DOCKETED	
Docket Number:	24-OPT-03
Project Title:	Soda Mountain Solar
TN #:	258459
Document Title:	Appendix D6 – Appendices H-R to 2024 Biological Resources Technical Report
Description:	This file contains Appendices H through R to the 2024 Biological Resources Technical Report.
Filer:	Hannah Gbeh
Organization:	Resolution Environmental
Submitter Role:	Applicant Consultant
Submission Date:	8/12/2024 3:06:33 PM
Docketed Date:	8/12/2024

APPENDIX H

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

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 14, 2024

Re: **Mojave Fringe-Toed Lizard Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347**

INTRODUCTION

This report summarizes the results of the 2023 Mojave fringe-toed lizard (*Uma scoparia*) survey conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM) (Figure 2). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

SWCA developed the biological survey methods in coordination with California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. The Mojave fringe-toed lizard is listed as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW) and as sensitive by the BLM. This report presents information about the species' life history and range, describes habitat at the project site, provides survey methodology, and provides a brief assessment of the species' potential to occur within the project site.

Species Background

The Mojave fringe-toed lizard is restricted to habitats with loose windblown sand, particularly aeolian sand deposits, and the immediate surroundings (Norris 1958; USFWS 2011). 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 this environment have not been documented (USFWS 2011). The species has several physical adaptations for 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 Staff 2000). The species is most active during the warmer seasons and typically hibernates between November and February (Norris 1958; U.S. Fish and Wildlife Service [USFWS] 2011). When not active, the species takes refuge in burrows or under the sand.

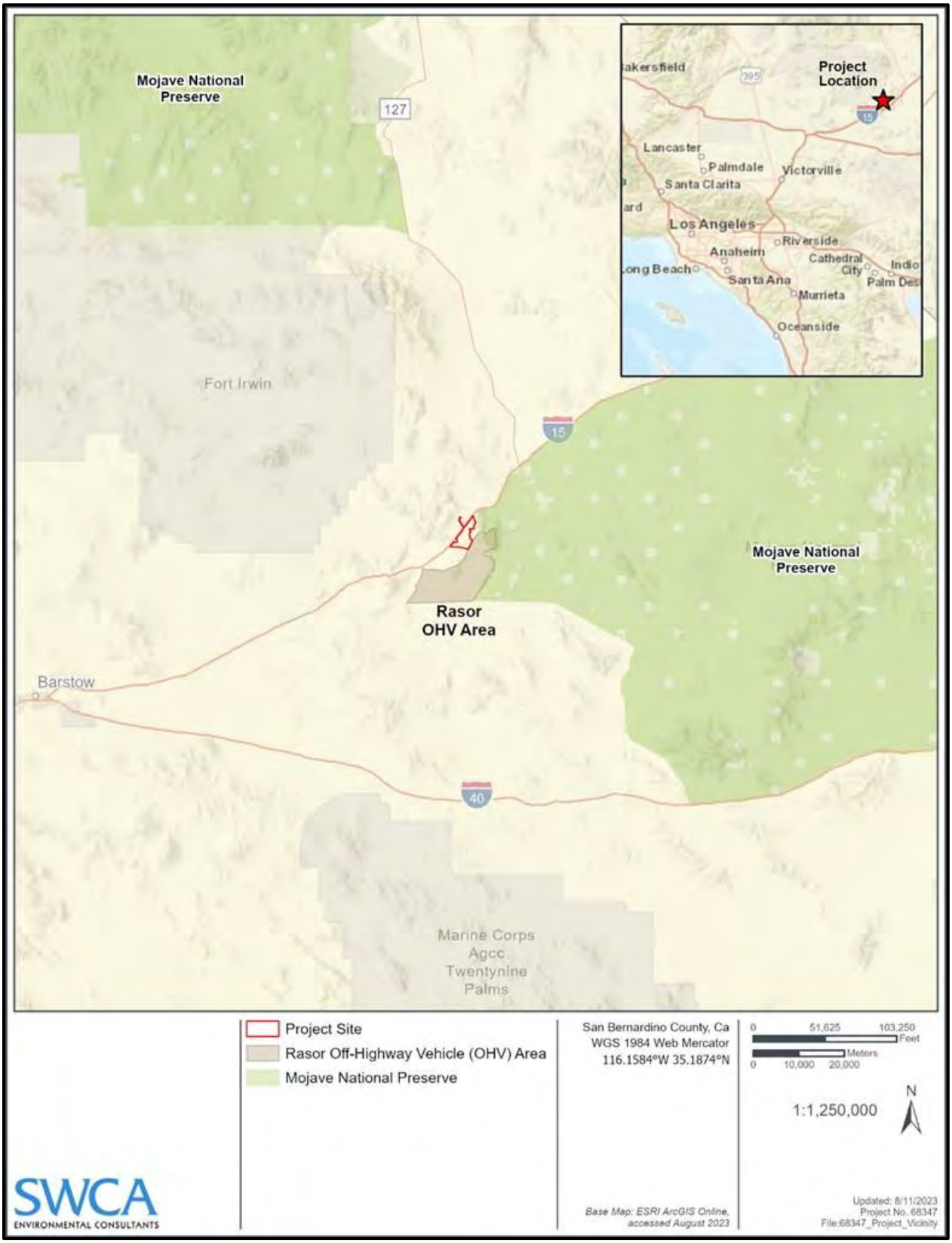

Figure 1. Soda Mountain Solar Project vicinity map.

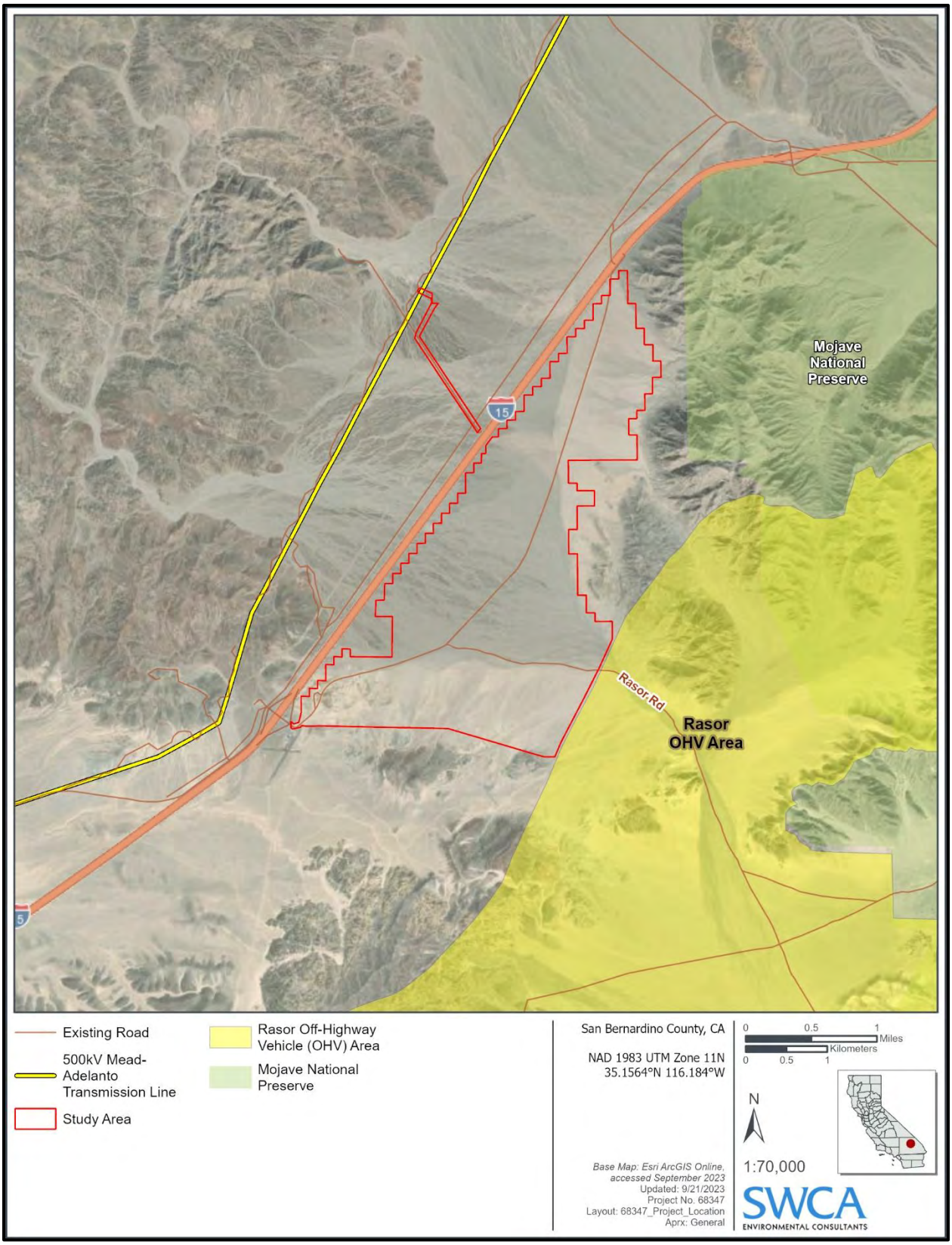

Figure 2. Soda Mountain Solar Project study area.

Species Range

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. Several populations of Mojave fringe-toed lizard have been documented as extirpated within the western part of its range (Murphy et al. 2006). Based on studies by the USFWS (2011) of extant Mojave fringe-toed lizard populations, the project site is in close proximity to the defined Crucero-Rasor population (Figure 3).

Threats

Natural predators of Mojave fringe-toed lizard include larger lizards, snakes, greater roadrunner (*Geococcyx californianus*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), hawks, American badger (*Taxidea taxus*), and coyote (*Canis latrans*) (Jones and Lovich 2009). Off-highway vehicle (OHV) activity may kill lizards directly and degrade the dune habitat; designated OHV recreation areas overlaps with three significant historic populations of Mojave fringe-toed lizard: El Mirage Dry Lake, Dumont Dunes, and Rasor Road (labeled as Dumont Dunes and Crucero-Rasor on Figure 3). 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 nonnative 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.

Previous Mojave Fringe-Toed Lizard Surveys

The project site was previously surveyed for Mojave fringe-toed lizard in 2009 and 2012. The 2013 biological resources technical report for the project identified approximately 5.82 acres of suitable habitat overlapping the southeastern portions of the previously proposed project boundary (Panorama Environmental, Inc. 2013). No Mojave fringe-toed lizards were found within the project boundary in either survey, but a total of 26 lizards were documented. The closest observation was approximately 1,000 feet from the southwest of the project boundary.

FIELD SURVEY METHODS

For this report, the study area included the 2,634-acre proposed project site and the proposed gen-tie route (approximately 35.75 acres) (Figure 2). The surveys focused on the southeastern areas of the study area closest to known populations and the wash outside of the study area where a population of Mojave fringe-toed lizards are documented. SWCA biologists Danny Cuellar and Par Singhaseni conducted focused field surveys for Mojave fringe-toed lizard on April 26 and July 11, 2023. The biologists walked 10-meter transects throughout areas with suitable habitat. Binoculars were used to observe lizards at a distance to confirm the species. Mojave fringe-toed lizard observations were recorded using a global positioning system (GPS) unit. The surveys were conducted during the active season for Mojave fringe-toed lizard, which is generally March – October. Conditions during the survey were ideal for the detection of lizards. Weather conditions are summarized in Table 1.

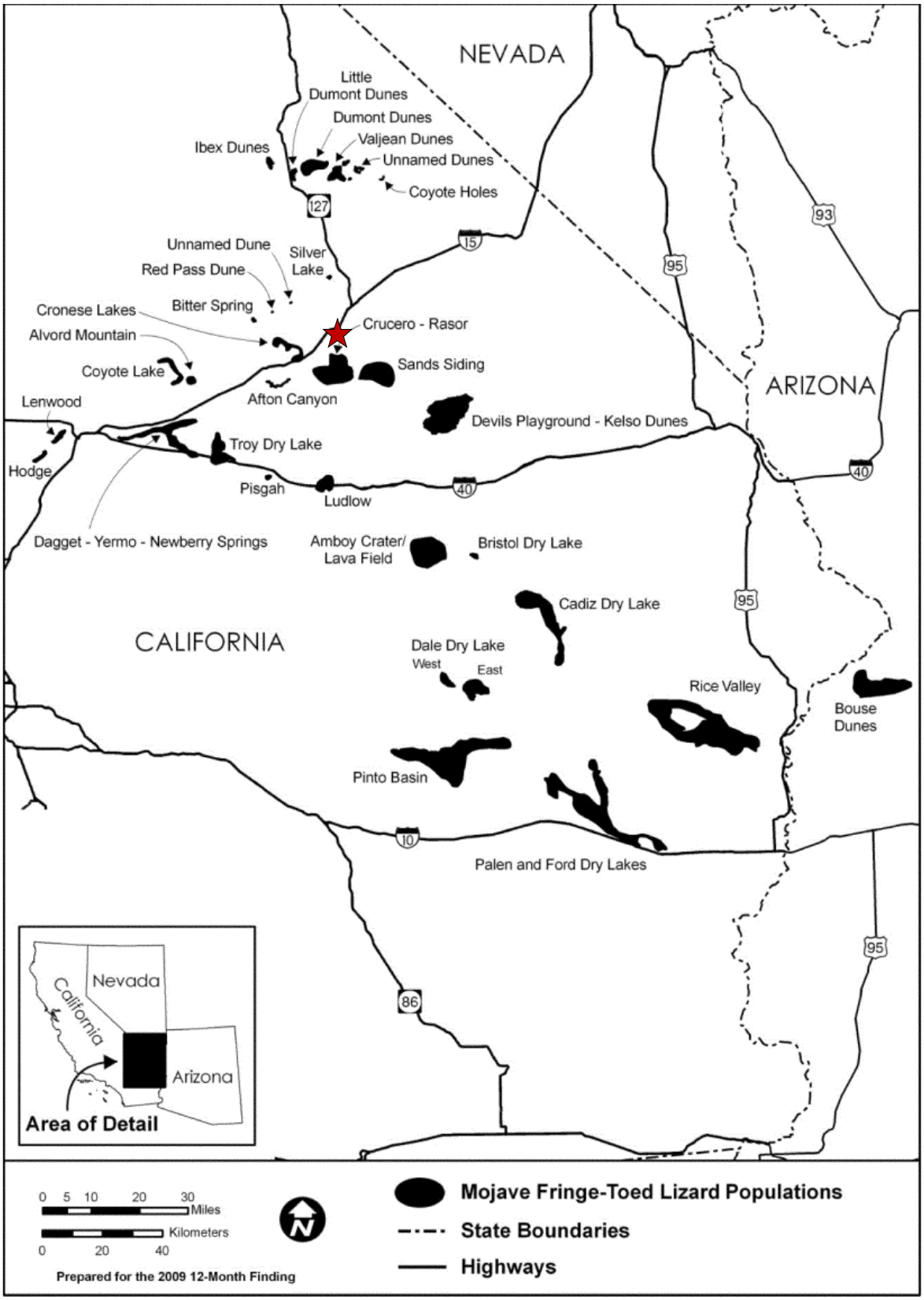

Figure 3. Mojave Fringe-toed Lizard populations (from U.S. Fish and Wildlife Service, 2011). The red star indicates the approximate project location.

Table 1. Weather Conditions and Survey Times

Date	Start Time	End Time	Temperature (°F)	Wind Speed (mph)	Conditions
4/26	08:00	11:00	75-91	0-2	Sunny
7/11	07:30	10:45	89-100	2-6	Sunny

RESULTS

A total of five Mojave fringe-toed lizards were observed during the surveys, two during the April survey and three during the July survey, within the sandy wash outside of the southern portion of the study area, the nearest observation approximately 1,000 feet south of the study area. (Figures 4 and 5; Photographs A-1 and A-2 in Attachment A). This result was similar to the findings of the 2009 and 2012 surveys. The lizards were found when temperatures ranged between 82.9 to 96.4 degrees Fahrenheit. Other common wildlife species observed during the surveys included western zebra-tailed lizard (*Callisaurus draconoides rhodostictus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidoscelis tigris tigris*), sidewinder (*Crotalus cerastes*), and common raven (*Corvus corax*).

Vegetation within the southeastern portion of the study area and within the sandy wash outside of the study area consisted primarily of creosote bush (*Larrea tridentata*). During the April survey, several blooming annual plant species were also found within the wash, including desert lily (*Hesperocallis undulata*), desert sand verbena (*Abronia villosa* var. *villosa*), desert calico (*Loeseliastrum matthewsii*), freckled milk-vetch (*Astragalus lentiginosus*), and dune primrose (*Oenothera deltoides*) (Photograph A-3). Several of these species were found only in sand dunes outside the study area and were not found within the study area during the rare plant survey conducted in April 2023. Invasive Mediterranean grass (*Schismus* sp.) was also prevalent within the study area. During the July survey, conditions were hot and dry and only the perennial vegetation remained (Photograph A-4).

DISCUSSION

Habitat suitability was evaluated based on aerial imagery, data collected from other focused surveys for the project, and the 2013 biological resources technical report. Suitable habitat for Mojave fringe-toed lizard occurs within the southeast portion of the study area (see Figure 4), however was not identified until after the surveys concluded therefore was not surveyed. The 5.82 acres of previously mapped suitable habitat overlapping the previous project boundary (identified in the 2013 biological resources technical report) is no longer within the current study area. The portions of the study area closest to the suitable habitat and observations from the survey, specifically the southeastern boundary, were also not suitable for Mojave fringe-toed lizard as the ground cover primarily consisted of gravel (Photographs A-5 and A-6).

The biologists mapped the limits of suitable habitat within the wash to approximately 750 feet south-southwest of the study area. In this location, the soils within the wash begin to transition from sand to gravel (Photographs A-7–A-9). The section of the wash that extends further north toward Rasor Road was entirely gravel and would not be suitable for Mojave fringe-toed lizard. Finally, the southern portion of the wash had notable OHV disturbance, which may be detrimental to the species.

The population of Mojave fringe-toed lizard south of the study area appears to be relatively isolated. The wash could potentially provide connectivity to a second known population further south; however, the flow is disrupted by Rasor Road, and windblown sand deposits are limited to the southern areas of the wash. The Mojave fringe-toed lizard is considered absent within the study area and would not be impacted by the project.

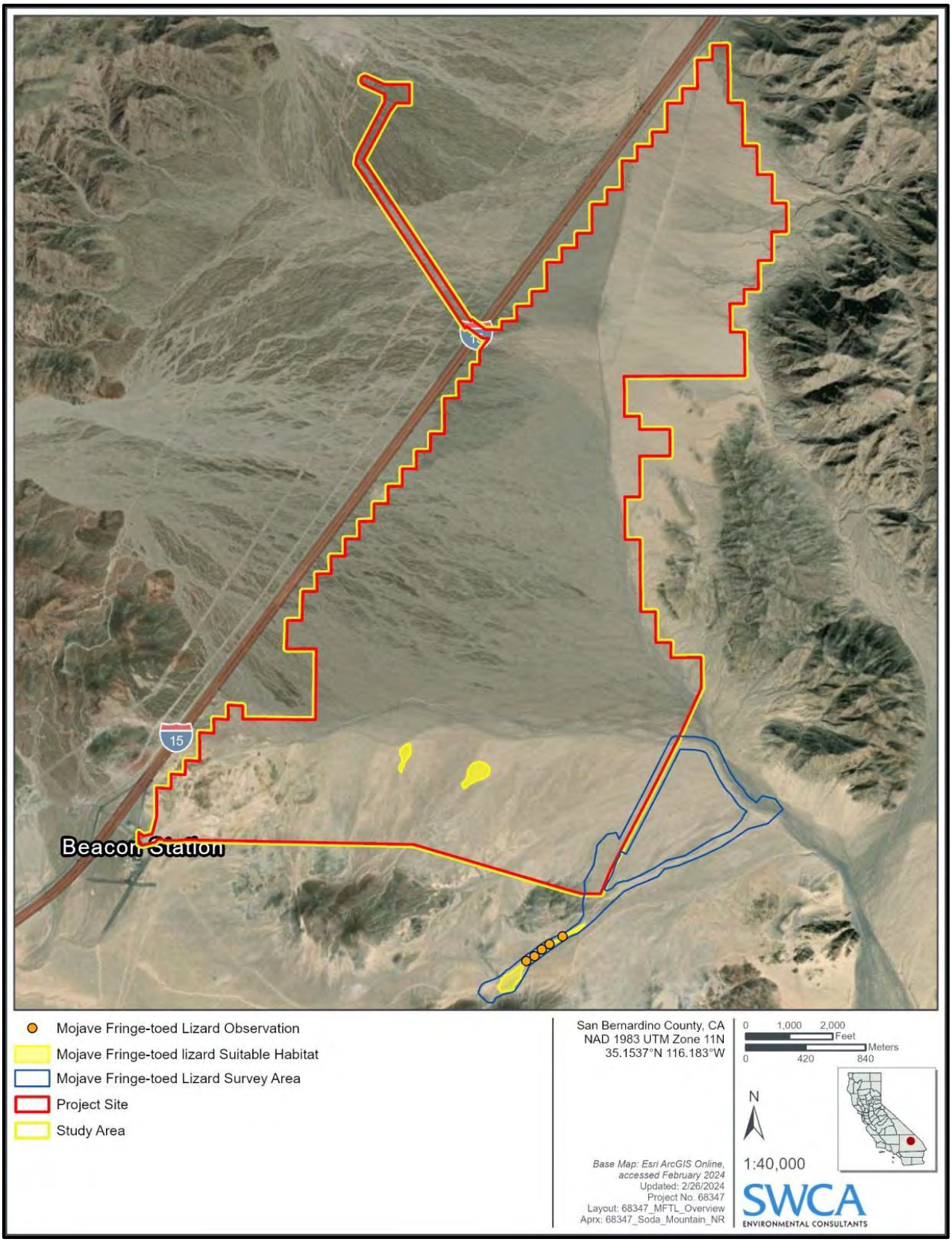

Figure 4. Mojave fringe-toed lizard suitable habitat and live observations.

