a minimum 150-m buffer zone of each work area. Work areas will be resurveyed following periods

of inactivity of 2 weeks or more. The applicant/owner shall submit the results of the preconstruction survey to CEC, BLM's Authorized Officer and CDFW.

5.2.1.3.5 Desert Kit Fox and American Badger

Desert kit fox was confirmed to be present based on the presence of sign and the identification of six active dens during the field surveys. Five potential American badger dens were identified during the field surveys. However, all were determined to be inactive based on cobwebs or obstructions in the entrances and the lack of maintenance and sign of recent use. Nonetheless, habitat is suitable for American badger and the species could be present during project construction, operation, and decommissioning. Potential impacts to desert kit fox and American badger would be similar to the impacts experienced by fossorial species. Direct impacts include vehicle collisions and equipment and inadvertent entombment from collapsing burrows. Indirect impacts would result from noise and human activity, which may deter kit foxes and badgers from the study area. In addition, the project will result in the direct, permanent removal of up to 2,645.4 acres of habitat for desert kit fox and American badger.

Implementation of APM-BIO 12, APM-BIO 17, APM-BIO 19, APM-BIO 21, APM-BIO 26, APM-BIO 27, APM-BIO 35, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to desert kit fox and American badger, to the extent feasible.

Significant impacts to desert kit fox and American badger would be reduced to less than significant by implementation of the MM summarized below:

- **MM BIO-1: Best Management Practices**. MM BIO-1 will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM-BIO 2: Worker Environmental Awareness Program**. MM BIO-2 will ensure that workers are aware of where Utah vine milkweed is located, and how to identify Utah vine milkweed to avoid direct, indirect, temporary, permanent, and cumulative impacts to individuals or populations of the plant during construction.
- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the work day, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-9: Compliance Monitoring by the Designated Biologist** will ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization, and project MMs. The Designated Biologist is responsible for providing notifications for ground-disturbing activities and noncompliance issues to CEC, USFWS and CDFW, and ensure performance of compliance inspections during construction. The Designated Biologist will submit a monthly compliance report to CEC until construction is complete.
- **MM BIO-22: American Badger and Desert Kit Fox Protection** includes required preconstruction surveys, excavation of inactive dens subject to direct impacts, biological monitoring by the Biological Monitor, and agency notification should natal dens be detected within the project area.

5.2.1.3.6 Desert Bighorn Sheep

A desert bighorn sheep skull was found during the burrowing owl survey on March 29, 2023. The environmental analysis and measures required for desert bighorn sheep will be completed by CDFW and included in the project EIR.

5.2.1.3.7 Birds

Common and special-status bird species forage at the study area and have the potential to nest at the project area. Being highly mobile, birds can generally move out of harm's way and avoid direct injury and harm from grading, construction, and project operations. Birds can use the study area for nesting, foraging, and roosting.

Suitable nesting habitat is present on-site and within 500 feet of the study area boundaries. Construction performed during the nesting season could directly affect active bird nests through crushing or removal of vegetation supporting or camouflaging nests, or by disturbing adults so much that they abandon the nest. The project will also result in the loss of up to approximately 2,670.4 acres of nesting habitat due to permanent vegetation removal. The project may indirectly impact nesting birds within and adjacent to the study area during construction by making the area less suitable due to increased noise or visual disturbances.

The development of utility-scale solar energy facilities is a recent phenomenon, and the biological relevance of avian mortality at PV solar facilities is not well understood. Preliminary information suggests that the levels of avian mortality at solar facilities of all technology types is much lower than mortality from other known anthropogenic sources such as fossil fuel plants, communication towers, vehicle collisions, and buildings (Walston et al. 2016). Nevertheless, these impacts may be biologically significant, and many species of North American birds are protected under the MBTA, BGEPA, and/or ESA, and California has several comparable state regulations.

All large artificial structures pose some collision risk to birds in flight; this phenomenon has been most extensively documented for nocturnal migrants (Loss, Will et al. 2014). Most small birds migrate at night and large birds are more likely to migrate during the day, especially raptors; both day and night migration occur in waterfowl. Non-nesting birds are killed at high rates by collision with buildings, radio towers, and other structures, especially those with lighting (Longcore et al. 2012; Loss et al. 2014). Collision with aboveground wires, including both electrical transmission lines and guy wires on radio towers, is also a significant anthropogenic cause of bird mortality (Longcore et al. 2012; Loss et al. 2014).

Avian mortalities have been recorded at PV solar facilities, with high-end estimates ranging from 2.49 birds per MW per year (Kosciuch et al. 2020) to 9.9 birds per MW per year (Walston et al. 2016). Most data on the impacts of PV solar facilities have been collected at sites in the Desert Southwest, primarily Southern California, an area that contains a substantial fraction of the large-scale (>1,000 acres) solar facilities in the United States. At PV solar facilities, impact trauma is the most frequently recorded identifiable cause of death (e.g., Kagan et al. 2014; Kosciuch et al. 2020; Walston et al. 2016).

Evidence that birds collide with PV panels at higher rates than with other stationary infrastructure is lacking, as is evidence that collisions with PV panels at solar facilities are a biologically significant source of avian mortality. However, Conkling et al. (2022) demonstrated that avian mortalities found at solar facilities originated from both local and distant sites, based on stable hydrogen isotopic analysis of feathers collected from bird fatalities found at wind and solar energy generating facilities. Therefore, PV solar facilities have the potential to impact non-local bird populations.

It has been hypothesized that birds in flight mistake the reflective surfaces of PV and concentrating solar energy generating facilities for water bodies and are attracted to the facilities due to this water-like appearance, a phenomenon called the "lake effect" (Kagan et al. 2014; Upton 2014). Once attracted to reflective features at solar facilities, birds might then be injured or killed by collision with facility infrastructure while in flight or when landing. Injured birds may then be exposed to the elements, predators, dehydration, and starvation. Some waterbird species like loons and grebes can only take off into flight from a body of water, and therefore, stranding without access to water or rescue is inevitably fatal.

Bird injuries and mortalities documented at PV solar facilities to date have included both landbird and waterbird species, and there is very little evidence supporting or refuting the lake effect hypothesis (Kagan et al. 2014; Kosciuch et al. 2020; Kosciuch et al. 2021). In an effort to assess the hypothesis, Kosciuch et al. (2021) searched for aquatic bird carcasses in both PV solar facilities and reference sites in agricultural, desert, and grassland habitats; they found no aquatic birds in undeveloped desert or grassland reference sites but did find aquatic bird carcasses at PV solar facilities, suggesting that some characteristic of the facilities attracted or impacted aquatic birds. They also found that the species diversity of aquatic birds using a small desert lake was substantially higher than both 1) the diversity of aquatic birds observed using habitats in and adjacent to solar energy facilities, and 2) the diversity of aquatic birds found dead and injured at solar energy facilities, which suggests that if lake effect attraction occurs, not all aquatic birds are equally susceptible. For insects, there is evidence that PV solar panels are attractive: field experiments showed that some species of flying insects with aquatic larval stages laid their eggs on solar panels more often than on water (Horvath et al. 2009).

Direct project impacts to birds may result from collision with project infrastructure of all kinds, including panel arrays and mounting structures, operation and maintenance buildings, substation and switchyard, BESS, gen-tie poles and overhead conductor wire, and fencing.

Indirect project impacts to non-nesting birds would result from vegetation removal and the conversion of native foraging habitat to development. Construction of the solar plant (including panel arrays and mounting structures), operation and maintenance buildings, stormwater infrastructure, the substation and switchyard, and the BESS would result in indirect impacts through habitat conversion.

The study area is in an area of relatively low use by avian species, is not within heavily used known migratory paths, and does not include features that would tend to attract or concentrate migrating birds, such as bodies of water, dense or riparian vegetation, or terrain that creates thermal uplift more than the surrounding area.

Avian impacts resulting from the project are expected to be comparable in type and levels to those documented at other PV solar facilities in the region. These include direct mortality of up to 2.49 or 9.9 birds per MW per year (Kosciuch et al. 2020; Walston et al. 2016). Extrapolating to this proposed 300-MW project, annual mortality of birds consistent with those examples would be approximately 747 to 2,970 birds per year. Indirect impacts will include the loss of up to 2,645.4 acres of foraging and nesting habitat.

Implementation of APM-BIO 12, APM-BIO 13, APM-BIO 14, APM-BIO 16, APM-BIO 17, APM-BIO 18, APM-BIO 19, APM-BIO 20, APM-BIO 21, APM-BIO 22, APM-BIO 24, APM-BIO 25, APM-BIO 26, APM-BIO 27, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to birds, to the extent feasible.

Direct mortality of up to 2,970 nesting and non-nesting birds per year and indirectly impact birds through conversion of approximately 2,645.4 acres of foraging and nesting habitat to development would be reduced to less than significant through the implementation of the MMs summarized below:

- **MM BIO-17: Avian Monitoring and Mitigation Program** directs the drafting of an avian monitoring and mitigation program (AMMP). The AMMP will be initiated and approved by the CEC and BLM in consultation with CDFW and USFWS prior to construction, and will prevent substantial adverse direct, indirect, temporary, permanent, and cumulative impacts to special-status species. The purpose of the AMMP is to provide an adaptive management and decision-making framework for reviewing, characterizing, and responding to avian and bat monitoring results, and reducing long-term impacts to these taxa.
- **MM BIO-18: Avoid Disturbance to Nesting Birds** requires vegetation clearing to occur outside of the general avian breeding season (February 15–September 1) when feasible. This measure also includes preconstruction surveys for nesting birds should work occur during the breeding season, as well as nest monitoring and buffer implementation protocols.
- **MM BIO-19: Lighting Specifications to Minimize Bird and Bat Impacts** requires that the applicant minimize night lighting during construction by using shielded directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky.
- **MM BIO-20: Bird and Bat Conservation Strategy** requires that the applicant develop a bird and bat conservation strategy (BBCS) to address potential direct, indirect, temporary, permanent, and cumulative impacts to special-status avian and bat species. The BBCS will include an assessment of potential avian and bat impacts from lighting, noise, collision, electrocution, and attraction of ravens, as applicable, as well as measures to mitigate for the effects to birds. The BBCS will also include a description of the reporting requirements and reporting schedule and duration, and an adaptive management strategy.

5.2.1.3.8 Bats

Special-status bat species with the potential for occurrence at the study area include Townsend's big-eared bat, pallid bat, California leaf-nosed bat, and Western mastiff bat. None of these species were detected during the bat surveys performed for the project. Two bat species were detected by sight and/or sound within the study area during the nighttime acoustic survey period: canyon bat and Mexican free-tailed bat. Potential impacts to bats are typically related to lighting and project infrastructure. Nighttime lighting during construction and project operations could attract insects, which could attract foraging bats. Project infrastructure may pose a collision risk for bats.

Implementation of APM-BIO 12, APM-BIO 15, APM-BIO 17, APM-BIO 19, APM-BIO 21, APM-BIO 25, APM-BIO 26, APM-BIO 27, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to bats, to the extent feasible.

Impacts to bats would be reduced to less than significant through the implementation of the MMs summarized below:

- **MM BIO-19: Lighting Specifications to Minimize Bird and Bat Impacts** requires that the applicant minimize night lighting during construction by using shielded directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky.
- **MM BIO-20: Bird and Bat Conservation Strategy** requires that the applicant develop a BBCS to address project impacts to special-status avian and bat species. The BBCS will include an assessment of potential avian and bat impacts from lighting, noise, collision, electrocution, and attraction of ravens. The BBCS will also include a description of the reporting requirements and reporting schedule and duration, and an adaptive management strategy.

5.2.1.3.9 Mountain Lion

There are no nearby CNDDB records for mountain lion, and no evidence of mountain lion was detected during protocol surveys for other special-status plant and wildlife species. The study area may provide a connectivity corridor for mountain lion rather than home territory or denning habitat, as it is in a flat valley as opposed to mountains, lacks cover, and is not suitable permanent habitat for local prey species (bighorn sheep, mule deer, and burros). However, the study area is potentially suitable for transient use by both mountain lions and their potential prey, which may pass through the study area while moving between mountain ranges or between water sources.

The implementation of APM BIO-12, APM BIO-17, APM BIO-19, APM BIO-21, APM BIO-26, APM BIO-27, and APM BIO-38 as part of the project would avoid or substantially lessen potentially significant impacts to mountain lion, to the extent feasible.

Impacts to mountain lion would be reduced to less than significant through the implementation of the MMs summarized below:

- **MM BIO-1: Best Management Practices**. MM BIO-1 will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM-BIO 2: Worker Environmental Awareness Program**. MM BIO-2 will ensure that workers are aware of where Utah vine milkweed is located, and how to identify Utah vine milkweed to avoid direct, indirect, temporary, permanent, and cumulative impacts to individuals or populations of the plant during construction.
- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the work day, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-8: Fence Design and Site Permeability.** Permanent site fencing installed around the project—including perimeter desert tortoise exclusionary fencing—should be designed to direct wildlife toward the wildlife undercrossing to provide safe passage under the freeway and shall be regularly inspected and maintained for the life of the project. Alternate designs may also be constructed with prior written approval from CEC, CDFW and USFWS. Regardless, the project shall ensure that any such fence meets existing specifications that have been developed to preclude accidental entanglement of desert bighorn sheep, deer, and other animals.

5.2.1.3.10 Southern California Ringtail

A search of CNDB records for ringtail yielded no nearby observations. While there have been documented occurrences of the species at the nearby Zzyzx, most of the study area is not considered suitable habitat for ringtail, with little to no permanent water sources and no plans to create artificial water sources. These factors coupled with the lack of sign observed during protocol surveys for other special-status plant and wildlife species, there is low likelihood that ringtail would use the proposed project area as a home territory.

The implementation of APM BIO-12, APM BIO-17, APM BIO-19, APM BIO-21, APM BIO-24, APM BIO-26, APM BIO-27, APM BIO-37, and APM BIO-38 as part of the project would avoid or substantially lessen potential impacts to ringtail, to the extent feasible.

Impacts to mountain lion would be reduced to less than significant through the implementation of the MMs summarized below:

- **MM BIO-1: Best Management Practices**. MM BIO-1 will reduce indirect impacts such as dust and potentially harmful chemicals through implementation of BMPs such as applying water to control dust and placing drip cans under vehicles and equipment when not in use.
- **MM-BIO 2: Worker Environmental Awareness Program**. MM BIO-2 will ensure that workers are aware of where Utah vine milkweed is located, and how to identify Utah vine milkweed to avoid direct, indirect, temporary, permanent, and cumulative impacts to individuals or populations of the plant during construction.
- **MM BIO-5 Biological Monitoring** will conduct pre-construction surveys and monitor protected species during ground disturbance, grading, construction, decommissioning, and restoration activities. The biological monitor will ensure compliance with avoidance and minimization measures for protected species, inspect the work site at the start and end of the work day, halt construction in areas where protected species are found, and create and maintain construction avoidance limits using staking or flagging.
- **MM BIO-8: Fence Design and Site Permeability.** Permanent site fencing installed around the project—including perimeter desert tortoise exclusionary fencing—should be designed to direct wildlife toward the wildlife undercrossing to provide safe passage under the freeway and shall be regularly inspected and maintained for the life of the project. Alternate designs may also be constructed with prior written approval from CEC, CDFW and USFWS. Regardless, the project shall ensure that any such fence meets existing specifications that have been developed to preclude accidental entanglement of desert bighorn sheep, deer, and other animals.

5.2.2 Sensitive Natural Communities

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

Less than Significant with Mitigation Incorporated. Two sensitive natural communities were identified within the study area: Rigid Spineflower – Hairy Desert Sunflower and California Joint Fir – Longleaf Joint-fir associations. No riparian habitat is present within the project boundary.

Direct impacts include permanent and temporary removal of the sensitive vegetation communities. At this time, it is assumed that all impacts to vegetation within the study area will be permanent. The permanent impacts within the study area are expected to be 33.2 acres. Approximately 32 acres of Rigid Spineflower – Hairy Desert Sunflower and 1.2 acres of California Joint Fir – Longleaf Joint-fir associations would be impacted by the project. If areas of vegetation are temporarily disturbed during construction, they will be reseeded to facilitate restoration of the original vegetation communities.

Implementation of APM-BIO 1, APM-BIO 2, APM-BIO 3, APM-BIO 4, APM-BIO 5, APM-BIO 6, APM-BIO 7, APM-BIO 8, APM-BIO 9, and APM-BIO 912 as part of the project would avoid or substantially lessen potentially significant impacts to sensitive natural communities, to the extent feasible.

Direct permanent and temporary impacts to sensitive natural communities will be reduced to less than significant through implementation of the MMs summarized below:

- **MM BIO-23: Vegetation Best Management Practices** directs the applicant to implement BMPs to manage the construction site and related facilities in a manner to avoid or minimize direct,

indirect, temporary, permanent, and cumulative impacts to vegetation resources, including minimizing road and traffic impacts, monitoring during construction, revegetating temporarily disturbed areas, and integrating weed management.

- **MM BIO-24: Final Closure Plan** directs the preparation of a Final Closure Plan to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities.

5.2.3 Wildlife Movement

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

Less than Significant with Mitigation Incorporated. No identified wildlife corridors exist within the project property, nor is any part of the project property within a wildlife connectivity area as mapped in the BLM's *A Linkage Network for the California Deserts* or the *California Essential Habitat Connectivity Project* (Spencer et al. 2010). The habitat types at the project area are dominated by low vegetation, grasslands, and widely spaced shrubs, which do not pose a physical barrier to the movements of most wildlife species. There is little topographic relief within the project area that would serve to funnel or direct wildlife movement into any particular areas or in specific directions.

Washes present in the study area are landscape features that are the most likely to represent wildlife movement corridors locally; however, there is no evidence that they provide avenues for concentrations of wildlife. Further, there is no riparian vegetation to support concentrations of wildlife. Migratory birds passing through the area may utilize the site for breeding, nesting, foraging, or transient rest sites. However, there are no significant stopover sites in the vicinity of the project, as there are no riparian habitats or water bodies with abundant resources to attract concentrations of birds.

Survey data for desert bighorn sheep mobility within and near the study area will be provided separately by CDFW and included in the EIR. Analyses will be based on CDFW-specific methodologies designed to understand how to reach their long-term management goals. Therefore, project-led data were not recorded and potential project impacts to desert bighorn sheep are not included in this report. Finally, the site does not support wildlife nursery sites such as bat maternity roosts or nesting bird colonies. Thus, the project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Implementation of APM-BIO 12, APM-BIO 17, APM-BIO 19, APM-BIO 21, APM-BIO 26, APM-BIO 27, APM-BIO 35, and APM-BIO 37 as part of the project would avoid or substantially lessen potentially significant impacts to wildlife movement, to the extent feasible.

However, the following MM would ensure that the project does not impede movement of wildlife.

- **MM BIO-8: Fence Design and Site Permeability.** Permanent site fencing installed around the project—including perimeter security fencing desert tortoise exclusionary fencing—should be designed to direct wildlife toward the wildlife undercrossing to provide safe passage under the freeway and shall be regularly inspected and maintained for the life of the project. Alternate designs may also be constructed with prior written approval from CEC, CDFW and USFWS. Regardless, the project shall ensure that any such fence meets existing specifications that have been developed to preclude accidental entanglement of desert bighorn sheep, deer, and other animals.

Fencing should be sufficient to prevent desert bighorn sheep passage (e.g., 2m-2.5m tall chain-link) – should be installed at the corridor entrances between (a) the East Array and South Array 1, (b) South Array 1 and South Array 2, and (c) South Array 2 and South Array 3 on the east side (Figure 2, Project Design). Additionally, the project shall extend a line of project fencing to the north to connect with the wildlife exclusion fencing associated with the I-15 overcrossing structure (Figure 13, Fencing Plans of the Desert Bighorn Sheep Study). Approximately 1,640 linear feet of this can be accomplished within the existing project boundary, but the additional approximately 300 linear feet will need to be coordinated with BLM and possibly Caltrans. The project will secure the necessary encroachment permits or other mechanism to continue fencing between the project boundary and the wildlife exclusion fencing associated with the I-15 overcrossing structure. Care should be taken when connecting the fences to make sure that they are physically connected or directly abut one another such that wildlife can't pass through or get stuck between them. The ultimate fencing plans should be reviewed by CEC for final approval prior to site disturbance activities.

- **MM BIO-19: Lighting Specifications to Minimize Bird and Bat Impact** will minimize night lighting during construction by using shielded directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky.

5.2.4 Local Policies and Ordinances

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

No Impact. The project is located entirely on federally owned land managed by the BLM. Given the project is on federal land, it is not subject to local regulations and policies. However, to comply with CEQA and for informational purposes, San Bernardino County policies are included in Section 2.3 Local Regulations. Implementation of the APMs and the MMs identified in this EIR would ensure consistency with San Bernardino County regulations and policies adopted for the purpose of avoiding or minimizing environmental impacts. Therefore, the project would not result in a conflict with local policies and ordinances; there would be no impact.

5.2.5 Adopted or Approved Plans

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

Less than Significant Impact. The project gen-tie falls within the Soda Mountains Expansion designated ACEC as designated by the BLM. ACECs are designated where the BLM has determined that important historical, cultural, scenic, fish and wildlife, or other natural resources occur, and special protection is warranted. In addition, ACECs may be designated for safety in areas with natural hazards. The Soda Mountains Expansion ACEC abuts the northern edge of I-15 and encompasses 16,720 acres between I-15 and the Soda Mountain Wilderness Study area. It was designated to protect plant and wildlife connectivity between surrounding wilderness and wilderness study areas.

Transmission activities are allowed in ACECs within the DRECP, as described in CMA ACEC-LANDS-1 (BLM 2016c). Disturbance within each ACEC in the DRECP is limited to a specified percentage of the total ACEC area, as described in CMA ACEC-DIST-1; for the Soda Mountain Expansion ACEC the disturbance is capped at 1%.

The Soda Mountains Expansion ACEC was designated as a part of the DRECP LUPA in September 2016 (BLM 2016c), after the project ROD was issued in March 2016. The project as described here is consistent with that described in the project ROD, and therefore the project would not need to conform to the Conservation and Management Actions outlined in the DRECP that would otherwise apply to activities within this ACEC. Nevertheless, an analysis of the potential impacts is appropriate. Construction and operation of the project gen-tie would impact up to 36 acres of the Soda Mountains Expansion ACEC, approximately 0.22% of its total area. The gen-tie construction would temporarily disrupt wildlife activity in the area, and temporarily and permanently remove some habitat for plants and wildlife. This impact is less than significant.

There are no other federal, state, or local designated conservation areas within or directly adjacent to the project area. Within 10 miles, there is no USFWS-designated critical habitat for ESA-listed species, no USFWS-authorized habitat conservation plans, and no CDFW natural community conservation plans.

5.2.6 Cumulative Impacts

Cumulative impacts for a project would be significant if the incremental effects of the individual project are considerable when combined with the effects of past projects, other current projects, and probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period.

As the County experiences growth in large-scale energy projects and other development, broad-scale impacts to biological resources are also increasing. As of May 2024, over 23,000 acres of land that has been approved for renewable energy projects by the County (San Bernardino County 2024). Currently the nearest large-scale solar projects are approximately 40-45 miles to the northeast and southwest of the project. Several special-status species use the study area and the surrounding area. Implementation of the project would impact special-status species that use the study area such as burrowing owl and desert tortoise, along with more common species that support the ecosystem. Habitats within the study area sustain a diverse range of insects, rodents, and small birds that serve as a crucial prey base for raptors and terrestrial wildlife. In addition, as detailed in the literature review and database search, the region is home to a variety of special-status species, most of which are anticipated to utilize the study area intermittently, if at all. When considered together with other existing or proposed projects in the County, impacts to special-species due to primarily habitat loss, wildlife corridor impairment, and land use conversion may be cumulatively considerable.

