DOCKETED	
Docket Number:	24-OPT-03
Project Title:	Soda Mountain Solar
TN #:	258460
Document Title:	Appendix D5 – Appendices D-G to 2024 Biological Resources Technical Report
Description:	This file contains Appendices D through G 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 D

Soda Mountain Solar Site Visit

TECHNICAL MEMORANDUM

To:Ziad Alaywan
ZGlobal
604 Sutter Street
Folsom, CA 95630From:Pauline Roberts, Principal Wildlife BiologistCc:Ian Todd, Project ManagerDate:January 13, 2022Re:Soda Mountain Solar Project Site Visit / SWCA Project No. 068347

SWCA Environmental Consultants (SWCA) was retained by ZGlobal to conduct a site visit to record biological resources at the Soda Mountain Solar Project (project) site. The project site is located along Interstate 15 (I-15) approximately 6 miles southwest of Baker, California. The project site is within an intermontane desert valley surrounded by the Soda Mountains. The elevation at the project ranges from 1,265 to 1,490 feet above mean sea level. The project site is bound by I-15 to the north and west, the Soda Mountains to the south and east, and the Bureau of Land Management's Rasor Off-highway Vehicle Area to the southeast.

The entirety of the project site was surveyed for biological resources in 2009 and 2011–2012. The previous surveys included surveys for desert tortoise (*Gopherus agassizii*), rare plants, desert bighorn sheep (*Ovis canadensis nelsoni*), golden eagle (*Aquila chrysaetos*), bats, Mojave fringe-toed lizard (*Uma scoparia*), as well as avian point counts and wetlands/waters delineations. The purpose of the site visit described in this memorandum was to document current habitat conditions.

METHODS

SWCA biologist Pauline Roberts and botanist Maisie Borg performed the site visit on December 30, 2021. Weather conditions were generally cool and partly cloudy, with temperatures averaging approximately 65 degrees Fahrenheit. The biologists slowly drove along Rasor Road as well as the unnamed road that runs North-South within the project area and surveyed on foot in selected portions of the project area, namely in the southernmost parcel and northernmost parcel (approximate area covered shown in Appendix A, Figure A-1). The biologists documented the current site conditions, and plant and wildlife species. Wildlife observations were made directly and aided by the use of binoculars or sign including tracks, scat, remains, and burrows or dens. When burrows or dens were encountered, the biologists examined them for the presence of sign, such as scat, American badger (*Taxidea taxus*) claw mark scrapes, burrowing owl (*Athene cunicularia*) pellets, whitewash, or prey remains. The presence of extensive spiderwebs, debris, or partial collapse was taken to indicate that the burrow/den was likely unoccupied. For potential desert tortoise burrows, the biologists assigned a condition class as described in

1

the *Desert Tortoise (Mojave Population) Field Manual: (Gopherus agassizii)* (U.S. Fish and Wildlife Service 2009). The condition classifications are as follows:

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

All special status species observations, and burrow and den locations were photographed and recorded using a global positioning system (GPS) unit. Lastly, the biologists documented the faunal diversity observed within the project site and incidental floral observations (Appendix B). Representative site photographs can be found in Appendix C

RESULTS

The overall habitat and vegetation communities observed during the survey were similar to those reported in *Biological Resources Technical Report* (Panorama Environmental, Inc. 2013). Vegetation communities were classified using A Manual of California Vegetation (California Native Plant Society 2022). The project site is dominated by Creosote Bush-White Bursage Scrub (*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance). Small portions of Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Cheesebush Scrub (*Ambrosia salsola* Shrubland Alliance) are also present throughout the project area.

Recent rains had catalyzed the germination of some annual plants in the northern part of the project site, however they were less than 0.5 cm high and thus too small to identify. Most of the perennial vegetation on-site seemed to be heavily affected by several consecutive years of drought. Many of the creosote shrubs had yellowed or brown leaves, especially in the northern areas of the site, and in some areas, many appeared dead (Photos C-4 and C-12). Creosote leaves may yellow when water is scarce, but healthy plants are usually green all year. Numerous creosote fruits were present on the ground, indicating conditions were sufficient for blooming and fruiting in spring-summer of 2021. The true extent of the creosote dieback would need to be verified during the growing season. Sixteen species of plants were documented during the site visit (Appendix B, Table B-1). However, because of the January timing of the site visit, some plant species could not be identified to the species level due to the lack of diagnostic characteristics. In addition, virtually all annual herbaceous plant species were not visible at this time of year except for the very small unidentifiable seedlings present.

The site and adjacent land was in active use by recreational off-highway vehicle (OHV) users, and at least 10 vehicles traveled between the Rasor Road interstate exit and the OHV area while the biologists were on site. Both old and fresh dirt bike and OHV tracks were visible throughout the site, especially the southern portion (Photo C-3). This type of land use has direct impacts on natural resources through noise pollution, increased illegal dumping, and land disturbance. This can be most damaging to delicate life such as the lichen and mosses in the biological soil crust present throughout the northeast part of the survey area (Photo C-13), which require long time periods to recover composition and function after physical disturbance. Small amounts of trash were observed throughout the site, which can affect local wildlife (Photo C-6).