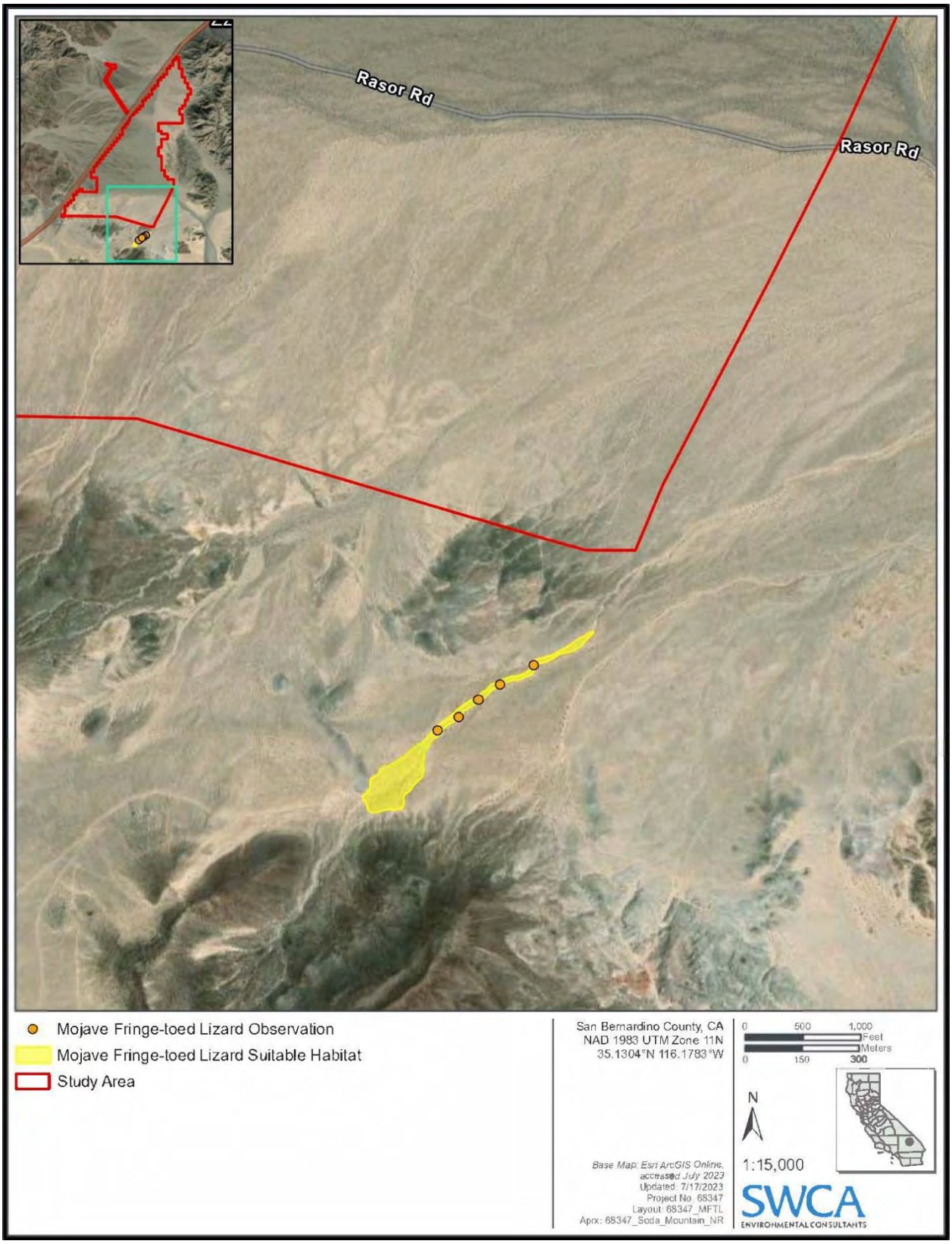

Figure 5. Focused view of Mojave fringe-toed lizard suitable habitat and live observations.

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ATTACHMENT A

Site Photographs

Photograph A-1. Adult Mojave fringe-toed lizard sheltering under a creosote bush; the individual was observed outside of the study area. Photographed April 26, 2023.

Photograph A-2. Mojave fringe-toed lizard tracks found within the sandy wash approximately 1,000 feet outside of the study area. Photographed April 26, 2023.

Photograph A-3. Habitat conditions during the spring survey in the southern area of the wash; view facing west. Photographed April 26, 2023.

Photograph A-4. Habitat conditions in the southern area of the wash during the summer survey; view facing north. Photographed July 11, 2023.

Photograph A-5. View of the southeastern boundary of the study area, facing west. This habitat is not suitable for Mojave fringe-toed lizard. Photographed July 11, 2023.

Photograph A-6. Close-up of the ground cover at the southeastern boundary of the study area; view facing north. This habitat is not suitable for Mojave fringe-toed lizard. Photographed July 11, 2023.

Photograph A-7. Overview of the wash transitioning from windblown sands to gravelly soils, facing northeast. Photographed July 11, 2023.

Photograph A-8. Upstream view of habitat in the wash transitioning from windblown sands to gravelly soils, facing north. Photographed April 26, 2023.

Photograph A-9. Downstream view of the sandy wash where the soils transition from sand to gravel, facing southwest. Photographed April 26, 2023.

Photograph A-10. Close-up of windblown sand habitat in the wash outside of the study area. An individual was found sheltering in the burrow in the foreground. Photographed July 11, 2023.

Photograph A-11. View of Rasor Road at the entrance of the wash, facing southwest. Soils were primarily gravely with minimal windblown sands. Photographed July 24, 2023.

APPENDIX I

Winter Avian Use Survey Report for the Soda Mountain Solar Project

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 14, 2024

Re: **Winter Avian Use Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347**

INTRODUCTION

This report describes the winter avian use survey conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM) (Figure 2). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

Avian use surveys provide the species data necessary to determine how implementation of the project could affect use of the project site by resident, seasonal, and migratory birds. Nearly all species of native birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513. Furthermore, some birds are protected under the federal Endangered Species Act and California Endangered Species Act.

SWCA developed the biological survey methods in coordination with California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. Avian survey methods included a series of four replicate point counts spread over an entire year. This report summarizes the methods and results of the winter avian use survey conducted in January 2023 by SWCA for the project.

Figure 1. Soda Mountain Solar Project vicinity map.

METHODS

For this report, the study area included 24 avian point-count locations across the 2,634-acre proposed project site excluding the gen-tie (Figure 2). SWCA avian biologist Gigi Wagnon performed the winter avian use survey on January 24, 25, and 26, 2023. G. Wagnon conducted 20-minute unlimited-radius point counts at each point-count location (see Figure 2) during the survey. The survey points were along existing roads; all avian species detected by sight and sound were documented. Each point-count location was monitored for 20 minutes to maximize the chances of detecting uncommon species, such as eagles and other raptors. All point-count locations were recorded using a GPS unit with submeter accuracy. All point-count location habitat types and quality were documented and are described below. The survey was conducted at all times of day to maximize observation potential. The survey was conducted in safe weather conditions with full visibility for each point-count location.

Incidental observations of avian and other wildlife outside the 20-minute formal survey periods were documented to develop a comprehensive species list for the study area and record any observations or patterns of use that may be relevant to the project.

RESULTS

Weather conditions during the survey were mostly sunny and moderate, with temperatures between 34 and 61 degrees Fahrenheit and low wind speeds (Table 1).

Table 1. Survey Times and Weather Conditions

Date	Start Time	End Time	Temperature (degrees Fahrenheit)	Wind Speed (miles per hour)	Conditions
1/24/2023	07:10	14:55	35–60	1	Sunny
1/25/2023	07:10	16:30	34–61	0–4	Sunny
1/26/2023	07:15	14:05	38–60	1–4	Sunny

A total of seven avian species were detected by sight and/or sound within the study area during the winter period: common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), European starling (*Sturnus vulgaris*), horned lark (*Eremophila alpestris*), house sparrow (*Passer domesticus*), Say's phoebe (*Sayornis saya*), and verdin (*Auriparus flaviceps*). The number of detections for each species can be found in Table 2. There were 60 avian detections total, with most detections occurring within 300 meters of the gas station on Rasor Road (Table 3, Figure 3). No birds were detected at 10 of the point-count locations (see Figure 3).

No special-status avian species were observed in the study area during the survey periods or incidentally. The vegetation at all point-count locations were described as Creosote Bush - White Bursage Scrub (*Larrea tridentata - Ambrosia dumosa* Shrubland Alliance) based on the California Native Plant Society guidelines (California Native Plant Society 2023). The biologist observed several trucks, dirt bikes, and all-terrain vehicles being driven off-road within or near the study area. There were no incidental observations of birds or other wildlife in the study area outside the survey periods.

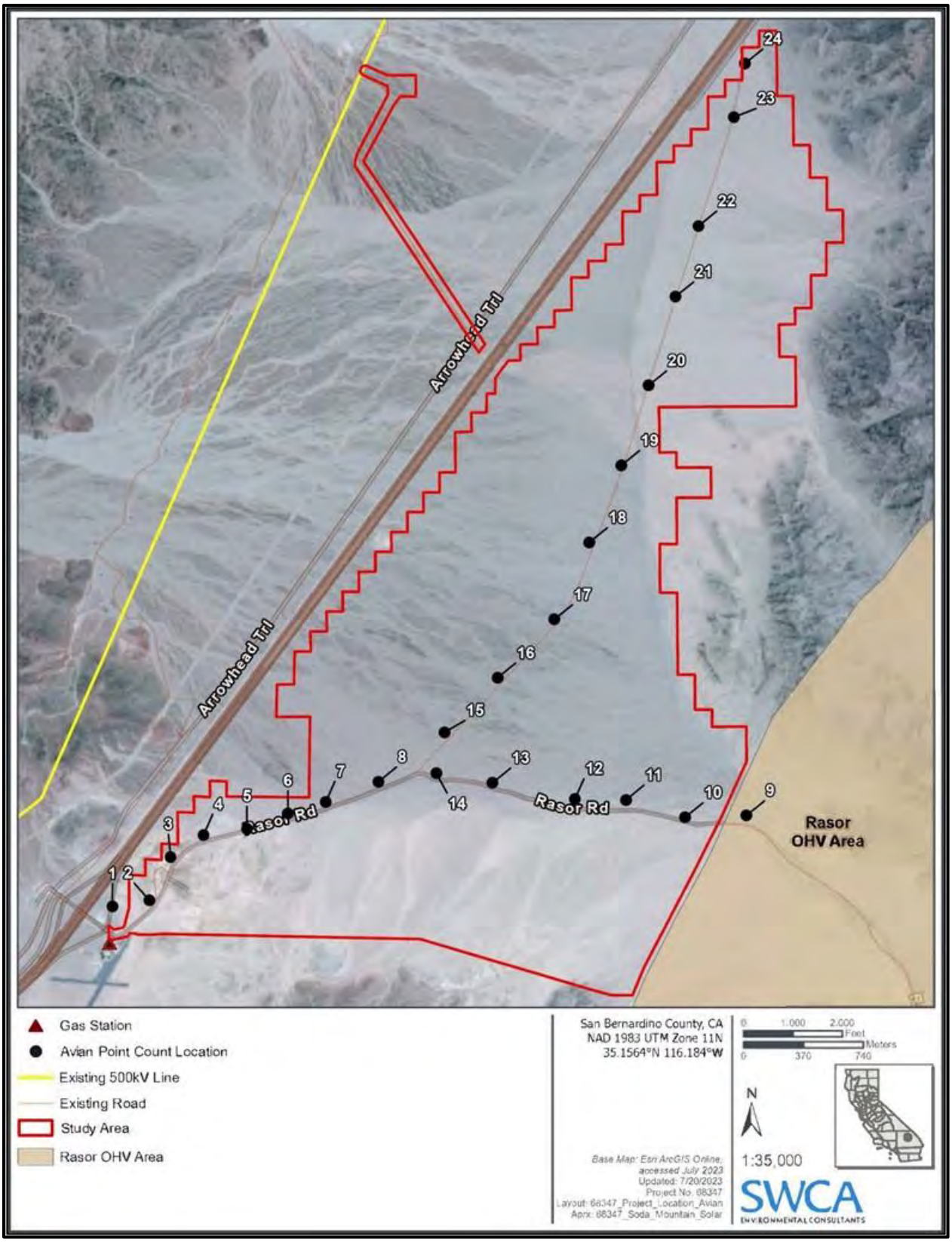

Figure 2. Avian point-count locations.

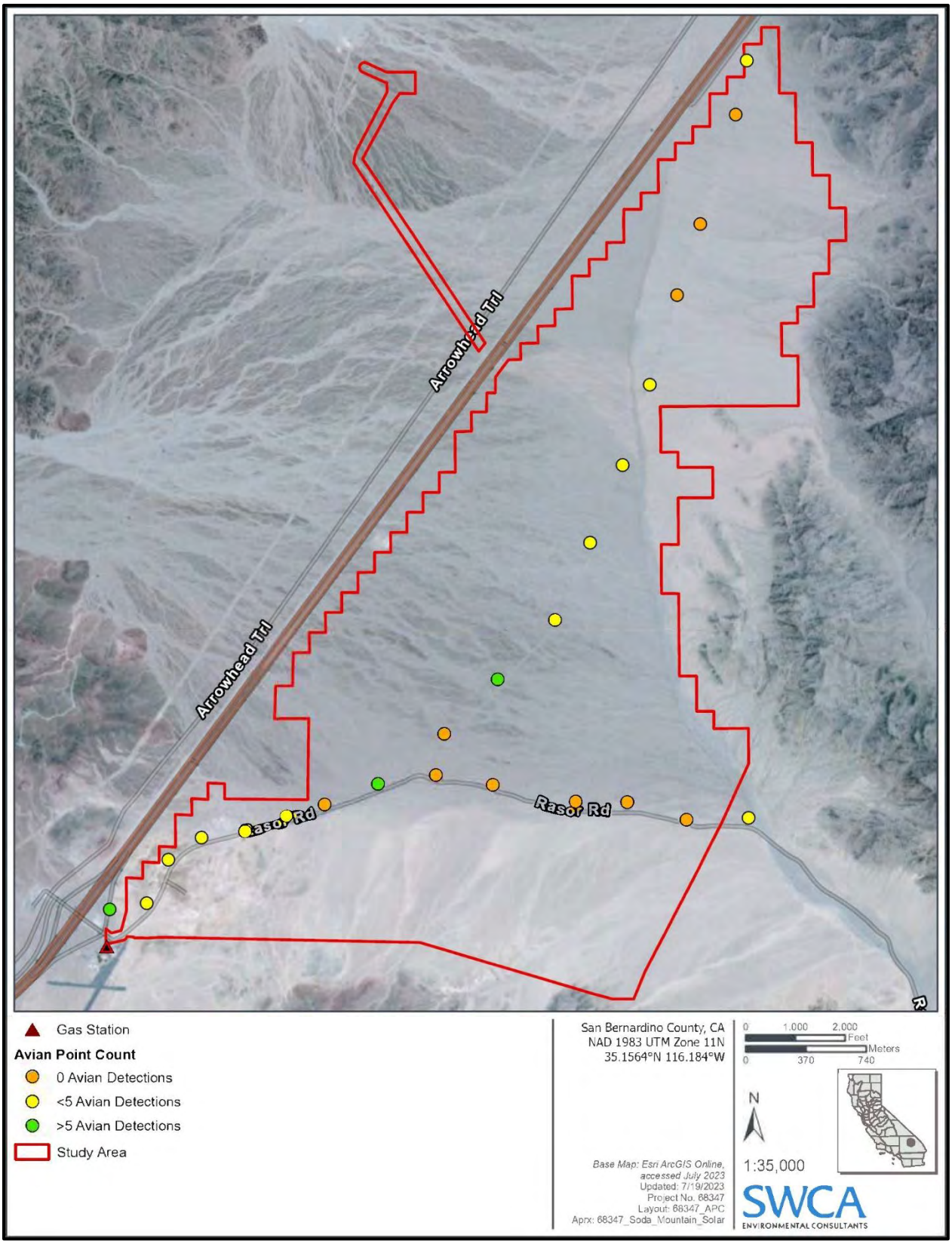

Figure 3. Winter avian use detections in the study area.

Table 2. Winter Avian Use Detections by Species

Species Group	Common Name	Scientific Name	Detections
Corvids	common raven	*Corvus corax*	19
Passerines	bushtit	*Psaltriparus minimus*	9
	European starling	*Sturnus vulgaris**	12
	horned lark	*Eremophila alpestris*	8
	house sparrow	*Passer domesticus**	1
	Say's phoebe	*Sayornis saya*	3
	verdin	*Auriparus flaviceps*	8
Total			**60**

* Nonnative species

Table 3. Winter Avian Use Detections by Point-Count

Point Count Number	Common Name (Scientific Name)	Detections
1	common raven (*Corvus corax*) European starling (*Sturnus vulgaris*)* house sparrow (*Passer domesticus*)* Say's phoebe (*Sayornis saya*)	11 12 1 1
2	common raven Say's phoebe	2 1
3	horned lark (*Eremophila alpestris*)	2
4	horned lark Say's phoebe	1 1
5	horned lark	1
6	horned lark	1
7	not applicable (N/A)	0
8	bushtit (*Psaltriparus minimus*)	9
9	verdin (*Auriparus flaviceps*)	2
10	N/A	0
11	N/A	0
12	N/A	0
13	N/A	0
14	N/A	0
15	N/A	0
16	common raven	5
17	horned lark verdin	3 1
18	verdin	2
19	verdin	1
20	verdin	2
21	N/A	0
22	N/A	0
23	N/A	0
24	common raven	1
Total		**60**

* Nonnative species

DISCUSSION

During the winter non-breeding season, the study area exhibited limited avian activity, with only 60 individuals detected across seven different avian species. Common raven, European starling, and house sparrow were the most frequently observed species in the study area. These species are adapted to human-altered landscapes and are closely associated with human-made structures such as the gas station immediately southwest of the project. European starlings and house sparrows are invasive species that often outcompete native birds for food and other resources due to their adaptability (Lowe 2020). Common ravens are known to be opportunistic and aggressive in their foraging and territorial behaviors, and their populations have increased in the Mojave Desert approximately 1,000% since the 1980s due to human built structures (Davidson 2017). Interstate 15 directly west of the study area is lined with utility poles which serve as suitable breeding sites for ravens. The presence of the common raven, European starling, and house sparrow may have an overall impact on avian species composition in the study area.

The point-count locations were characterized as Creosote Bush - White Bursage Scrub, which provides nesting sites, shelter from predators, and a source of food for birds and other wildlife. Off-road vehicle activity can alter native vegetation and soil composition, creating unsuitable habitat for avian species and other wildlife (U.S. Geological Survey 2020). Interstate 15 directly west of the study area introduces noise pollution that has the potential to negatively affect avian communities and influence their distribution patterns (Senzaki 2020). The combined impacts of these disturbances are likely to adversely affect avian use within the study area.