Caltrans, CDFW, and Brightline West have entered into an agreement to design and construct three wildlife overcrossings across I-15 and the future Brightline West high-speed rail system connecting Las Vegas and Southern California (Caltrans 2023). These dedicated overcrossings would provide a sustainable and safe path for wildlife—especially for desert bighorn sheep—over the existing northbound and southbound highway lanes and the future high-speed rail system to be built within the median (Caltrans 2023). CDFW has identified three priority locations for the wildlife overcrossing, all in San Bernardino County (Caltrans 2023). These overcrossings will be built near Zzyzx Road, near Mountain Pass and near Rasor Road, spanning the entire width of I-15 including the Brightline West rail line (Caltrans 2023). Beyond the three wildlife overcrossings, the Brightline West project will maintain or improve more than 600 culverts and large-scale crossings under I-15 that exist today (Caltrans 2023). The project also will restore and install desert tortoise fencing and directional wildlife exclusionary fencing (Caltrans 2023). The proposed Brightline overcrossings would reduce project impacts associated with temporary and/or permanent disruptions to local wildlife movement, most notably impacts that pertain to desert bighorn sheep. The environmental analysis and measures required for desert bighorn sheep will be completed by CDFW and included in the project EIR. This report does not contain an analysis of potential impacts and measures to reduce impacts for desert bighorn sheep. The proposed

Brightline overcrossings would reduce cumulative impacts associated with temporary and/or permanent disruptions to local wildlife movement, most notably impacts that pertain to desert bighorn sheep.

All the proposed MMs—and specifically the following summarized MMs—would reduce cumulative impacts to common species, prey species, pollinators, special-status wildlife, habitat for special-status wildlife, and sensitive vegetation communities to less than significant:

- **MM BIO-1: Best Management Practices**
- **MM BIO-2: Worker Environmental Awareness Program**
- **MM BIO-4: Special-Status Plant Species and Cacti Impact Avoidance and Minimization**
- **MM BIO-6: Crotch's Bumble Bee Impact Avoidance and Minimization**
- **MM BIO-11: Desert Tortoise Protection**
- **MM BIO-12: Desert Tortoise Translocation Plan**
- **MM BIO-14: Desert Tortoise Compensatory Mitigation**
- **MM BIO-17: Avian Monitoring and Mitigation Program**
- **MM BIO-18: Avoid Disturbance to Nesting Birds**
- **MM BIO-20: Bird and Bat Conservation Strategy**
- **MM BIO-21: Burrowing Owl Protection Measures**
- **MM BIO-22: American Badger and Desert Kit Fox Protection**
- **MM BIO-23: Vegetation Best Management Practices**
- **MM BIO-24: Final Closure Plan**

The measures listed are intended to reduce project impacts—both permanent and temporary, direct and indirect—for all wildlife and vegetation, and special-status plant and wildlife species, including their habitats, to less than significant. These measures are also intended to reduce impacts to sensitive vegetation communities to less than significant. Thus, the implementation of the above-listed MMs would reduce the project's cumulative impacts to common species, prey species, pollinators, special-status wildlife, habitat for special-status wildlife, and sensitive vegetation communities to less than significant.

5.3 Mitigation Measures

For the purposes of this analysis, the APMs listed in Section 5.1 are considered part of the project. However, where other impacts are identified that are not addressed by these APMs, or where the APMs do not reduce impacts to less-than significant levels, the EIR identifies and recommends the additional MMs below to avoid and substantially lessen significant effects to the extent feasible.

- **MM BIO-1: Best Management Practices**. To reduce indirect impacts to special-status plants and wildlife that may occur in the study area, BMPs shall be implemented prior to and during construction to control dust pollution, prevent discharge of potentially harmful chemicals, and prevent changes in hydrology. BMPs may include the installation of erosion and sedimentation control devices, applying water to control dust, placing drip pans under equipment when not in use, refueling in designated areas, and containing concrete washout properly, among other practices.

- **MM BIO-2: Worker Environmental Awareness Program**. Prior to project initiation, the Designated Biologist shall develop and implement the WEAP (APM BIO-12), which will be available in English and Spanish. Wallet-sized cards summarizing the information shall be provided to all construction and operation and maintenance personnel. The WEAP shall include the following:
    1. An explanation of the sensitivity of the vegetation communities and special-status plant and wildlife species within and adjacent to work areas, and proper identification of these resources.
    2. Biology and status of the desert tortoise, golden eagle, burrowing owl, other nesting birds, kit fox, and American badger and measures to reduce potential effects on these species.
    3. Actions and reporting procedures to be used if desert tortoise, burrowing owl, other nesting birds, kit fox, or American badger are encountered.
    4. An explanation of the function of flagging that designates authorized work areas.
    5. Driving procedures and techniques to reduce mortality of wildlife on roads.
    6. Discussion of the federal ESA and CESA, BGEPA, and MBTA and the consequences of non-compliance with these acts.
    7. The importance of avoiding the introduction of invasive weeds onto the project area and surrounding areas.
    8. A discussion of general safety protocols such as hazardous substance spill prevention and containment measures and fire prevention and protection measures.
    9. A review of mitigation requirements that are applicable to their work.
- **MM BIO-3: Construction Impact Minimization**. The project shall implement an advanced technology terrain-following solar tracker system (such as the Nextracker NX Horizon-XTR-0.75 10-inch tracker system, Nevados All Terrain Tracker system, or other system resulting in a similar reduction) that reduces grading under the solar field, consisting of solar power arrays identified as East Array and South Arrays 1, 2 and 3. Quarterly construction monitoring reports shall be provided to the California Energy Commission during the construction period for the project. The quarterly construction monitoring reports shall quantify and document all remaining permanent and temporary grading acreage from project construction with the terrain-following tracker system. All temporary grading impact areas shall be revegetated onsite as described in the project-specific Temporary Disturbance Revegetation Plan (APM BIO-7 and MM-BIO-23). All permanent grading impact areas shall be mitigated at the required compensatory mitigation standards of the resource agencies (APM BIO-36, MM BIO-14, MM BIO-24).
- **MM BIO-4: Special-Status Plant Species and Cacti Impact Avoidance and Minimization.** This measure will provide guidance on how project personnel can avoid unintended impacts to special-status plants on the project area (e.g., Utah vine milkweed) and provide for the salvage of protected cacti prior to construction. This measure includes the following requirements:
    - The applicant shall establish Environmentally Sensitive Areas around Utah vine milkweed that have been identified on the project area and/or may be identified in project disturbance areas during site preparation. A minimum 100-foot exclusion area shall be established around the plants, which shall be clearly identified and maintained throughout construction to ensure that avoided plants are not inadvertently harmed. ESAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls.

- *Worker Environmental Awareness Program*. The WEAP (APM BIO-12; MM BIO-2) shall include training components specific to protection of special-status plants that occur on the project area.
- *Herbicide and Soil Stabilizer Drift Control Measures*. Special-status plant occurrences within 100 feet of the project disturbance area, including Utah vine milkweed, shall be protected from herbicide and soil stabilizer drift. The IWMP includes measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's Global Invasive Species Team (Hillmer et al. 2003), the U.S. Environmental Protection Agency, and the Pesticide Action Network Database.
- *Erosion and Sediment Control Measures*. Erosion and sediment control measures shall not inadvertently impact special-status plants (e.g., by using invasive or non–Mojave Desert native plants in seed mixtures, introducing pest plants through contaminated seed or straw, etc.). These measures shall be incorporated in the Comprehensive Drainage, Stormwater, and Sedimentation Control Plan.
- *Preconstruction Vegetation Salvage*. The applicant shall provide a draft Vegetation Resources Management Plan detailing the methods for the salvage and transplantation of target succulent species covered under the CDNPA. The plan shall be submitted to CEC for review and approval at least 30 days prior to the start of ground-disturbing activities and shall include, at a minimum, the following elements:

    a. **Soil baseline characterization**. The characterization shall be presented to CEC prior to ground disturbance and shall include:

        i. Profile description of three representative pedons. (A pedon is the smallest three-dimensional sampling unit displaying the full range of characteristics of a particular soil and typically occupies an area ranging from about 1 to 10 square yards.)

        ii. Characterization of surface application (desert pavement or biological soil crust present). Description of biological soil crust shall include major groups of organisms identified at the site (filamentous cyanobacteria, other cyanobacteria, mosses, lichens, liverworts) and the characteristics by which they were identified (see item b, below).

        iii. Documentation of soil macro-invertebrates (that is, presence of ants, termites, and other significant macro-invertebrates).

- Bulk density, along with a reference to a generally accepted method for making the determination.
- Fertility (nutrient status, electrical conductivity, sodium adsorption ratio), along with methods by which composite samples were collected and the laboratory methods used to determine these properties. Composite samples will contain equal contributions from at least six randomly located collection points within the soil donor area.
- Organic matter content and total carbon and nitrogen content, along with a reference to generally accepted methods for making the determinations.

    a. Soil compaction shall be determined by measurement of bulk density in grams per cubic centimeter (or numerically equivalent units). Bulk density may be determined by any of several standard measurements, but the method used must be referenced to a widely accepted soil methodology publication. In no case shall soil be compacted to a bulk density that exceeds 1.6 grams per cubic centimeter

except where no planting is to take place. Penetrometer measurements are not a substitute for bulk density measurements.

Once characterized, the top 3 inches of topsoil shall be salvaged from the areas where traditional grading will be used per the following protocol and stored within the project area. The upper 0.25 inch may be collected separately to preserve biological crust organisms. Topsoil may not be distinguishable from subsoils by color or organic content at the time of salvage but is characterized as the layer that contains fine roots during the active growing season. Soil shall be collected, transported, and formed into stockpiles only while the soil is dry. The vegetation in place at or immediately before topsoil collection shall be healthy native vegetation with less than 15% absolute cover of exotic weed growth. Soil occupied by vegetation of high plant diversity shall be given priority over soil occupied by low-diversity native vegetation. Soil may be collected with a front loader, bulldozer, or scraper and transported to storage areas by front loader, dump truck, or scraper. The equipment transporting the soil may not travel across the stockpile more than the minimum number of times required to build the soil to its intended depth. The depth of the stockpiles shall not exceed 4 feet in the case of sandy loam or loamy sand soils. Topsoil stockpiles shall be kept dry and covered if no vegetation is introduced. If native vegetation is grown on the stockpiles to increase seeds and soil organisms, no cover is required. Artificial watering may be provided at the applicant's option.

Stockpiled topsoil shall be used to grow native plant species for the purpose of producing native seeds and building beneficial microorganisms in the soil volume. All native plant species encountered in the vegetation surveys shall be included in the growing rotation on the stockpiles. Most growing space needs to be dedicated to the species for which the most seeds shall be required. At least half by area of the growing area during each growing cycle shall be dedicated to plant species known to be good mycorrhizal host plants. Members of the families Chenopodiaceae and Amaranthaceae should be limited to less than half the area of the soil stockpiles, with the other half occupied by known mycorrhizal host plant species.

b. **Biological Soil Crust Characterization and Preservation.** Biological soil crust is defined here as a mixture of organisms that occupy and protect the surface of the soil in most desert ecosystems. The organisms often include filamentous and non-filamentous cyanobacteria, mosses, lichens, liverworts, and fungi. Biological soil crust shall be preserved by collecting the upper 0.25 inch of topsoil from areas to be graded. The applicant and/or its contractor(s) shall collect from specific areas known to contain biological crust organisms or collect upper soil from the entire area to be graded. Collections shall emphasize filamentous cyanobacteria, but other cyanobacteria, mosses, lichens, and liverworts are also considered valuable contributors to biological soil crust and important in protecting against erosion and reducing weed invasion, and shall be collected as a secondary priority. Soil surface crust shall be air dried and stored dry in a shaded location in containers that allow air movement, such as loose-weave fabric bags. In no case may the stored crust be subject to wetting or direct sunlight during storage. All containers shall be clearly labeled with date and location of original collection; name and contact information of persons responsible for identifying suitable material to collect; and the persons who collected, stored, and maintained collections. Biological soil crust shall be re-applied at the time of replanting by

crumbling the stored material and broadcasting it on the surface of the soil. Approximately 10% of the stored material shall be broadcast on topsoil storage areas among plants being grown for seed and soil microorganisms. When the growing cycle progresses to new planting, the soil supporting biological crust shall be collected and stored by the same methods prescribed for collections from the original soil, in clearly labeled bags or other suitable containers.

c. **Succulent Transplant**. The majority of the succulent plants located in areas to be dragged, rolled, or spot graded, or above mowing height, shall be salvaged and transplanted into a nursery area. The Succulent Transplant portion of the Vegetation Resources Management Plan shall include, at a minimum:

    i. The location of target plants on the project area;

    ii. Criteria for determining which individual plants are appropriate for salvage;

    iii. The proposed methods for salvage, propagation, transport, and planting;

    iv. Procedures for identifying target species during preconstruction clearance surveys;

    v. Considerations for storing salvaged plants or pre-planting requirements; and

    vi. Suggested transplantation sites.

    Succulents to be transplanted into the nursery area shall be placed in their same compass orientation as they were in their original location. The salvaged plants also shall be kept in long-term soil stockpiles, along with natives grown on the stockpiles, to keep the soil biota fresh.

    Succulent transplants done during preparation of the project area shall be fully documented and serve as trials of methods to be used during plant salvage on the project area. Records shall be maintained for each transplanted specimen including species; height; number of branches or pads as appropriate; donor location by UTM coordinates; methods used to remove, transport, and store the plant; period of temporary storage; location; facility description; planting medium used for storage; and frequency of watering during storage. Records shall be kept at the time of planting at the storage area, and quarterly thereafter during storage until such time as each plant is placed in the field or dies. Transplanted individuals shall be maintained for 3 years, including removal of invasive species and irrigation (if necessary), as well as monitored for 3 years to determine the percentage of surviving plants each year and to adjust maintenance activities using an adaptive management approach.

d. **Seed Collection**. Seed collection shall be carried out within the ROW grant area and within 10 miles of the boundaries of the project area on similar terrain, soil, exposure, slope and elevation to the project area. Seed collection guidelines shall conform to all laws and regulations in effect at the time of collection. Seed collection shall include all plant species known to be removed from the facility. If insufficient seeds are provided by “seed farming” and collection within 10 miles of the site, CEC may approve collection from a greater distance provided other environmental factors at the collection site are good matches to the project area. Collected seed may be used to seed salvaged topsoil piles during the

construction phase and after decommissioning related to restoring the project area.

e. If the palo verde trees on-site meet the CDFW size criterion for replacement (i.e., at least one stem greater than 2 inches in diameter) and cannot be salvaged based on the professional opinion of a qualified biologist/horticulturalist, three replacement plants shall be planted in or near the project area for each affected tree and monitored following the above guidance.

- **MM BIO-5: Biological Monitoring.** Biological Monitor(s) shall be employed to assist the Designated Biologist in conducting preconstruction surveys and monitoring ground disturbance, grading, construction, decommissioning, and restoration activities. Additionally, biological monitoring shall be performed during any ground disturbance or grading activities that occur during operation and maintenance. The Biological Monitor(s) shall have sufficient education and field experience to understand resident wildlife species biology; have experience conducting desert tortoise, burrowing owl, kit fox, and badger field monitoring; and be able to identify these species and their sign (including active burrows). The Designated Biologist shall submit a resume, at least three references, and contact information for each prospective Biological Monitor to CEC, CDFW, and USFWS for approval. To avoid and minimize effects on biological resources, the Biological Monitor(s) shall assist the Designated Biologist with the following:

    1. Be present during construction activities that take place in suitable habitat for desert tortoise, burrowing owl, kit fox, badger, or other protected species to prevent or minimize harm or injury to these species.
    2. Activities of the Biological Monitor(s) include, but are not limited to, ensuring compliance with all avoidance and minimization measures; monitoring for desert tortoise, burrowing owl, kit fox, badger, and other protected species; halting construction activity in the area if an individual is found; and checking the staking/flagging of all disturbance areas to be sure that they are intact and that all construction activities are being kept within the staked/flagged limits. If a desert tortoise, burrowing owl, kit fox, badger, or other protected species is found within a work area, the Biological Monitor(s) shall immediately notify the Designated Biologist, who shall determine measures to be taken to ensure that the individual is not harmed.
    3. Inspect the study area for any special-status wildlife species.
    4. Ensure that potential habitats within the construction zone are not occupied by special-status species (e.g., potential burrows or nests are inspected).
    5. In the event of the discovery of a non-listed, special-status ground-dwelling animal, recover and relocate the animal to adjacent suitable habitat at least 200 feet from the limits of construction activities.
    6. At the end of each work day, inspect all potential wildlife pitfalls (e.g., trenches, bores, other excavations) for wildlife and remove wildlife as necessary. If the potential pitfalls will not be immediately backfilled following inspection, the Biological Monitor(s) will ensure that the construction crew slopes the ends of the excavation (3:1 slope), provides wildlife escape ramps, or completely and securely covers the excavation to prevent wildlife entry.
    7. Inspect the site to ensure trash and food-related waste is placed in closed-lid containers and that workers do not feed wildlife. Also inspect the work area each day to ensure that no microtrash (e.g., bolts, screws, etc.) is left behind.

- **MM BIO-6: Crotch's Bumble Bee Impact Avoidance and Minimization.** The below mitigation measures shall only be required if Crotch's bumble bee remains as a candidate state endangered species or is listed as a state endangered species at the time of project construction, operations and maintenance, or decommissioning. These avoidance measures will be implemented to avoid take of the species if vegetation clearance and ground disturbance activities are proposed to occur during the following periods:
    - Queen Flight Season (February through March), when queens emerge in the spring searching for nest sites.
    - Colony Active Period (April through August), the most active flight period and highest detection probability for the species.
    - Gyne Flight Season (September through October), the fall flight period when gynes mate and search for overwintering habitat.

  If it is determined that "take" or adverse impacts to Crotch's bumble bee cannot be avoided during project activities, the applicant must consult with the CEC to determine if a CESA incidental take permit is required.

  1. ***Pre-construction Surveys*.** Pre-construction surveys for the Crotch's bumble bee shall be conducted by a qualified biologist prior to vegetation clearance and ground disturbance activities that are proposed to occur during the following periods:

     a. *Nesting Season.* Prior to vegetation removal and ground disturbing activities occurring during the Queen Flight Season and Colony Active Period (February 1 through August 31), a qualified biologist shall perform two (2) visual surveys consisting of meandering transects no more than 10 days prior to the commencement of vegetation removal and ground disturbance in that area. A qualified biologist shall conduct surveys at least four (4) days apart, with the second survey occurring within two (2) days prior to the onset of vegetation removal and ground disturbance in that area. The biologist shall focus attention on areas with blooming native and non-native nectar and pollen resources. The survey duration shall be appropriate to the size of the area planned for vegetation removal and ground disturbance plus 50 feet, based on the metric of a minimum of one (1) person-hour of searching per three (3) acres of suitable habitat as outlined within CDFW's Survey Considerations for CESA Candidate Bumble Bee Species (CDFW 2023). To the maximum extent possible, surveys shall be conducted between 8:00 AM and 4:00 PM on sunny days between 55- and 90-degrees Fahrenheit, with sustained wind speeds measuring less than 10 miles per hour.

        If Crotch's bumble bee is detected or suspected during pre-construction surveys, the biologist shall flag the area where the observation was made and closely monitor the flagged areas during vegetation removal and ground disturbing activities. Additionally, if Crotch's bumble bee is suspected or confirmed within the project area, a qualified biologist shall make every effort to locate active nests. The biologist shall observe any burrow entrances for signs of Crotch's bumble bee. To confirm a suspected nest, a qualified biologist may block/cover any burrow entrance with a jar of appropriate size for no more than 30 minutes or until a bumble bee is detected. If a Crotch's bumble bee nest is detected or suspected, the applicant shall immediately halt all project activities within 50 feet of the nest. A qualified biologist shall delineate the 50-foot buffer and notify all workers not to enter the environmentally sensitive area. The applicant shall contact the CEC within 24 hours for further consultation. The biologist shall

record the nest location with a GPS unit (including datum and horizontal accuracy in feet) and include photographs and a map of the nest location as part of notification to CEC and CDFW. The no disturbance buffer shall be maintained until the nest(s) senesce. Starting in July, nest activity shall be observed for a minimum of 1 hour per day for 3 consecutive days to determine if activity has ceased and if the nest has senesced. The applicant shall increase the size and/or modify the nest buffer dependent upon notice from the CEC.

b. *Overwintering Season.* If vegetation removal and ground disturbing activities occur during the overwintering season (November 1 through January 31), a qualified biologist shall walk ahead of grading and vegetation removal equipment and look for potential hibernacula such as leaf litter, logs, and rodent burrows. If any overwintering Crotch's bumble bees are found, the applicant shall immediately stop and prohibit all project activities within 50 feet of the overwintering queen and hibernaculum. A qualified biologist shall delineate a 50-foot buffer and notify all workers not to enter the environmentally sensitive area. If an overwintering queen is exposed, a qualified biologist shall cover and protect the queen using the substrate it was found within/under and return any removed materials (e.g., grass, vegetation, bark, and debris) to re-create pre-disturbed conditions. The applicant shall contact the CEC within 24 hours for further consultation. The biologist shall record the queen's location with a GPS unit (including datum and horizontal accuracy in feet) and include photographs and a map of the queen's location as part of notification to the CEC. The applicant shall increase the size and/or modify the nest buffer dependent upon notice from the CEC. Overwintering buffers shall be maintained until further instructions are received from the CEC.

If Crotch's bumble bee individuals are identified during pre-construction surveys, then the following additional avoidance measures should be implemented:

1. ***Initiate Consultation with CEC.*** The applicant will consult with CEC to determine if incidental take at the project will be likely, and if an incidental take permit is required.
2. ***Biological Monitoring During Construction.*** A qualified biologist(s) will be present each day during initial ground disturbance activities if Crotch's bumble bees are identified during pre-construction surveys.
3. ***Seasonal Restrictions and Vegetation Management.*** Vegetation and ground disturbance within suitable Crotch's bumble bee habitat shall be avoided during the Queen Flight Season (February through March) and the Gyne Flight Season (September through October), to the greatest extent feasible. If feasible, native and non-native flowering vegetation removal shall occur prior to the blooming period of potential floral resources and before the Queen/Gyne Flight Seasons and Colony Active Period (February through October). If vegetation removal cannot be avoided during this period, or if vegetation needs to be removed during the bloom period for potential floral resources: flowering vegetation should be removed in a patched manner so as to leave areas of floral resources as refugia for foragers or wait until bloom has ceased. Additionally, removal of non-native plants should be prioritized over native plants. If mowing activities are to occur, vegetation shall be mowed to a height no lower than 4 inches to prevent disturbance of established nests or overwintering queen hibernacula.
4. ***Provide Compensatory Mitigation for Impacts on Crotch's Bumble Bee.*** Direct impacts to suitable Crotch's bumble bee habitat shall be offset through compensatory mitigation,

which may include, but is not necessarily limited to, on-site or off-site habitat preservation, enhancement, restoration, and/or creation at a ratio of no less than 1:1.

- **MM BIO-7: Designated Biologist.** The applicant shall assign at least one Designated Biologist to the project. The applicant shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the BLM Authorized Officer for approval in consultation with the CEC, CDFW, and USFWS.

  The Designated Biologist must meet the following minimum qualifications:

  1. Have a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
  2. Have 3 years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
  3. Have at least 1 year of field experience with biological resources found in or near the study area;
  4. Meet the current USFWS Authorized Biologist qualifications criteria, demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS;
  5. Possess a CESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise.

  In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the BLM Authorized Officer, in consultation with the CEC, CDFW, and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the MMs.

- **MM BIO-8: Fence Design and Site Permeability.** Permanent site fencing installed around the project—including perimeter security fencing desert tortoise exclusionary fencing—should be designed to direct wildlife toward the wildlife undercrossing to provide safe passage under the freeway and shall be regularly inspected and maintained for the life of the project. Alternate designs may also be constructed with prior written approval from CEC, CDFW, and USFWS. Regardless, the project shall ensure that any such fence meets existing specifications that have been developed to preclude accidental entanglement of desert bighorn sheep, deer, and other animals.