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APPENDIX J

Spring Avian Use Survey Report for the Soda Mountain Solar Project

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 14, 2024

Re: **Spring Avian Use Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347**

INTRODUCTION

This report describes the spring avian use survey conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM) (Figure 2). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

Avian use surveys provide the species data necessary to determine how implementation of the project could affect use of the project site by resident, seasonal, and migratory birds. Nearly all species of native birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513. Furthermore, some birds are protected under the federal Endangered Species Act and California Endangered Species Act.

SWCA developed the biological survey methods in coordination with California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. Avian survey methods included a series of four replicate point counts spread over an entire year. This report summarizes the methods and results of the spring avian use survey conducted in March 2023 by SWCA for the project.

Figure 1. Soda Mountain Solar Project vicinity map.

METHODS

For this report, the study area included 24 avian point-count locations across the 2,634-acre proposed project site excluding the gen-tie (Figure 2). SWCA avian biologists Gigi Wagnon and Bridget Manjarrez performed the spring avian use survey on March 23 and 24, 2023. The biologists conducted 20-minute unlimited-radius point counts at each point-count location (see Figure 2) during the survey. The survey points were along existing roads; all avian species detected by sight and sound were documented. Each point-count location was monitored for 20 minutes to maximize the chances of detecting uncommon species, such as eagles and other raptors. All point-count location habitat types and quality were documented and are described below. The survey was conducted at all times of day to maximize observation potential. The survey was conducted in safe weather conditions with full visibility for each point-count location.

Incidental observations of avian and other wildlife outside the 20-minute formal survey periods were documented to develop a comprehensive species list for the study area and record any observations or patterns of use that may be relevant to the project.

RESULTS

Weather conditions during the survey were mostly sunny and moderate, with temperatures between 45 and 59 degrees Fahrenheit and low wind speeds (Table 2).

Table 2. Survey Times and Weather Conditions

Date	Start Time	End Time	Temperature (degrees Fahrenheit)	Wind Speed (miles per hour)	Conditions
3/23/2023	07:48	15:10	45–59	4–8	Partly cloudy
3/24/2023	07:19	10:50	49–56	3–7	Sunny

A total of 11 avian species were detected by sight and/or sound within the study area during the spring period: common raven (*Corvus corax*), sage thrasher (*Oreoscoptes montanus*), rock wren (*Salpinctes obsoletus*), cactus wren (*Campylorhynchus brunneicapillus*), horned lark (*Eremophila alpestris*), Say's phoebe (*Sayornis saya*), black-throated sparrow (*Amphispiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), house finch (*Haemorhous mexicanus*), dark-eyed junco (*Junco hyemalis*), and verdin (*Auriparus flaviceps*). The number of detections for each species can be found in Table 2. In total, there were 123 bird detections, with most detections occurring in the northern portion of the study area (Table 3, Figure 3).

One CDFW species of special concern was detected in the study area: loggerhead shrike. The vegetation at all point-count locations were described as Creosote Bush - White Bursage Scrub (*Larrea tridentata - Ambrosia dumosa* Shrubland Alliance) based on the California Native Plant Society guidelines (California Native Plant Society 2023). The biologists observed several trucks, dirt bikes, and all-terrain vehicles being driven off-road within the southern portion of the study area. There were no incidental observations of birds or other wildlife in the study area outside the survey periods.

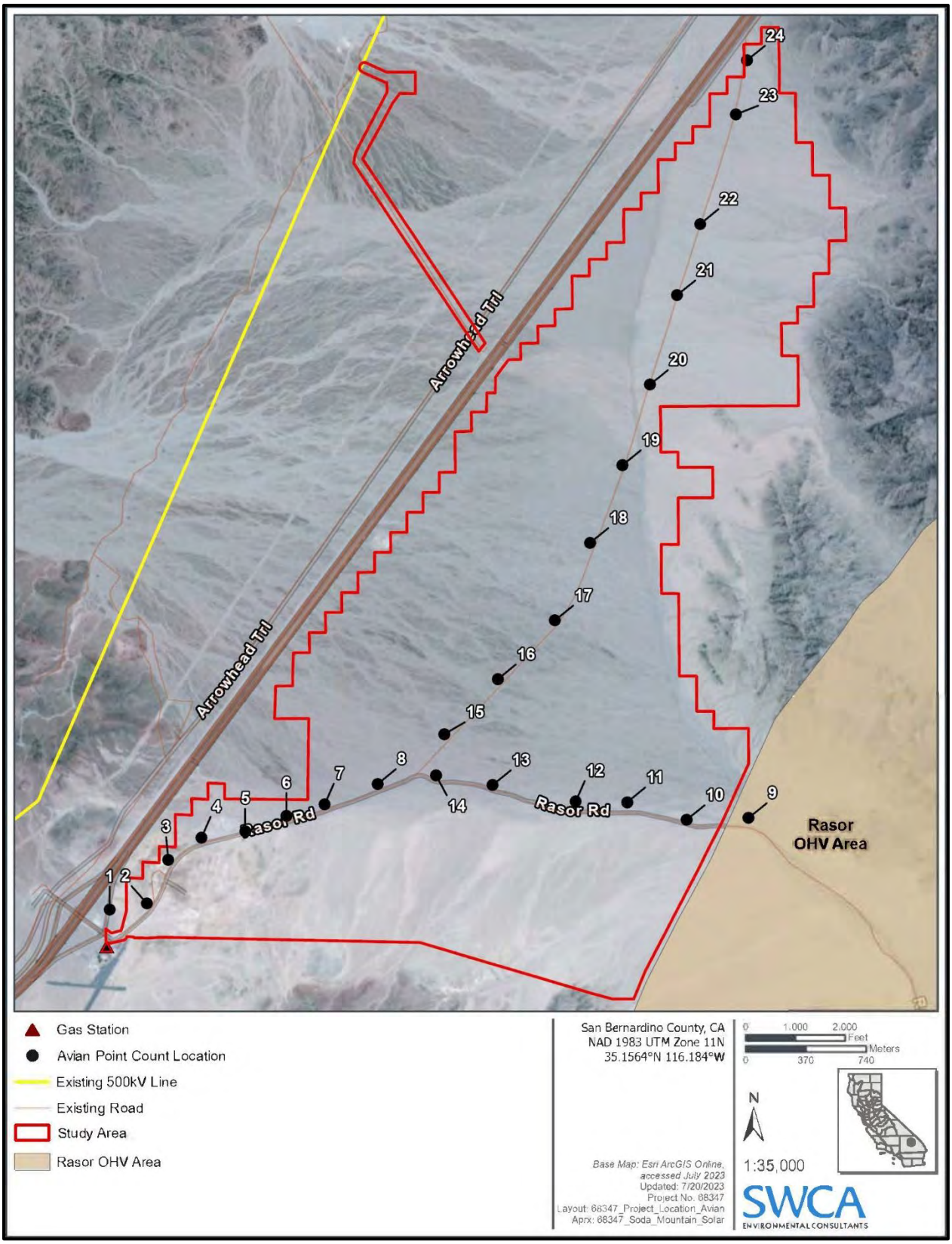

Figure 2. Avian point-count locations.

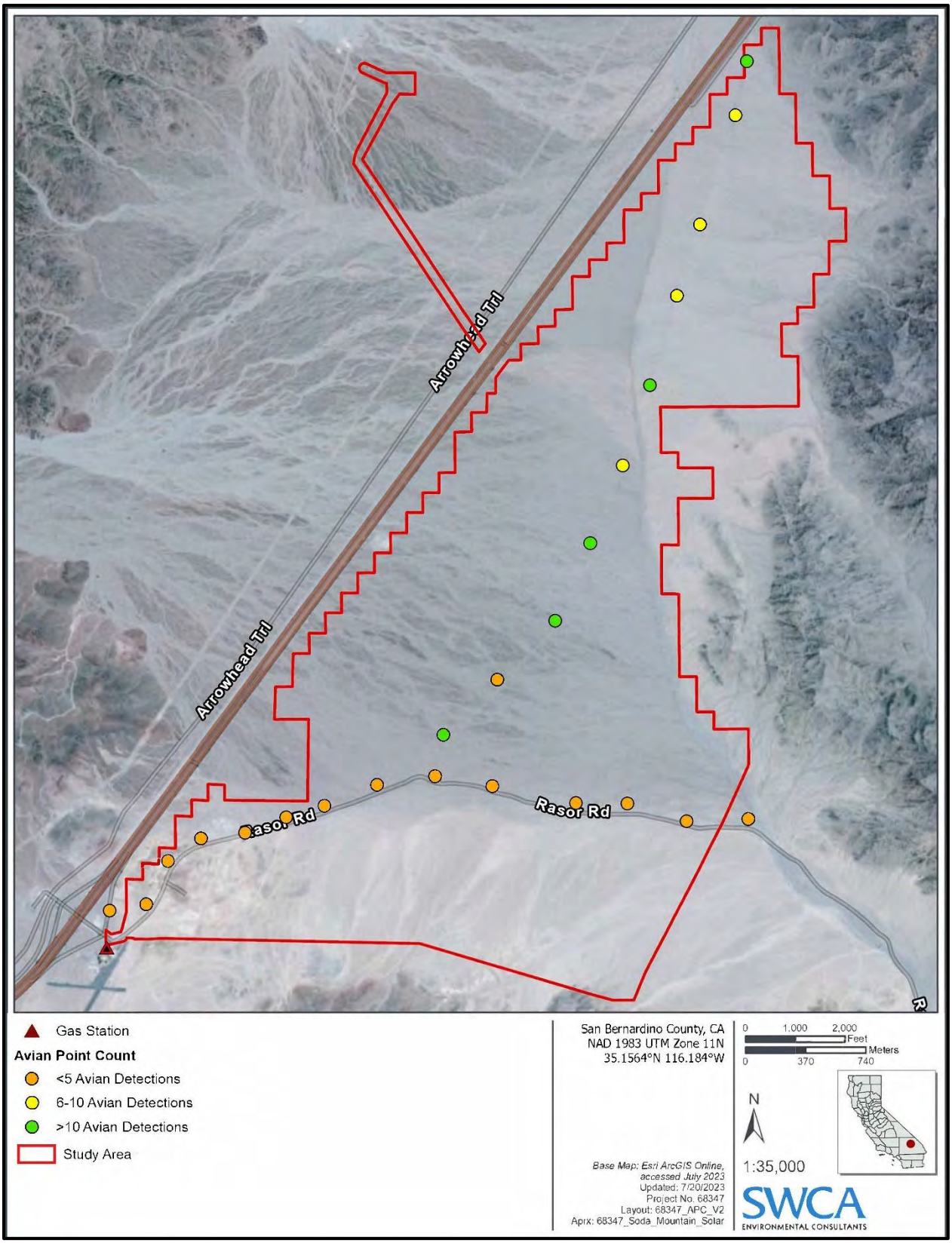

Figure 3. Spring avian use detections in the study area.

Table 1. Spring Avian Use Detections by Species

Species Group	Common Name	Scientific Name	Detections
Corvids	common raven	*Corvus corax*	12
Passerines	sage thrasher	*Oreoscoptes montanus*	1
	cactus wren	*Campylorhynchus brunneicapillus*	1
	rock wren	*Salpinctes obsoletus*	2
	horned lark	*Eremophila alpestris*	50
	Say's phoebe	*Sayornis saya*	2
	black-throated sparrow	*Amphispiza bilineata*	35
	loggerhead shrike*	*Lanius ludovicianus*	2
	house finch	*Haemorhous mexicanus*	10
	dark-eyed junco	*Junco hyemalis*	6
	verdin	*Auriparus flaviceps*	2
Total			**123**

* CDFW Species of Special Concern

Table 3. Spring Avian Use Detections by Point-Count

Point Count Number	Species	Detections
1	common raven (*Corvus corax*)	1
2	common raven	3
3	horned lark (*Eremophila alpestris*)	1
4	horned lark Say's phoebe (*Sayornis saya*)	3 1
5	horned lark	1
6	horned lark black-throated sparrow (*Amphispiza bilineata*)	1 1
7	horned lark	3
8	black-throated sparrow	1
9	loggerhead shrike (*Lanius ludovicianus*)* sage thrasher (*Oreoscoptes montanus)* rock wren (*Salpinctes obsoletus)*	1 1 1
10	common raven	1
11	horned lark	1
12	horned lark	1
13	common raven	1
14	loggerhead shrike*	1
15	horned lark house finch (*Haemorhous mexicanus*) black-throated sparrow	7 2 2
16	horned lark black-throated sparrow	2 2
17	horned lark house finch black-throated sparrow common raven	4 3 2 2

Point Count Number	Species	Detections
18	horned lark	4
	house finch	1
	black-throated sparrow	6
19	black-throated sparrow	5
	cactus wren	1
	horned lark	3
20	horned lark	5
	house finch	4
	black-throated sparrow	3
21	horned lark	4
	black-throated sparrow	2
22	verdin (*Auriparus flaviceps*)	2
	horned lark	5
	black-throated sparrow	2
23	dark-eyed junco (*Junco hyemalis)*	4
	horned lark	4
	black-throated sparrow	2
24	horned lark	1
	black-throated sparrow	7
	common raven	4
	dark-eyed junco	2
	Say's phoebe	1
	rock wren	1
Total		**123**

* CDFW Species of Special Concern

DISCUSSION

During the spring migration season, the study area exhibited limited avian activity, with only 123 individuals detected across 11 different avian species, including one CDFW species of special concern. Common raven, horned lark, black-throated sparrow, and house finch were the most frequently observed species in the study area.

Loggerhead shrike was detected on-site and 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 point-count locations were characterized as Creosote Bush - White Bursage Scrub, which is defined by shrubs less than 1 meter in height (California Native Plant Society 2023). In addition to the short vegetation, the study area has many prey species available on-site for the loggerhead shrike such as many insects, reptiles, and small rodents.

Horned larks, black-throated sparrows, and house finches forage in mixed-species flocks in the nonbreeding season for increased foraging efficiency and enhanced vigilance against potential threats (Badyaev 2020; Beason 2020; Johnson 2020). Horned larks often form foraging groups with dark-eyed juncos, which were also detected in the study area (Beason 2020). Black-throated sparrows have large territories in the spring during courtship and nest building, and often glean insect prey off creosote bush (*Larrea tridentata*) and other desert shrubs (Johnson 2020). The house finch has a diet largely consisting of seeds, and it is known to feed on creosote bush (Badyaev 2020). These species were most commonly found in groups in the northern portion of the study area where off-road vehicle activity occurred the least and the habitat is likely less disturbed.

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APPENDIX K

Summer Avian Use Survey Report for the Soda Mountain Solar Project

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 14, 2024

Re: **Summer Avian Use Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347**

INTRODUCTION

This report describes the summer avian use survey conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM) (Figure 2). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

Avian use surveys provide species data necessary to determine how implementation of the project could affect use of the project site by resident, seasonal, and migratory birds. Nearly all native birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513. Furthermore, some birds are protected under the federal Endangered Species Act and the California Endangered Species Act.

SWCA developed the biological survey methods in coordination with the California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. Avian survey methods included a series of four replicate point counts spread over an entire year. This report summarizes the results of the summer avian use survey conducted in July 2023 by SWCA for the project.

Figure 1. Soda Mountain Solar Project vicinity map.

METHODS

For this report, the study area included 24 avian point-count locations across the 2,634-acre proposed project site (Figure 2). SWCA avian biologist Lauren Strong performed the summer avian use survey on July 12, 13, and 14, 2023. L. Strong conducted a 20-minute unlimited-radius point count at each point-count location (see Figure 2) during the survey. The survey points were located along existing roads; all avian species detected by sight and sound were documented. Each point-count location was monitored for 20 minutes to maximize the chances of detecting uncommon species, such as eagles and other raptors. All point-count locations were recorded using a GPS unit capable of submeter accuracy. All point-count location habitat types and quality were documented and are described in this report. The summer survey was conducted at earlier times of day to maximize observation potential, since avian species' activity decreases as temperatures increase. The survey was conducted in safe weather conditions with full visibility of the surrounding area.

The biologist also documented incidental observations of avian and other wildlife outside the 20-minute formal survey periods to develop a comprehensive species list for the study area and record any observations or patterns of use that may be relevant to the project.

RESULTS

Weather conditions during the survey were mostly sunny and dry, with temperatures between 80 and 94 degrees Fahrenheit (°F) and wind speeds between 0 and 13 miles per hour (mph) (Table 1).

Table 1. Weather Conditions and Survey Times

Date	Start Time	End Time	Temperature (°F)	Wind Speed (mph)	Conditions
7/12/2023	6:42	8:58	86–94	2–13 mph	Sunny, 0%–9% cloud cover, dry
7/13/2023	5:20	8:53	81–94	0–4.8	Sunny, 35%–45% cloud cover, dry
7/14/2023	5:16	8:17	80–88	1.3–6.5	Sunny, 0% cloud cover, dry

A total of seven avian species were detected by sight and/or sound within the study area during the winter period. Avian species present on-site included dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), black-throated sparrow (*Amphispiza bilineata),* common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), verdin (*Auriparus flaviceps*), and one unidentified passerine. Individual detection quantities for each species can be found in Table 2. There were 15 avian detections in total, with most detections occurring within 1.3 miles of the southwest corner of the study area (Table 3, Figure 3). No birds were detected at 14 of the point-count locations (see Figure 3).

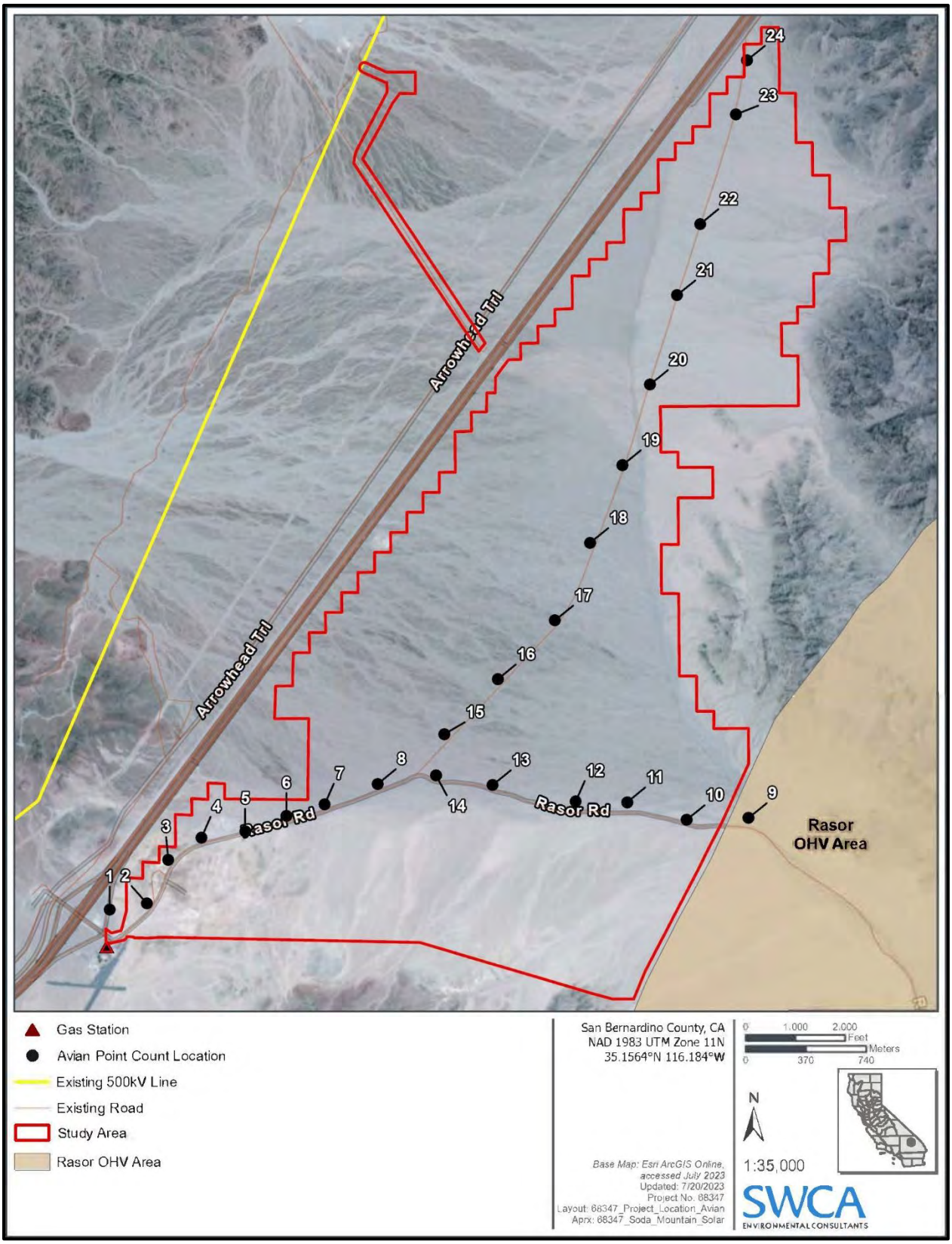

Figure 2. Avian point-count locations in the study area.