  Fencing should be sufficient to prevent desert bighorn sheep passage (e.g., 2m-2.5m tall chain-link) – should be installed at the corridor entrances between (a) the East Array and South Array 1, (b) South Array 1 and South Array 2, and (c) South Array 2 and South Array 3 on the east side (Figure 2, Project Design). Additionally, the project shall extend a line of project fencing to the north to connect with the wildlife exclusion fencing associated with the I-15 overcrossing structure (Figure 13, Fencing Plans of the Desert Bighorn Sheep Study). Approximately 1,640 linear feet of this can be accomplished within the existing project boundary, but the additional approximately 300 linear feet will need to be coordinated with BLM and possibly Caltrans. The project will secure the necessary encroachment permits or other mechanism to continue fencing between the project boundary and the wildlife exclusion fencing associated with the I-15 overcrossing structure. Care should be taken when connecting the fences to make sure that they are physically connected or directly abut one another such that wildlife cannot pass through or get stuck between them. The ultimate fencing plans should be reviewed by the CEC for final approval prior to site disturbance activities.

- **MM-BIO-9: Compliance Monitoring by the Designated Biologist.** Prior to ground-disturbing activities, an individual shall be designated and approved by CEC and CDFW as a Designated Biologist (i.e., field contact representative). Designated Biologist qualifications are presented below.

  The Designated Biologist shall be employed for the period during which ongoing construction and postconstruction monitoring and reporting by an approved biologist is required. Each successive Designated Biologist shall be approved by CEC. The Designated Biologist shall have the authority to ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization and with all MMs included herein, and shall be the primary agency contact for the implementation of these measures. The Designated Biologist shall have the authority and responsibility to halt any project activities that are in violation of the terms of the BO, Section 2081 take authorization, or project MMs. A list of responsibilities of the Designated Biologist is summarized below.

  To avoid and minimize effects to biological resources, the Designated Biologist shall:

  1. Notify CEC, CDFW, and USFWS at least 14 calendar days before initiation of ground-disturbing activities.
  2. Immediately notify the CEC in writing if the applicant/owner does not comply with any of the MMs or terms of the BO and/or the Section 2081 take authorization including, but not limited to, any actual or anticipated failure to implement such measures within the periods specified.
  3. Ensure performance of daily compliance inspections during ongoing construction as clearing, grubbing, and grading are completed, and submit a monthly compliance report to CEC until construction is complete.

- **MM BIO-10: Speed Limits.** Speed limits along all access roads outside of permanent desert tortoise fencing shall not exceed 15 mph to minimize dust during construction activities. Speed limits within permanent desert tortoise fencing shall not exceed 25 mph to minimize impacts during operation and maintenance. Nighttime vehicle traffic associated with project activities shall be kept to a minimum volume and speed (maximum of 15 mph) to prevent mortality of nocturnal wildlife species.

- **MM BIO-11: Desert Tortoise Protection.** The applicant/owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the USFWS's *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009) or more current guidance provided by CDFW and USFWS.
  The applicant/owner shall also implement all terms and conditions described in the BO to be prepared by USFWS and CESA ITP. These measures include, but are not limited to, the following, subject to modification by the terms of incidental take authorizations issued by the USFWS and CEC:

  1. ***Desert Tortoise Fencing along I-15.*** If required by CEC, to avoid increases in vehicle-related mortality from disruption of local movement patterns along the existing ephemeral wash systems, desert tortoise-proof fencing shall be installed along the existing freeway ROW fencing on both sides of I-15 for the entire east-west dimension of the project area. The tortoise fencing shall be designed to direct tortoises to existing undercrossing to provide safe passage under the freeway and shall be regularly inspected and maintained for the life of the project.

2. ***Desert Tortoise Exclusion Fence Installation.*** To avoid impacts to desert tortoise, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along road corridors during construction. The proposed alignments for the permanent perimeter fence and temporary fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and temporary fencing areas shall be conducted by the Designated Biologist(s) using techniques outlined in the USFWS's *Desert Tortoise (Mojave Population) Field Manual* and may be conducted in any season with CEC, USFWS, and CDFW approval. Biological Monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide 100% coverage of all areas to be disturbed and an additional transect along both sides of the fence line covering an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoise shall be examined to assess occupancy of each burrow by desert tortoise and handled in accordance with the USFWS's *Desert Tortoise Field Manual*. Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist in accordance with the USFWS's 2009 *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009).

    a. *Timing, Supervision of Fence Installation*. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

    b. *Fence Material and Installation*. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS's *Desert Tortoise (Mojave Population) Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence) (USFWS 2009).

    c. *Security Gates*. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry.

    d. *Fence Inspections*. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing, the fencing shall be regularly inspected. If tortoises were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times per day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during or within 24 hours following all major rainfall events. Exceptions to inspections during major rainfall events may be made as needed to maintain crew safety. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All damaged temporary fencing shall be repaired immediately upon discovery and, if the fence may have

permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

3. ***Desert Tortoise Clearance Surveys within Solar Arrays and Gen-tie.*** Clearance surveys shall be conducted in accordance with the USFWS *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009) (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100% of the study area by walking transects no more than 15 feet apart. If a desert tortoise is located during the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the project area may only be conducted when tortoises are most active (April–May or September–October) unless the project receives approval from CEC, CDFW, and USFWS. Clearance surveys of linear features may be conducted during any time of the year. Any tortoise located during clearance surveys of solar arrays shall be translocated or relocated and monitored in accordance with the DTTP (MM 3.4-2b). The Designated Biologist, who may be assisted by the Biological Monitors, shall assess occupancy of each burrow by desert tortoise in accordance with the USFWS *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009). All potential desert tortoise burrows located during clearance surveys shall be excavated by hand, tortoises removed, and burrows collapsed or blocked to prevent occupation by desert tortoise in accordance with the DTTP.

4. ***Monitoring Following Clearing.*** Following the desert tortoise clearance and removal from the project area, workers and heavy equipment shall be allowed to enter the project area to perform clearing, grubbing, leveling, and trenching activities. A Designated Biologist or Biological Monitor shall be on-site for clearing and grading activities to move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the DTTP.

5. ***Reporting.*** The Designated Biologist shall record the following information for any desert tortoise handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled tortoise. Desert tortoise moved from within the project area shall be marked and monitored in accordance with the DTTP. All collected data related to tortoise relocation shall be provided to CEC, CDFW, and USFWS.

- **MM BIO-12: Desert Tortoise Translocation Plan.** The applicant/owner shall develop and implement a USFWS- and CEC-approved DTTP. The DTTP, which shall be approved prior to any ground disturbance or tortoise relocation, shall include measures to minimize the potential for repeated translocations of individual desert tortoise. The goals of the DTTP shall be to relocate all desert tortoise from the project area to nearby suitable habitat; minimize impacts on resident desert tortoise outside the project area; minimize stress, disturbance, and injuries to relocated/translocated tortoises; and assess the success of the translocation effort through monitoring. The DTTP shall follow the *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (USFWS 2020) and shall clearly define how it addresses the 11 steps outlined in the guidance. The final DTTP shall be based on the draft DTTP prepared by the applicant/owner and shall include all revisions deemed necessary by CEC, CDFW, and USFWS. The final plan will be subject to modification for consistency with the CESA ITP, USFWS take authorization and/or BO conservation requirements.

- **MM BIO-13: Desert Tortoise Compliance Verification.** The applicant/owner shall provide CEC, CDFW, and USFWS staff with unfettered access to the project area and compensation lands under the control of the project owner and shall otherwise fully cooperate with the CEC's efforts to verify the project owner's compliance with, or the effectiveness of, adopted MMs. The Designated Biologist shall do all of the following:

    1. ***Notification*.** Notify CEC at least 14 calendar days before initiating construction-related ground disturbance activities; immediately notify CEC in writing if the project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement MMs within the time periods specified in the conditions of certification;

    2. ***Monitoring During Grubbing and Grading*.** Remain on-site daily while vegetation salvage, grubbing, grading, and other ground-disturbing construction activities are taking place to avoid or minimize take of listed species, and verify personally or have Biological Monitor(s) verify compliance with all impact avoidance and minimization measures, including checking all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.

    3. ***Monthly Compliance Inspections*.** Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to CEC, CDFW, and USFWS during construction.

    4. ***Notification of Injured or Dead Listed Species*.** If an injured or dead federally or state-listed species is detected on or near the project area CEC, CDFW, and USFWS shall be notified immediately by phone. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine whether further actions are required to protect listed species. Written follow-up notification via facsimile or electronic communication shall be submitted to these agencies within 2 calendar days of the incident and include the following information as relevant:

        a. *Injured Desert Tortoise*. If a desert tortoise is injured as a result of project-related activities during construction, the Designated Biologist or Biological Monitor(s) shall immediately take it to a CDFW-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the applicant/owner. Following phone notification as required above, CDFW and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, and circumstances of the incident and the name of the facility where the animal was taken.

        b. *Desert Tortoise Fatality*. If a desert tortoise is killed by project-related activities during construction, operation and maintenance, or decommissioning, a written report with the same information as an injury report shall be submitted CEC, CDFW, and USFWS. These desert tortoises shall be salvaged according to federally established guidelines. The applicant/owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

    5. ***Final Listed Species Mitigation Report.*** The Designated Biologist shall provide CEC a Final Listed Species Mitigation Report that includes, at a minimum, 1) all available information about project-related incidental take of listed species; 2) information about other project impacts to the listed species; 3) construction dates; 4) an assessment of the

effectiveness of conditions of certification in minimizing and compensating for project impacts; 5) recommendations on how MMs might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 6) any other pertinent information, including the level of take of the listed species associated with the project.

6. ***Stop Work Order.*** CEC may issue the project owner a written stop work order to suspend any activity related to the construction or operation of the project to prevent or remedy a violation of one or more conditions of certification (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or protected species. The project owner shall comply with the stop work order immediately upon receipt thereof.

- **MM BIO-14: Desert Tortoise Compensatory Mitigation:** To fully mitigate for habitat loss and potential take of desert tortoise, the project owner shall provide compensatory mitigation consistent with federal requirements, adjusted to reflect the final project footprint. The acreage for mitigation of desert tortoise habitat will be at a 1:1 ratio. For the purposes of this condition, the project footprint means all lands disturbed in the construction and operation of the project, including all project linears, as well as undeveloped areas inside the project's boundaries that will no longer provide viable long-term habitat for the desert tortoise. To satisfy this condition, the project owner shall acquire, protect, and transfer 1 acre of desert tortoise habitat for every acre of habitat within the final project footprint, and provide associated funding for the acquired lands, as specified below. In lieu of acquiring land itself, the project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as provided below in Section 3.i. of this measure.

  If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands include all of the following, subject to modification by the terms of incidental take authorizations issued by USFWS and CEC:

  1. ***Selection Criteria for Compensation Lands.*** The compensation lands selected for acquisition in fee title or in easement shall:

     a. be within the Western Mojave Recovery Unit, or, with prior USFWS and CDFW approval, within the Eastern Mojave Recovery Unit as defined in the 2011 Revised Recovery Plan (USFWS 2011b), with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands;

     b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;

     c. be prioritized near larger blocks of land that are either already protected or planned for protection, such as Desert Wildlife Management Areas within the Western Mojave Recovery Unit (or nearby portions of the Eastern Mojave Recovery Unit with prior USFWS and CDFW approval) or which could feasibly be protected long term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

     d. be connected to lands with desert tortoise habitat equal to or better quality than the project area, ideally with populations that are stable, recovering, or likely to recover;

e. not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible;

f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and

h. have water and mineral rights included as part of the acquisition, unless CEC, BLM and CDFW, in consultation with CDFW and USFWS, agree in writing to the acceptability of the land.

2. ***Review and Approval of Compensation Lands Prior to Acquisition*.** The project owner shall submit a formal acquisition proposal to CEC, BLM, CDFW, and USFWS describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above. Approval from the CEC, BLM, and CDFW in consultation with USFWS shall be required for acquisition of all compensatory mitigation parcels.

3. ***Compensation Lands Acquisition Requirements*.** The project owner shall comply with the following requirements relating to acquisition of the compensation lands after CEC, BLM, in consultation with CDFW and USFWS, have approved the proposed compensation lands:

   a. *Preliminary Report*. The project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the BLM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by CEC and BLM, in consultation with CDFW and USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife Conservation Board.

   b. *Title/Conveyance*. The project owner shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CEC and BLM. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFW, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or BLM under terms approved by the BLM. If an approved non-profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFW in a form approved by CDFW. If an approved non-profit holds a conservation easement, CDFW shall be named a third-party beneficiary.

   c. *Initial Habitat Improvement Fund*. The project owner shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code

Section 65965) and if it meets the approval of CEC, CDFW, and BLM. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee.

d. *Property Analysis Record*. Upon identification of the compensation lands, the project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands.

e. Long-term Maintenance and Management Fund. The project owner shall deposit in NFWF's REAT Account a capital long-term maintenance and management fee in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands. BLM, in consultation with CDFW, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision.

f. *Interest, Principal, and Pooling of Funds*. The project owner, CEC, BLM, and CDFW shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

    i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFW designed to protect or improve the habitat values of the compensation lands.

    ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by CDFW or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFW takes fee title to the compensation lands, monies received by CDFW pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFW designates NFWF or another entity to manage the long-term maintenance and management fee for CDFW.

    iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFW, or a BLM- and CDFW-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFW.

g. *Other expenses*. In addition to the costs listed above, the project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to title and document review costs; expenses incurred from other state agency reviews; overhead related to providing compensation lands to CDFW or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures.

h. *Mitigation Securit*y. The project owner shall provide financial assurances to the BLM and CEC with copies of the document(s) to the CDFW and USFWS, to guarantee that an adequate level of funding is available to implement the MMs described in this condition. These funds shall be used solely for implementation of the measures associated with the project in the event the project owner fails to comply with the requirements specified in this condition, or shall be returned to the project owner upon successful compliance with the requirements in this condition. The BLM's or CEC's use of the security to implement measures in this condition may not fully satisfy the project owner's obligations under this condition. Financial assurance can be provided to the BLM and CEC in the form of an irrevocable letter of credit, a pledged savings account, or another form of security ("Security"). Prior to submitting the Security to the BLM, the project owner shall obtain the BLM's approval in consultation with CDFW and the USFWS of the form of the Security. The actual costs to comply with this condition will vary depending on the final footprint of the project and the actual costs of acquiring, improving, and managing the compensation lands.

i. NFWF REAT Account. The project owner may elect to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the security required above, and may be provided in lieu of security. If this option is used for the acquisition and initial improvement, the project owner shall make an additional deposit into the REAT Account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than anticipated in the PAR analysis, the excess money deposited in the REAT Account shall be returned to the project owner. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the BLM and CEC. Such delegation shall be subject to approval by the BLM and CEC, in consultation with CDFW and USFWS, prior to land acquisition, initial protection, or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented with 18 months of BLM's approval.

- **MM BIO-15: Minimize Vehicle and Equipment Impacts during Operation and Maintenance.** The applicant/owner shall implement measures to minimize the potential for desert tortoise and other wildlife species mortality along access and maintenance roads. These measures shall include:

    1. Speed limits identified in MM BIO-10 shall continue to be applied during operation and maintenance.

2. Pedestrian access outside the limits of the designated access/maintenance roads is permitted year-round as long as no ground-disturbing activities take place.
3. Vehicle traffic and parking shall be confined to designated access roads, and equipment and materials staging areas shall be clearly defined to avoid impacting habitat during the operation phase.

- **MM BIO-16: Mojave Fringe-toed Lizard Protection Measures**. A qualified biologist will conduct a focused survey for Mojave fringe-toed lizard prior to ground disturbance in suitable habitat (aeolian sand deposits) within all active work areas. Two survey replicates will be performed during the Mojave fringe-toed lizard active season (March–October) during appropriate weather conditions. Qualified biologists will walk transects spaced 10m apart throughout areas with suitable habitat within the study area. Detections of Mojave fringe-toed lizard will be recorded using a GPS unit. If Mojave fringe-toed lizards are not detected, then no further action is needed. If Mojave fringe-toed lizards are found, then a pre-construction survey should be conducted no more than one week before ground disturbance begins, and any Mojave fringe-toed lizards should be moved to suitable habitat south of the Project area where the species was confirmed to be present.
- **MM BIO-17: Avian Monitoring and Mitigation Program.** An AMMP shall be initiated and approved by the CEC and BLM in consultation with CDFW and USFWS prior to construction and continue for at least 5 years following commercial operation (and longer if determined necessary and appropriate by the Designated Biologist). The AMMP shall prevent substantial adverse effects to special-status species through implementation of the approach outlined in the postconstruction monitoring and adaptive management provisions of USFWS Region 8 Interim Guidelines for the Development of a Project-specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010), in conjunction with any measures required after consultation with USFWS and/or CDFW under the ESA, CESA, or BGEPA, if applicable. The Program shall use surveys and monitoring of on-site avian and bat use and behavior to document species composition and changes in avian and bat use over time. The purpose of the AMMP is to provide an adaptive management and decision-making framework for reviewing, characterizing, and responding to avian and bat monitoring results, and reducing long-term impacts on these taxa. The AMMP shall include the following components:
    1. A description of the baseline and ongoing avian and bat survey methods, including identification of onsite survey locations and seasonal survey considerations, and a description of acoustic bat monitoring methods.
    2. Avian and bat mortality and injury monitoring that includes:
        a. Onsite monitoring of representative locations in the facility, at a level of effort that accounts for potential spatial bias and allows for the extrapolation of survey results to non-surveyed areas. The AMMP will provide a rationale justifying the proposed schedule of carcass searches.
        b. Low-visibility and high-wind weather event monitoring to document potential weather-related collision risks that may be associated increased risk of avian or bat collisions with project features, including foggy, highly overcast, or rainy night-time weather typically associated with an advancing frontal system, and high wind events (40-mph winds) are sustained for period of greater than 4 hours. The monitoring report shall include survey frequency, locations, and methods.
        c. Scavenger and searcher efficiency trials to document the extent to which avian or bat fatalities remain visible over time and can be detected, and to adjust the

survey timing and survey results to reflect scavenger and searcher efficiency rates.

d. A description of statistical methods used to generate facility estimates of potential avian and bat impacts based on the number of detections during standardized searches during the monitoring season for which the cause of death can be determined.

e. Field detection and mortality or injury identification, cause attribution, handling and reporting requirements. The AMMP shall include detailed specifications on data collection and provide a carcass collection protocol.

3. All postconstruction mortality monitoring studies included in the AMMP shall be performed by a -third party contractor for 5 years following commercial operation and approval of the AMMP by the CEC and BLM. At the end of the 5-year period, the CEC and BLM shall determine whether the survey program shall be continued.

4. An adaptive management program shall be developed to identify and implement reasonable and feasible measures that would reduce levels of avian or bat mortality or injury attributable to project operations and facilities. Such measures could potentially include efforts to make panels more visible to birds (e.g., white borders around panel edges or the use of noise deterrents).

The adaptive management program shall include (i) reasonable measures for characterizing the extent and importance of detected mortality and injuries clearly attributable to the project; (ii) potential measures that the project owner could implement to adaptively respond to detected mortality and injuries attributable to the project. Adaptive actions undertaken will be discussed and evaluated in survey reports. 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; and (iii) Appropriate performance standards for mitigation of impacts to any species regulated by BGEPA, ESA, and CESA as well as MMs that reduce or offset mortalities caused by the project to a level that avoids a substantial, long-term reduction in the demographic viability of the local population of the species in question.

- **MM BIO-18. Avoid Disturbance to Nesting Birds.** Vegetation clearing shall take place outside of the general avian breeding season (February 15–September 1), when feasible. If vegetation clearing cannot occur outside the avian breeding season, the Designated Biologist/Biological Monitor(s) shall conduct a preconstruction survey for nesting birds no more than 3 days prior to vegetation clearing. If no active nests are found, clearing can proceed. If active nests are found, no clearing shall be allowed within 150 feet (for passerines) to 250 feet (for raptors) of the active nests until the Designated Biologist/Biological Monitor(s) determines the nest is no longer active or the nest fails. Based on observation of the individual birds' tolerance to human activity, this buffer may be reduced by a qualified biologist. Encroachment into the buffer may occur at the discretion of a qualified biologist.

  The Designated Biologist/Biological Monitor(s) shall submit the results of the preconstruction nesting bird surveys to CEC, BLM, USFWS, and CDFW. Following agency coordination, the size of the next buffer may be adjusted based upon the magnitude of proposed activities and observed sensitivity of the bird to disturbance.

- **MM BIO-19: Lighting Specifications to Minimize Bird and Bat Impacts.**
  The applicant/owner shall minimize night lighting during construction by using shielded

directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky.

- **MM BIO-20: Bird and Bat Conservation Strategy (BBCS).** The applicant/owner shall develop a BBCS to address project impacts to special-status avian and bat species that shall be consistent with the Region 8 *Interim Guidelines for the Development of a Project-specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities* (USFWS 2010). The applicant/owner shall submit the BBCS to the CEC, CDFW, and USFWS for review and approval prior to initiation of project construction. The BBCS shall include an assessment of potential avian and bat impacts from lighting, noise, collision, electrocution, and attraction of ravens, as applicable; measures to mitigate for the effects to birds; a description of general avoidance and minimization measures applicable during construction, operation and maintenance, and postconstruction to include nest management and postconstruction monitoring; a description of the reporting requirements and reporting schedule and duration; and the adaptive management strategy. A raven management element shall be included in the BBCS or provided separately that includes measures such as storage of garbage in raven-proof containers and installation of anti-nesting devices on structures where raven nests could be built.
- **MM BIO-21: Burrowing Owl Protection Measures.** To fully mitigate for habitat loss and potential take of burrowing owl, the project owner shall provide compensatory mitigation consistent with CDFW requirements, adjusted to reflect the final project footprint. The acreage for mitigation of burrowing owl habitat will be at a 1:1 ratio. For the purposes of this condition, the project footprint means all lands disturbed in the construction and operation of the project, including all project linears, as well as undeveloped areas inside the project's boundaries that will no longer provide viable long-term habitat for burrowing owl.

  If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands must comply with the terms of incidental take authorizations issued by CEC. The compensation lands selected for acquisition in fee title or in easement shall comply with the terms of incidental take authorizations issued by CEC.

  No more than 14 days prior to the start of ground disturbance, a preconstruction survey for burrowing owls in conformance with the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFW 2012) shall be completed within suitable habitat at every work area and within a minimum 150-m buffer zone of each work area. Work areas will be resurveyed following periods of inactivity of 2 weeks or more. The applicant/owner shall submit the results of the preconstruction survey to CEC, BLM's Authorized Officer, and CDFW. The applicant/owner shall also submit evidence of conformance with federal and state regulations regarding the protection of the burrowing owl by demonstrating compliance with the following:

  1. Impacts to active burrowing owl territories shall be mitigated at a minimum of a 1:1 ratio through a combination of off-site habitat compensation and/or off-site restoration of disturbed habitat capable of supporting this species. The acquisition of occupied habitat off-site shall be in an area where energy facilities would not pose a mortality risk. Acquisition of habitat shall be consistent with the CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). The preserved habitat shall be occupied by burrowing owl and shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified ornithologist. The site shall be approved by CEC, BLM, and CDFW. Land shall be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. The off-site area to be preserved can coincide with other off-site mitigation lands, with the approval of CEC.

2. The approved biologist shall remain on-site until all vegetation is cleared and, at a minimum, conduct site and fence inspections on a regular (monthly) schedule throughout construction to ensure that the project is in compliance with the MMs.
3. Employees and contractors shall look under vehicles and equipment for the presence of wildlife prior to moving vehicles and equipment. If present, the animal shall be left to move on its own. No listed species shall be handled without concurrence from USFWS and/or CDFW, as applicable.