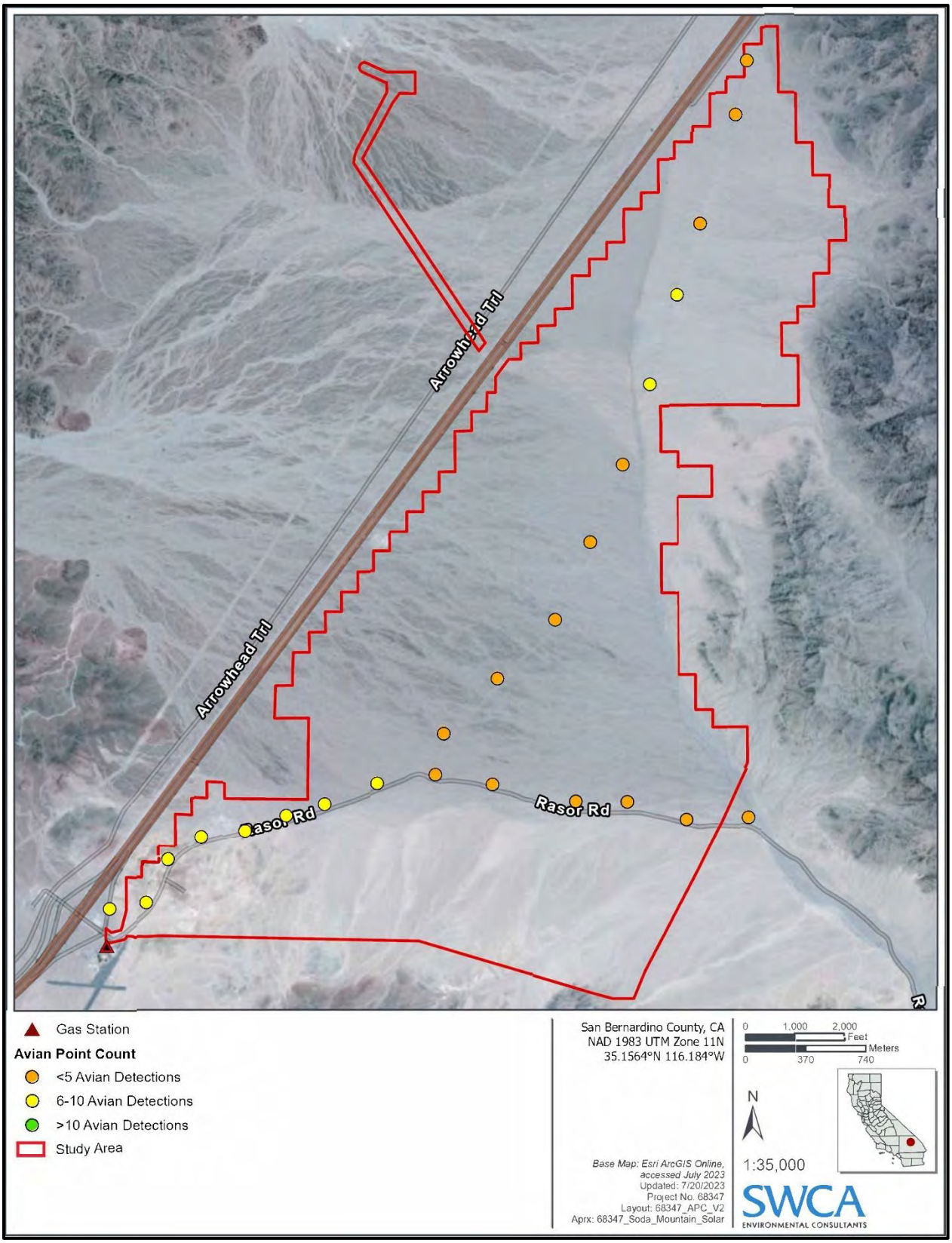

Figure 3. Summer avian use detections in the study area.

No special-status avian species were observed in the study area during the point counts or incidentally. All point-count locations were described as creosote bush-white bursage scrub (*Larrea tridentata - Ambrosia dumosa* Shrubland Alliance) based on the California Native Plant Society (CNPS) guidelines (CNPS 2023). The biologist observed recent tracks of all-terrain vehicles being driven off-road within or near the study area. The scat of a large carnivorous mammal approximately 37 cm long was observed incidentally approximately 165 meters south of point-count location 15, within the access road (Attachment C-1; Photograph C-1).

Table 2. Summer Avian Use Detections by Species

Species Group	Common Name (Scientific Name)	Detections
Doves	mourning dove (*Zenaida macroura*)	1
Corvids	common raven (*Corvus corax*)	5
Passerines	dark-eyed junco (*Junco hyemalis*)	1
	verdin (*Auriparus flaviceps*)	1
	horned lark (*Eremophila alpestris*)	5
	black-throated sparrow (*Amphispiza bilineata*)	1
	unidentified passerine	1

Table 3. Summer Avian Use Detections by Point Count

Point-Count Location	Common Name (Scientific Name)	Detections
1	common raven (*Corvus corax*)	1
2	common raven	3
3	unidentified passerine	1
4	black-throated sparrow (*Amphispiza bilineata*)	1
5	horned lark	1
6	horned lark	3
7	common raven horned lark	1 1
8	mourning dove (*Zenaida macroura*)	1
9	N/A	0
10	N/A	0
11	N/A	0
12	N/A	0
13	N/A	0
14	N/A	0
15	N/A	0
16	N/A	0
17	N/A	0
18	N/A	0
19	N/A	0
20	dark-eyed junco (*Junco hyemalis*)	1
21	verdin (*Auriparus flaviceps*)	1
22	N/A	0

Point-Count Location	Common Name (Scientific Name)	Detections
23	N/A	0
24	N/A	0

DISCUSSION

Avian use in the study area during the summer breeding season is determined to be low, with only 15 individuals across seven avian species. Common raven and horned lark were the most frequently observed species on the study area. Within the study area, potential nesting sites exist at the southwest corner and the northern tip of the gen-tie route, in the form of utility poles or towers that could serve as suitable breeding locations for ravens. Nevertheless, no nests were sighted on these utility structures.

The point-count locations were characterized as creosote bush - white bursage scrub, which is defined by shrubs less than 1 meter tall (CNPS 2023). Avian diversity is generally low in all desert habitats, but there are characteristic species, such as verdin, that exclusively reside in desert habitats (Austin 1976). A decline in bird song from spring to summer is typical, which may reduce the observers' ability to detect birds that are present (Ehnes et al. 2018).

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ATTACHMENT C-1

Site Photographs

Photograph C-1. Canine scat observed on July 13, 2023. This scat was found in the northern portion of the study area, west of Interstate 15.

APPENDIX L

Fall Avian Use Survey Report for the Soda Mountain Solar Project

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 14, 2024

Re: **Fall Avian Use Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347**

INTRODUCTION

This report describes the fall avian use survey conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

Avian use surveys provide the species data necessary to determine how implementation of the project could affect use of the project site by resident, seasonal, and migratory birds. Nearly all species of native birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513. Furthermore, some birds are protected under the federal Endangered Species Act and California Endangered Species Act.

SWCA developed the biological survey methods in coordination with California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. Avian survey methods included a series of four replicate point counts spread over an entire year. This report summarizes the methods and results of the fall avian use survey conducted in October 2023 by SWCA for the project.

Figure 1. Soda Mountain Solar Project vicinity map.

METHODS

For this report, the study area included 24 avian point-count locations across the 2,634-acre proposed project site excluding the gen-tie (Figure 2). SWCA avian biologist Gigi Wagnon performed the fall avian use survey on October 9, 10, and 11, 2023. The biologist conducted 20-minute unlimited-radius point counts at each point-count location (see Figure 2) during the survey. The survey points were located along existing roads; all avian species detected by sight and sound were documented. Each point-count location was monitored for 20 minutes to maximize the chances of detecting uncommon species, such as eagles and other raptors. All point-count location habitat types and quality were documented and are described below. The survey was conducted at all times of day to maximize observation potential. The survey was conducted in safe weather conditions with full visibility for each point-count location.

Incidental observations of avian and other wildlife outside the 20-minute formal survey periods were documented to develop a comprehensive species list for the study area and record any observations or patterns of use that may be relevant to the project.

RESULTS

Weather conditions during the survey were mostly sunny and moderate to hot, with temperatures between 61 and 92 degrees Fahrenheit (°F) and low wind speeds (Table 1).

Table 1. Survey Times and Weather Conditions

Date	Start Time	End Time	Temperature (°F)	Wind Speed (miles per hour)	Conditions
10/9/2023	06:58	13:46	66–92	3–6	Partly cloudy
10/10/2023	07:08	13:55	63–86	3–7	Sunny
10/11/2023	07:05	09:15	61–64	3–4	Sunny

A total of eight avian species were detected by sight and/or sound within the study area during the fall period: common raven (*Corvus corax*), house sparrow (*Passer domesticus*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), Say's phoebe (*Sayornis saya*), Brewer’s sparrow (*Spizellabreweri*), loggerhead shrike (*Lanius ludovicianus*), and house finch (*Haemorhous mexicanus*). The number of detections for each species can be found in Table 2. In total, there were 71 bird detections, with most detections occurring in the northern portion of the study area (Table 3, Figure 3).

One CDFW species of special concern was detected in the study area: loggerhead shrike. The vegetation at all point-count locations was described as Creosote Bush - White Bursage Scrub (*Larrea tridentata - Ambrosia dumosa* Shrubland Alliance) based on the California Native Plant Society guidelines (California Native Plant Society 2023). The biologist observed several dispersed campsites with RVs and campers southwest of Rasor Road near point counts 5, 6, and 7. There were no incidental observations of birds or other wildlife in the study area outside the survey periods.

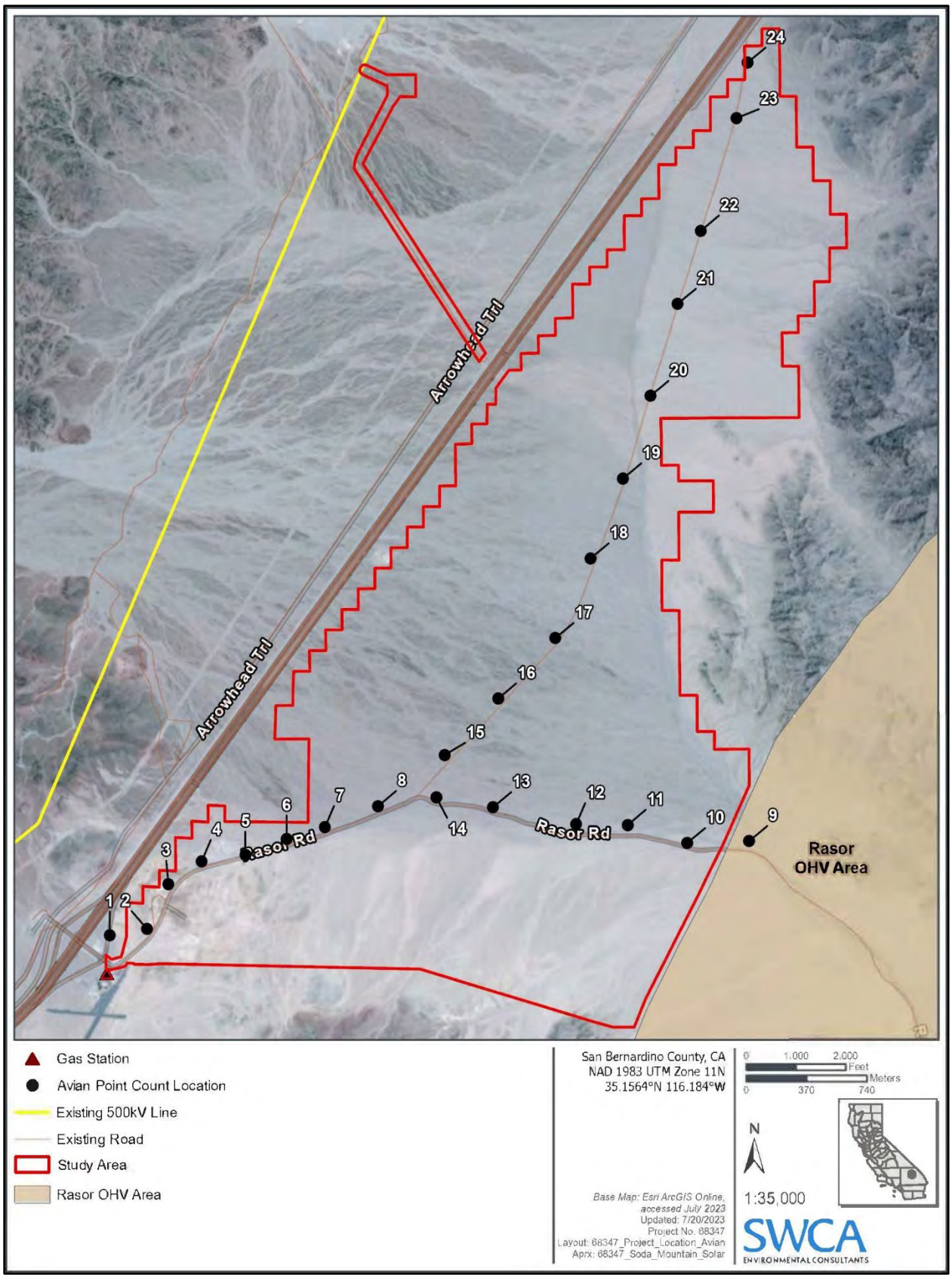

Figure 2. Avian point-count locations.

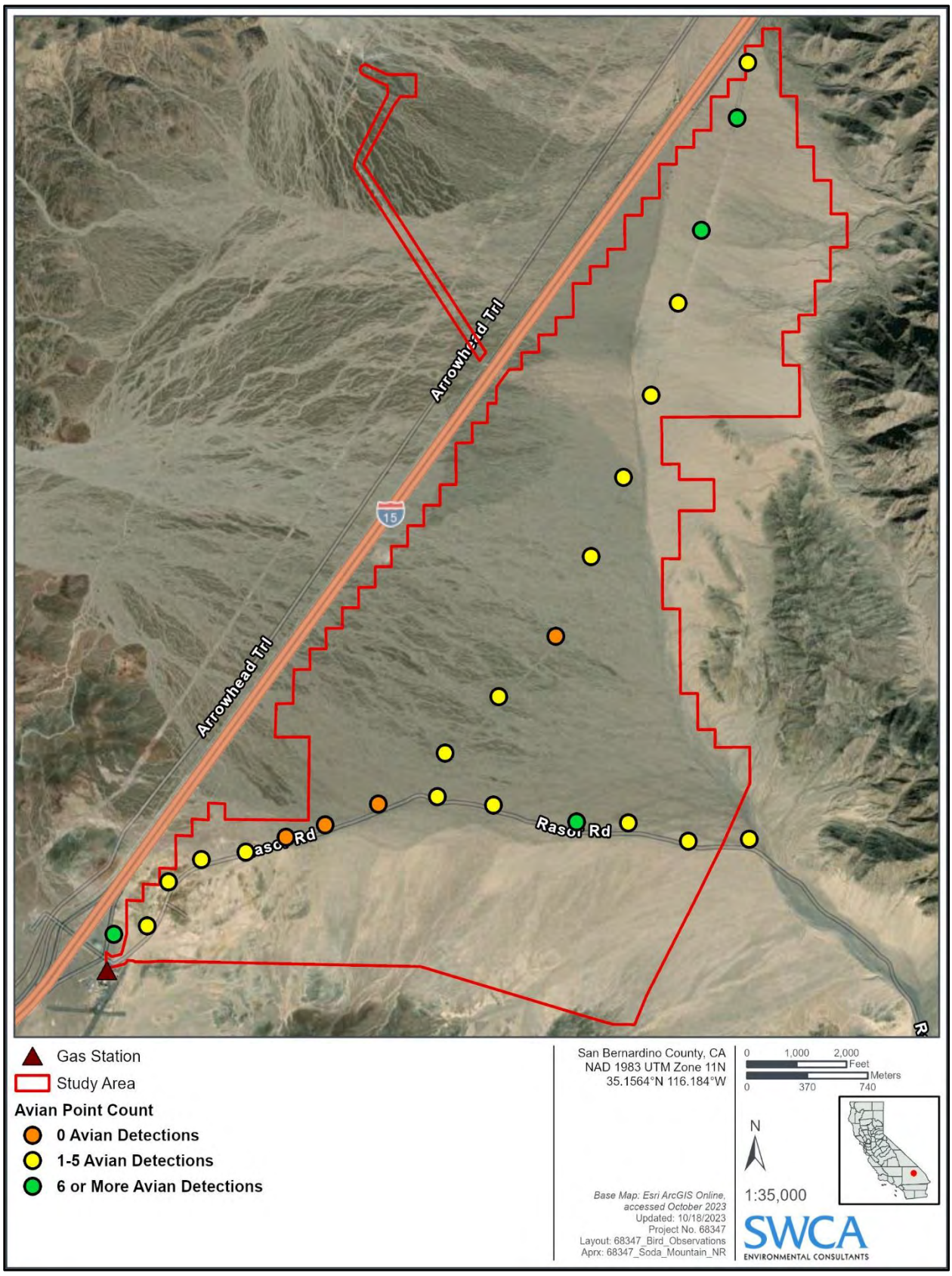

Figure 3. Fall avian detections in the study area.

Table 2. Fall Avian Use Detections by Species

Species Group	Common Name	Scientific Name	Detections
Corvids	common raven	*Corvus corax*	8
Passerines	house sparrow*	*Passer domesticus*	6
	rock wren	*Salpinctes obsoletus*	6
	horned lark	*Eremophila alpestris*	37
	Say's phoebe	*Sayornis saya*	2
	Brewer's sparrow	*Spizella breweri*	6
	loggerhead shrike†	*Lanius ludovicianus*	4
	house finch	*Haemorhous mexicanus*	2
Total			71

* Non-native species

† CDFW species of special concern

Table 3. Fall Avian Use Detections by Point Count

Point Count Number	Species	Detections
1	common raven (*Corvus corax*)	3
	house sparrow (*Passer domesticus*)	6
2	Say's phoebe (*Sayornis saya*)	1
	common raven	2
3	horned lark (*Eremophila alpestris*)	2
4	horned lark	1
	Say's phoebe	1
5	horned lark	1
6	N/A	0
7	N/A	0
8	N/A	0
9	common raven	1
	Brewer's sparrow (*Spizella breweri*)	1
	rock wren (*Salpinctes obsoletus*)	1
	horned lark	1
10	rock wren	1
	horned lark	1
11	horned lark	2
12	horned lark	7
13	rock wren	1
14	horned lark	1
15	rock wren	1
	loggerhead shrike (*Lanius ludovicianus*)*	1
	common raven	2

Point Count Number	Species	Detections
16	horned lark	1
17	N/A	0
18	horned lark	1
	rock wren	1
19	horned lark	1
20	horned lark	2
21	horned lark	3
22	rock wren	1
	horned lark	8
	loggerhead shrike*	1
	Brewer's sparrow	1
23	loggerhead shrike*	2
	horned lark	3
	Brewer's sparrow	4
24	horned lark	2
	house finch (*Haemorhous mexicanus*)	2
Total		71

* CDFW species of special concern

DISCUSSION

During the fall migration season, the study area exhibited limited avian activity, with only 71 individuals detected across eight avian species. The project site was previously surveyed for avian use in the spring and fall of 2009. The 2013 biological resources technical report for the project identified 23 avian species and 210 birds total in the fall 2009 survey (Panorama Environmental, Inc. 2013). Low avian activity at the project site could be a reflection of declining bird populations in the Mojave Desert (Riddell 2021). Bird populations are on the decline in the Mojave Desert due to the increase in average temperatures and declines in annual precipitation (Riddell 2021).

Common raven and horned lark were the most frequently observed species in the study area. Four loggerhead shrike individuals were detected on-site during the survey. This species is listed as a CDFW species of special concern. Four individuals were detected in the northern portion of the study area; two were detected at point count 23 (see Table 3). Loggerhead shrike was also detected in the spring 2023 avian use survey and incidentally during other biological resource surveys in the study area (SWCA 2023a, 2023b), indicating loggerhead shrike may use the project site year-round.

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APPENDIX M

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

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 20, 2024

Re: **Spring 2024 Avian Use and Raptor Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347**

INTRODUCTION

This report describes the spring 2024 avian use and raptor surveys conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

Avian use surveys provide the species data necessary to determine how implementation of the project could affect use of the project site by resident, seasonal, and migratory birds. Nearly all species of native birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513. Furthermore, some birds are protected under the federal Endangered Species Act and California Endangered Species Act.

SWCA developed the biological survey methods in coordination with California Department of Fish and Wildlife (CDFW). This report details the methods and results of the bird surveys conducted in April and May 2024 by SWCA for the project.

Figure 1. Soda Mountain Solar Project vicinity map.

METHODS

For this report, the study area included 22 avian point count, and 5 raptor survey locations across the 2,634-acre proposed project site and gen-tie (Figure 2). Sentinel Science biologist Jonathan Nakai performed two replicate avian point count and raptor surveys on April 29–30, 2024 and May 20–21, 2024 (Table 1).

Table 1. Field Survey Dates, Type of Survey, and Personnel

Date	Field Survey	Personnel
April 29–30, 2024	Avian point count and raptor April survey	Jonathan Nakai
May 20–21, 2024	Avian point count and raptor May survey	Jonathan Nakai

Avian Point Count

The biologist conducted 10-minute unlimited-radius point counts at each point count location (Figure 2) during the survey. The survey points were provided by CDFW and distributed in areas not surveyed in the 2023 point counts. During each 10-minute count, all avian species detected by sight and sound were documented, and two replicate surveys were performed at least one week apart. The surveys were conducted in the morning hours when songbirds are most active. All point count location habitat types and quality were documented and are described below. All avian point count locations were accessible by foot, and the survey was conducted in safe weather conditions with full visibility for each point count location.

Raptor and Large Bird Survey

The biologist visited five raptor and large bird observation points no earlier than 10:00 AM for one-hour-long observation periods concurrent with the avian point counts (Figure 2). All large birds (raptors, ravens, etc.) detected within 800 meters 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 (ECPG; USFWS 2013). The distance to each bird was estimated with the use of a laser rangefinder and terrain features. Flight paths of all large birds within the 800-m-radius circle around the biologist were documented consistent with the ECPG, with a sketch of the flight path and notes on flight duration to record minutes spent within the circle. The observation points were selected to afford clear views of the mountains surrounding and the open valley/location of the project. All raptor point locations were accessible by foot, and the survey was conducted in safe weather conditions with full visibility for each survey location.

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.

RESULTS

Weather conditions during the surveys were mostly sunny and moderate to hot, with temperatures between 59 and 88 degrees Fahrenheit (°F), and moderate to high wind speeds with gusts of up to 28 miles per hour (mph) (Table 2).

Table 2. Field Survey Weather Conditions

Date	Start Time	Stop Time	Temperature (°F)	Wind Speed (mph)	Conditions
April 29, 2024	6:37 a.m.	16:00 p.m.	59–88	3–24	Sunny
April 30, 2024	6:24 a.m.	15:55 p.m.	59–88	3–29	Sunny
May 20, 2024	5:57 a.m.	13:36 p.m.	65–87	9–16	Sunny; wind gusts up to 28 mph
May 21, 2024	6:24 a.m.	11:56 a.m.	61–81	2–16	Sunny; wind gusts up to 20 mph

Avian Point Count

A total of nine bird species were detected by sight and/or sound within the study area during the April survey including: rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), Say's phoebe (*Sayornis saya*), black-throated sparrow (*Amphispiza bilineata*), western tanager (*Piranga ludoviciana*), Hammond's flycatcher (*Empidonax hammondii*), Costa's hummingbird (*Calypte costae*), lazuli bunting (*Passerina amoena*), and blue-gray gnatcatcher (*Polioptila caerulea*). The number of detections for each species can be found in Table 3. There were 98 bird detections during the April survey (Table 4, Figure 3).

A total of five bird species were detected by sight and/or sound within the study area during the May survey including: horned lark, black-throated sparrow, rock wren, common raven (*Corvus corax*), and house finch (*Haemorhous mexicanus*). There were 94 bird detections during the May survey (Table 4, Figure 3). Avian detections per point count location were relatively consistent, with only Points 3 and Point 21 resulting in a difference of over 6 detections between surveys.

As mapped during prior surveys, the vegetation at all point count locations was described as Creosote Bush - White Bursage Scrub (*Larrea tridentata - Ambrosia dumosa* Shrubland Alliance) based on the Manual of California Vegetation (CNPS 2024).

Raptor Survey

A total of three turkey vultures were detected during the two replicate raptor surveys. Two turkey vulture individuals were observed soaring, circling, and gliding to the north and northwest of the mountains at Point R5 during the April survey (Figure 4). An individual turkey vulture was observed circling over the mountains to the west at Point R3 during the May survey (Figure 5). No golden eagles (*Aquila chrysaetos*) were observed during the raptor survey.

Incidental Observations

During the 2024 avian point counts in April and May, the biologist did not observe any birds incidentally within the study area outside the survey periods. A red-tailed hawk pair were observed incidentally outside of the 800-m survey range and outside of the study area soaring over the mountains near Point R1 during the April raptor survey.

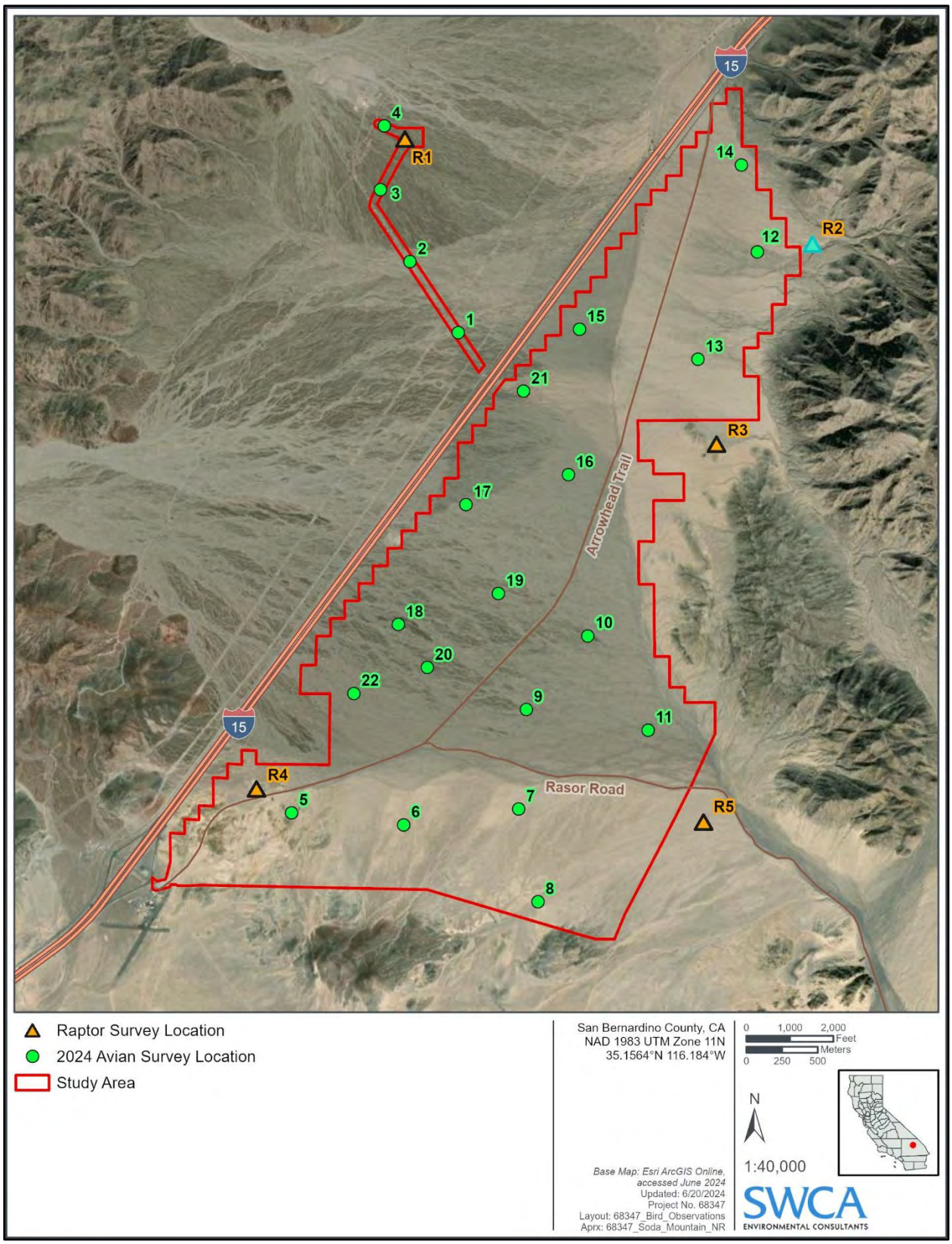

Figure 2. Spring 2024 avian point count and raptor survey locations.

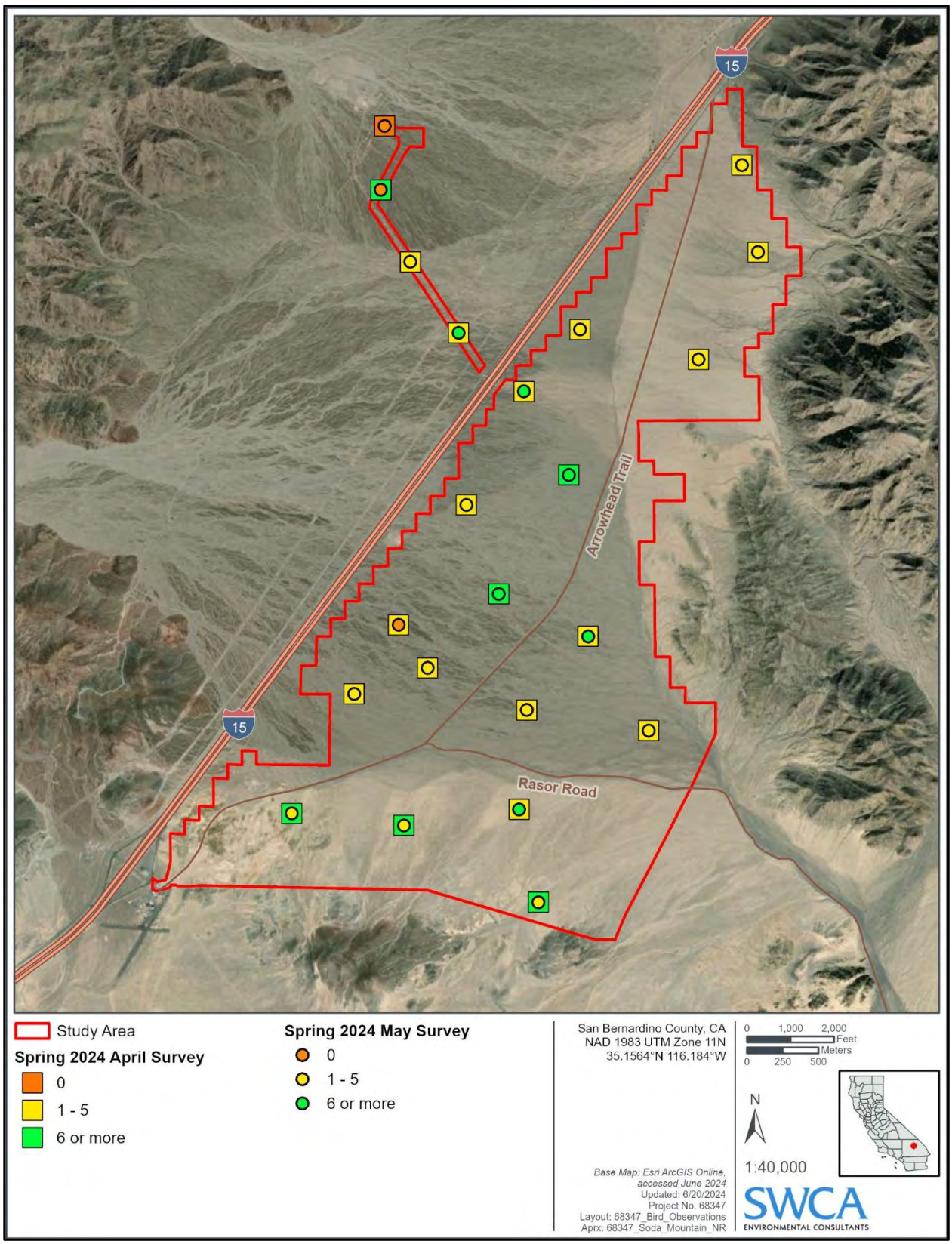

Figure 3. Spring 2024 avian detections in the study area for April and May surveys.

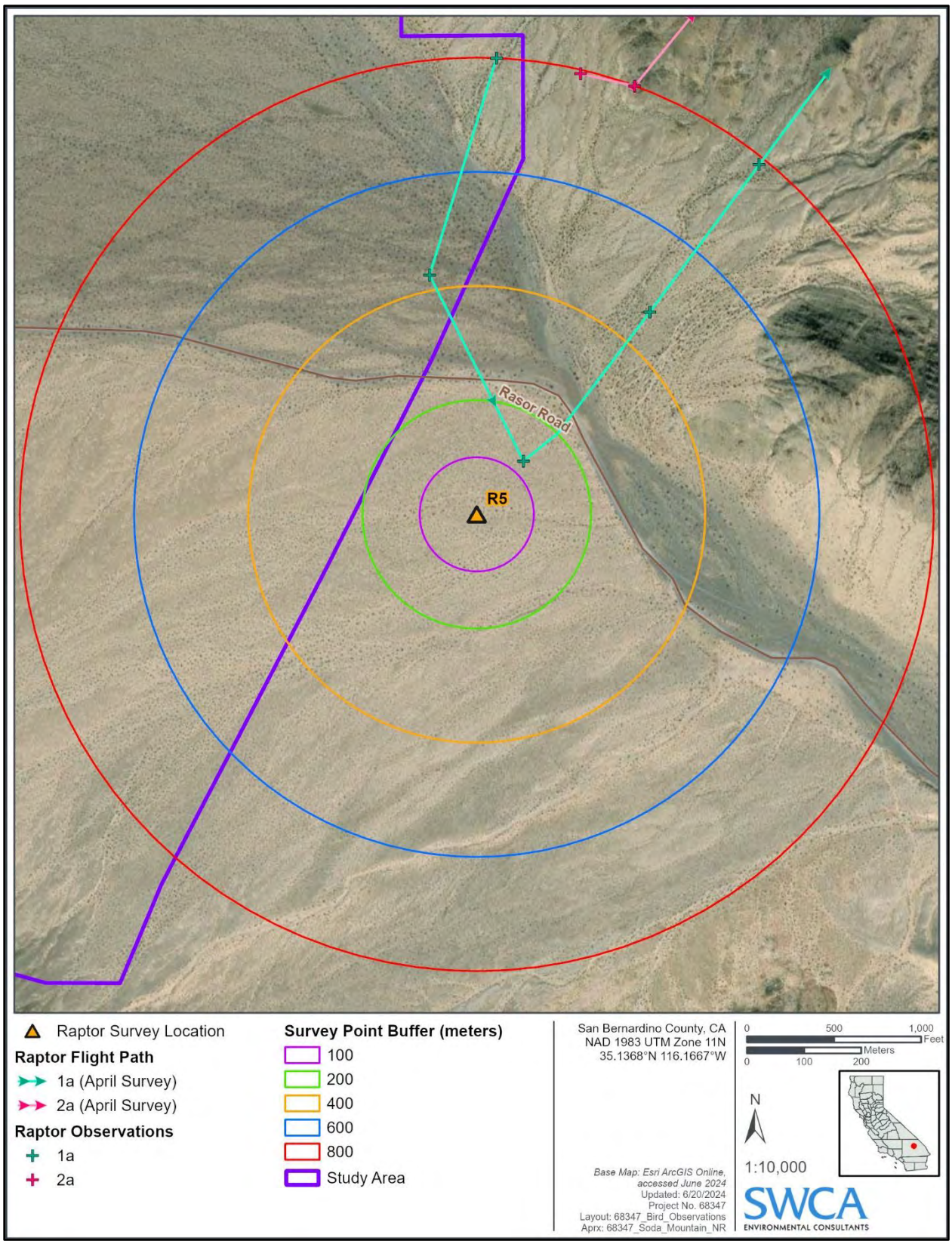

Figure 4. Raptor flight paths in the study area for the April survey.

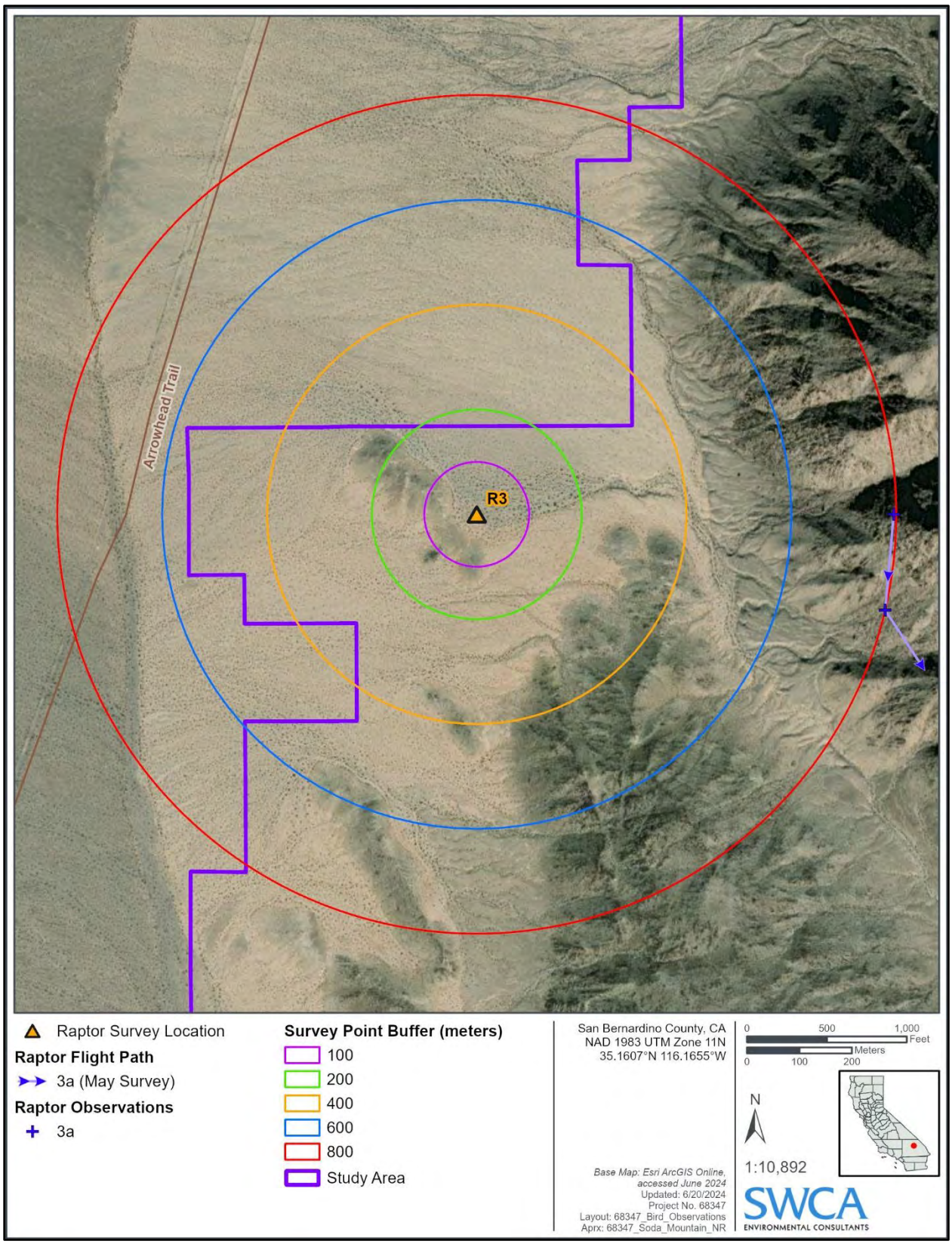

Figure 5. Raptor flight paths in the study area for the May survey.