- **MM BIO-22: American Badger and Desert Kit Fox Protection.** To avoid direct impacts to American badger and desert kit fox, preconstruction surveys shall be conducted for these species concurrently with the desert tortoise surveys. Surveys shall be conducted as described below:

1. Biological Monitors shall perform preconstruction surveys for badger and kit fox dens in the project disturbance area, including a 20-foot swath beyond the disturbed area, utility corridors, and access roads. If dens are detected, each den shall be classified as inactive, potentially active, or definitely active.
2. Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox.
3. Potentially and definitely active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for 3 consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance.
4. If no tracks are observed in the tracking medium or no photos of the target species are captured after 3 consecutive nights, the den shall be excavated and backfilled by hand.
5. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the badger or kit fox from continued use. After verification that the den is unoccupied it shall then be excavated and backfilled by hand to ensure that no badgers or kit fox are trapped in the den.
6. If an active natal den is detected on the site, the BLM Authorized Officer and CDFW shall be contacted within 24 hours to determine the appropriate course of action to minimize the potential for harm or mortality. The course of action would depend on the age of the pups, location of the den on the site (e.g., is the den in a central area or in a perimeter location), status of the perimeter site fence (completed or not), and the pending construction activities proposed near the den. A 500-foot no-disturbance buffer shall be maintained around active natal dens.
7. The following measures are required to reduce the likelihood of distemper transmission:
    a. No pets shall be allowed on the site prior to or during construction, with the possible exception of kit fox scat detection dogs during preconstruction surveys, and then only with prior CEC approval;
    b. Any kit fox hazing activities that include the use of animal repellents such as coyote urine must be cleared through CEC prior to use; and
    c. Any documented kit fox mortality shall be reported to CEC, CDFW, and the BLM Authorized Officer within 24 hours of identification. If a dead kit fox is observed, it shall be retained and protected from scavengers until CEC determines whether the collection of necropsy samples is justified.

- **MM BIO-23: Vegetation Best Management Practices.** The applicant shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to vegetation resources:

    1. Limit Area of Disturbance. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas within the project area. Parking areas and staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, project vehicles, and equipment shall be confined to the flagged areas.
    2. Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.
    3. Minimize Traffic Impacts. Vehicular traffic during project construction and operation shall be confined to existing routes of travel to and from the project area, and cross-country vehicle and equipment use outside designated work areas shall be prohibited.
    4. Monitor During Construction. In areas that have not been fenced with desert tortoise exclusion fencing and cleared, a Designated Biologist shall be present at the construction site during all project construction activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall review areas immediately ahead of equipment during brushing and grading activities.
    5. Minimize Impacts of Staging Areas. Staging areas for construction on the project area shall be within the area that has been fenced with desert tortoise exclusion fencing. For construction activities outside of the solar project area, access roads, pulling sites, and storage and parking areas shall be designed, utilized, and maintained with the goal of avoiding or minimizing impacts to native plant communities and sensitive biological resources. Staging areas outside of the project area shall maintain a minimal disturbance footprint, avoid jurisdictional wetlands, and avoid disturbance to native plant communities whenever possible.
    6. Avoid Use of Toxic Substances. Soil bonding and weighting agents used on unpaved surfaces (per MM 3.2-1) shall be non-toxic to plants and wildlife.
    7. Implement Erosion Control Measures. All erosion control measures promoted by the Lahontan Regional Water Quality Control Boards (RWQCB) in its Project Guidelines for Erosion Control (Board Order No R6T-2003-0-04 Attachment G) (Lahontan RWQCB 2003) shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter "waters of the State." Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into drainages. All disturbed soils and roads within the project area shall be stabilized to reduce erosion potential, both during and following construction. Areas of disturbed soils (access and staging areas) with slopes toward a drainage shall be stabilized to reduce erosion potential. To avoid impacts associated with generation of fugitive dust, surface application of water would be employed during construction and operation and maintenance activities.

8. Monitor Ground-Disturbing Activities Prior to Preconstruction Site Mobilization. If preconstruction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

9. Revegetation of Temporarily Disturbed Areas. The applicant shall prepare and implement a Temporary Disturbance Revegetation Plan to restore all areas subject to temporary disturbance to pre-project grade and conditions. The plan shall be submitted to the CEC and BLM for review and approval at least 30 days prior to the start of ground-disturbing activities. Temporarily disturbed areas within the project area include, but are not limited to, all proposed locations for linear facilities, temporary access roads, berms, areas surrounding the drainage diffusers, construction work temporary lay-down areas not converted to part of the solar field, and construction equipment staging areas.
The Temporary Disturbance Revegetation Plan shall include a description of topsoil salvage and seeding techniques and a monitoring and reporting plan, and plan to achieve the following performance standards by the end of monitoring year 2:

    a. At least 80% of the species observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; and

    b. Relative cover and density of plant species within the temporarily disturbed areas shall equal at least 60% relative to pre-disturbance conditions.

10. Integrated Weed Management Plan. This measure provides further detail and clarifies requirements for the applicant's draft IWMP. Prior to beginning construction on the project, the applicant shall prepare, circulate to BLM for comment and approval, and then implement an IWMP that meets the approval of BLM's Authorized Officer and conforms to the CDCA Plan to prevent the spread of existing invasive species and the introduction of new invasive species to the project area. The plan shall be consistent with BLM's *Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States* (BLM 2007) and the *2008–2012 National Invasive Species Management Plan* (National Invasive Species Council 2008). The IWMP shall include, at a minimum, specific management objectives and measures for each target invasive species, baseline conditions, weed risk assessment, measures (both preventative and containment/control) to prevent/limit the introduction and spread of invasive species, monitoring and surveying methods, and reporting requirements. The BLM-approved IWMP shall include:

    a. Preventative measures to prevent the spread of weeds into new habitats, such as equipment inspections, use of weed-free erosion control materials and soils, and a mandatory site training element that includes weed management;

    b. Weed containment and control measures such as the removal of invasive species primarily via mechanical means, with the use of herbicides restricted to BLM-policies and approved usage (e.g., BLM's Herbicide Use Standard Operating Procedures provided in Appendix B of the *Record of Decision for the Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement* (BLM 2007);

    c. Monitoring and reporting standards annually during construction and for 3 years following the completion of construction to describe trends in weed distribution and direct weed management measures, and;

d. Reporting of monitoring and management efforts in annual reports and a final monitoring report completed at the end of 3 years of postconstruction monitoring. Copies of these reports will be provided to BLM for review and comment. BLM will use the results of these reports to determine whether any additional monitoring or control measures are necessary. Weed control will be ongoing on the project area for the life of the project, but plan success will be determined by BLM after the 3 years of operations monitoring through the reporting and review process. Success criteria will be defined as having no more than a 10% increase in a weed species or in overall weed cover in any part of the project area.

- **MM BIO-24: Final Closure Plan.** At least 12 months prior to project closure, the applicant shall prepare a Final Closure Plan to restore the site's topography and hydrology to a relatively natural condition and to establish native vegetation communities within the project area. The Final Closure Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities and shall cover the estimated cost as though BLM were to contract with a third party to decommission the project and reclaim the project area. The plan shall be subject to review and revisions from the CEC and BLM Authorized Officer in consultation with USFWS and CDFW.

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APPENDIX A

2013 Panorama Environmental, Inc. Biological Resources Technical Report

APPENDIX B

IPaC Search Results

APPENDIX C

California Natural Diversity Database
10-Mile Search 1:6,000 Scale

APPENDIX D

Soda Mountain Solar Site Visit

APPENDIX E

Rare Plant Survey and Vegetation Mapping Report for the Soda Mountain Solar Project

APPENDIX F

Crotch's Bumble Bee Focused Survey Report for the Soda Mountain Solar Project

APPENDIX G

Desert Tortoise Survey Report for the Soda Mountain Solar Project

APPENDIX H

Mojave Fringe-Toed Lizard Survey Report for the Soda Mountain Solar Project

APPENDIX I

Winter Avian Use Survey Report for the Soda Mountain Solar Project

APPENDIX J

Spring Avian Use Survey Report for the Soda Mountain Solar Project

APPENDIX K

Summer Avian Use Survey Report for the Soda Mountain Solar Project

APPENDIX L

Fall Avian Use Survey Report for the Soda Mountain Solar Project

APPENDIX M

Spring Avian Use and Raptor Survey Report for the Soda Mountain Solar Project

APPENDIX N

Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project

APPENDIX O

Bat Survey Report for the Soda Mountain Solar Project

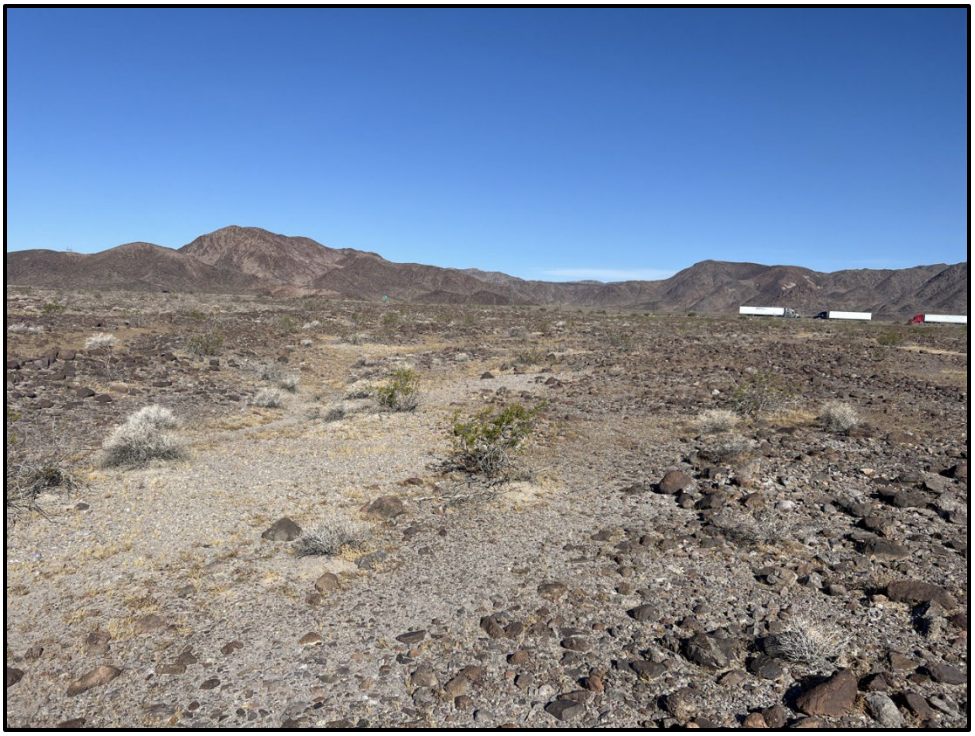
APPENDIX P

Site Photographs

Photograph P-1. Site conditions in the southeastern portion of the study area; view facing south. Photographed June 16, 2023.

Photograph P-2. Site conditions in the northern region of the study area; view facing northeast. Photographed April 3, 2023.

Photograph P-3. Example of off-road vehicle tracks in the southeastern portion of the study area; view facing northwest. Photographed March 27, 2023.



Photograph P-4. I-15 visible in the distance, directly west of the study area. Photographed May 25, 2023.

Photograph P-5. Wandering dog frequently encountered near the south end of the study area on Rasor Road. Illegal trash dumping can be seen in the background. Photographed April 4, 2023.

Photograph P-6. Utah vine milkweed observed along the gen-tie route in the northern portion of the study area, west of I-15. Photographed April 19, 2023.

Photograph P-7. Creosote Bush – White Bursage Scrub in the northwestern portion of the study area; view facing southwest. Photographed April 25, 2023.

Photograph P-8. Creosote Bush Scrub in the southeastern portion of the study area; view facing northeast. Photographed April 20, 2023.

Photograph P-9. Example of desert pavement consisting of Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens* Desert Pavement Association) in the western portion of the study area; view facing east. Photographed April 18, 2023.

Photograph P-10. Cheesebush – Sweetbush Scrub in the northeastern portion of the study area; view facing west. Photographed April 13, 2023.

Photograph P-11. California Joint fir – Longleaf Joint-fir Scrub (*Ephedra californica – Ambrosia salsola* Association) in the southeast corner of the study area; view facing north. Photographed April 20, 2023.

Photograph P-12. Example of aeolian sands, where tighter transects were performed, at the south end of study area.

Photograph P-13. Less than 1-day-old scat from a subadult desert tortoise. Photographed April 4, 2023.

Photograph P-14. Less than 1-month-old scat from a juvenile desert tortoise. Photographed May 11, 2023.

Photograph P-15. Example of a Class 2 desert tortoise burrow. Photographed April 7, 2023.

Photograph P-16. Example of a Class 3 desert tortoise burrow. Photographed March 27, 2023.

Photograph P-17. Example of a Class 4 desert tortoise burrow. Photographed March 27, 2023.

Photograph P-18. Example of a Class 5 desert tortoise burrow. Photographed March 28, 2023.

Photograph D-19. Closeup of windblown sand habitat suitable for the Mojave fringe-toed lizard in the wash outside of the project boundary. An individual was found sheltering in the burrow in the foreground. Photographed July 11, 2023.

Photograph P-20. Adult Mojave fringe-toed lizard sheltering under a creosote bush; the individual was observed outside of the project boundary. Photographed April 26, 2023.

Photograph P-21. Black-throated sparrow nest in white bursage. Photographed April 6, 2023.

Photograph P-22. Horned lark nest at the base of a creosote bush. Photographed April 18, 2023.

Photograph P-23. Whitewash (feces) where a burrowing owl was observed during the habitat assessment. Photographed June 6, 2023.

Photograph P-24. Whitewash (indicated by red circle) near the entrance of a potential burrowing owl burrow that was identified during the habitat assessment. Photographed March 29, 2023.

Photograph P-25. Inactive badger den showing no webbing at the entrance and no fresh soil pile. Photographed March 25, 2023.

Photograph P-26. Active kit fox den exhibiting a characteristic keyhole den entrance, fresh prints leading to and from the burrow entrance, and sign of fresh excavation as indicated by silty sand near entrance. Photographed July 6, 2023.

Photograph P-27. Kit fox tracks, an indication of relatively recent activity closely linked to the depicted den. Photographed July 6, 2023.

Photograph P-28. Relatively fresh kit fox scat compared with old scat found near the depicted den. Photographed July 6, 2023.

Photograph P-29. Desert bighorn sheep skull found in the south-central portion of the study area. Photographed March 29, 2023.

Photograph P-30. *Muilla* sp. voucher specimen. Photographed April 2023.

Photograph P-31. *Muilla* sp. fruiting inflorescence. Photographed April 2023.

Photograph P-32. *Muilla* sp. corm. Photographed April 2023.

Photograph P-33. *Muilla* sp. close-up of seed capsule and substrate. Photographed April 2023.

APPENDIX Q

Plant and Wildlife Species with the Potential to Occur within 10 Miles of the Project Area

Table Q-1. Plant Species with the Potential to Occur within 10 Miles of the Project Area

Scientific Name	Common Name
Adoxaceae (Moschatel Family)	
Sambucus mexicana	Mexican elder
Agavaceae (Agave Family)	
Hesperocallis undulata	desert lily
Aizoaceae (Fig-marigold Family)	
*Mesembryanthemum nodiflorum**	small flowered iceplant
Sesuvium verrucosum	sea purslane, verrucose seapurslane, verrucose sea-purslane, western purslane, western seapurslane
Trianthema portulacastrum	desert horsepurslane, desert horse-purslane, horse purslane
Amaranthaceae (Amaranth Family)	
Allenrolfea occidentalis	iodinebush
Amaranthus albus	pigweed, pigweed amaranth, prostrate pigweed, tumble pigweed, tumbleweed, white pigweed
Amaranthus blitoides	mat amaranth, prostrate amaranth, prostrate pigweed
Amaranthus fimbriatus	fringed amaranth, fringed pigweed
Amaranthus palmeri	carelessweed, Palmer's amaranth
Amaranthus torreyi	Torrey's amaranthus
Atriplex canescens var. canescens	fourwing saltbush
Atriplex confertifolia	shadscale, shadscale saltbush, spiny saltbush
Atriplex elegans var. elegans	wheelscale saltbush
Atriplex elegans var. fasciculata	wheelscale, wheelscale saltbush
Atriplex hymenelytra	desert holly, desertholly, Yuma desert holly
Atriplex lentiformis ssp. lentiformis	big saltbush
Atriplex phyllostegia	arrow saltbush, arrow saltweed, leafcover saltweed
Atriplex polycarpa	all-scale, cattle sppinach
Atriplex rosea	redscale
Bassia hyssopifolia	fivehook bassia, fivehorn smotherweed, smotherweed
Chenopodium album	pigweed
Chenopodium fremontii	Fremont's goosefoot
Chenopodium incanum var. occidentale	mealy goosefoot
Chenopodium leptophyllum	narrowleaf goosefoot, narrowleaf lambsquarters, narrowleaved goosefoot, slimleaf goosefoot, slimleaf lambsquarters
Chenopodium murale	nettleleaf goosefoot, nettle-leaf goosefoot
Cycloloma atriplicifolium	tumble ringwing, winged pigweed, winged-pigweed
Grayia spinosa	spiny hopsage
Halogeton glomeratus	barilla, saltlover
Krascheninnikovia lanata	winterfat
Nitrophila occidentalis	boraxweed, western niterwort
Salsola paulsenii	barbwire Russian thistle

Scientific Name	Common Name
Salsola tragus	tumbleweed
Suaeda moquinii	alkali seepweed, Mojave seablite, shrubby seepweed, Torrey's seepweed
Tidestromia lanuginosa	honeymat, woolly tidestromia
Tidestromia oblongifolia	Arizona honeysweet, honeysweet tidestromia
Tidestromia suffruticosa var. Oblongifolia	honeysweet
Amaryllidaceae (Amaryllis Family)	
Allium atrorubens var. cristatum	darkred onion, Wild onion
Allium nevadense	Nevada onion
Muilla coronata	crowned muilla
Muilla transmontana	inland muilla
Anacardiaceae (Sumac Family)	
Rhus trilobata	skunkbush sumac
Apiaceae (Parsley Family)	
Bowlesia incana	hairy bowlesia, hoary bowlesia
Cymopterus gilmanii	Gilman's springparsley
Cymopterus multinervatus	Arizona springparsley, purplenerve springparsley, wild parsnip
Cymopterus panamintensis var. acutifolius	Panamint springparsley
Cymopterus purpurascens	Utah springparsley, widewing spring parsley, widewing springparsley
Daucus pusillus	American wild carrot, rattlesnake carrot, rattlesnake weed, southwest wild carrot
Lomatium nevadense var. nevadense	Nevada biscuitroot
Lomatium nevadense var. parishii	Parish's biscuitroot
Lomatium parryi	Parry's biscuitroot, Utah desertparsley, Utah desert-parsley
Yabea microcarpa	false carrot, false hedge-parsley, falsecarrot
Apocynaceae (Dogbane Family)	
Amsonia tomentosa	woolly amosonia, woolly bluestar
Apocynum cannabinum	common dogbane, dogbane, hemp dogbane, Indian hemp, Indian-hemp, prairie dogbane
Asclepias asperula ssp. asperula	antelope horns, spider milkweed
Asclepias erosa	desert milkweed
Asclepias nyctaginifolia	Mojave milkweed
Asclepias subulata	desert milkweed, rush milkweed
Cynanchum utahense	Utah astephanus, Utah swallowwort, Utah swallow-wort
Funastrum hirtellum	Funastrum hirtellum
Funastrum utahense (CRPR 4.2)*	Utah vine milkweed
Nerium oleander	oleander
Sarcostemma cynanchoides ssp. hartwegii	Hartweg's twinevine
Sarcostemma hirtellum	hairy milkweed

Scientific Name	Common Name
Arecaceae (Palm Family)	
Phoenix reclinata	reclining date palm, Senegal date palm
Washingtonia filifera	California fan palm
Washingtonia robusta	Mexican fan palm, Washington fan palm
Asclepiadaceae (Milkweed Family)	
Asclepias erosa	Desert Milkweed
Sarcostemma cynanchoides hartwegii	Climbing-milkweed, Townula
Asparagaceae (Asparagus Family)	
Agave deserti	desert agave
Agave utahensis	Utah agave
Dichelostemma capitatum ssp. pauciflorum	bluedicks
Hesperocallis undulata	desert lily
Yucca baccata	banana yucca, datil yucca
Yucca brevifolia	Joshua tree
Yucca schidigera	Mojave yucca, Spanish dagger
Asteraceae (Aster Family)	
Acamptopappus shockleyi	Shockley's goldenhead
Acamptopappus sphaerocephalus var. hirtellus	rayless goldenhead
Acroptilon repens	hardheads, Russian knapweed, Turestan thistle
Adenophyllum cooperi	Cooper's dogweed, Cooper's dyssodia
Adenophyllum porophylloides	San Felipe dogweed, San Felipe dyssodia
Ageratina herbacea	fragrant snakeroot, herbaceous joepyeweed
Ambrosia acanthicarpa	annual bursage, bursage, bursage ragweed, flatspine bur ragweed, flatspine burr ragweed, flat-spine burr-ragweed, sand bursage
Ambrosia artemisiifolia	annual ragweed, common ragweed, low ragweed, ragweed, Roman wormwood, short ragweed, small ragweed
Ambrosia confertiflora	ragweed, weakleaf bur ragweed, weakleaf burr ragweed
Ambrosia dumosa	burrobush, white bursage
Ambrosia eriocentra	hollyleaf bursage, woolly bursage, woolly fruit bur ragweed, woolly fruit burr ragweed, wooly bursage
Ambrosia salsola	burrobrush
Amphipappus fremontii ssp. fremontii	Fremont's chaffbush
Amphipappus fremontii ssp. spinosus	chaffbush, Fremont's chaffbush
Anisocoma acaulis	scale bud, scalebud
Artemisia biennis	biennial sagewort, biennial wormwood
Artemisia bigelovii	Bigelow sage, Bigelow sagebrush, Bigelow's sagebrush
Artemisia dracunculus	false tarragon, green sagewort, silky wormwood, tarragon, wormwood
Artemisia ludoviciana ssp. albula	gray sagewort, white sagebrush, white sagewort
Artemisia ludoviciana ssp. incompta	Columbia River wormwood, mountain sagewort, white sagebrush

Scientific Name	Common Name
Artemisia nova	black sagebrush
Artemisia spinescens	bud sagebrush
Artemisia tridentata ssp. parishii	big sagebrush
Artemisia tridentata ssp. tridentata	basin big sagebrush, big sagebrush
Aster subulatus var. ligulatus	annual saltmarsh aster, panicled aster, saltmarsh aster, slender aster, southern annual saltmarsh aster
Atrichoseris platyphylla	gravel ghost, parachute plant, parachute-plant
Baccharis brachyphylla	shortleaf baccharis
Baccharis salicifolia	mule-fat, mule's fat, seep willow, seepwillow, seepwillow baccharis
Baccharis sergiloides	desert baccharis, squaw waterweed baccharis
Bahia dissecta	ragleaf bahia
Baileya multiradiata	desert baileya, desert marigold
Baileya pauciradiata	laxflower
Baileya pleniradiata	desertmarigold baileya, woolly desert marigold, woolly desert-marigold
Bebbia juncea	sweetbush, sweetbush bebbia
Brickellia arguta var. arguta	pungent brickellbush, spearleaf brickellia
Brickellia atractyloides	hollyleaf brickellbush, spearleaf brickellbush
Brickellia californica	California brickellbush, Jepson's brickellbush
Brickellia desertorum	desert brickellbush
Brickellia incana	white brickellbush, woolly brickellbush
Brickellia microphylla	littleleaf brickellbush
Brickellia multiflora	
Brickellia oblongifolia var. linifolia	narrow leaf brickellbush, narrowleaf brickellbush
Brickellia watsonii	
Calycoseris parryi	yellow tackstem
Calycoseris wrightii	white tackstem
Centaurea melitensis	Malta starthistle, Maltese star thistle, Maltese star-thistle, Napa thistle, spotted knapweed, tocalote
Chaenactis carphoclinia var. carphoclinia	pebble pincushion, Peeble pincushion
Chaenactis fremontii	Fremont's pincushion, morningbride, pincushion flower
Chaenactis macrantha	bighead dustymaiden, bighead pincushion, large-flower pincushion
Chaenactis stevioides	Esteve's pincushion, Steve's dusty maiden, Steve's dustymaiden, Steve's pincushion
Chaetopappa ericoides	rose heath, smallflower aster
Chamomilla suaveolens	Pineapple weed
Chrysothamnus depressus	rabbit brush
Chrysothamnus nauseosus ssp. hololeucus	
Chrysothamnus nauseosus ssp. leiospermus	
Chrysothamnus nauseosus ssp. mohavensis	

Scientific Name	Common Name
Chrysothamnus paniculatus	
Chrysothamnus teretifolius	
Chrysothamnus viscidiflorus ssp. viscidiflorus	Douglas' rabbitbrush, green rabbitbrush, yellow rabbitbrush
Cirsium neomexicanum	thistle
Cirsium nidulum	
Conyza canadensis	horseweed
Coreopsis bigelovii	Bigelow's tickseed
Dicoria canescens	desert twinbugs
Encelia actonii	Acton's brittlebush
Encelia farinosa	brittle-bush
Encelia frutescens	bush encelia, button brittlebush
Encelia virginensis	Virgin River brittlebush, Virgin River encelia
Enceliopsis nudicaulis	naked-stemmed sunray
Ericameria cuneata var. spathulata	cliff goldenbush, cliff heathgoldenrod
Ericameria laricifolia	turpentine bush
Ericameria linearifolia	narrowleaf goldenbush, slimleaf goldenbush
Ericameria nana	dwarf goldenbush, low goldenbush
Erigeron aphanactis var. aphanactis	rayless shaggy daisy, rayless shaggy fleabane
Erigeron breweri var. covillei	Coville's erigeron
Erigeron breweri var. porphyreticus	Brewer's daisy, Brewer's fleabane
Erigeron concinnus var. concinnus	Navajo daisy, Navajo fleabane
Erigeron divergens	spreading daisy, spreading fleabane
Erigeron uncialis ssp. uncialis	lone daisy, lone fleabane
Erigeron utahensis	Utah fleabane
Eriophyllum ambiguum var. paleaceum	beautiful woolly sunflower, beautiful woollysunflower
Eriophyllum ambiguum	woolly-daisy
Eriophyllum lanosum	white easterbonnets
Eriophyllum pringlei	Pringle's eriophyllum, Pringle's woolly sunflower, wooly sunflower
Eriophyllum wallacei	woolly easterbonnets
Filago californica	California cottonrose, California fluffweed
Filago depressa	dwarf cottonrose, dwarf filago
Geraea canescens	desert sunflower
Glyptopleura marginata	carveseed
Gnaphalium palustre	cudweed, lowland cudweed, marsh everlasting, western marsh cudweed
Gnaphalium stramineum	
Gutierrezia microcephala	matshweed, broomweed
Gutierrezia sarothrae	broom snakeweed, broomweed, perennial snakeweed, stinkweed, turpentine weed, yellow top

Scientific Name	Common Name
Helianthus annuus	annual sunflower, common sunflower, sunflower, wild sunflower
Heliomeris multiflora var. nevadensis	Nevada goldeneye, Nevada goldeneyes
Hymenoclea salsola var. pentalepis	burrobrush, white burrobrush
Hymenoclea salsola var. salsola	burrobrush, white burrobrush
Hymenopappus filifolius var. eriopodus	fineleaf hymenopappus
Hymenopappus filifolius var. megacephalus	fineleaf hymenopappus
Hymenoxys acaulis var. arizonica	Arizona hymenoxys
Hymenoxys cooperi	Cooper's hymenoxys, Cooper's rubberweed
Isocoma acradenia ssp. acradenia	alkali goldenbush
Isocoma acradenia ermophila	desert isocoma
Isocoma menziesii var. vernonioides	Menzies' goldenbush
Lactuca serriola	wild lettuce
Lasthenia gracilis	needle goldfields
Layia glandulosa	white tidy-tips
Lepidospartum latisquamum	Nevada broomsage
Lepidospartum squamatum	California broomsage, California scalebroom
Logfia depressa	dwarf cottonrose
Machaeranthera arida	arid machaeranthera, arid tansyaster
Machaeranthera canescens var. leucanthemifolia	whiteflower tansyaster
Machaeranthera carnosa	shrubby alkali aster, shrubby alkali tansyaster, shrubby alkaliaster
Machaeranthera gracilis	slender goldenweed
Machaeranthera tanacetifolia	Takhoka-daisy, tanseyleaf aster, tanseyleaf goldenweed, tanseyleaf tansyaster
Malacothrix coulteri	snake's head
Malacothrix glabrata	desert dandelion
Malacothrix sonchoides	sowthistle desert dandelion, sowthistle desertdandelion, yellow-saucers
Malacothrix stebbinsii	Stebbins' desert dandelion, Stebbins' desertdandelion
Monoptilon bellidiforme	desert star
Monoptilon bellioides	desertstar, Mojave desertstar
Nicolletia occidentalis	hole-in-the-sand pland
Palafoxia arida var. arida	desert palafox, desert palafoxia
Pectis papposa var. papposa	manybristle chinchweed, manybristle cinchweed, many-bristle cinchweed
Perityle emoryi	rock-daisy
Perityle megalocephala var. oligophylla	limestone rockdaisy, small-leaved rockdaisy
Petradoria pumila ssp. pumila	rock-goldenrod
Peucephyllum schottii	pygmy cedar, pygmycedar, Schott's pygmycedar
Pleurocoronis pluriseta	arrowleaf, bush arrowleaf
Pluchea sericea	arrowweed

Scientific Name	Common Name
Porophyllum gracile	slender poreleaf, yerba de venado
Prenanthella exigua	brightwhite, feeble prenanthella
Psathyrotes annua	annual psathyrotes, mealy rosettes, turtleback
Psathyrotes ramosissima	turtleback, velvet turtleback
Psilostrophe cooperi	paperflower
Rafinesquia californica	California chicory
Rafinesquia neomexicana	desert chicory
Sanvitalia abertii	Albert's creeping zinnia
Senecio flaccidus var. monoensis	green groundsel, Mono groundsel, Mono ragwort
Senecio mohavensis	ragwort
Senecio multilobatus	ragwort
Solidago confinis	goldenrod
Sonchus asper ssp. asper	sow-thistle
Sonchus oleraceus	annual sowthistle, common sowthistle, common sow-thistle, pualele, sow thistle, sow-thistle
Stephanomeria exigua ssp. exigua	Schott's wirelettuce, small wirelettuce, wire lettuce
Stephanomeria parryi	Parry's wire lettuce, Parry's wirelettuce
Stephanomeria pauciflora	Stephanomeria pauciflora
Stylocline intertexta	Morefield's neststraw
Stylocline micropoides	desert nest-straw
Syntrichopappus fremontii	Fremont's gold, yellow-ray Fremont's-gold, yellowray Fremont's-gold
Taraxacum officinale	dandelion
Tetradymia argyraea	striped horsebush
Tetradymia axillaris var. axillaris	longspine horsebrush
Tetradymia canescens	spineless gorsebush
Tetradymia stenolepis	Mojave cottonthorn, Mojave horsebrush
Thymophylla pentachaeta var. belenidium	firehair dogweed, fiveneedle pricklyleaf
Trichoptilium incisum	yellow-head
Uropappus lindleyi	Lindley's silverpuffs
Viguiera parishii	Parish's goldeneye
Xylorhiza tortifolia var. tortifolia	Mojave aster, Mojave woodyaster
Berberidaceae (Barberry Family)	
Berberis fremontii	Fremont's berberis
***Bignoniaceae* (Bignonia Family)**	
Chilopsis linearis ssp. arcuata	desert willow, hairy clematis
Boraginaceae (Borage Family)	
Amsinckia menziesii var. intermedia	coast buckthorn, coast fiddleneck, common fiddleneck, intermediate fiddleneck
Amsinckia tessellata var. tessellata	bristly fiddleneck

Scientific Name	Common Name
Cryptantha angustifolia	bristlelobe cryptantha, narrowleaf pick-me-not, Panamint catseye, Panamint cryptantha
Cryptantha barbigera	bearded catseye, bearded cryptantha
Cryptantha circumscissa	cushion catseye, cushion cryptantha, matted cryptantha
Cryptantha confertiflora	basin yellow catseye, basin yellow cryptantha, roundleaf cryptantha
Cryptantha decipiens	gravel cryptantha, gravel-bar catseye, gravelbar cryptantha
Cryptantha dumetorum	bush-loving catseye, bushloving cryptantha
Cryptantha flavoculata	roughseed catseye, rough-seed catseye, roughseed cryptantha
Cryptantha gracilis	narrowstem catseye, narrowstem cryptantha, narrowstem pick-me-not
Cryptantha maritima	Guadalupe catseye, Guadalupe cryptantha
Cryptantha micrantha	purpleroot pick-me-not, redroot catseye, redroot cryptantha
Cryptantha nevadensis	Nevada catseye, Nevada cryptantha
Cryptantha pterocarya	winged pick-me-not, wingnut catseye, wingnut cryptantha
Cryptantha pterocarya var. *pterocarya*	wingnut cryptantha
Cryptantha racemosa	brushy cryptantha, bushy cryptantha, forget-me-not cryptantha
Cryptantha recurvata	curvednut cryptantha, curvenut catseye, curvenut cryptantha
Cryptantha tumulosa	Mojave cryptantha, New York Mountain cryptantha
Cryptantha utahensis	scented catseye, scented cryptantha, Utah cryptantha
Cryptantha virginensis	Virgin River catseye, Virgin River cryptantha, Virgin Valley cryptantha
Eremocarya micrantha var. *micrantha*	desert red-root
Eriodictyon angustifolium	narrowleaf yerba santa, yerba santa
Heliotropium curassavicum	Seaside heliotrope
Johnstonella angustifolia	narrow-leaved johnstonella
Lithospermum incisum	puccoon
Nama demissum var. demissum	purple mat, purplemat
Nama depressum	depressed fiddleleaf, narrowleaf nama
Nama pusillum	eggleaf fiddleleaf, egg-leaf fiddleleaf, smallleaf nama
Pectocarya heterocarpa	chuckwalla combseed
Pectocarya penicillata	shortleaf combseed, sleeping combseed, winged combseed
Pectocarya platycarpa	broadfruit combseed, broadnut combseed
Pectocarya recurvata	combbur, curvenut combseed, recurve combseed
Pectocarya setosa	bristly combseed, moth combseed
Plagiobothrys arizonicus	popcorn flower
Plagiobothrys jonesii	Jones' popcornflower, Mojave popcornflower
Tiquilia plicata	plicata coldenia
Brassicaceae (Mustard Family)	
Arabis glaucovalvula	rock-cress
Arabis perennans	perennial rockcress

Scientific Name	Common Name
Arabis pulchra var. gracilis	beautiful rockcress, desert rockcress
Brassica nigra	black mustard
Brassica tournefortii	African mustard, Asian mustard, Tournefort's birdrape, wild turnip
Capsella bursa-pastoris	shepherdspurse, shepherd's-purse
Cardaria pubescens	globe-pod hoarycress, globe-podded hoarycress, hairy whitetop, hoary cress, whitetop
Caulanthus cooperi	Cooper's wild cabbage, Cooper's wildcabbage
Caulanthus crassicaulis	wild-cabbage
Caulanthus lasiophyllus	California mustard
Caulanthus major	slender wild cabbage, slender wildcabbage
Descurainia californica	Sierra tansy-mustard
Descurainia pinnata ssp. glabra	tansy-mustard
Descurainia pinnata ssp. halictorum	western tansy mustard, western tansymustard
Descurainia sophia	tansy-mustard
Dithyrea californica	California shieldpod, California spectaclepod, spectaclepod
Draba cuneifolia	wedgeleaf draba, wedgeleaf whitlowgrass
Guillenia lasiophylla	California mustard, coast wild cabbage, hairyleaf wildcabbage
Halimolobos jaegeri	Mojave halimolobos
Hirschfeldia incana	shortpod mustard
Hutchinsia procumbens	ovalpurse, prostrate hutchinsia
Lepidium fremontii var. fremontii	desert pepperweed
Lepidium lasiocarpum var. lasiocarpum	hairypod pepperweed, hairy-pod pepperwort, shaggyfruit pepperweed
Lepidium latifolium	broadleaf pepperweed, broadleaved peppergrass, broadleaved pepperweed, peppergrass mustard, perennial peppercress, perennial pepperweed, tall whitetop, Virginia pepperweed
Lepidium montanum var. cinereum	mountain pepperweed
Lepidium virginicum var. pubescens	hairy pepperweed
Lesquerella kingii ssp. kingii	King bladderpod, King's bladderpod
Lesquerella kingii ssp. latifolia	bladderpod
Lesquerella tenella	Moapa bladderpod
Malcolmia africana	African addersmouth, African malcolmia, African mustard
Physaria chambersii	double bladder pod
Rorippa nasturtium-aquaticum	water-cress
Sisymbrium irio	London rocket, rocketmustard
Sisymbrium orientale	Indian hedgemustard, Indian hedge-mustard, oriental hedgemustard
Stanleya pinnata var. pinnata	desert princesplume, golden prince's-plume, pinnate princesplume
Streptanthella longirostris	longbeak fiddle mustard, longbeak streptanthella
Streptanthus cordatus var. cordatus	heartleaf twistflower

Scientific Name	Common Name
Thelypodium integrifolium ssp. affine	entireleaved thelypody
Thysanocarpus curvipes	common fringe pod
Thysanocarpus laciniatus	mountain fringepod, narrowleaf lacepod, Santa Cruz Island fringepod
Cactaceae (Cactus Family)	
Cylindropuntia echinocarpa	silver cholla
Cylindropuntia ramosissima	branched pencil cholla
Echinocactus polycephalus var. polycephalus	cottontop cactus
Echinocereus engelmannii	hedgegog cactus
Echinocereus engelmanii var. chrysocentrus	Saints' cactus
Echinocereus triglochidiatus	claretcup hedgehog, kingcup cactus, Mojave mound cactus
Escobaria vivipara var. deserti	desert spinystar
Escobaria vivipara var. rosea	spinystar, spinystar pincushion cactus
Ferocactus cylindraceus var. lecontei	Leconte's barrel cactus, redspine barrel cactus
Mammillaria tetrancistra	fishhook cactus, nipple cactus
Opuntia acanthocarpa var. coloradensis	Colorado buckhorn cholla
Opuntia basilaris var. basilaris	beavertail pricklypear
Opuntia bigelovii	teddybear cholla
Opuntia chlorotica	pancake-pear
Opuntia echinocarpa	golden cholla, silver cholla
Opuntia engelmannii var. engelmannii	cactus apple, desert pricklypear, Engelmann's pricklypear
Opuntia erinacea var. erinacea	grizzlybear pricklypear
Opuntia parishii	matted cholla
Opuntia phaeacantha	brownspine pricklypear, tulip pricklypear
Opuntia polyacantha var. rufispina	hairspine pricklypear, plains pricklypear, red-spine pricklypear
Opuntia ramosissima	diamond cholla, pencil cholla
Sclerocactus polyancistrus	Mohave fishhook cactus, Mojave fishhook cactus, redspined fishhook cactus
Campanulaceae (Bellflower Family)	
Nemacladus glanduliferus var. orientalis	glandular threadplant
Nemacladus orientalis	eastern glandular nemacladus
Nemacladus rubescens	desert threadplant
Nemacladus sigmoideus	sigmoid threadplant, smallflower threadplant
Nemacladus tenuis var. *aliformis*	desert namacladus
Cannabaceae (Hemp Family)	
Cannabis sativa	hemp, marijuana
Celtis reticulata	netleaf hackberry, palo blanco
Capparaceae (Caper Family)	
Cleomella obtusifolia	bushy cleomella

Scientific Name	Common Name
Caprifoliaceae (Honeysuckle Family)	
Symphoricarpos longiflorus	waxberry
Caryophyllaceae (Carnation Family)	
Achyronychia cooperi	frost-mat, onyx flower
Arenaria congesta var. charlestonensis	Charleston sandwort
Arenaria macradenia var. macradenia	Mojave sandwort
Scopulophila rixfordii	rockwort
Silene antirrhina	catchfly, sleepy campion, sleepy catchfly, sleepy silene
Silene verecunda ssp. andersonii	Anderson's campion, San Francisco campion
Spergularia sp.	spurrey
Celastraceae (Staff-vine Family)	
Mortonia utahensis	Utah mortonia
Chenopodiaceae (Goosefoot Family)	
Allenrolfea occidentalis	iodine bush
Atriplex canescens canescens	hoary saltbush
Atriplex hymenelytra	desert-holly
Atriplex lentiformis lentiformis	lens-fruited saltbush, quail brush
Atriplex phyllostegia	arrow saltbush
Atriplex polycarpa	allscale saltbush
Salsola tragus	prickly Russian thistle
Cleomaceae (Spider Family)	
Cleome lutea	spider flower
Cleomella obtusifolia	Mojave cleomella, Mojave stinkweed
Isomeris arborea	
Wislizenia refracta ssp. refracta	spectacle fruit
Convolvulaceae (Morning glory Family)	
Convolvulus arvensis	creeping jenny, European bindweed, field bindweed, perennial morningglory, smallflowered morningglory
Cressa truxillensis	alkaliweed, spreading alkaliweed
Cuscuta californica var. californica	California dodder, chaparral dodder
Cuscuta denticulata	desert dodder
Crassulaceae (Stonecrop Family)	
Dudleya pulverulenta ssp. arizonica	chalk-lettuce
Dudleya saxosa ssp. aloides	Panamint liveforever
Sedum niveum	Davidson's stonecrop
Crossosomataceae (Rockflower Family)	
Glossopetalon pungens	dwarf greasebush, smooth greasebush
Glossopetalon spinescens	spiny greasebush

Scientific Name	Common Name
Cucurbitaceae (Cucumber Family)	
Cucurbita foetidissima	buffalo gourd, buffalogourd pumpkin, calabazilla, foetid gourd, Missouri gourd, wild gourd, wild pumkin
Cucurbita palmata	coyote gourd, coyote melon
Cupressaceae (Cypress Family)	
Juniperus californica	California juniper
Juniperus osteosperma	Utah juniper
Cyperaceae (Sedge Family)	
Carex alma	Alma sedge, sturdy sedge
Carex aurea	golden sedge, golden-fruit sedge
Carex hassei	Hasse's sedge, salt sedge, saltsedge
Carex occidentalis	western sedge
Carex praegracilis	clustered field sedge, slim sedge
Carex rossii	Ross sedge, Ross' sedge, Ross's sedge, shortstemmed sedge
Carex subfusca	brown sedge
Cyperus eragrostis	tall flatsedge
Cyperus squarrosus	awned flat sedge, bearded flatsedge, bearded nutgrass
Eleocharis parishii	Parish spikerush, Parish's spikerush
Scirpus americanus	
Scirpus pungens	
Ehretiaceae (Tropical Family)	
Pholisma arenarium	desert Christmas tree
Tiquilia canescens	ratear coldenia, woody crinklemat
Tiquilia nuttallii	Nuttall's crinklemat, Nuttall's tiquilia, rosette crinklemat
Tiquilia palmeri	Palmer's coldenia, Palmer's crinklemat, Palmer's tiquilia
Tiquilia plicata	fanleaf crinklemat, fan-leaf crinklemat, fanleaf tiquilia
Ephedraceae (Ephedra Family)	
Ephedra aspera	aspera Mormon tea, boundary ephedra, Mormon tea, rough jointfir
Ephedra californica	California jointfir, California Mormon tea
Ephedra fasciculata var. clokeyi	
Ephedra funerea	Death Valley ephedra, Death Valley jointfir, funera Mormon tea
Ephedra nevadensis	Nevada ephedra, Nevada jointfir, Nevada Mormon tea
Ephedra viridis	green ephedra, green Mormon tea, Mormon tea
Equisetaceae (Horsetail Family)	
Equisetum laevigatum	scouring rush
Ericaceae (Heath Family)	
Arctostaphylos patula	greenleaf manzanita
Arctostaphylos pungens	Mexican manzanita, pointleaf manzanita

Scientific Name	Common Name
Euphorbiaceae (Euphorbia Family)	
Chamaesyce abramsiana	Abrams' sandmat, Abrams' spurge
Chamaesyce albomarginata	rattlesnake weed, whitemargin euphorbia, whitemargin sandmat, whitemargin spurge
Chamaesyce fendleri	Fendler's sandmat
Chamaesyce micromera	desert spurge, Sonoran sandmat
Chamaesyce ocellata ssp. arenicola	Contura Creek sandmat
Chamaesyce parishii	Parish's sandmat, Parish's spurge
Chamaesyce parryi	Parry's sandmat, Parry's spurge
Chamaesyce polycarpa	manyfruit spurge, smallseed sandmat, small-seed sandmat
Chamaesyce revoluta	threadstem sandmat, thread-stem sandmat, threadstem spurge
Chamaesyce serpyllifolia	thymeleaf sandmat, thyme-leaf sandmat
Chamaesyce setiloba	Yuma sandmat, Yuma spurge
Croton californicus	California croton
Ditaxis neomexicana	
Ditaxis serrata	California silverbush, New Mexico silverbush, Yuma silverbush
Euphorbia exstipulata var. exstipulata	Clark Mountain spurge, squareseed spurge
Euphorbia incisa	Mojave spurge
Euphorbia micromera	Sonoran sandmat
Euphorbia polycarpa	smallseed sandmat
Stillingia linearifolia	tooth-leaf
Stillingia spinulosa	annual stillingia, annual toothleaf
Tragia ramosa	branched noseburn, branched tragia, catnip noseburn, noseburn
Fabaceae (Pea Family)	
Acacia greggii	catclaw, catclaw acacia, devilsclaw, Gregg's catclaw, Texas catclaw
Acmispon strigosus	strigose lotus
Astragalus acutirostris	locoweed
Astragalus allochrous var. playanus	halfmoon milkvetch, playanus locoweed, Wooton's loco, Wooton's milkvetch
Astragalus bernardinus	lesser threekeel milkvetch, San Bernardino milkvetch
Astragalus calycosus var. calycosus	Torrey milkvetch, Torrey's milkvetch
Astragalus cimae var. cimae	cima milkvetch, Cima rattleweed
Astragalus didymocarpus var. didymocarpus	dwarf white milkvetch
Astragalus didymocarpus var. dispermus	dwarf white milkvetch, Wickenburg milkvetch
Astragalus layneae	widow's milkvetch
Astragalus lentiginosus var. borreganus	rattleweed
Astragalus lentiginosus var. fremontii	Fremont's milkvetch
Astragalus minthorniae var. villosus	Minthorn's milkvetch
Astragalus mohavensis var. mohavensis	Mojave milkvetch