Table 3. Spring Avian Use Detections by Species

Species Group	Common Name	Scientific Name	April Survey	May Survey
Corvids	common raven	*Corvus corax*	0	1
Passerines	rock wren	*Salpinctes obsoletus*	2	1
	horned lark	*Eremophila alpestris*	62	67
	Say's phoebe	*Sayornis saya*	1	0
	black-throated sparrow	*Amphispiza bilineata*	27	23
	blue-gray gnatcatcher	*Polioptila caerulea*	2	0
	house finch	*Haemorhous mexicanus*	0	2
	Lazuli bunting	*Passerina amoena*	1	0
	Hammond’s flycatcher	*Empidonax hammondii*	1	0
	Costa’s hummingbird	*Calypte costae*	1	0
	western tanager	*Piranga ludoviciana*	1	0
Total			**98**	**94**

Table 4. Spring Avian Use Detections by Point Count – April and May Survey

Point Count Number	April Detections	May Detections
1	3	7
2	1	3
3	13	N/A
4	N/A	N/A
5	7	2
6	7	4
7	5	7
8	6	5
9	5	5
10	1	6
11	4	4
12	4	5
13	4	4
14	4	4
15	1	4
16	6	7
17	4	3
18	5	N/A
19	6	6
20	5	5
21	2	9
22	5	4
Total	**98**	**94**

DISCUSSION

During the spring season, the study area exhibited limited avian activity. The April survey resulted in 98 detections across eight avian species, and the May survey resulted in 94 detections across five avian species. The project site was previously surveyed for avian use in the spring and fall of 2009. The 2013 biological resources technical report for the project identified 23 avian species and 210 birds total in the fall 2009 survey (Panorama Environmental, Inc. 2013). In 2023, a total of 16 avian species were detected by sight and/or sound within the study area during the winter, spring, summer, and fall avian surveys, and an additional 13 species were detected incidentally during surveys for other biological resources (SWCA 2023). Four species were detected during the April survey that had not been recorded during surveys conducted in 2023: lazuli bunting, Costa's hummingbird, Hammond's flycatcher, and western tanager.

The April survey documented more migrant species such as lazuli bunting, Hammond's flycatcher, and western tanager. These species do not nest in desert habitats, however, commonly migrate through the desert to reach suitable nesting habitat. Detections per point count across the site were relatively consistent, with only Points 3 and Point 21 resulting in a difference of over 6 detections between surveys. The detections at both points during the April and May survey consisted of horned larks, and likely reflects the movement of these birds throughout the project site.

During the raptor and large bird surveys, two turkey vultures were observed during the April survey, and one turkey vulture was observed during the May survey. A red-tailed hawk pair were also observed incidentally during the April survey. In 2023, raptors and other large birds were observed incidentally on-site including turkey vulture, red-tailed hawk, burrowing owl (*Athene cunicularia*), American kestrel (*Falco sparverius*) and common raven (SWCA 2023). No golden eagles were observed during the raptor survey.

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APPENDIX N

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

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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Lead Natural Resources Project Manager

Date: June 14, 2024

Re: **Burrowing Owl, Desert Kit Fox, and American Badger Survey Report for the Soda Mountain Solar Project / SWCA Project No. 068347-002**

INTRODUCTION

This report summarizes the results of the burrow survey conducted for burrowing owl (*Athene cunicularia*), desert kit fox (*Vulpes macrotis arsipus*), and American badger (*Taxidea taxus*), and breeding season surveys conducted for burrowing owl. Surveys were conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 approximately 50 miles northeast of Barstow, San Bernardino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM) (Figure 2). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

The burrow survey and burrowing owl breeding season surveys were conducted to support environmental analysis of the project pursuant to the California Environmental Quality Act (CEQA) and supplements the final Biological Resources Technical Report (BRTR) prepared for the project by SWCA. The surveys were conducted in accordance with the most current burrowing owl survey guidelines outlined by California Department of Fish and Wildlife (CDFW) (2012). Upon reviewing the previously completed biological resources technical report for the Soda Mountain Solar Project prepared by Panorama Environmental, Inc. (2013), a burrow survey and subsequent burrowing owl breeding season surveys were conducted in the study area, consisting of a total of six visits.

SWCA developed the biological survey methods in coordination with California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. The purpose of the burrow survey was to identify potentially 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. Following the burrow survey, breeding season surveys were conducted for burrowing owl due to the observation of a live burrowing owl and presence of potential burrows. Three site visits were conducted to determine the occupancy of these burrows. The breeding season surveys were spaced at least 3 weeks apart and took place during the burrowing owl breeding season in California (February 1–August 31), as recommended in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

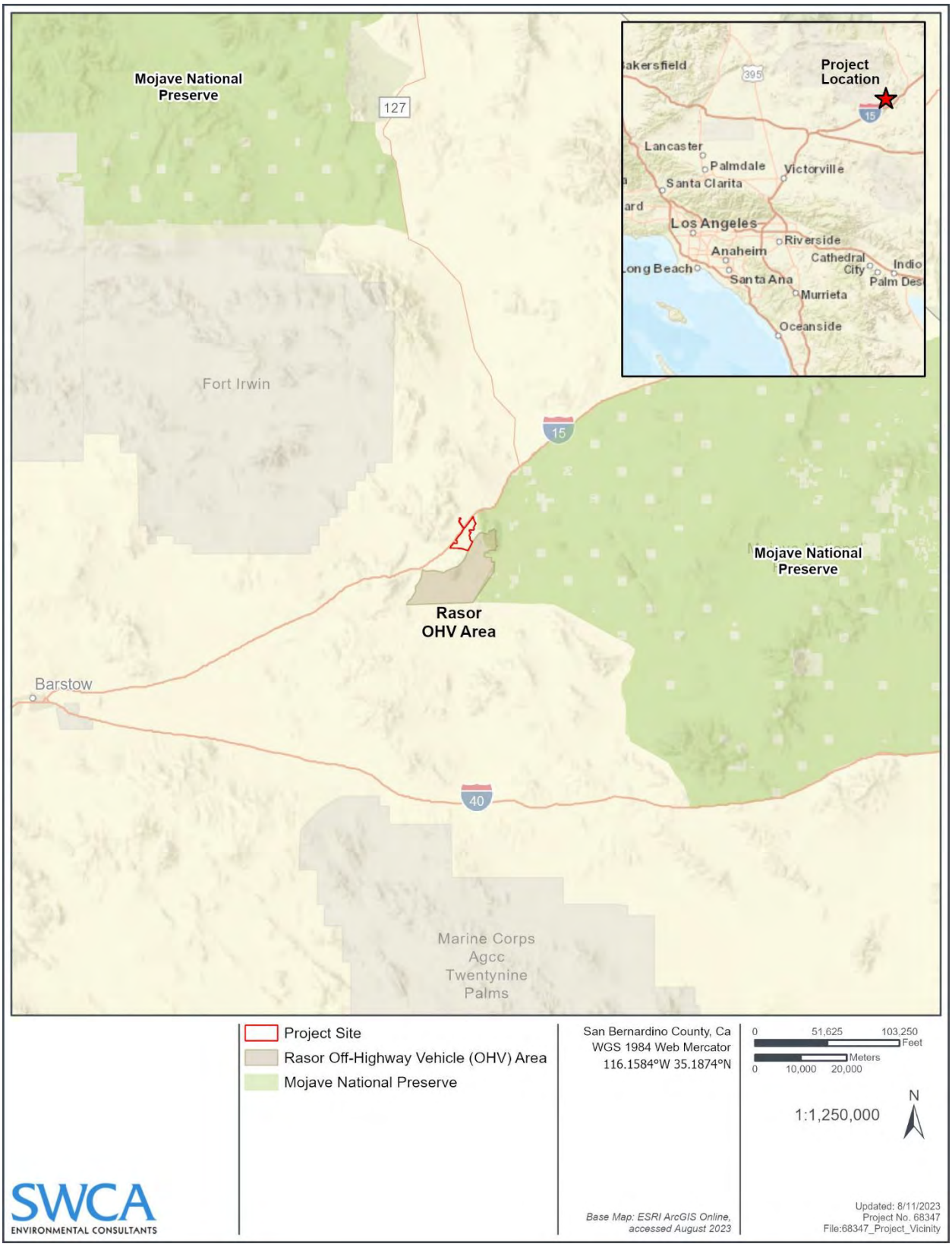

Figure 1. Soda Mountain Solar Project vicinity map.

SPECIES BACKGROUND

Burrowing Owl

In California, the burrowing owl is designated as a Species of Special Concern by the CDFW. This designation is given to species that are facing population declines or other vulnerability factors, which negatively impact their survival and population viability (CDFW 2012). Preliminary analyses conducted on breeding populations of this species in California have indicated declines in their central and southern breeding areas, as well as a statewide retraction of their breeding range (CDFW 2012).

Ecological Requirements

Burrowing owl predominantly inhabit open areas with short vegetation and access to low perches, such as fence posts, elevated mounds, or shrubs. They are commonly associated with grasslands, agricultural fields, prairies, scrublands, and desert areas; however, they have also demonstrated adaptability to landscapes modified by human activities. Suitable habitat for the burrowing owl in the study area is characterized by the availability of burrows for roosting and nesting, as well as relatively short vegetation with sparse shrubs and taller vegetation. This species often utilize burrows dug by fossorial mammals as nesting sites including those made by ground squirrels (e.g., *Otospermophilus beecheyi*), American badger, coyote (*Canis latrans*), and fox (e.g., *Vulpes macrotis*) (Ronan 2002). Additionally, human-made structures like culverts, concrete rubble piles, and pipes can serve as alternative nest sites.

The diet of burrowing owl consists of a diverse range of arthropods, small rodents, birds, amphibians, reptiles, and carrion (Gervais et al. 2000; Green et al. 1993; Plumpton and Lutz 1993; Thompson and Anderson 1988; York et al. 2002). During the breeding season, this species primarily forage in close proximity to their burrows but have been recorded hunting up to 1.7 miles away (Gervais et al. 2003; Haug and Oliphant 1990).

Threats

Habitat loss, degradation, and fragmentation present the most significant threats to burrowing owl in California. The majority of burrowing owl 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). Urbanization in coastal counties has already led to the extirpation or drastic reduction of owl populations (Gervais et al. 2008). Loss of open lands further negatively impacts owl populations (Gervais et al. 2008). Another critical threat is the control of burrowing rodents, including California ground squirrel (*Otospermophilus variegatus*) burrows, which are most often used by burrowing owl for nesting and cover in California (Klute et al. 2003). Direct mortality from various sources is also a significant concern, with vehicle collisions being a major threat, especially in urban areas and along roads where owl nest (Gervais et al. 2008; Haug et al. 1993).

Desert Kit Fox

The desert kit fox is afforded protection from take under California Fish and Game Code Sections 460 and 4000-4003 as a California-protected furbearer. Much of the Mojave Desert provides habitat for this species, although its population status and trends are unclear.

Ecological Requirements

Although it is regularly encountered in desert habitats, the 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 kit fox dens are frequently located on west- and northwest-facing slopes on friable soils with an absence of

stones, caliche, or hardpan. Kit fox 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. The entirety of the project site is suitable habitat for desert kit fox. This species primarily exhibits carnivorous behavior, with its diet primarily consisting of black-tailed jackrabbit (*Lepus californicus*) desert cottontail (*Sylvilagus audubonii*), kangaroo rat (*Dipodomys* spp.) and ground squirrels. Additionally, the species consumes insects, reptiles, some birds, bird eggs, and vegetation (Egoscue 1962; Laughrin 1970; Morrell 1971; Orloff et al. 1986).

Threats

Potential threats to this species including habitat loss and fragmentation, disease, predation, and vehicle collisions (Kadaba 2014).

American Badger

The American badger is classified as a species of special concern by CDFW. It is known to inhabit different regions throughout the state, except for heavily forested areas in the extreme northwest. Recent trends for this species indicate a significant reduction in both range and abundance, particularly in areas where it was once common (Williams 1986).

Ecological Requirements

American badger is typically found in open environments, such as open woodlands, desert scrub, and grasslands. It requires friable soils and a sufficient prey base of small rodents. Dens constructed by this species are distinctive in size and may display claw marks on the sides when excavated. 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). As obligate carnivores, American badger primarily rely on a diet composed of fossorial 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.

Threats

While the American badger may exhibit some tolerance toward human activities, the implementation of predator control through indiscriminate trapping and persistent poisons results in significant losses for this species.

METHODS

Burrow Survey for Burrowing Owl, Desert Kit Fox, and American Badger

For this report, the study area included the 2,634-acre proposed project site and the proposed gen-tie route (approximately 35.75 acres) (Figure 2). The burrow survey was conducted from March 27 to April 5, May 8 to 12, and May 22 to 26, 2023 in order to cover the entire extent of the study area. The surveys were conducted in teams of two to four and included SWCA biologists Bridget Manjarrez, Par Singhaseni, Lauren Strong, Gigi Wagnon, Parker Richardson, and Kristen Burgess.

The biologists walked parallel transects spaced approximately 20 meters apart throughout the study area and documented potentially suitable burrows or dens for burrowing owl, desert kit fox, and American badger. Potential burrows or dens encountered were each thoroughly examined. General size and shape were recorded along with any signs of occupancy by these species.

Potential burrowing owl burrows were identified based on several factors, including the presence of whitewash, pellets, decorations, or burrows within areas that provided suitable conditions for this species. Burrow suitability factors included burrow entrances that measured approximately 4 to 6 inches wide and burrows located in areas with short vegetation and proximity to potential perch locations, such as dirt mounds and bushes. Burrows that were only partially dug were not considered potential burrowing owl burrows.

Potential desert kit fox dens and burrows were identified based on the shape of entrance, which are typically narrow and keyhole-shaped, and the presence of scat and tracks. An indicator of a desert kit fox den includes multiple entrances. Potential American badger dens or dig sites were identified based on horizontal scrapes along the walls of the tunnel and the presence of large spoils at the entrance. Additionally, 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. Each burrow was photographed, and its location recorded on a GPS unit. The timing of the survey and conditions were generally ideal for detection of burrowing owl, with the exception of March 29 and April 3, 2023, when wind gusts were up to 22 and 40 miles per hour (mph), respectively. Burrowing owl detection is generally more difficult when wind speeds are greater than 12 mph, (CDFW 2012). Weather conditions are summarized in Table 1.

Table 1. Burrow Survey Conditions

Date	Survey Start	Survey End	Temperature (°F)	Conditions
3/27/2023	8:15	16:30	50–61	Sunny, 5–9 mph wind speed
3/28/2023	7:15	15:15	48–69	Sunny, 0–1 mph wind speed
3/29/2023	7:30	14:15	53–63	Sunny, 9–22 mph wind speed
3/30/2023	7:45	15:00	54–60	Cloudy, 3–5 mph wind speed
3/31/2023	7:30	11:15	45–64	Sunny, 1–2 mph wind speed
4/3/2023	7:30	12:30	52–57	Partly cloudy, 8–40 mph wind speed
4/4/2023	8:00	15:15	50–65	Sunny, 3–4 mph wind speed
4/5/2023	7:15	16:25	47–65	Sunny, 1–2 mph wind speed
5/8/2023	6:45	14:45	69–86	Sunny, 3–10 mph wind speed
5/9/2023	6:00	14:00	63–85	Sunny, 1–2 mph wind speed
5/10/2023	7:00	13:45	59–85	Sunny, 5–6 mph wind speed
5/11/2023	6:15	14:00	64–89	Sunny, 0–2 mph wind speed
5/12/2023	7:00	10:30	68–80	Sunny, 1–4 mph wind speed
5/22/2023	6:15	14:15	75 -92	Sunny, 1-3 mph wind speed
5/23/2023	6:15	13:45	74-93	Sunny, 1-5 mph wind speed
5/24/2023	7:30	14:00	79-95	Sunny, 1-4 mph wind speed
5/25/2023	6:15	14:30	76-94	Sunny, 1-3 mph wind speed
5/26/2023	6:15	14:00	77-93	Sunny, 1-3 mph wind speed

Burrowing Owl Breeding Season Surveys

Three follow-up survey visits were conducted by SWCA biologists, with two visits occurring during the peak of the burrowing owl breeding season (between April 15 and July 15) (CDFW 2012) and one occurring after July 15. The first follow-up survey visit took place from June 5 to June 6, 2023, and was carried out by Omar Moquit and Marcus Goncalves. The second follow-up survey visit was conducted on July 6, 2023, by G. Wagnon and P. Richardson. The third follow-up survey was conducted by O. Moquit and Marisol Sanchez on July 24, 2023. Survey conditions were generally ideal for burrowing owl detection (Table 2). Photographs of site conditions during the breeding season surveys are shown in Photographs D-1 through D-4.

Table 2. Breeding Season Survey Conditions

Date	Survey Start	Survey End	Temperature (°F)	Conditions
Survey #1				
6/5/2023	7:30	15:00	76–85	Sunny, 3–7 mph wind speed
6/6/2023	6:30	14:30	61–85	Sunny, 5–7 mph wind speed
Survey #2				
7/6/2023	6:15	10:45	76–90	Cloudy, 11 mph wind speed
Survey #3				
7/24/2023	8:45	1140	93–111	Sunny, 0–1 mph wind speed

During each follow-up visit, the biologists examined burrows that had been identified as potential burrowing owl burrows. Burrows that showed no indication of activity or showed obvious sign of inactivity (such as the presence of debris or webbing at the entrance) were not revisited during subsequent survey visits.

During each survey, SWCA biologists systematically verified burrow activity by conducting a targeted field survey for each potential burrowing owl burrow within the study area. Data captured for each burrow included assessing the condition of the burrow entrance. This involved recording the presence of cobwebs and determining whether they were still intact, noting evidence of fresh excavations or scrapings, and noting whether the entrance of the burrow was collapsed. Detailed observations were made to document any changes compared with the previous status of each burrow recorded during the burrow survey. Potential burrows were examined with an emphasized focus on the presence pellets, prey remains, whitewash, or decoration. Finally, the biologists surveyed the surrounding areas using binoculars.

RESULTS

Burrow Survey for Burrowing Owl, Desert Kit Fox, and American Badger

The burrow survey for burrowing owl, desert kit fox, and American badger resulted in the identification and inventory of a total of 148 burrows (Figure 2). Based on further examination of each burrow, 50 were identified as potential burrowing owl burrows, six were identified as active desert kit fox dens, 28 were identified as inactive desert kit fox dens, five were identified as inactive American badger dens, and 59 were identified as unknown mammal burrows.

Burrowing Owl

Upon close examination of each burrow, only one burrow exhibited recent sign of potential burrowing owl activity, with whitewash staining around the entrance (Photographs D-5 through D-7 in Attachment D-1). During the burrow survey, it was deduced that the remaining 49 potential burrowing owl burrows in the study area were not inhabited at the time or actively being used by burrowing owl.

During the burrow survey on March 27, 2023, a single live burrowing owl was detected in the southern section of the study area, specifically within a desert wash located approximately 0.28 mile south of Rasor Road (see Figure 2). After the initial sighting, the observed individual dispersed to the southeast and out of visible range of the surveyors. No burrows were observed within proximity to the detected live specimen. After further investigation, there was no definitive association established between this individual owl and any of the surrounding burrows within the study area. Additionally, the observed behaviors of this owl did not clearly indicate any breeding or nesting activities. The primary behaviors noted were limited to vocalizations, which were promptly followed by dispersal. As a result, this observation did not provide substantial evidence of reproductive or nesting behavior in the vicinity.

Desert Kit Fox and American Badger

Upon completion of the burrow survey, it was determined that desert kit fox and American badger are likely be present in the project vicinity based on the presence of signs. Neither species was directly observed during the burrow surveys as: both species are nocturnal and would have been underground during the daytime surveys. A desert kit fox was observed during a nighttime bat survey in the study area Fresh signs, including scat, entrance scrapings, and tracks, were found at six burrow locations within the study area (see Figure 2). These burrows were considered active kit fox dens. Notably, all dens determined to be active showed evidence of fresh excavations, loose silty soil at the entrances, and/or relatively fresh or fresh scat (Photographs D-8–D-10 in Attachment D-1).

While the occurrence data for the desert kit fox species is not currently tracked in any online database, it is widely known that the species is distributed throughout the Mojave Desert based on scientific research and observations conducted by biologists, ecologists, and wildlife experts.