Scientific Name	Common Name
Astragalus newberryi	wooly pod
Astragalus nutans	chuckwalla milkvetch, Providence Mountain milkvetch
Astragalus nuttallianus var. imperfectus	imperfect milkvetch, turkey peas, turkeypeas
Astragalus purshii var. tinctus	dyed milkvetch, woollypod milkvetch
Astragalus tidestromii	Tidestrom's milkvetch
Caesalpinia gilliesii	bird of paradise
Cercidium floridum var floridum	border palo verde
Dalea mollis	hairy prairie clover, soft dalea
Dalea mollissima	hairy dalea, soft prairie clover
Dalea searlsiae	Searles dalea, Searles' prairie clover, Searle's prairieclover
Glycyrrhiza lepidota	American licorice, licorice, wild licorice
Hoffmannseggia glauca	hog potato, Indian rushpea, pignut, shoestring weed
Lotus argyraeus var. multicaulis	canyon birdsfoot trefoil, canyon bird's-foot trefoil
Lotus argyraeus var. notitius	canyon bird's-foot trefoil
Lotus humistratus	foothill deervetch, maresfat
Lotus rigidus	rock-pea
Lotus salsuginosus var. brevivexillus	Arizona maresfat, coastal bird's-foot trefoil, coastal trefoil
Lotus strigosus	Bishop's lotus, strigose bird's-foot trefoil, strigose bird's-foot-trefoil
Lupinus argenteus var. argenteus	silver-stem lupine, silvery lupine
Lupinus arizonicus	Arizona lupine
Lupinus brevicaulis	shortstem lupine
Lupinus concinnus	bajada lupine, elegant lupine, scarlet lupine
Lupinus flavoculatus	yelloweye lupine, yelloweyes
Lupinus microcarpus var. microcarpus	Wide-bannered lupine
Lupinus shockleyi	desert lupine, purple desert lupine
Lupinus sparsiflorus	Coulter's lupine, Mojave lupine
Marina parryi	Parry dalea, Parry's false prairie-clover, Parry's indigobush
Melilotus alba	white sweetclover
Melilotus indica	yellow sweet-clover
Parkinsonia aculeata	Jerusalem thorn, Jerusalem-thorn, Mexican palo verde, retama
Parkinsonia florida	blue paloverde
Prosopis glandulosa var. torreyana	western honey mesquite
Prosopis pubescens	screwbean, screwbean mesquite
Psorothamnus arborescens var. minutifolius	Johnson false dalea, Johnson's dalea, Johnson's indigobush
Psorothamnus fremontii var. fremontii	indigo bush
Psorothamnus spinosus	smoketree
Robinia neomexicana	New Mexico locust
Robinia pseudoacacia	black locust, false acacia, yellow locust
Senna armata	desert senna, desertsenna

Scientific Name	Common Name
Senna covesii	Coues' cassia, Coves' cassia, desert senna
Quercus chrysolepis	canyon live oak
Quercus turbinella	scrub oak, shrub live oak, Sonoran scrub oak, turbinella oak
Garryaceae (Silktassel Family)	
Garrya flavescens	ashy silktassel, yellowleaf silktassel
Gentianaceae (Gentian Family)	
Centaurium exaltatum	desert centaury, Great Basin centaury
Swertia albomarginata	
Geraniaceae (Geranium Family)	
Erodium cicutarium	alfilaree, alfilaria, California filaree, cutleaf filaree, filaree, redstem filaree, redstem stork's bill, stork's bill
Erodium texanum	bull filaree, Texas filaree, Texas fillarie, Texas stork's bill, tufted filaree
Grossulariaceae (Currant Family)	
Ribes cereum var. cereum	wax currant, white squaw currant
Ribes velutinum	desert gooseberry
Heliotropiaceae	
Heliotropium convolvulaceum var. californicum	phlox heliotrope
Heliotropium curassavicum	quail plant, salt heliotrope, seaside heliotrope
Hydrangeaceae (Hydrangea Family)	
Fendlerella utahensis	Utah fendlerbush, Utah fendlerella, yerba desierto
Philadelphus microphyllus	littleleaf mock orange, littleleaf mockorange
Hydrophyllaceae (Waterleaf Family)	
Emmenanthe penduliflora var. penduliflora	whisperingbells
Eucrypta chrysanthemifolia var. bipinnatifida	spotted eucrypta, spotted hideseed
Eucrypta micrantha	dainty desert hideseed, desert eucrypta, desert hideseed
Nama demissum var. demissum	purple mat
Nemophila menziesii var. integrifolia	baby blue eyes, Menzies' baby blue eyes
Phacelia affinis	limestone phacelia, limestone scorpionweed, limestone scorpion-weed, purplebell phacelia
Phacelia anelsonii	Aven Nelson's phacelia, Macbride phacelia, Nelson's phacelia
Phacelia barnebyana	Barneby's phacelia
Phacelia campanularia ssp. vasiformis	desert-bluebell, wild-canterbury bell
Phacelia coerulea	skyblue phacelia, skyblue scorpionweed
Phacelia crenulata var. ambigua	wild-heliotrope
Phacelia crenulata var. crenulata	cleftleaf wildheliotrope, heliotrope phacelia
Phacelia cryptantha	hiddenflower phacelia, hidden-flower scorpion-weed, limestone phacelia
Phacelia curvipes	Washoe phacelia, Washoe scorpion-weed
Phacelia distans	wild-heliothorpe
Phacelia fremontii	yellow-throats

Scientific Name	Common Name
Phacelia ivesiana	Ives' phacelia, Ives' scorpion-weed
Phacelia lemmonii	Lemmon's phacelia, Lemmon's scorpion-weed
Phacelia neglecta	alkali phacelia, alkali scorpion-weed
Phacelia pachyphylla	blacktack phacelia
Phacelia pedicellata	pedicellate phacelia, pedicellate scorpion-weed
Phacelia perityloides var. jaegeri	
Phacelia rotundifolia	natalgrass, roundleaf phacelia, round-leaf scorpion-weed
Phacelia vallis-mortae	Death Valley phacelia, Death valley scorpion-weed
Pholistoma membranaceum	white fiestaflower
Tricardia watsonii	threehearts
Iridaceae (Iris Family)	
Sisyrinchium halophilum	Nevada blue-eyed grass
Juncaceae (Rush Family)	
Juncus balticus	Baltic rush
Juncus bufonius var. bufonius	toad rush
Juncus bufonius var. occidentalis	toad rush
Juncus cooperi	Cooper rush, Cooper's rush
Juncus macrophyllus	longleaf rush
Juncus mexicanus	Mexican rush
Juncus nodosus	jointed rush, knotted rush
Juncus occidentalis	western rush
Juncus torreyi	Torrey rush, Torrey's rush
Juncus xiphioides	irisleaf rush
Krameriaceae (Ratany Family)	
Krameria erecta	littleleaf ratany, range ratany
Krameria grayi	white ratany
Lamiaceae (Mint Family)	
Hedeoma drummondii	Drummond's false pennyroyal, Drummond's pennyroyal
Hedeoma nanum var. californicum	
Marrubium vulgare	horehound, white horehound
Mentha arvensis	field mint, wild mint
Monarda pectinata	horse mint, miners lettuce, plains beebalm, pony beebalm, spotted beebalm
Monardella linoides ssp. linoides	horsemint
Salazaria mexicana	bladdersage, Mexican bladdersage
Salvia columbariae	chia
Salvia dorrii var. dorrii	Dorr's sage, purple sage
Salvia dorrii var. pilosa	purple sage
Salvia mohavensis	Mojave sage
Salvia pachyphylla	blue sage, rose sage

Scientific Name	Common Name
Liliaceae (Lilly Family)	
Calochortus flexuosus	straggling mariposa lily, weakstem mariposa lily, winding mariposa lily
Calochortus kennedyi var. kennedyi	desert mariposa lily
Calochortus kennedyi var. munzii	desert mariposa lily
Linaceae Flax Family)	
Linum lewisii	
Linum puberulum	yellow flax
Loasaceae (Blazingstar Family)	
Eucnide urens	desert rock nettle, desert stingbush, stingbush
Mentzelia albicaulis	white blazingstar, whitestem blazingstar, whitestem stickleaf, white-stemmed evening-star
Mentzelia desertorum	desert blazingstar
Mentzelia involucrata	white bract stickleaf, whitebract blazingstar
Mentzelia laevicaulis	blazingstar mentzelia, smoothstem blazingstar
Mentzelia leucophylla	Ash Meadows blazingstar
Mentzelia multiflora ssp. longiloba	
Mentzelia obscura	Pacific blazingstar, Pacific stickleaf
Mentzelia oreophila	Argus blazingstar
Mentzelia polita	polished blazingstar
Mentzelia pterosperma	wingseed blazingstar, wingseed stickleaf
Mentzelia reflexa	Panamint blazingstar, reflexed blazingstar
Mentzelia veatchiana	Veatch's blazingstar, whitestem blazingstar, whitestem stickleaf
Petalonyx thurberi ssp. thurberi	Thurber's sandpaper plant, Thurber's sandpaperplant
Malvaceae (Mallow Family)	
Abutilon parvulum	dwarf abutilon, dwarf Indian mallow
Ayenia compacta	California ayenia, compact ayenia
Eremalche exilis	white mallow, white-mallow
Eremalche rotundifolia	desert fivespot, desert five-spot
Malvella leprosa	alkali mallow, dollar-weed, scurfy sida
Sphaeralcea ambigua ssp. ambigua	apricot globemallow
Sphaeralcea ambigua var. rugosa	
Sphaeralcea rusbyi ssp. eremicola	Rusby's desert-mallow, Rusby's globemallow
Melanthiaceae (Bunchflower Family)	
Zigadenus brevibracteatus	desert deathcamas
Meliaceae (Mahogany Family)	
Melia azedarach	chinaberry, Chinaberry tree, Indian lilac, lelah, paraiso, pride of India, white cedar
Molluginaceae (Carpetweed Family)	
Mollugo cerviana	slender carpet-weed, threadstem carpetweed, thread-stem carpet-weed

Scientific Name	Common Name
Montiaceae (Miner's lettuce Family)	
Calyptridium monandrum	
Namaceae (Nama Family)	
Nama pusilla	small leaf nama
Nyctaginaceae (Four-o'clock Family)	
Abronia nana ssp. covillei	
Abronia villosa var. villosa	desert sand verbena, woolly desert sand verbena
Allionia incarnata	trailing allionia, trailing four o'clock, trailing windmills
Boerhavia coulteri	Coulter's spiderling
Boerhavia intermedia	fivewing spiderling, five-wing spiderling, Jone's boerhavia
Boerhavia triquetra	slender spiderling
Boerhavia wrightii	largebract spiderling, large-bract spiderling, Wright's boerhavia
Mirabilis bigelovii var. bigelovii	Bigelow's four o'clock, desert wishbonebush, wishbone-bush
Mirabilis bigelovii var. retrorsa	Bigelow's four o'clock, wishbone-bush
Mirabilis coccinea	red four-o'clock, scarlet four o'clock, scarlet four-o'clock
Mirabilis laevis var. *retorsa*	wishbone bush
Mirabilis multiflora var. pubescens	Colorado four o'clock
Mirabilis oblongifolia	
Mirabilis pumila	dwarf four o'clock, dwarf four-o'clock, little four-o'clock
Tripterocalyx micranthus	sandpuffs, smallflower sand verbena, small-flower sandpuffs
Oleaceae (Lilac Family)	
Forestiera pubescens	desert olive, downy forestiera, elbowbush, stretchberry
Fraxinus anomala	singleleaf ash
Menodora scabra	rough menodora
Menodora scoparia	
Menodora spinescens	spiny menodora
Onagraceae (Evening-primrose Family)	
Camissonia boothii ssp. intermedia	Booth's evening primrose, Booth's evening-primrose, intermediate suncup
Camissonia boothii var. condensata	
Camissonia boothii var. desertorum	
Camissonia brevipes ssp. brevipes	golden suncup
Camissonia brevipes pallidula	Desert-primrose
Camissonia californica	California primrose, California suncup
Camissonia campestris ssp. campestris	Mojave suncup
Camissonia chamaenerioides	longcapsule suncup, long-capsule suncup, willowherb suncup
Camissonia claviformis ssp. aurantiaca	browneyes
Camissonia claviformis ssp. claviformis	browneyes
Camissonia claviformis lancifolia	Clavate-fruited primrose
Camissonia claviformis x brevipes	Clavate-fruited primrose

Scientific Name	Common Name
Camissonia kernensis ssp. gilmanii	Gilman's evening primrose, Gilman's evening-primrose, Gilman's suncup
Camissonia munzii	Death Valley suncup
Camissonia pallida ssp. pallida	paleyellow suncup, pale-yellow suncup
Camissonia palmeri	Palmer's evening primrose, Palmer's evening-primrose, Palmer's suncup, sagebrush suncup
Camissonia pterosperma	wingfruit suncup, wing-fruit suncup, wingseed suncup
Camissonia refracta	narrowleaf suncup, narrow-leaf suncup
Camissonia walkeri ssp. tortilis	Walker's suncup
Chylismia brevipes	yellow cups
Chylismia claviformis	clavate fruited primrose
Epilobium canum ssp. latifolium	hummingbird trumpet
Epilobium ciliatum ssp. ciliatum	coast willowweed, fringed willowherb
Eremothera boothii ssp. *condensata*	clustered booth's desert primrose
Eremothera boothii ssp. *decorticans*	shredding evening-primrose
Eremothera boothii ssp. *desertorum*	Booth's desert primrose
Gaura coccinea	scarlet beeblossom, scarlet gaura, Scarlet guara
Oenothera caespitosa ssp. crinita	tufted evening primrose, tufted evening-primrose
Oenothera caespitosa ssp. marginata	tufted evening primrose, tufted evening-primrose
Oenothera californica ssp. avita	California evening primrose, California evening-primrose
Oenothera deltoides ssp. deltoides	birdcage evening primrose, birdcage evening-primrose, birdcage primrose, triangle eveningprimrose
Oenothera longissima	longstem evening primrose, longstem eveningprimrose, longstem evening-primrose
Oenothera primiveris ssp. bufonis	desert evening primrose, desert eveningprimrose, desert evening-primrose
Oenothera primiveris ssp. primiveris	desert evening primrose, desert eveningprimrose, desert evening-primrose
Orobanchaceae (Broomrape Family)	
Aphyllon cooperi	burroweed strangler
Castilleja angustifolia	northwestern Indian paintbrush, northwestern paintbrush
Castilleja linariifolia	Wyoming Indian paintbrush, Wyoming paintbrush
Cordylanthus parviflorus	purple bird'sbeak, purple bird's-beak
Orobanche cooperi	Cooper's broomrape, desert broomrape
Orobanche fasciculata	clustered broomrape, clustered broom-rape, purple broomrape, tufted broomrape
Orobanche parishii ssp. parishii	Parish's broomrape
Papaveraceae (Poppy Family)	
Arctomecon merriamii	desert bearpoppy, white bear desert-poppy, white bearpoppy
Argemone corymbosa	Mojave prickly poppy, Mojave pricklypoppy
Argemone munita	flat-bud prickly poppy, flatbud pricklypoppy
Eschscholzia glyptosperma	desert goldenpoppy, desert poppy

Scientific Name	Common Name
Eschscholzia minutiflora	pygmy goldenpoppy, pygmy poppy
Eschscholzia parishii	Parish's poppy
Platystemon californicus	California creamcups, creamcups
Phrymaceae (Lopseed Family)	
Diplacus bigelovii var. bigelovii	Bigelow's monkeyflower
Mimulus guttatus	common monkeyflower, seep monkeyflower
Mimulus parishii	Parish's monkeyflower
Mimulus pilosus	false monkeyflower
Mimulus rubellus	little redstem monkeyflower, red monkeyflower, redstem monkey-flower
Pinaceae (Pine Family)	
Abies concolor	balsam fir, Colorado fir, concolor fir, silver fir, white balsam, white fir
Pinus edulis	Colorado pinyon, nut pine, piÃ±on pine, pinyon, pinyon pine, two-leaf pinyon, twoneedle pinyon, two-needle pinyon
Pinus monophylla	nut pine, one-leaf pine, singleleaf pinyon
Plantaginaceae (Plantain Family)	
Antirrhinum filipes	tangled snapdragon
Antirrhinum kingii	
Keckiella antirrhinoides var. microphylla	
Maurandya antirrhiniflora	
Mohavea breviflora	golden desert snapdragon, golden desert-snapdragon
Mohavea confertiflora	ghost flower, ghostflower
Penstemon calcareus	limestone beardtongue, limestone penstemon
Penstemon centranthifolius	scarlet bugler
Penstemon clevelandii var. mohavensis	Cleveland's beardtongue
Penstemon eatonii ssp. eatonii	Eaton's penstemon, firecracker penstemon
Penstemon eatonii var. undosus	
Penstemon palmeri var. palmeri	Palmer's penstemon
Penstemon pseudospectabilis	desert penstemon
Penstemon rostriflorus	beaked beardtongue, beakflower penstemon, Bridges' penstemon
Penstemon stephensii	Stephens' beardtongue, Stephens' penstemon
Penstemon thompsoniae	Thompson's beardtongue, Thompson's penstemon
Penstemon thurberi	Thurber's penstemon
Penstemon utahensis	Utah penstemon
Plantago major	broadleaf plantain, buckhorn plantain, common plantain, great plantain, rippleseed plantain
Plantago ovata	desert Indianwheat, desert plantain
Plantago patagonica	woolly Indianwheat, woolly plantain

Scientific Name	Common Name
Poaceae (Grass Family)	
Achnatherum aridum	arid needlegrass, Mormon needlegrass
Achnatherum hymenoides	Indian ricegrass
Achnatherum parishii	Parish achnatherum, Parish's needlegrass
Achnatherum speciosum	desert needlegrass
Agrostis semiverticillata	
Aristida adscensionis	sixweeks threeawn
Aristida purpurea var. fendleriana	Fendler threeawn, Fendler's threeawn
Aristida purpurea var. longiseta	Fendler threeawn, Fendler's threeawn, red threeawn, red threeawn (Fendler)
Aristida purpurea var. nealleyi	blue threeawn
Aristida purpurea var. parishii	Parish threeawn, Parish's threeawn
Aristida purpurea var. purpurea	purple threeawn
Aristida purpurea var. wrightii	wright threeawn, Wright's threeawn
Aristida ternipes var. hamulosa	
Arundo donax	giant reed, giantreed
Avena fatua	flaxgrass, oatgrass, wheat oats, wild oat, wild oats
Bothriochloa barbinodis	cane beardgrass, cane bluestem
Bouteloua aristidoides var. aristidoides	Arizona needle grama, needle grama
Bouteloua barbata var. barbata	six-weeks gramma
Bouteloua curtipendula	sideoats grama
Bouteloua eriopoda	black grama
Bouteloua gracilis	blue grama
Bouteloua trifida	red grama
Bromus arenarius	Australian brome
Bromus carinatus var. carinatus	
Bromus diandrus	ripgut brome
Bromus madritensis ssp. rubens	
Bromus tectorum	cheat grass, cheatgrass, downy brome, early chess, military grass, wild oats
Bromus trinii	
Cynodon dactylon	Bermudagrass, chiendent pied-de-poule, common bermudagrass, devilgrass, grama-seda, manienie, motie molulu
Deschampsia danthonioides	annual hairgrass
Distichlis spicata	desert saltgrass, inland saltgrass, marsh spikegrass, saltgrass, seashore saltgrass
Echinochloa crus-galli var. crus-galli	large barnyardgrass
Elymus elymoides ssp. brevifolius	squirreltail
Elymus elymoides ssp. elymoides	bottlebrush squirreltail, squirreltail
Elymus glaucus ssp. glaucus	blue wild rye, blue wildrye
Elymus multisetus	big squirreltail, big wild rye

Scientific Name	Common Name
Elytrigia intermedia ssp. intermedia	intermediate wheatgrass
Enneapogon desvauxii	feather pappusgrass, nineawn pappusgrass, spike pappusgrass
Eragrostis cilianensis	candy grass, lovegrass, stink grass, stinkgrass, strongscented lovegrass
Erioneuron pilosum	hairy tridens, hairy woollygrass
Erioneuron pulchellum	low woollygrass
Festuca octoflora	sixweeks grass
Hesperostipa comata ssp. comata	needle and thread, needleandthread
Hilaria rigida	big galleta
Hordeum murinum ssp. murinum	wall barley
Hordeum vulgare	barley, cereal barley, common barley
Leymus salinus ssp. mojavensis	Mojave wildrye
Leymus triticoides	beardless lyme grass, beardless wildrye, creeping wildrye
Melica frutescens	woody melic, woody melicgrass
Melica imperfecta	smallflower melicgrass
Muhlenbergia appressa	Devils Canyon muhly, spreading littleseed muhly
Muhlenbergia arsenei	Navajo muhly
Muhlenbergia asperifolia	alkali muhly, scratchgrass
Muhlenbergia fragilis	annual muhly, delicate muhly
Muhlenbergia microsperma	littleseed muhly
Muhlenbergia minutissima	annual muhly
Muhlenbergia pauciflora	New Mexico muhly
Muhlenbergia porteri	bush muhly
Muhlenbergia rigens	deer muhly, deergrass
Munroa squarrosa	false buffalograss
Panicum urvilleanum	desert panicgrass
Phragmites australis	common reed
Piptatherum micranthum	little-seed mountain-rice grass, littleseed ricegrass, Piptatherum micranthum
Pleuraphis jamesii	galleta, James' galleta
Pleuraphis rigida	big galleta
Poa bigelovii	Bigelow bluegrass, Bigelow's bluegrass
Poa fendleriana ssp. longiligula	muttongrass
Poa secunda ssp. secunda	
Polypogon australis	Chilean rabbitsfoot grass, Chilean rabbit's-foot grass
Polypogon monspeliensis	annual rabbitsfoot grass, annual rabbit's-foot grass, rabbitfoot beardgrass, rabbitfoot grass,
Schismus arabicus	Arabian schismus
Schismus barbatus	common Mediterranean grass, Mediterranean grass, Mediterraneangrass
Scleropogon brevifolius	burrograss

Scientific Name	Common Name
Setaria gracilis	
Sporobolus airoides	alkali sacaton, alkali-sacaton
Sporobolus contractus	spike dropseed
Sporobolus cryptandrus	sand dropseed
Sporobolus flexuosus	mesa dropseed
Tridens muticus	slim tridens
Triticum aestivum	common wheat, wheat
Vulpia bromoides	brome fescue, brome six-weeks grass, desert fescue
Vulpia microstachys var. ciliata	Eastwood fescue, gray fescue
Vulpia microstachys var. pauciflora	Pacific fescue
Vulpia myuros var. myuros	
Vulpia octoflora var. hirtella	sixweeks fescue
Vulpia octoflora var. octoflora	eight-flower six-weeks grass, sixweeks fescue
Polemoniaceae (Phlox Family)	
Aliciella latifolia var. *latifolia*	broad-leaved aliciella
Eriastrum densifolium ssp. mohavense	Mojave woolstar
Eriastrum diffusum	diffuse eriastrum, diffuse woolstar, miniature woollystar, miniature woolstar
Eriastrum eremicum ssp. eremicum	desert woollystar, desert woolstar
Eriastrum sparsiflorum	fewflower woolstar, Great Basin woollystar
Gilia aliquanta ssp. aliquanta	puffcalyx gilia
Gilia aliquanta ssp. breviloba	puffcalyx gilia
Gilia australis	southern gilia
Gilia cana ssp. speciformis	showy gilia
Gilia cana ssp. triceps	showy gilia
Gilia clokeyi	Clokey's gilia, Clokey's gily-flower
Gilia filiformis	yellow gilia, yellow gily-flower
Gilia hutchinsifolia	desert pale gilia, desert pale gily-flower, Hutchin's gilia
Gilia latiflora ssp. latiflora	hollyleaf gilia
Gilia latifolia	broadleaf gilia, broad-leaf gily-flower
Gilia leptomeria	sand gilia, sand gily-flower, slender gilia
Gilia malior	Great Basin gilia, scrub gilia
Gilia ochroleuca ssp. ochroleuca	volcanic gilia
Gilia ophthalmoides	eyed gilia, eyed gily-flower, eyelike gilia
Gilia scopulorum	rock gilia, rock gily-flower, Rocky Mountain gilia
Gilia sinuata	rosy gilia
Gilia splendens ssp. splendens	grand gilia
Gilia stellata	star gilia, star gily-flower
Gilia transmontana	transmontane gilia, transmontane gily-flower
Gilia triodon	coyote gilia