The signs indicating desert kit fox activity encompassed various observable characteristics, including the presence of fresh or recent scat, evidence of recent digging or excavation, and well-maintained entrances. The inactive American badger dens were identified by the lack of evidence of distinct claw prints and size and shape of den entrances (Photograph D-12 in Attachment D-1), and unknown inactive mammal burrows or digs were identified as such due to the lack of insufficient or inconclusive evidence of excavation or maintenance by a specific species (Photograph D-13 in Attachment D-1).

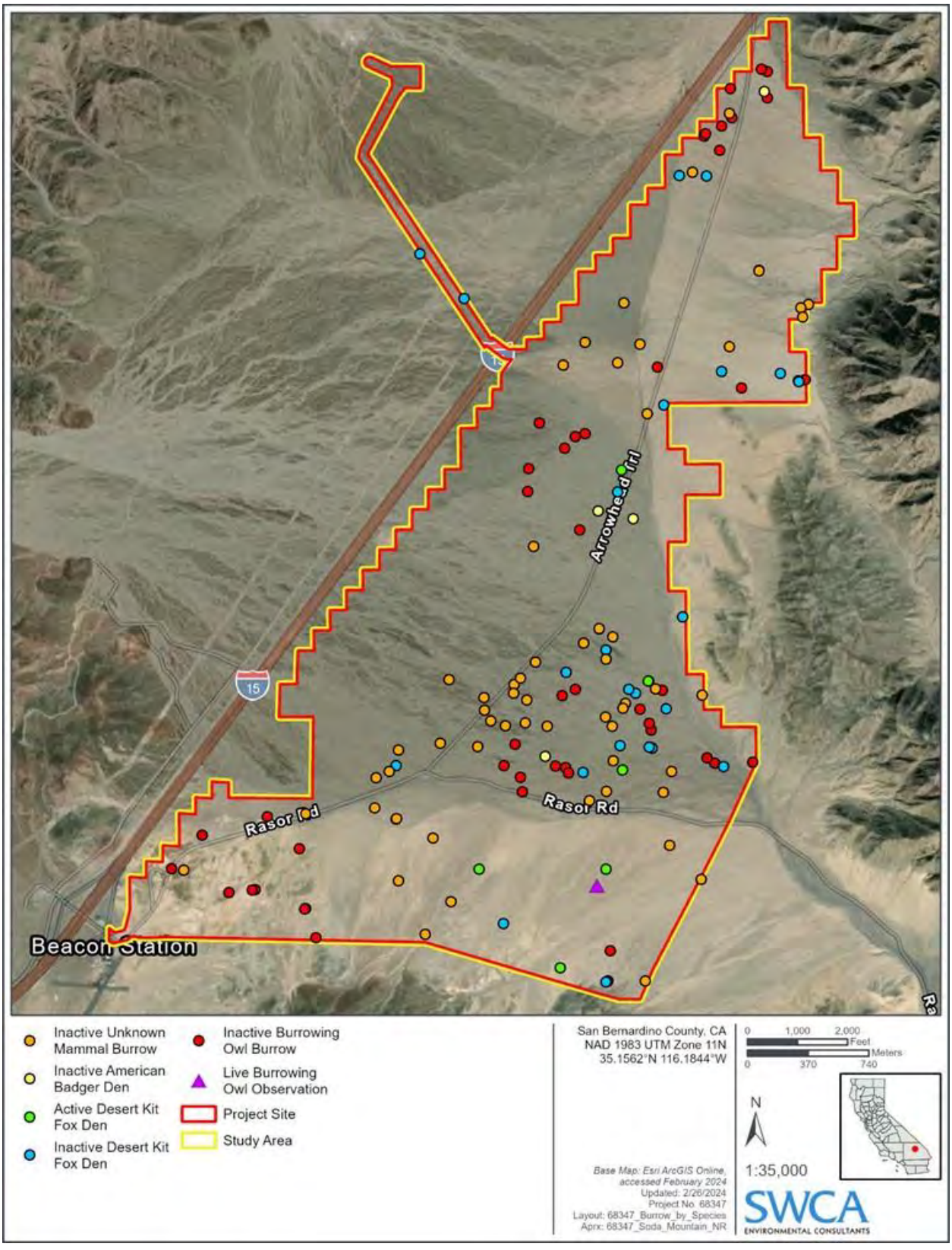

Figure 2. Location of live burrowing owl observation, unknown mammal burrows, and desert kit fox and American badger dens identified within the study area.

Burrowing Owl Breeding Season Surveys

The following section describes the results of three rounds of surveys conducted during the burrowing owl breeding season to assess the activity and occupancy status of 50 potential burrowing owl burrows that were identified during the initial burrow survey. During each survey, potential burrowing owl burrows that showed evidence of inactivity since the prior survey visit were noted and were determined to not require a revisit during the subsequent visits.

Survey #1

During the initial round of surveys, each of the 50 potential burrowing owl burrows were visited by SWCA biologists. None of these burrows, including one burrow that exhibited sign of potential burrowing owl activity, exhibited signs of new signs of burrowing owl activity. Additionally, during the survey, the location where a live specimen had been previously identified within an ephemeral wash was revisited. While remnants of old whitewash were still discernible at the location of the live observation, there was an absence of fresh whitewash, suggesting a lack of recent burrowing owl activity in the area.

After analyzing the data collected during this survey, it was observed that 15 burrows showed insufficient evidence of inactivity, as they lacked indicators of an inactive burrow such as debris or webbing at their entrances. As a result, these burrows were determined to require a revisit during the second round of surveys.

Survey #2

During the second round of surveys, similar findings were observed as in the initial round. Out of the 15 revisited potential burrowing owl burrows, no new signs of burrowing owl activity were detected and seven of these burrows displayed clear signs of inactivity which included desiccated plant matter or webbing at the entrances. Additionally, when revisiting the location where a live specimen had been previously identified in an ephemeral wash, it was observed that, although old whitewash persisted, the absence of fresh whitewash indicated a continued lack of recent burrowing owl activity.

Based on the data collected during this survey, it was determined that during the third and final round of surveys, eight burrows would require revisiting based on insufficient evidence of inactivity

Survey #3

The third and final round of surveys resulted in findings similar to those of the initial and second rounds of surveys. Of the eight burrows revisited; no indications of new burrowing owl activity were detected. Thorough examinations of these burrows determined that they were not occupied by burrowing owl.

Burrowing Owl Summary

All 50 potential burrowing owl burrows were determined to be unoccupied by burrowing owl. A complete inventory of burrows is provided in Table 3.

Other Burrows

The 28 inactive desert kit fox dens, five inactive badger dens, and six active desert kit fox dens were revisited to confirm their occupancy status based on the findings from the burrow survey. Dens that were confirmed to still be inactive at the time of the first survey visit were not revisited during the subsequent surveys. All 33 of the previously identified inactive desert kit fox and American badger dens, and the six active desert kit fox dens were revisited during the first visit. All 33 of the dens were confirmed to still be

inactive. Six of the previously identified active desert kit fox dens were revisited during the second and third visits in order to determine if changes had occurred to their occupancy status. All six active burrows were determined to be active and occupied by desert kit fox during each survey visit.

Table 3. Burrows Identified within the Study Area

Observation Type	Quantity	Description
Burrowing Owl		
Occupied burrow, active nest	0	Burrows with chicks present and/or adults exhibiting nesting behavior.
Occupied burrow, nesting not confirmed	0	Burrows with at least one burrowing owl present but not displaying clear signs of nesting.
Unoccupied, with sign	1	Suitable potential burrows with burrowing owl signs such as whitewash, pellets, and/or feathers.
Unoccupied, no sign	49	Suitable potential burrows that have no sign of occupancy.
Sign (no burrow)	1	Sign of burrowing owl or live observation that was discovered but not associated with a burrow.
Desert Kit Fox		
Active den	6	Den displays evidence of recent activity, including recent or fresh excrements, fresh excavations indicated by silty soil near entrances, and/or distinct tracks near the vicinity of the den.
Inactive den	28	Den shows no signs of recent activity, with no recent tracks, webbed or debris-blocked entrances, and no evidence of entrance maintenance.
American Badger		
Inactive den	5	Den does not exhibit recent activity, such as recent tracks or claw scrapings. The entrances are either webbed or obstructed by debris, indicating a lack of maintenance or recent use.
Unknown Mammal Burrow		
Inactive burrow/dig	59	Burrow/dig appears partially excavated or has collapsed; no signs of recent activity such as tracks or scrapings. The entrances are either webbed or obstructed by debris, indicating a lack of maintenance or recent use.

Other Wildlife Observations

During the preliminary burrow survey, SWCA biologists discovered a desert bighorn sheep (*Ovis canadensis nelsoni*) skull. The skull showed evident signs of deterioration, including conspicuous cracks and absent teeth, indicative that it had likely been deceased for some time. Other common wildlife species that were observed during the surveys included western zebra-tailed lizard (*Callisaurus draconoides rhodostictus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidoscelis tigris tigris*), Bell's sparrow (*Artemisiospiza belli*), black-throated sparrow (*Amphispiza bilineata*), common raven (*Corvus corax*), and pallid-winged grasshopper (*Trimerotropis pallidipennis*).

DISCUSSION

The burrow survey conducted for burrowing owl, desert kit fox, and American badger and subsequent breeding season surveys conducted for burrowing owl found no evidence of active burrow use by burrowing owl or American badger in the study area for any of the 148 burrows that were identified. A total of six active burrows, determined to be occupied by desert kit fox, were identified. During the initial burrow surveys, a single burrowing owl and one burrow with signs of potential burrowing owl use were

detected. However, no evidence of burrowing owl utilization occurred during the subsequent breeding season surveys.

As described in the 2013 biological resources technical report (Panorama Environmental, Inc. 2013), burrowing owl was detected in the study area during botanical surveys conducted in 2012 (C.S. Ecological Surveys and Assessments 2012). Based on observations made during the time of the survey (late October to early November), the study area appeared to support between nine and 24 burrowing owl individuals. Twenty-four burrows with recent sign of use by burrowing owl were mapped during the botanical surveys. Live individuals were observed using eight of the 24 active burrows; one additional live owl was also observed in the project right-of-way. Many of the burrowing owls were observed foraging on grasshoppers, which were abundant during fall 2012 surveys (Schnurrenberger 2012). Burrowing owl that are observed during fall migration will commonly move on to other overwintering or nesting habitat (Schnurrenberger 2012). It is likely that a number of the burrowing owls observed in the fall were using the study area for foraging during migration. Only a portion of the owls observed on-site would be expected to overwinter in the area; other owls were likely migrating (Schnurrenberger 2012).

The absence of occupied burrowing owl burrows during the 2023 burrow survey and follow up surveys could be attributed to various factors. Low breeding densities for burrowing owl may be a characteristic of desert ecosystems (Crowe and Longshore 2010). Potential disturbances to suitable burrow sites caused by human activities may also be impacting burrowing owl burrow selection in the area. Primarily, the presence of humans and off-highway vehicle (OHV) use in the vicinity, particularly associated with BLM land, could contribute to their avoidance of suitable burrow sites in the study area.

Desert kit fox and American badger are presumed to be on-site, based on evidence of sign by each species. A desert kit fox was observed during a nighttime bat survey in the study area. American badger was not directly observed; however, as this species is nocturnal and rarely observed during daylight hours.

The results of the burrow survey suggest that desert kit fox and American badger are present within the study area. Although direct observations of these species were not made, both are nocturnal and are rarely seen during daylight hours. The identification of desert kit fox is supported by the discovery of distinctive signs commonly associated with this species. Notable evidence includes identifiable tracks, as well as the presence of scat and burrow openings displaying typical features of desert kit fox activity associated with six desert kit fox entrances. The identification of American badger is supported by evidence of conspicuous claw marks on five burrow entrances.

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ATTACHMENT A

Photographs

Photograph B-1. Site conditions from the southeastern extent of the study area from Rasor Road; view facing southwest. Photographed June 2023.

Photograph B-2. Site conditions from the southwestern extent of the study area from Rasor Road; view facing northwest. Photographed June 2023.

Photograph B-3. Site conditions in June 2023; view facing northwest from the central region of the study area. The photograph was taken from an unnamed access road within the study area.

Photograph B-4. Site conditions in July 2023; view facing Southeast from the northern region of the study area from the unnamed access road within the study area.

Photograph B-5. Whitewash staining at the location a live individual burrowing owl was detected during the burrow survey. Photographed June 2023.

Photograph B-6. Whitewash staining (indicated by red circle) near the entrance of a potential burrowing owl burrow that was identified during the burrow survey. Photographed March 2023.

Photograph B-7. Whitewash staining (indicated by red circle) near the entrance of a potential burrowing owl burrow that was identified during the burrow survey. Photographed March 2023.

Photograph B-8. 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 2023.

Photograph B-9. Kit fox tracks, an indication of relatively recent activity closely linked to the depicted den. Photographed July 2023.

Photograph B-10. Relatively fresh kit fox scat compared with old scat found near the depicted den. Photographed July 2023.

Photograph B-11. Inactive kit fox den displaying a characteristic keyhole den entrance with no signs of recent excavations. Photographed May 2023.

Photograph B-12. Inactive badger den showing no webbing at the entrance and no fresh soil pile. Photographed March 2023.

Photograph D-13. Representative photograph of an inactive, unknown mammal burrow exhibiting webbing at the entrance and lack of fresh excavations. Photographed May 2023.

APPENDIX O

Bat Survey Report for the Soda Mountain Solar Project

SWCA
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TECHNICAL MEMORANDUM

To: Soda Mountain Solar, LLC

From: Shirley Innecken, Natural Resources Lead Project Manager

Date: June 14, 2024

Re: **Bat Survey Report for the Soda Mountain Solar Project / SWCA Project No. 068347**

INTRODUCTION

This report summarizes the results of the bat habitat assessment survey and nighttime acoustic surveys conducted by SWCA Environmental Consultants (SWCA) for the Soda Mountain Solar Project (project). The project is located along Interstate 15 (I-15) approximately 50 miles northeast of Barstow, San Bernadino County, California (Figure 1). Soda Mountain Solar, LLC plans to develop a utility-scale photovoltaic (PV) solar facility on approximately 2,670 acres of land managed by the Bureau of Land Management (BLM) (Figure 2). The project site is situated in an alluvial valley between the northern and southern portions of the Soda Mountains in the Mojave Desert.

SWCA developed the biological survey methods in coordination with the California Department of Fish and Wildlife (CDFW) and prepared a biological and aquatic resources work plan. The purpose of this survey was to document the suitability, potential habitat usage, and suitability of areas within the immediate project site and the surrounding landscape of structures, both natural and constructed, as potential maternity, hibernacula, and/or nocturnal roost sites for bats. The survey was conducted in accordance with *Caltrans Bat Mitigation: A Guide to Developing Feasible and Effective Solutions* (H.T. Harvey & 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.

Figure 1. Regional vicinity map.

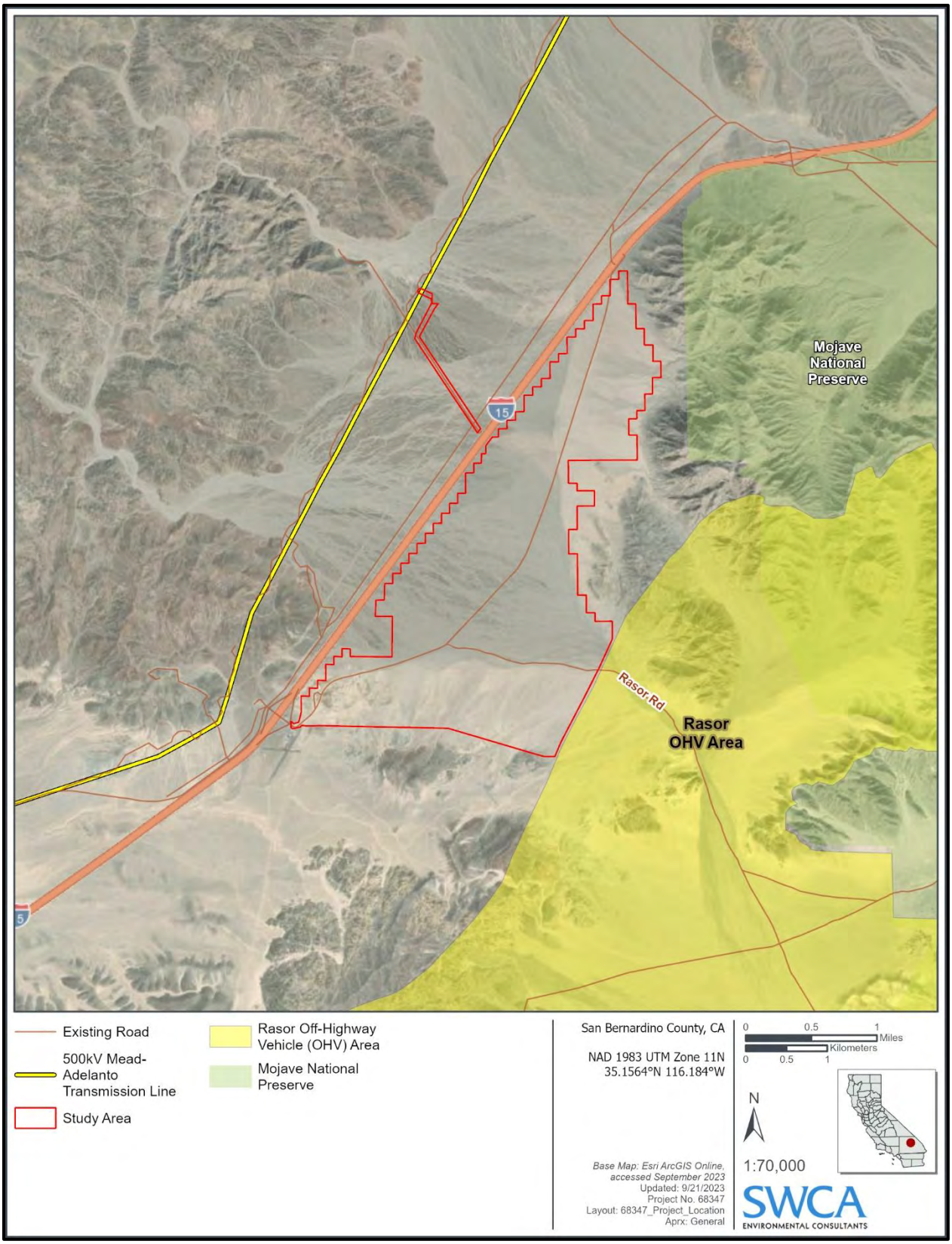

Figure 2. Soda Mountain Solar Project study area.

METHODS

This section identifies the methods and information sources used to describe and evaluate how bat species utilize the study area.

Database Reviews

Prior to conducting field surveys, a comprehensive review of relevant biological databases was conducted, including the California Natural Diversity Database (CNDDB) (CDFW 2023), Section 5 of *Caltrans Bat Mitigation: A Guide to Developing Feasible and Effective Solutions* (H.T. Harvey & Associates 2019), and *Log of Bridges on State Highways, District 8* (California Department of Transportation 2018). Desktop reviews of aerial imagery from Google Earth and ArcGIS Online were also conducted to identify geographically and environmentally suitable locations within the study area and its surrounding topography where bats may roost. Additionally, locations identified by Panorama Environmental, Inc. (2014) were referenced to determine habitat suitability.

Field Surveys

For this report, the study area included the 2,634-acre proposed project site and the proposed gen-tie route (approximately 35.75 acres). SWCA biologists conducted a daytime habitat assessment survey with the primary objective to identify structures or environmental features within the study area that could serve as suitable roosting, foraging, or commuting habitat for bats. Additionally, 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.

Following the daytime habitat assessment survey, SWCA biologists conducted 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. Conditions were generally clear, with temperatures between 98 and 108 degrees Fahrenheit, and wind speeds from 1 to 16 miles per hour. Table 1 summarizes the conditions throughout the survey period.