Scientific Name	Common Name
Ipomopsis arizonica	Arizona ipomopsis, Arizona skyrocket
Ipomopsis polycladon	manybranched gilia, manybranched ipomopsis, sprawling skyrocket
Langloisia setosissima ssp. punctata	Great Basin langloisia
Langloisia setosissima ssp. setosissima	Great Basin langloisia
Leptodactylon pungens	common prickly gilia, granite gilia, granite prickly gilia, granite prickly phlox
Linanthus arenicola	sanddune linanthus
Linanthus aureus ssp. aureus	golden deserttrumpets, golden linanthus
Linanthus aureus ssp. decorus	golden deserttrumpets, golden linanthus
Linanthus bigelovii	Bigelow's deserttrumpets, Bigelow's linanthus
Linanthus demissus	desert linanthus, desertsnow
Linanthus filiformis	yellow gilia
Linanthus dichotomus	evening snow, eveningsnow
Linanthus jonesii	Jones' desert-trumpets, Jones' linanthus
Loeseliastrum matthewsii	desert calico
Loeseliastrum schottii	Schott's calico
Phlox gracilis	slender phlox
Phlox stansburyi	cold-desert phlox, Stansbury's phlox
Polygonaceae (Buckwheat Family)	
Centrostegia thurberi	red triangles, spring flower
Chorizanthe brevicornu var. brevicornu	brittle spineflower
Chorizanthe corrugata	wrinkled chorizanthe, wrinkled spineflower
Chorizanthe rigida	devil's spineflower, spiny chorizanthe, turkshead
Chorizanthe watsonii	fivetooth spineflower, five-tooth spineflower, Watson's chorizanthe
Eriogonum brachyanthum	shortflower buckwheat
Eriogonum brachypodum	Parry's buckwheat, Parry's wild buckwheat
Eriogonum davidsonii	Davidson's buckwheat, Davidson's wild buckwheat
Eriogonum deflexum var. baratum	flatcrown buckwheat
Eriogonum deflexum var. deflexum	flatcrown buckwheat
Eriogonum ericifolium ssp. thornei	
Eriogonum fasciculatum ssp. polifolium	
Eriogonum heermannii var. argense	Heermann's buckwheat
Eriogonum heermannii var. floccosum	Clark Mountain buckwheat, Clark Mountain eriogonum, Heermann's buckwheat
Eriogonum heermannii var. sulcatum	Heermann's buckwheat
Eriogonum inflatum var. inflatum	desert trumpet, Native American buckwheat
Eriogonum maculatum	spotted buckwheat, spotted wild buckwheat
Eriogonum microthecum var. simpsonii	Simpson's buckwheat
Eriogonum mohavense	Western Mojave buckwheat

Scientific Name	Common Name
Eriogonum nidularium	birdnest buckwheat, birdnest wild buckwheat
Eriogonum palmerianum	Palmer's buckwheat, Palmer's wild buckwheat
Eriogonum panamintense	Panamint Mountain buckwheat
Eriogonum plumatella	yucca buckwheat
Eriogonum pusillum	puny buckwheat, yellowturbans, yellow-turbans
Eriogonum reniforme	kidneyleaf buckwheat
Eriogonum thomasii	Thomas' buckwheat
Eriogonum thurberi	Thurber's buckwheat, Thurber's wild buckwheat
Eriogonum trichopes var. trichopes	little deserttrumpet
Eriogonum umbellatum var. juniporinum	juniper buckwheat, sulphurflower buckwheat
Eriogonum umbellatum var. subaridum	sulphur flower buckwheat, sulphurflower buckwheat, sulphur-flower buckwheat
Eriogonum wrightii var. wrightii	bastardsage, shrubby buckwheat, Wright's bastardsage
Nemacaulis denudata var. gracilis	cottonheads
Oxytheca perfoliata	perfoliate oxytheca, roundleaf oxytheca, round-leaf puncturebract
Polygala acanthoclada	desert polygala, thorny polygala
Pterostegia drymarioides	woodland pterostegia, woodland threadstem
Rumex crispus	curly dock, narrowleaf dock, sour dock, yellow dock
Rumex hymenosepalus	canaigre, canaigre dock
Polypodiaceae (Fern Family)	
Polypodium hesperium	polypody
Portulacaceae (Purslane Family)	
Portulaca halimoides	silkcotton purslane, silk-cotton purslane, sinkerleaf purslane
Portulaca oleracea	akulikuli-kula, common purslane, duckweed, garden purslane, little hogweed, little-hogweed, purslane, pursley, wild portulaca
Potamogetonaceae (Pondweed Family)	
Zannichellia palustris	horned pondweed, horned poolmat, horned-pondweed
Primulaceae (Primrose Family)	
Anagallis arvensis	pimpernel, scarlet pimpernel
Pteridaceae (Maidenhair Fern Family)	
Adiantum capillus-veneris	maidenhair fern
Argyrochosma jonesii	Jones' false cloak fern, Jones' lipfern
Argyrochosma limitanea ssp. limitanea	southwestern false cloak fern, southwestern false cloakfern, southwestern falsecloak fern
Cheilanthes covillei	Coville's lip fern, Coville's lipfern
Cheilanthes feei	Fee's lipfern, slender lip fern, slender lipfern
Cheilanthes parryi	Parry's lip fern, Parry's lipfern
Cheilanthes viscida	viscid lipfern
Cheilanthes wootonii	beaded lip fern, beaded lipfern, Wooton's lipfern
Notholaena californica	California cloak fern

Scientific Name	Common Name
Pellaea mucronata ssp. mucronata	birdfoot cliffbrake
Pellaea mucronata var. californica	
Pellaea truncata	spiny cliffbrake
Ranunculaceae (Family)	
Anemone tuberosa	desert windflower, tuber anemone
Aquilegia formosa	crimson columbine, western columbine
Delphinium parishii ssp. parishii	Parish's desert larkspur, Parish's larkspur
Myosurus cupulatus	Arizona mousetail
Resedaceae (Mignonette Family)	
Oligomeris linifolia	linearleaf combess, lineleaf whitepuff
Rhamnaceae (Buttercup Family)	
Ceanothus greggii var. vestitus	Mojave ceanothus
Rhamnus ilicifolia	hollyleaf redberry
Rhamnus tomentella ssp. ursina	
Rosaceae (Rose Family)	
Amelanchier utahensis	Utah serviceberry, Utah shadberry, western serviceberry
Cercocarpus intricatus	littleleaf mountain-mahogany
Cercocarpus ledifolius var. intermontanus	curl-leaf mountain-mahogany
Coleogyne ramosissima	blackbrush
Fallugia paradoxa	Apache plume
Holodiscus microphyllus var. microphyllus	
Ivesia jaegeri	Jaeger's ivesia, Jaeger's mousetail
Ivesia saxosa	rock mousetail
Petrophyton caespitosum var. caespitosum	mat rockspirea, Rocky Mountain rockmat, Rocky Mountain rockspirea
Prunus fasciculata var. fasciculata	desert almond
Purshia mexicana var. stansburiana	
Purshia tridentata var. glandulosa	desert bitterbrush
Rubiaceae (Bedstraw Family)	
Galium angustifolium ssp. gracillimum	slender bedstraw
Galium aparine	bedstraw, catchweed bedstraw, cleavers, cleaverwort, goose grass, scarthgrass, stickywilly, sticky-willy, white hedge
Galium magnifolium	largeleaf bedstraw
Galium matthewsii	bushy bedstraw, Matthew bedstraw
Galium munzii	Munz's bedstraw
Galium parishii	Parish's bedstraw
Galium proliferum	limestone bedstraw
Galium stellatum var. eremicum	
Galium wrightii	slenderbranch bedstraw, Wright's bedstraw

Scientific Name	Common Name
Ruppiaceae (Bedstraw Family)	
Ruppia cirrhosa	spiral ditchgrass
Rutaceae (Rue Family)	
Thamnosma montana	Mohave desertrue, turpentine broom, turpentinebroom
Salicaceae (Willow Family)	
Populus fremontii ssp. fremontii	Fremont's cottonwood
Salix exigua	coyote willow, desert willow, narrowleaf willow, sandbar willow
Salix gooddingii	Goodding's black willow, Goodding's willow
Salix lasiolepis	arroyo willow
Santalaceae (Sandalwoods Family)	
Arceuthobium divaricatum	pinyon dwarf mistletoe
Phoradendron californicum	mesquite mistletoe
Phoradendron juniperinum	incense cedar mistletoe, juniper mistletoe
Sapindaceae (Soapberry Family)	
Acer glabrum ssp. diffusum	
Saururaceae (Lizard's-tail Family)	
Anemopsis californica	yerba mansa, yerba-mansa
Saxifragaceae (Saxifrage Family)	
Heuchera rubescens var. alpicola	pink alumroot
Scrophulariaceae (Figwort Family)	
Buddleja utahensis	panamint butterflybush, utah butterflybush, utah butterfly-bush
Mimulus bigelovii bigelovii	bigelow's monkey-flower
Mimulus bigelovii cuspidatus	bigelow's monkey-flower
Mohavea breviflora	golden desert snapdragon
Selaginellaceae (Sole Family)	
Selaginella leucobryoides	spike-moss
Solanaceae (Nightshade Family)	
Chamaesaracha coronopus	green false nightshade, greenleaf five eyes, green-leaf five-eyes
Datura wrightii	sacred datura, sacred thornapple, sacred thorn-apple
Lycium andersonii	Anderson wolfberry, Anderson's wolfberry, water jacket
Lycium cooperi	Cooper wolfberry, Cooper's wolfberry, peach thorn
Nicotiana acuminata var. multiflora	manyflower tobacco
Nicotiana attenuata	coyote tabacco, coyote tobacco
Nicotiana obtusifolia	desert tobacco, tobacco plant
Physalis crassifolia	thickleaf groundcherry, yellow nightshade groundcherry
Physalis hederifolia var. fendleri	Fendler groundcherry, Fendler's groundcherry
Physalis lobata	
Solanum americanum	American black nightshade, common purple nightshade, smallflower nightshade

Scientific Name	Common Name
Solanum elaeagnifolium	silverleaf nightshade, tomato weed, trompillo, white horsenettle, white nightshade
Solanum triflorum	cutleaf nightshade, cut-leaf nightshade
Tamaricaceae (Tamarisk Family)	
Tamarix aphylla	Athel tamarisk, saltcedar, tamarisk, tamarix
Tamarix ramosissima	salt cedar, saltcedar, tamarisk, tamarix
Themidaceae (Brodiaea Family)	
Muilla sp.	muilla
Typhaceae (Cattail Family)	
Typha domingensis	southern cattail
Ulmaceae (Elm Family)	
Ulmus pumila	Chinese elm, Siberian elm
Urticaceae (Nettle Family)	
Parietaria hespera var. hespera	rillita pellitory
Urtica dioica var. holoserica	
Verbenaceae (Verbena Family)	
Aloysia wrightii	lemon verbena, mintbush lippia, Wright's aloysia, Wright's beebrush, Wright's lippia
Verbena bracteata	bigbract verbena, bracted vervain, carpet vervain, prostrate verbena, prostrate vervain
Verbena gooddingii	
Viscaceae (Mistletoe Family)	
Phoradendron californicum	California mistletoe
Woodsiaceae (Fern Family)	
Woodsia oregana	Oregon cliff fern, Oregon woodsia, western cliff fern
Woodsia plummerae	Plummer's cliff fern
Zygophyllaceae (Caltrop Family)	
Kallstroemia californica	California caltrop
Kallstroemia parviflora	warty caltrop
Larrea tridentata	creosote bush, creosotebush
Tribulus terrestris	bullhead, caltrop, goathead, Mexican sandbur, puncture vine, Texas sandbur

Table Q-2. Wildlife Species with the Potential to Occur within 10 Miles of the Project Area

Scientific Name	Common Name
MAMMAL	
Bovidae	
Bos taurus	domestic cattle
Ovis canadensis	bighorn sheep
Canidae	
Canis familiaris	domestic dog
Canis latrans	coyote
Urocyon cinereoargenteus	gray fox
Vulpes macrotis	kit fox
Vulpes macrotis var macrotis (CPF)	desert kit fox
Cervidae	
Odocoileus hemionus	mule deer
Cricetidae	
Neotoma fuscipes	dusky-footed woodrat
Neotoma lepida	desert woodrat
Onychomys torridus	southern grasshopper mouse
Peromyscus boylii	brush deermouse
Peromyscus crinitus	canyon deermouse
Peromyscus eremicus	cactus deermouse
Peromyscus maniculatus	North American deermouse
Peromyscus truei	piÃ±on deermouse
Reithrodontomys megalotis	western harvest mouse
Equidae	
Equus asinus	feral burro
*Equus africanus asinus**	donkey
Felidae	
Felis rufus	Bobcat
Lynx rufus	bobcat
Puma concolor	cougar
Geomyidae	
Thomomys bottae	Botta's pocket gopher
Heteromyidae	
Chaetodipus fallax	San Diego pocket mouse
Chaetodipus formosus	long-tailed pocket mouse
Chaetodipus penicillatus	Desert Pocket Mouse
Chaetodipus spinatus	spiny pocket mouse
Dipodomys deserti	desert kangaroo rat
Dipodomys merriami	Merriam's kangaroo rat

Scientific Name	Common Name
Dipodomys microps	chisel-toothed kangaroo rat
Dipodomys panamintinus	Panamint kangaroo rat
Perognathus longimembris	little pocket mouse
Leporidae	
Lepus californicus	black-tailed jackrabbit
Sylvilagus audubonii	desert cottontail
Mephitidae	
Mephitis mephitis	Striped Skunk
Spilogale gracilis	western spotted skunk
Molossidae	
Eumpos perotis	Western Mastiff Bat
Tadarida brasiliensis	Mexican free-tailed bat
Mustelidae	
Taxidea taxus	American badger
Procyonidae	
Bassariscus astutus	ringtail
Rodentia	
Erethizon dorsata	North American porcupine
Sciuridae	
Ammospermophilus leucurus	white-tailed antelope squirrel
Spermophilus tereticaudus	round-tailed ground squirrel
Spermophilus variegatus	rock squirrel
Tamias panamintinus	Panamint chipmunk
Soricidae	
Notiosorex crawfordi	Crawford's grey shrew
Vespertilionidae	
Antrozous pallidus	pallid bat
Corynorhinus townsendii	Townsend's big-eared bat
Eptesicus fuscus	big brown bat
Euderma maculatum	Spotted Bat
Lasiurus cinereus	hoary bat
Myotis californicus	California myotis
Myotis cilioabrum	Western Small-footed Bat
Myotis evotis	long-eared myotis
Myotis melanorhinus	Mouse-eared bat, dark-nosed small-footed myotis
Myotis thysanodes	fringed myotis
Myotis volans	long-legged myotis
Myotis yumanensis	Yuma Myotis
Parastrellus hesperus	canyon bat

Scientific Name	Common Name
Pipistrellus hesperus	western pipistrelle
Tadarida brasiliensis	Mexican free-tailed bat
BIRD	
Accipitridae	
Accipiter cooperii	Cooper's Hawk
Accipiter striatus	Sharp-shinned Hawk
Aquila chrysaetos	Golden Eagle
Buteo jamaicensis	Red-tailed Hawk
Buteo lagopus	Rough-legged Hawk
Buteo swainsoni	Swainson's Hawk
Parabuteo unicinctus	Harris's Hawk
Aegithalidae	
Psaltriparus minimus	Bushtit
Alaudidae	
Eremophila alpestris	Horned Lark
Anatidae	
Anas cyanoptera	Cinnamon Teal
Mergus serrator	Red-breasted Merganser
Apodidae	
Aeronautes saxatalis	White-throated Swift
Chaetura vauxi	Vaux's Swift
Ardeidae	
Nycticorax nycticorax	Black-crowned Night-Heron
Bombycillidae	
Bombycilla cedrorum	Cedar Waxwing
Cardinalidae	
Passerina amoena	Lazuli Bunting
Pheucticus ludovicianus	Rose-breasted Grosbeak
Pheucticus melanocephalus	Black-headed Grosbeak
Piranga flava	Hepatic Tanager
Piranga ludoviciana	Western Tanager
Cathartidae	
Cathartes aura	Turkey Vulture
Caprimulgidae	
Caprimulgus arizonae	Mexican Whip-poor-will
Chordeiles acutipennis	Lesser Nighthawk
Phalaenoptilus nuttallii	Common Poorwill
Certhiidae	
Certhia americana	Brown Creeper

Scientific Name	Common Name
Charadrius vociferus	Killdeer
Columbidae	
Patagioenas fasciata	Band-tailed Pigeon
Zenaida asiatica	White-winged Dove
Zenaida macroura	Mourning Dove
Corvidae	
Aphelocoma californica	Western Scrub-Jay
Corvus corax	Common Raven
Gymnorhinus cyanocephalus	Pinyon Jay
Cuculidae	
Geococcyx californianus	Greater Roadrunner
Falconidae	
Falco mexicanus	Prairie Falcon
Falco sparverius	American Kestrel
Fringillidae	
Carpodacus cassinii	Cassin's Finch
Carpodacus mexicanus	House Finch
Coccothraustes vespertinus	Evening Grosbeak
Haemorhous mexicanus	house finch
Loxia curvirostra	Red Crossbill
Spinus lawrencei	Lawrence's goldfinch
Spinus pinus	Pine Siskin
Spinus psaltria	Lesser Goldfinch
Hirundinidae	
Hirundo rustica	Barn Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Riparia riparia	Bank Swallow
Tachycineta thalassina	Violet-green Swallow
Icteridae	
Agelaius phoeniceus	Red-winged Blackbird
Icterus bullockii	Bullock's Oriole
Icterus cucullatus	Hooded Oriole
Icterus parisorum	Scott's Oriole
Molothrus ater	Brown-headed Cowbird
Sturnella neglecta	Western Meadowlark
Laniidae	
Lanius ludovicianus	Loggerhead Shrike
Laridae	
Larus delawarensis	Ring-billed Gull

Scientific Name	Common Name
Mimidae	
Mimus polyglottos	Northern Mockingbird
Oreoscoptes montanus	Sage Thrasher
Toxostoma bendirei	Bendire's Thrasher
Toxostoma crissale	Crissal Thrasher
Toxostoma lecontei	Le Conte's Thrasher
Motacillidae	
Anthus rubescens	American Pipit
Odontophoridae	
Callipepla gambelii	Gambel's quail
Paridae	
Baeolophus ridgwayi	Juniper Titmouse
Poecile gambeli	Mountain Chickadee
Picidae	
Colaptes auratus	northern flicker
Parulidae	
Cardellina pusilla	Wilson's Warbler
Cardellina rubrifrons	Red-faced Warbler
Geothlypis tolomiei	MacGillivray's Warbler
Geothlypis trichas	Common Yellowthroat
Icteria virens	Yellow-breasted Chat
Mniotilta varia	Black-and-White Warbler
Myioborus pictus	Painted Redstart
Oreothlypis celata	Orange-crowned Warbler
Oreothlypis luciae	Lucy's Warbler
Oreothlypis ruficapilla	Nashville Warbler
Oreothlypis virginiae	Virginia's Warbler
Seiurus aurocapilla	Ovenbird
Setophaga coronata	Yellow-rumped Warbler
Setophaga graciae	Grace's Warbler
Setophaga nigrescens	Black-throated Gray Warbler
Setophaga occidentalis	Hermit Warbler
Setophaga petechia	Yellow Warbler
Setophaga townsendi	Townsend's warbler
Passerellidae	
Aimophila ruficeps	Rufous-crowned Sparrow
Amphispiza belli	Sage Sparrow
Amphispiza bilineata	Black-throated Sparrow
Auriparus flaviceps	verdin

Scientific Name	Common Name
Junco hyemalis	Dark-eyed Junco
Melospiza lincolnii	Lincoln's Sparrow
Melospiza melodia	Song Sparrow
Passerculus sandwichensis	Savannah Sparrow
Passerella iliaca	Fox Sparrow
Pipilo chlorurus	Green-tailed Towhee
Pipilo maculatus	spotted towhee
Spizella atrogularis	Black-chinned Sparrow
Spizella breweri	Brewer's Sparrow
Spizella passerina	Chipping Sparrow
Zonotrichia atricapilla	Golden-crowned Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Passeridae	
Passer domesticus	House Sparrow
Picidae	
Colaptes auratus	Northern Flicker
Colaptes chrysoides	Gilded Flicker
Melanerpes lewis	Lewis's Woodpecker
Picoides scalaris	Ladder-backed Woodpecker
Phasianidae	
Alectoris chukar	Chukar
Podicipedidae	
Podiceps nigricollis	Eared Grebe
Polioptilidae	
Polioptila caerulea	Bluy-gray Gnatcatcher
Polioptila melanura	Black-tailed Gnatcatcher
Ptilogonatidae	
Phainopepla nitens	Phainopepla
Regulidae	
Regulus calendula	Ruby-crowned Kinglet
Remizidae	
Auriparus flaviceps	Verdin
Scolopacidae	
Actitis macularius	Spotted Sandpiper
Tringa solitaria	Solitary Sandpiper
Sittidae	
Sitta canadensis	Red-breasted Nuthatch
Strigidae	
Asio otus	Long-eared Owl

Scientific Name	Common Name
Athene cunicularia	Burrowing Owl
Bubo virginianus	Great Horned Owl
Megascops kennicottii	Western Screech-Owl
Otus flammeolus	Flammulated Owl
Sturnidae	
Sturnus vulgaris	European Starling
Trochilidae	
Calypte anna	Anna's Hummingbird
Calypte costae	Costa's Hummingbird
Selasphorus platycercus	Broad-tailed Hummingbird
Selasphorus rufus	Rufous Hummingbird
Troglodytidae	
Campylorhynchus brunneicapillus	Cactus Wren
Catherpes mexicanus	Canyon Wren
Salpinctes obsoletus	Rock Wren
Thryomanes bewickii	Bewick's Wren
Troglodytes aedon	House Wren
Turdidae	
Catharus guttatus	Hermit Thrush
Catharus ustulatus	Swainson's Thrush
Myadestes townsendi	Townsend's Solitaire
Sialia currucoides	Mountain Bluebird
Sialia mexicana	Western Bluebird
Turdus migratorius	American Robin
Tyrannidae	
Contopus cooperi	Olive-sided Flycatcher
Contopus sordidulus	Western Wood-Pewee
Empidonax difficilis	Pacific-slope Flycatcher
Empidonax hammondii	Hammond's Flycatcher
Empidonax oberholseri	dusky flycatcher
Empidonax occidentalis	Cordilleran Flycatcher
Empidonax traillii	Willow Flycatcher
Empidonax wrightii	Gray Flycatcher
Myiarchus cinerascens	Ash-throated Flycatcher
Myiarchus tyrannulus	Brown-crested Flycatcher
Sayornis nigricans	Black Phoebe
Sayornis saya	Say's Phoebe
Tyrannus verticalis	Western Kingbird
Tyrannus vociferans	Cassin's Kingbird

Scientific Name	Common Name
Vireonidae	
Vireo bellii	Bell's Vireo
Vireo cassinii	Cassin's Vireo
Vireo gilvus	Warbling Vireo
Vireo plumbeus	Plumbeous Vireo
Vireo vicinior	Gray Vireo
REPTILE	
Charinidae	
Lichanura trivirgata	rosy boa
Colubridae	
Arizona elegans	glossy snake
Chionactis occipitalis	western shovel-nosed snake
Coluber flagellum	coachwhip
Coluber taeniatus	striped whipsnake
Diadophis punctatus	ring-necked snake
Hypsiglena chlorophaea	desert nightsnake
Lampropeltis californiae	California kingsnake
Phyllorhynchus decurtatus	spotted leaf-nosed snake
Pituophis catenifer	gopher snake
Rhinocheilus lecontei	long-nosed snake
Salvadora hexalepis	western patch-nosed snake
Sonora semiannulata	western groundsnake
Tantilla hobartsmithi	Smith's black-headed snake
Trimorphodon biscutatus	California lyresnake
Crotaphytidae	
Crotaphytus bicinctores	Great Basin collared lizard
Gambelia wislizenii	long-nosed leopard lizard
Eublepharidae	
Coleonyx variegatus	western banded gecko
Helodermatidae	
Heloderma suspectum	gila monster
Iguanidae	
Dipsosaurus dorsalis	desert iguana
Dipsosaurus dorsalis dorsalis	northern desert iguana
Sauromalus ater	common chuckwalla
Sceloporus occidentalis	western fence lizard
Sceloporus uniformis	yellow-backed spiny lizard
Urosaurus graciosus	long-tailed brush lizard
Uta stansburiana	common side-blotched lizard

Scientific Name	Common Name
Leptotyphlopidae	
Rena humilis	western threadsnake
Phrynosomatidae	
Callisaurus draconoides	zebra-tailed lizard
Callisaurus draconoides rhodostictus	western zebra-tailed lizard
Phrynosoma platyrhinos	desert horned lizard
Phrynosoma platyrhinos calidiarum	southern desert horned lizard
Uma scoparia	Mojave fringe-toed lizard
Uta stansburiana elegans	western side-blotched lizard
Scincidae	
Plestiodon "gilberti"	Gilbert's skink
Teiidae	
Aspidoscelis tigris	tiger whiptail
Aspidoscelis tigris tigris	Great Basin whiptail
Viperidae	
Crotalus cerastes	sidewinder
Crotalus cerastes cerastes	Mohave desert sidewinder
Crotalus mitchellii	speckled rattlesnake
Crotalus scutulatus	Mojave rattlesnake
Xantusiidae	
Xantusia vigilis	desert night lizard
Testudinidae	
Gopherus agassizii	desert tortoise
AMPHIBIANS	
Bufonidae	
Anaxyrus punctatus	red-spotted toad
Hylidae	
Pseudacris regilla	northern Pacific treefrog
FISH	
Cyprinodontidae	
Cyprinodon nevadensis nevadensis	springs pupfish
Leuciscidae	
Siphateles bicolor mohavensis	Mojave tui chub
Poeciliidae	
Gambusia affinis	western mosquitofish
ARACHNIDS	
Araneidae	
Aculepeira sp.	orb weaver

Scientific Name	Common Name
Solifugae	
Unknown species	camel spider
Theridiidae	
Latrodectus sp.	black widow
Thomisidae	
Misumena vatia	goldenrod crab spider
INSECTS	
Acrididae	
Trimerotropis pallidipennis	pallid-winged grasshopper
Aeshnidae	
Anax junius	common green darner
Amelidae	
Litaneutria sp.	*Litaneutria* sp.
Andrenidae	
Perdita sp.	fairy bee
Apidae	
Anthophora urbana	urbane digger bee
Apis mellifera	western honey bee
Centris sp.	Centridine bee
Centris sp.	oil digger bee
Centris rhodopus	red-legged oil-digger
Ericrocis lata	ericrocidine cuckoo bee
Aphididae	
Aphis nerii	*Aphis nerii*
Aphis sp.	*Aphis* sp.
Asilidae	
Saropogon sp.	robber fly
Bombyliidae	
Lordotus sp.	bee fly
Cecidomyiidae	
Asphondylia floccosa	woolly stem gall midge
Cerambycidae	
Plionoma rubens	longhorn beetle
Coccinellidae	
Coccinella septempunctata	seven-spotted ladybug
Hippodamia convergens	convergent lady beetle
Crambidae	
Achyra rantalis	garden webworm moth

Scientific Name	Common Name
Formicidae	
Pogonomyrmex sp.	harvester ant
Veromessor pergandei	harvester ant
Geometridae	
Digrammia colorata	creosote moth
Halictidae	
Agapostemon sp.	striped sweat bee
Dieunomia sp.	sweat bee
Hesperiidae	
Burnsius albescens	white checkered-skipper
Erynnis funeralis	funereal duskywing
Heliopetes ericetorum	northern white-skipper
Libellulidae	
Libellula saturata	flame skimmer
Sympetrum corruptum	variegated meadowhawk
Lycaenidae)	
Brephidium exilis	western pygmy-blue
Echinargus isola	Reakirt's blue
Hemiargus ceraunus	Ceraunus blue
Leptotes marina	marine blue
Strymon melinus	gray hairstreak
Meloidae	
Cysteodemus armatus	inflated blister beetle
Eupompha elegans	elegant blister beetle
Lytta magister	desert blister beetle
Mutillidae	
Dasymutilla sp.	velvet ant
Nymphalidae	
Danaus gilippus	queen butterfly
Vanessa cardui	painted lady
Pentatomidae	
Chlorochroa sayi	Say's stink bug
Pieridae	
Abaeis nicippe	sleepy orange
Pontia protodice	checkered white
Pompilidae	
Pepsis thisbe	Thisbe's tarantula-hawk wasp
Pterophoridae	
Anstenoptilia marmarodactyla	sage plume moth

Scientific Name	Common Name
Sphecidae	
Ammophila aberti	thread-waisted wasp
Sphex ashmeadi	Ashmead's digger wasp
Palmodes or *Prionyx* sp.	thread-waisted wasp
Prionyx parkeri	thread-waisted wasp
Sphingidae	
Hyles lineata	white-lined sphinx moth
Syrphidae	
Syrphidae sp.	hover fly
Tenebrionidae	
Eleodes sp.	Pinacate beetle
Tiphiidae	
Paratiphia sp.	Tiphiid wasp
Vespidae	
Euodynerus sp.	potter wasp
Pterocheilus pimorum	potter wasp

APPENDIX R

Floral and Faunal Compendia

Table R-1. Observed Flora at the Soda Mountain Solar Project

Scientific Name	Common Name	Life Form
	GYMNOSPERMS (DICOTS)	
Ephedraceae (Ephedra Family)		
Ephedra californica	California joint fir	shrub
	ANGIOSPERMS (DICOTS)	
Aizoaceae (Iceplant Family)		
*Mesembryanthemum nodiflorum**	small flowered iceplant	annual herb
Amaranthaceae (Pigweed Family)		
Tidestromia suffruticosa var. *oblongifolia*	honeysweet	annual herb
Apocynaceae (Dogbane Family)		
Asclepias erosa	desert milkweed	perennial herb
Asclepias subulata	rush milkweed	perennial herb
Funastrum hirtellum	hairy milkweed	perennial herb
Funastrum utahense (CRPR 4.2)*	Utah vine milkweed	perennial herb
Asteraceae (Aster Family)		
Ambrosia acanthicarpa	annual bursage	annual herb
Ambrosia dumosa	white bursage	shrub
Ambrosia salsola	burrobrush	shrub
Baccharis brachyphylla	short-leaved baccharis	shrub
Bebbia juncea	sweetbush shrub	shrub
Brickellia incana	woolly brickellia	shrub
Chaenactis carphoclinia var. *carphoclinia*	pebble pincushion	annual herb
Chaenactis fremontii	Fremont pincushion	annual herb
Chaenactis steviodies	desert pincushion	annual herb
Encelia farinosa	brittlebush	shrub
Encelia frutescens	rayless encelia	shrub
Eriophyllum wallacei	Wallace's woolly daisy	annual herb
Geraea canescens	hairy desert sunflower	annual herb
Lasthenia gracilis	needle goldfields	annual herb
Logfia depressa	dwarf cottonrose	annual herb
Malacothrix coulteri	snake's head	annual herb
Malacothrix glabrata	desert dandelion	annual herb
Monoptilon bellioides	Mojave Desert star	annual herb
Pectis papposa	manybristle chinchweed	annual herb
Perityle emoryi	Emory's rock daisy	annual herb
Peucephyllum schottii	Schott's pygmycedar	shrub
Porophyllum gracile	odora	perennial herb
Prenanthella exigua	bright white	annual herb
Rafinesquia neomexicana	desert chicory	annual herb

Scientific Name	Common Name	Life Form
Senecio mohavensis	Mojave ragwort	annual herb
Stephanomeria pauciflora	wire lettuce	perennial herb
Stylocline micropoides	desert nest straw	annual herb
Boraginaceae (Borage Family)		
Amsinckia tessellata var. *tessellata*	devil's lettuce	annual herb
Cryptantha barbigera var. *barbigera*	bearded cryptantha	annual herb
Cryptantha dumetorum	bush loving cryptantha	annual herb
Cryptantha maritima	Guadalupe cryptantha	annual herb
Cryptantha nevadensis	Nevada cryptantha	annual herb
Cryptantha pterocarya var. *pterocarya*	wingnut cryptantha	annual herb
Eremocarya micrantha var. *micrantha*	desert red-root	annual herb
Johnstonella angustifolia	narrow-leaved johnstonella	annual herb
Pectocarya heterocarpa	chuckwalla pectocarya	annual herb
Pectocarya platycarpa	broad fruited combseed	annual herb
Pectocarya recurvata	curvenut combseed	annual herb
Brassicaceae (Mustard Family)		
*Brassica tournefortii**	Saharan mustard	annual herb
Caulanthus lasiophyllus	California mustard	annual herb
Lepidium lasiocarpum	shaggyfruit pepperweed	annual herb
*Sisymbrium irio**	London rocket	annual herb
Thysanocarpus curvipes	common fringe pod	annual herb
Cactaceae (Cactus Family)		
Cylindropuntia echinocarpa	silver cholla	stem succulent
Cylindropuntia ramosissima	branched pencil cholla	stem succulent
Echinocactus polycephalus	cottontop cactus	stem succulent
Mammillaria tetrancistra	common fishhook cactus	stem succulent
Opuntia basilaris var. *basilaris*	beavertail cactus	stem succulent
Campanulaceae (Bellflower Family)		
Nemacladus orientalis	eastern glandular nemacladus	annual herb
Nemacladus tenuis var. *aliformis*	desert namacladus	annual herb
Caryophyllaceae (Carnation Family)		
Spergularia sp.	spurrey	annual herb
Chenopodiaceae (Goosefoot Family)		
Atriplex hymenelytra	desert holly	shrub
Atriplex polycarpa	allscale saltbush	shrub
Salsola tragus	prickly Russian thistle	annual herb
Convolvulaceae (Morning Glory Family)		
Cuscuta denticulata	desert dodder	annual herb, vine

Scientific Name	Common Name	Life Form
Cucurbitaceae (Cucumber Family)		
Cucurbita palmata	coyote melon	annual or perennial herb
Euphorbiaceae (Euphorbias Family)		
Euphorbia micromera	Sonoran sandmat	annual herb
Euphorbia polycarpa	smallseed sandmat	perennial herb
Fabaceae (Bean Family)		
Acmispon strigosus	strigose lotus	annual herb
Lupinus shockleyi	purple desert lupine	annual herb
Dalea mollissima	silky dalea	perennial herb
Lupinus arizonicus	Arizona lupine	annual herb
Parkinsonia florida	blue paloverde	tree
Senna armata	desert senna	shrub
Geraniaceae (Storksbill Family)		
*Erodium cicutarium**	coastal heron's bill	annual herb
Erodium texanum	desert heron's bill	annual herb
Hydrophyllaceae (Waterleaf Family)		
Eucrypta micrantha	desert eucrypta	annual herb
Phacelia crenulata	notch-leaved phacelia	annual herb
Phacelia distans	distant phacelia	annual herb
Phacelia neglecta	alkali phacelia	annual herb
Krameriaceae (Ratany Family)		
Krameria erecta	little leaved ratany	shrub
Lamiaceae (Mint Family)		
Salvia columbariae	chia sage	annual herb
Loasaceae (Blazingstar Family)		
Mentzelia albicaulis	white stemmed blazing star	annual herb
Mentzelia involucrata	sand blazing star	annual herb
Mentzelia obscura	pacific blazing star	annual herb
Petalonyx thurberi ssp. *thurberi*	Thurber's sandpaper plant	perennial herb
Malvaceae (Mallow Family)		
Eremalche rotundifolia	desert fivespot	annual herb
Namaceae (Nama Family)		
Nama pusilla	small leaf nama	perennial herb
Nyctaginaceae (Four o'clock Family)		
Allionia incarnata	trailing windmills	perennial herb
Mirabilis laevis var. *retorsa*	wishbone bush	perennial herb
Onagraceae (Evening Primrose Family)		
Chylismia brevipes	yellow cups	annual or perennial herb
Chylismia claviformis	clavate fruited primrose	annual or perennial herb

Scientific Name	Common Name	Life Form
Eremothera boothii ssp. *condensata*	clustered booth's desert primrose	annual herb
Eremothera boothii ssp. *decorticans*	shredding evening-primrose	annual herb
Eremothera boothii ssp. *desertorum*	Booth's desert primrose	annual herb
Orobanchaceae (Broomrape Family)		
Aphyllon cooperi	burroweed strangler	Perennial herb
Papaveraceae (Poppy Family)		
Eschscholzia glyptosperma	desert gold poppy	annual herb
Eschscholzia minutiflora	pygmy poppy	annual herb
Phrymaceae (Lopseed Family)		
Diplacus bigelovii	Bigelow's monkeyflower	annual herb
Plantaginaceae (Plantain Family)		
Antirrhinum filipes	tangled snapdragon	annual herb
Plantago ovata	desert plantain	annual herb
Polemoniaceae (Phlox Family)		
Aliciella latifolia var. *latifolia*	broad-leaved aliciella	annual herb
Gilia scopulorum	rock gilia	annual herb
Gilia sp.	gilia	annual herb
Gilia stellata	star gilia	annual herb
Langloisia setosissima ssp. *punctata*	Great Basin langloisia	annual herb
Linanthus demissus	Desert linanthus	annual herb
Linanthus filiformis	yellow gilia	annual herb
Linanthus jonesii	Jones' linanthus	annual herb
Loeseliastrum matthewsii	desert calico	annual herb
Loeseliastrum schottii	Schott gilia	annual herb
Polygonaceae (Buckwheat Family)		
Chorizanthe brevicornu var. *brevicornu*	brittle spineflower	annual herb
Chorizanthe corrugate	wrinkled spineflower	annual herb
Chorizanthe rigida	devil's spineflower	annual herb
Eriogonum inflatum	desert trumpet	perennial herb
Eriogonum sp.	annual buckwheat	annual herb
Eriogonum trichopes	little desert buckwheat	annual herb
Resedaceae (Reseda Family)		
Oligomeris linifolia	leaved cambess	annual herb
Solanaceae (Nightshade Family)		
Nicotiana obtusifolia	desert tobacco	perennial herb
Physalis crassifolia	thick-leaved ground-cherry	annual or perennial herb
Tamaricaceae (Tamarisk Family)		
*Tamarix aphylla**	Athel tamarisk	tree
Tamarix sp.*	tamarisk	tree

Scientific Name	Common Name	Life Form
Zygophyllaceae (Caltrop Family)		
Larrea tridentata	creosote bush	shrub
*Tribulis terrestris**	puncturevine	annual herb
ANGIOSPERMS (MONOCOTS)		
Agavaceae (Agave Family)		
Hesperocallis undulata	desert lily	perennial herb
Poaceae (Grass Family)		
Aristida adscensionis	three awn	annual grass
Bromus madritensis ssp. *rubens**	red brome	annual grass
Festuca octoflora	sixweeks grass	annual grass
Hilaria rigida	big galleta	perennial grass
*Hordeum murinum**	foxtail barley	annual grass
*Schismus arabicus**	Mediterranean grass	annual grass
*Schismus barbatus**	common Mediterranean grass	annual grass
Themidaceae (Brodiaea Family)		
Muilla sp.	muilla	perennial herb

Note: *non-native species

Table C-2. Observed Fauna at the Soda Mountain Solar Project

Scientific Name	Common Name	Additional Observation Notes
CLASS ARACHNIDA (ARACHNIDS)		
Araneidae (orb weaver spiders)		
Aculepeira sp.	orb weaver	
Solifugae (camel spiders, wind scorpions, and sun spiders)		
Unknown species	camel spider	
Theridiidae (cobweb spiders)		
Latrodectus sp.	black widow	
Thomisidae (crab spiders)		
Misumena vatia	goldenrod crab spider	
CLASS INSECTA (INSECTS)		
Acrididae (short-horned grasshoppers)		
Trimerotropis pallidipennis	pallid-winged grasshopper	
Aeshnidae (darners)		
Anax junius	common green darner	
Amelidae (mantids)		
Litaneutria sp.	*Litaneutria* sp.	
Andrenidae (miner, fairy, allied panurgine, and oxaenine bees)		
Perdita sp.	fairy bee	

Scientific Name	Common Name	Additional Observation Notes
Apidae (cuckoo, carpenter, digger, bumble, and honey bees)		
Anthophora urbana	urbane digger bee	
Apis mellifera	western honey bee	
Centris sp.	Centridine bee	
Centris sp.	oil digger bee	
Centris rhodopus	red-legged oil-digger	
Ericrocis lata	ericrocidine cuckoo bee	
Aphididae (aphids)		
Aphis nerii	*Aphis nerii*	
Aphis sp.	*Aphis* sp.	
Asilidae (robber flies)		
Saropogon sp.	robber fly	
Bombyliidae (bee flies)		
Lordotus sp.	bee fly	
Cecidomyiidae (gall midges)		
Asphondylia floccosa	woolly stem gall midge	
Cerambycidae (longhorn beetles)		
Plionoma rubens	longhorn beetle	
Coccinellidae (lady beetles)		
Coccinella septempunctata	seven-spotted ladybug	
Hippodamia convergens	convergent lady beetle	
Crambidae (crambid snout moths)		
Achyra rantalis	garden webworm moth	
Formicidae (ants)		
Pogonomyrmex sp.	harvester ant	
Veromessor pergandei	harvester ant	
Geometridae (geometrid moths)		
Digrammia colorata	creosote moth	
Halictidae (sweat bees)		
Agapostemon sp.	striped sweat bee	
Dieunomia sp.	sweat bee	
Hesperiidae (skipper butterflies)		
Burnsius albescens	white checkered-skipper	
Erynnis funeralis	funereal duskywing	
Heliopetes ericetorum	northern white-skipper	
Libellulidae (skimmers)		
Libellula saturata	flame skimmer	
Sympetrum corruptum	variegated meadowhawk	

Scientific Name	Common Name	Additional Observation Notes
Lycaenidae (blues, coppers, hairstreaks, harvesters)		
Brephidium exilis	western pygmy-blue	
Echinargus isola	Reakirt's blue	
Hemiargus ceraunus	Ceraunus blue	
Leptotes marina	marine blue	
Strymon melinus	gray hairstreak	
Meloidae (blister beetles)		
Cysteodemus armatus	inflated blister beetle	
Eupompha elegans	elegant blister beetle	
Lytta magister	desert blister beetle	
Mutillidae (velvet ants)		
Dasymutilla sp.	velvet ant	
Nymphalidae (brush-footed butterflies)		
Danaus gilippus	queen butterfly	
Vanessa cardui	painted lady	
Pentatomidae (shield bugs)		
Chlorochroa sayi	Say's stink bug	
Pieridae (cabbage butterflies)		
Abaeis nicippe	sleepy orange	
Pontia protodice	checkered white	
Pompilidae (spider wasps)		
Pepsis thisbe	Thisbe's tarantula-hawk wasp	
Pterophoridae (plume moths)		
Anstenoptilia marmarodactyla	sage plume moth	
Sphecidae (thread-waisted wasps)		
Ammophila aberti	thread-waisted wasp	
Sphex ashmeadi	Ashmead's digger wasp	
Palmodes or *Prionyx* sp.	thread-waisted wasp	
Prionyx parkeri	thread-waisted wasp	
Sphingidae (sphinx moths)		
Hyles lineata	white-lined sphinx moth	
Syrphidae (hover flies)		
Syrphidae sp.	hover fly	
Tenebrionidae (darkling beetles)		
Eleodes sp.	Pinacate beetle	
Tiphiidae (tiphiid wasps)		
Paratiphia sp.	Tiphiid wasp	
Vespidae (yellowjackets, hornets, and paper wasps)		
Euodynerus sp.	potter wasp	

Scientific Name	Common Name	Additional Observation Notes
Pterocheilus pimorum	potter wasp	
CLASS REPTILIA (REPTILES)		
Crotaphytidae (collard lizards and leopard lizards)		
Gambelia wislizenii	long-nosed leopard lizard.	
Iguanidae (iguanas and chuckwallas)		
Dipsosaurus dorsalis dorsalis	northern desert iguana	
Phrynosomatidae (spiny lizards, horned lizards, fringe-toed lizards)		
Callisaurus draconoides rhodostictus	western zebra-tailed lizard	
Phrynosoma platyrhinos calidiarum	southern desert horned lizard	
Uma scoparia (BLMS, SSC)	Mojave fringe-toed lizard	Observed 1,000 feet outside of the project boundary. No suitable habitat within the study area.
Uta stansburiana elegans	western side-blotched lizard	
Teiidae (whiptails)		
Aspidoscelis tigris tigris	Great Basin whiptail	
Testudinidae (land tortoises)		
Gopherus agassizii (FT, SE)	desert tortoise	Fresh scat and burrows observed. No live observations.
Viperidae (Vipers)		
Crotalus cerastes cerastes	Mohave desert sidewinder	
CLASS AVES (BIRDS)		
Accipitridae (hawks, kites, and eagles)		
Buteo jamaicensis	red-tailed hawk	
Aegithalidae (bushtits)		
Psaltriparus minimus	bushtit	
Alaudidae (larks)		
Eremophila alpestris	horned lark	
Caprimulgidae (nighthawks)		
Chordeiles acutipennis	lesser nighthawk	
Phalaenoptilus nuttallii	common poorwill	
Cathartidae (new world vultures)		
Cathartes aura	turkey vulture	
Corvidae (jay's and crows)		
Corvus corax	common raven	
Falconidae (falcons)		
Falco sparverius	American kestrel	
Fringillidae (finches)		
Haemorhous mexicanus	house finch	
Hirudinidae (swallows, martins, and saw-wings)		
Tachycineta bicolor	tree swallow	

Scientific Name	Common Name	Additional Observation Notes
Laniidae (shrikes)		
Lanius ludovicianus (SSC)	loggerhead shrike	
Picidae (woodpeckers)		
Colaptes auratus	northern flicker	Red-shafted form. Only primary and secondary feathers found.
Strigidae (true owls)		
Athene cunicularia (BLMS, SSC)	burrowing owl	Live observation during the burrowing owl survey and one burrow with sign.
Mimidae (mockingbirds and thrashers)		
Oreoscoptes montanus	sage thrasher	
Passerellidae (New World sparrows)		
Amphispiza bilineata	black-throated sparrow	
Auriparus flaviceps	verdin	
Junco hyemalis	dark-eyed junco	
Spizella breweri	Brewer's sparrow	
Zonotrichia leucophrys	white-crowned sparrow	
Passeridae (Old World sparrows)		
Passer domesticus	house sparrow	
Poliptilidae (gnatcatchers)		
Polioptila caerulea	blue-gray gnatcatcher	
Sturnidae (starlings)		
Sturnus vulgaris	European starling	
Troglodytidae (wrens)		
Campylorhynchus brunneicapillus anthonyi	cactus wren	
Salpinctes obsoletus	rock wren	
Tyrannidae (tyrant flycatchers)		
Myiarchus cinerascens	ash-throated flycatcher	
Sayornis saya	Say's phoebe	
Vireonidae (vireos)		
Vireo cassinii	Cassin's vireo	
CLASS MAMMALIA (MAMMALS)		
Bovidae (bovines)		
Ovis canadensis nelsoni (BLMS, FP)	desert bighorn sheep	No live observations. A skull was found during the field surveys.
Canidae (canids)		
Canis familiaris	domestic dog	Feral dog observed at the south end of the study area near Rasor Road.
Canis latrans	coyote	Live observations along with scat and tracks.
Vulpes macrotis macrotis (CPF)	desert kit fox	Live observation during nighttime acoustic bat survey, along with scat and burrows.

Scientific Name	Common Name	Additional Observation Notes
Equidae (horses and donkeys)		
*Equus africanus asinus**	donkey	Scat observed.
Leporidae (rabbits and hares)		
Lepus californicus	black-tailed jackrabbit	
Vespertilionidae (common, vesper, and simple nosed bats)		
Parastrellus hesperus	canyon bat	Sixteen detections during the nighttime acoustic surveys.
Tadarida brasiliensis	Mexican free-tailed bat	Two detections during the nighttime acoustic surveys.

*Non-native species

Status Codes:

Federal Status:

FT = Federally Listed Threatened

BLMS = Bureau of Land Management: Sensitive

California State Status:

ST = California State-Listed Threatened

FP = CDFW Fully Protected

SSC = CDFW Species of Special Concern

CPF = California Protected Fur-bearer