Table 1. Survey Times and Weather Conditions

Date	Start Time	End Time	Temperature (°F)	Wind Speed (mph)	Conditions
6/27	07:00	13:00	62–94	1–2	Sunny
6/28	07:00	13:00	60–96	2–3	Sunny
7/23	19:30	22:00	101–104	2–5	Clear
7/24	19:30	22:00	102–108	3–10	Clear
7/25	19:30	22:00	104–106	3–15	Clear
7/26	19:30	22:00	102–106	4–8	Clear
8/14	19:00	21:00	100–102	1–6	Clear
8/15	19:00	21:00	100–103	2–5	Clear
8/16	19:00	21:00	98–102	2–6	Cloudy
8/17	19:00	21:00	100–101	3–16	Cloudy
8/28	18:45	21:15	103–106	2–3	Clear
8/29	18:45	21:15	102–106	2–5	Clear
8/30	18:45	21:15	103–108	5–10	Clear
8/31	18:45	21:15	103–108	3–6	Cloudy

Daytime Habitat Assessment Survey

On June 27 and 28, 2023, SWCA biologists Mason Townley and Omar Moquit conducted a daytime habitat assessment survey of the study area. The evaluation encompassed various types of structures, including stormwater culverts, bridges, large-diameter trees with suitable cavities, boulder piles exhibiting appropriate openings, and other comparable formations that have the potential to provide cavities suitable for roosting.

During the survey, the biologists visually scanned the survey area, focusing on designated locations identified during the desktop review, for potential roosting sites. 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. Specific locations that were determined to have the potential to support bats were mapped. Relevant information was noted for locations suitable for bat roosting or with habitat capable of supporting bats, as well as for locations with poor suitability to support bat roots or foraging habitat. Landscape features such as water features suitable for foraging within proximity to locations with crevice availability and suitability of structures to support bat roosts were noted. Locations that had the potential to support roosts, such as trees with suitable cavities and exfoliating bark, boulder outcroppings, and human-made structures, were documented. Photographs were taken at designated locations with likelihood of supporting roosts or foraging areas (Attachment A-1).

POTENTIAL ROOST LOCATIONS

Four potentially suitable roosting locations were identified during the daytime survey: Roost Emergence 1 (RE1), Roost Emergence 2 (RE2), Roost Emergence 3 (RE3), and Roost Emergence 4 (RE4) (see Figure 3). All four of these potential roosting locations occur within stormwater culverts passing underneath I-15.

TRANSECT LOCATIONS

Five transects were established throughout the study area that were designed to account for all habitat types within the project site: Transect 1 (T1), Transect 2 (T2), Transect 3 (T3), Transect 4 (T4), and Transect 5 (T5) (Figure 3). These chosen transect locations serve as the foundation for the nighttime acoustic surveys, which will involve systematic observations and data recording to capture bat activity patterns and identify specific roosting and foraging locations within the study area. 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. This focused approach aimed to investigate regions with a higher likelihood of bat occupancy and roosting activity, considering factors such as the presence of water features, insect abundance, and vegetation types that support their feeding habits (Pierson and Rainey 1994). The strategically selected transects across habitats with key foraging characteristics allowed for a comprehensive assessment of bat habitat utilization within the study area.

Nighttime Acoustic Surveys

SWCA biologists Leonard Griffiths, M. Townley, Bridget Manjarrez, Tamara Kramer, Gigi Wagnon, Marisol Sanchez, and Minerva Lara conducted three nighttime acoustic surveys from July 23 through 26, August 14 through 17, and August 28 through August 31, 2023. Nighttime acoustic surveys took place at locations identified during the daytime habitat assessment survey as having potential roost sites, and along transects that present opportunities for bats to emerge from roosts and disperse to foraging grounds (T1, T2, T3, T4, and T5) (see Figure 3). 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 nighttime acoustic surveys were conducted from a half hour prior to sunset to 2 hours after sunset. The surveys were conducted in all safe weather conditions with full visibility throughout the entire survey plot.

RESULTS

Two bat species listed as Species of Special Concern by the CDFW and as Sensitive by the Bureau of Land Management (BLM) were determined to have the potential to occur within the project site based on existing records and the presence of potentially suitable habitat: pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*) (Table 2).

Table 2. Occurrence Potential for Special-Status Bats within the Soda Mountain Solar Project study area.

Common Name (Species Name)	Status Federal/ State*	Range or Habitat Requirements	Potential to Occur at the Project Site
Pallid bat (*Antrozous pallidus*)	SSC, BLM S	Pallid bats roost in a variety of places but favor rocky outcrops and desert habitats. They also typically occur in oak and pine forested areas and open farmland. Roosting sites are variable, depending on what is available. They can be found roosting in caves, rock crevices, mines, hollow trees, and buildings.	May occur (foraging only). No suitable habitat for roosting was observed during the summer 2023 surveys. The nearest CNDDB record is more than 12 miles from the project site and was a documented mist net capture.
Townsend's big-eared bat (*Corynorhinus townsendii*)	SSC, BLM S	Typical roosting habitat is located in mines, caves, old buildings, and tree hollows. Townsend's big-eared bats require moths and beetles for feeding, with moths being their primary food source.	May occur (foraging only). No suitable habitat for roosting was observed during the summer 2023 surveys. The nearest CNDDB record is 3.5 miles east of the project site and was a documented mist net capture.

SCC = Species of Special Concern
BLM S = BLM Sensitive Species

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*) (Table 3). There were 18 detections total, all occurring between August 28 and August 31 at RE4, T2, and T5. 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). Possible urine staining was additionally observed at RE3.

No roost emergence behavior was observed. Bat behavior during all acoustic detections and visual observations was 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.

The highest densities of acoustic and visual detections were near RE4, the southern portion of T5, and the northern portion of T2. The areas displaying aggregations of bats were found in proximity to human-built structures such as the Rasor Road Shell Station in the southern portion of the study area, the wash adjacent to RE4 in the northern portion, and over natural communities such as Creosote Bush – White

Bursage Scrub (*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance) and Cheesebush – Sweetbush Scrub (*Ambrosia salsola – Bebbia juncea* Shrubland Alliance) with rocky outcroppings in the northern portion of the study area (see Figure 4). These observations consisted of foraging, supported by acoustic data and visual documentation, and commuting behavior, supported by visible documentation, from the species observed.

Table 3. Bat Species Observed during Nighttime Acoustic Surveys

Common Name (Scientific Name)	Detections	Observed Behavior
Canyon bat (*Parastrellus hesperus*)	16	Foraging, commuting
Mexican free-tailed bat (*Tadarida brasiliensis*)	2	Foraging

DISCUSSION

No Species of Special Concern or BLM Sensitive bat species were found in the study area during the surveys. Conditions during the survey were good for detecting bats by sight and/or sound, with appropriate temperatures and conditions (Table 1). No bats were seen emerging from the potential roosts during the three nighttime acoustic surveys. Eighteen total observations of two species were recorded as part of the surveys; these were associated with activity transect and roost emergence surveys, on August 28, 29, and 31. Given this, use of the study area by bats is determined to be limited to foraging and/or commuting only, with minimal amounts of visual and acoustic evidence observed.

Conditions during the survey were suitable for detecting bat activity, with optimal temperatures, weather conditions, and timing of surveys (Table 1). The project site consisted of appropriate topography, elevation, and open foraging habitat to support pallid bat and Townsend's big-eared bat, and the project site is located within the known range of these species.

Additionally, foraging resources were limited at the project site. There are no permanent water sources within 3 miles of the project site, and insect and arachnid activity was limited during surveys. Therefore, SWCA has determined that habitat at the project site is best described as low-quality roosting habitat and moderate-quality foraging habitat for Species of Special Concern and BLM Sensitive bat species due to limited resources and moderate disturbance.

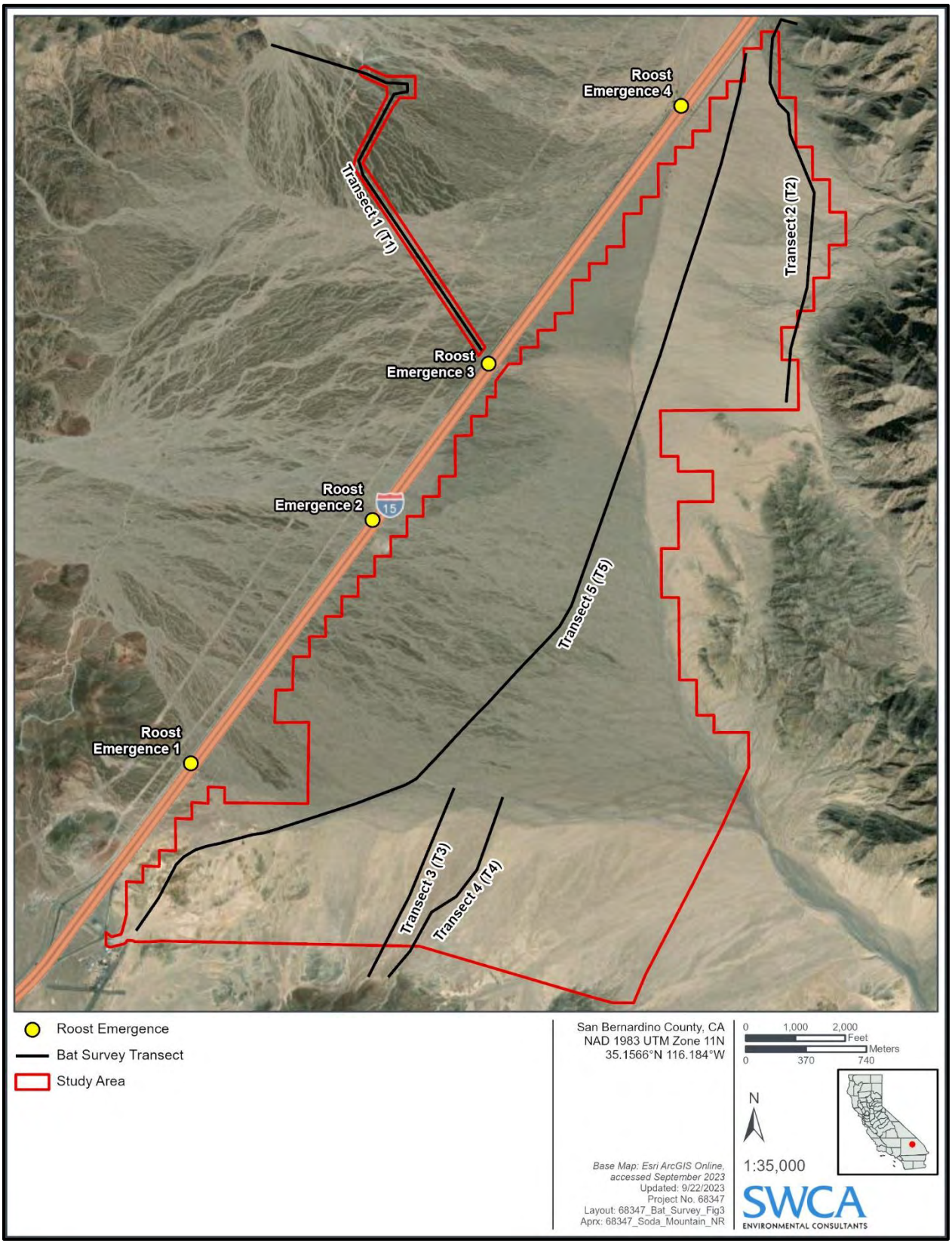

Figure 3. Locations of roost emergence and transect survey locations within the Soda Mountain Solar Project study area.

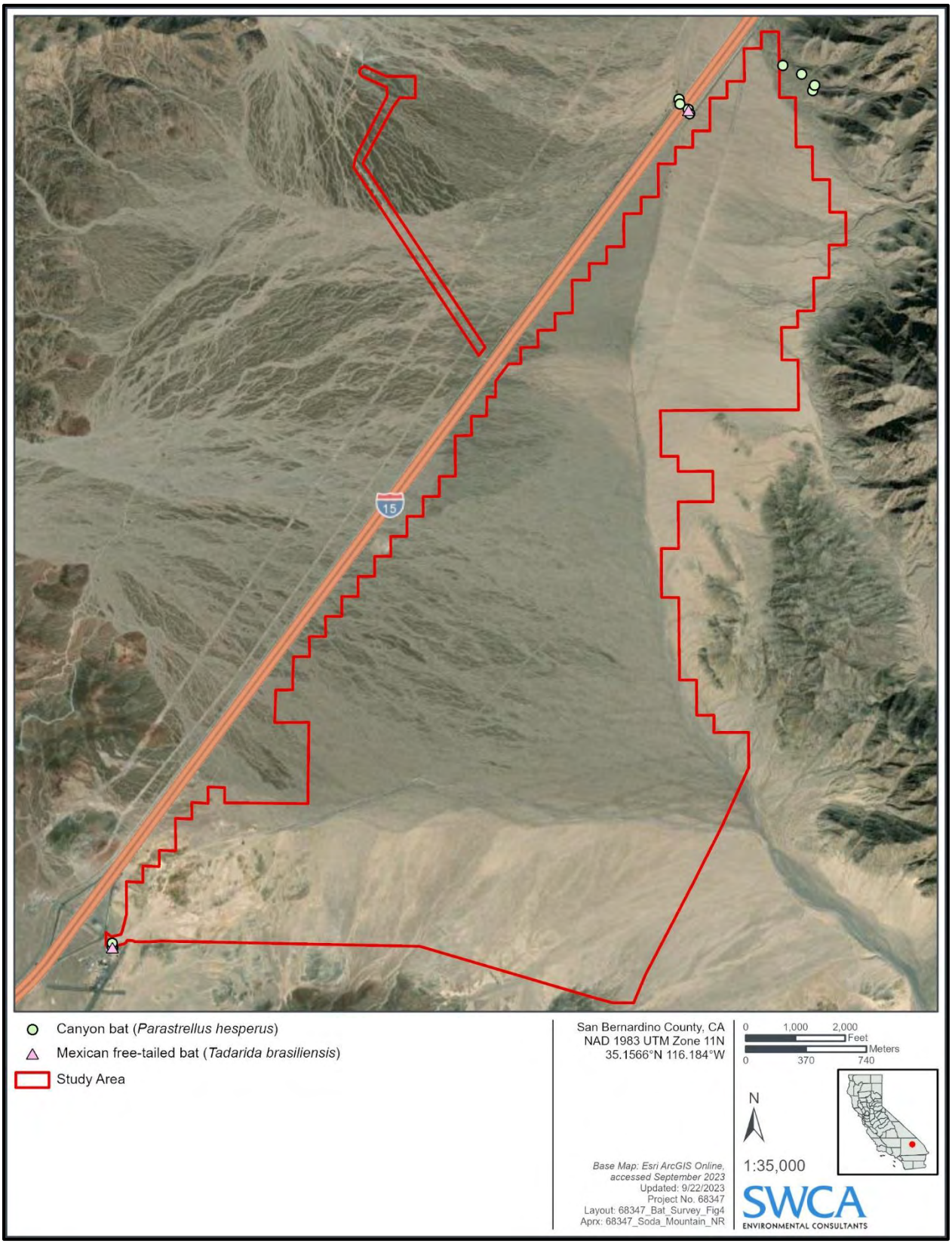

Figure 4. Locations of bats observed within the Soda Mountain Solar Project study area.

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ATTACHMENT A

Photographs

Photograph A-1. Site conditions at RE1; view facing northwest. Photographed June 2023.

Photograph A-2. Site conditions at RE2; view facing southeast. Photographed June 2023.

Photograph A-3. Site conditions at RE3; view facing southeast. Photographed June 2023.

Photograph A-4. Site conditions at RE4; view facing northwest. Photographed June 2023.

Photograph A-5. Site conditions from the northwestern point of T1, showing suitable foraging habitat of Creosote Bush – White Bursage Scrub; view facing southeast. Photographed June 2023.

Photograph A-6. Site conditions from the northeastern point of T2, showing suitable foraging habitat of Creosote Bush – White Bursage Scrub; view facing northwest. Photographed June 2023.

Photograph A-7. Site conditions from the southwestern point of T3, showing suitable foraging habitat of Creosote Bush Scrub; view facing north. Photographed June 2023.

Photograph A-8. Site conditions from the southwestern point of T4, showing suitable foraging habitat of Creosote Bush – White Bursage Scrub; view facing south. Photographed June 2023.

Photograph A-9. Site conditions at the approximate midpoint of T5, showing suitable foraging habitat of Creosote Bush – White Bursage Scrub; view facing northwest. Photographed June 2023.

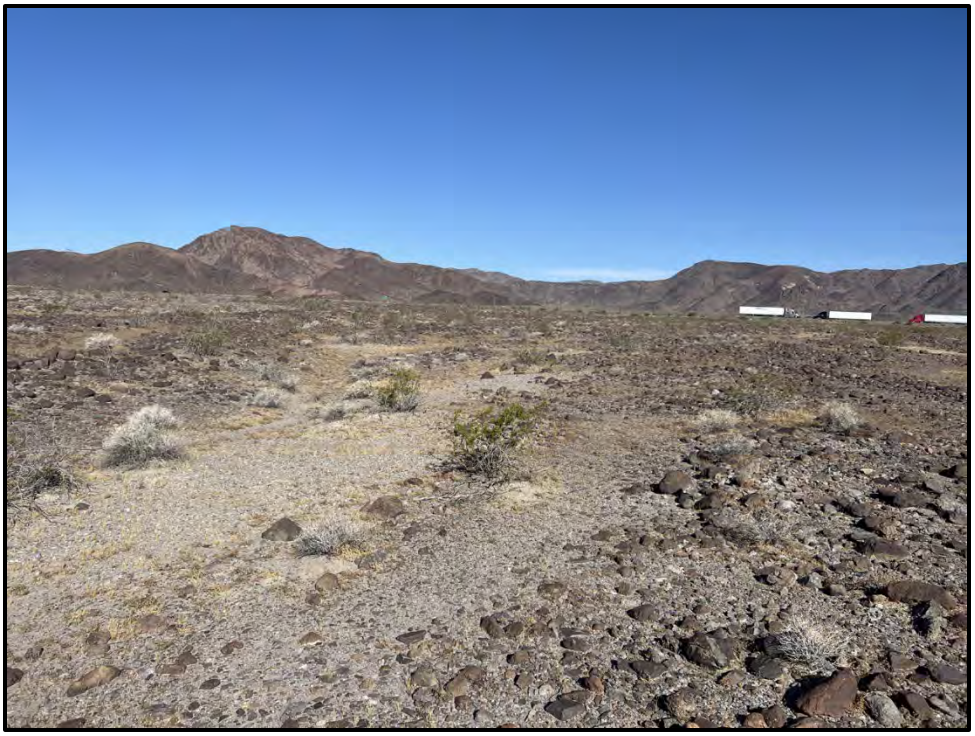
APPENDIX P

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.

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

Scientific Name	Common Name
Pluchea sericea	arrowweed
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

Scientific Name	Common Name
Amsinckia tessellata var. tessellata	bristly fiddleneck
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

Scientific Name	Common Name
Arabis perennans	perennial rockcress
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

Scientific Name	Common Name
Streptanthus cordatus var. cordatus	heartleaf twistflower
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

Scientific Name	Common Name
Elymus multisetus	big squirreltail, big wild rye
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

Scientific Name	Common Name
Schismus barbatus	common Mediterranean grass, Mediterranean grass, Mediterraneangrass
Scleropogon brevifolius	burrograss
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

Scientific Name	Common Name
Gilia stellata	star gilia, star gily-flower
Gilia transmontana	transmontane gilia, transmontane gily-flower
Gilia triodon	coyote gilia
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

Scientific Name	Common Name
Eriogonum maculatum	spotted buckwheat, spotted wild buckwheat
Eriogonum microthecum var. simpsonii	Simpson's buckwheat
Eriogonum mohavense	Western Mojave buckwheat
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

Scientific Name	Common Name
Cheilanthes viscida	viscid lipfern
Cheilanthes wootonii	beaded lip fern, beaded lipfern, Wooton's lipfern
Notholaena californica	California cloak fern
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

Scientific Name	Common Name
Galium stellatum var. eremicum	
Galium wrightii	slenderbranch bedstraw, Wright's bedstraw
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	

Scientific Name	Common Name
Solanum americanum	American black nightshade, common purple nightshade, smallflower nightshade
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
Senecio mohavensis	Mojave ragwort	annual herb
Stephanomeria pauciflora	wire lettuce	perennial herb

Scientific Name	Common Name	Life Form
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
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

Scientific Name	Common Name	Life Form
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
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

Scientific Name	Common Name	Life Form
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
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

Scientific Name	Common Name	Life Form
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 R-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	
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	

Scientific Name	Common Name	Additional Observation Notes
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	
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	

Scientific Name	Common Name	Additional Observation Notes
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	
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	

Scientific Name	Common Name	Additional Observation Notes
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	
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	
Polioptilidae (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	

Scientific Name	Common Name	Additional Observation Notes
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.
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