Seven species of wildlife (direct sighting or their sign) were documented during the site visit (Appendix B, Table B-2). Two of these wildlife species are special status species: desert tortoise and desert kit fox (*Vulpes macrotis arsipus*). Four potential desert tortoise burrows were identified: one class 2, one class 3, and two class 5 burrows. The class 2 desert tortoise burrow had the characteristic half-moon shape and

was in good condition (Photo C-5). However, there were no recent signs of use nearby. The biologists did not expect to find signs of recent activity: tracks and other sign outside occupied burrows can be erased by rain or high winds, and desert tortoise are generally inactive in their burrows during cold winter weather. The class 3 burrow was in poor condition and had trash in the entrance, with no sign of recent use (Photo C-6). The class 5 burrows appear to have the half-moon shape, but were partially collapsed and could not be confirmed as desert tortoise burrows (Photos C-7 and C-8). For desert kit fox, several potential burrows and scat were found in the project area (Photos C-9 and C-10). Several unknown burrows were also found during the site visit (Photo C-11). The species of animal that made these unknown burrows could not be identified due to the lack of sign, such as scat or scrape marks. However, desert tortoises are known to shelter in burrows excavated by a wide range of fossorial mammals.

DISCUSSION

Overall conditions at the project site appear to be similar to the previous surveys conducted in 2009 and 2011–2012, however many of the dominant shrubs now show severe signs of drought stress. Two special status wildlife species, desert tortoise and desert kit fox, were determined to be present on-site based on the presence of burrows and other sign.

LITERATURE CITED

California Native Plant Society. 2022. A Manual of California Vegetation, Online Edition. California Native Plant Society, Sacramento, CA. Available at: http://www.cnps.org/cnps/vegetation/. January 2022.

Panorama Environmental, Inc. 2013. Biological Resources Technical Report. San Francisco, California.

U.S. Fish and Wildlife Service. 2009. *Desert Tortoise (Mojave Population) Field Manual: (Gopherus agassizii)*. U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California.

APPENDIX A

Maps



APPENDIX B

Floral and Faunal Compendia

Scientific Name	Common Name	Life Form	Native Status
GYMNOSPERMS			
EPHEDRACEAE			
Ephedra sp.	Mormon tea	shrub	native
ANGIOSPERMS (EUDICOTS)			
ASTERACEAE			
Ambrosia dumosa	burro weed	shrub	native
Ambrosia salsola	burrobrush	shrub	native
Bebbia juncea var. aspera	rough sweetbush	shrub	native
Encelia frutescens	rayless encelia	shrub	native
BORAGINACEAE			
Cryptantha sp.	cryptantha	annual herb	native
CACTACEAE			
Cylindropuntia echinocarpa	silver cholla	shrub (stem succulent)	native
CHENOPODIACEAE			
Atriplex sp.	saltbush	shrub	native
CONVOLVULACEAE			
<i>Cuscuta</i> sp.	dodder	annual herb or vine (parasitic)	native
FABACEAE			
Parkinsonia florida	blue paloverde	tree	native
LOASACEAE			
Petalonyx thurberi	sandpaper plant	perennial herb	native
PLANTAGINACEAE			
Plantago ovata	desert plantain	annual herb	native
POLYGONACEAE			
Chorizanthe brevicornu	brittle spine flower	annual herb	native
Chorizanthe rigida	rigid spiny herb	annual herb	native
Eriogonum sp.	buckwheat	annual herb	native
ZYGOPHYLLACEAE			
Larrea tridentata	creosote bush	shrub	native

Table B-1. Observed Plants at the Soda Mountain Solar Project

Table B-2. Wildlife and Sign Observed at the Soda Mountain Solar Project

Scientific Name	Common Name
CLASS REPTILIA	REPTILES
TESTUDINIDAE	TORTOISES
Gopherus agassizii ^{⊀†}	desert tortoise
CLASS AVES	BIRDS
ALAUDIDAE	LARKS
Eremophila alpestris	horned lark
CORVIDAE	JAYS & CROWS
Corvus corax	common raven
CLASS MAMMALIA	MAMMALS
LEPORIDAE	HARES & RABBITS
Lepus californicus	black-tailed jackrabbit
SCIURIDAE	SQUIRRELS
Spermophilus beecheyi	California ground squirrel
HETEROMYIDAE	POCKET MICE & KANGAROO RATS
Dipodomys sp.*	kangaroo rat
CANIDAE	CANIDS
Vulpes macrotis arsipus* [†]	desert kit fox

*Not directly observed, signs such as burrows and dens, pellets, whitewash, feathers, or scat were present

[†]Special status species. Includes federal and state listed and candidate species, California species of special concern, and California protected furbearer

APPENDIX C

Site Photographs



Photo C-1. Overview of the southern portion of the project site.



Photo C-2. View of an ephemeral wash in the southern portion of the project area.



Photo C-3. Overview of the southeastern boundary of the project area, with numerous OHV tracks visible.



Photo C-4. Overview of the northern area of the project site showing the dry, nearly dead, creosote.



Photo C-5. Class 2 desert tortoise burrow.



Photo C-6. Class 3 desert tortoise burrow.



Photo C-7. Class 5 burrow, possibly desert tortoise.



Photo C-8. Class 5 burrow, possibly desert tortoise.



Photo C-9. Example of a potential desert kit fox burrow.



Photo C-10. Desert kit fox scat.



Photo C-11. Example of an unidentified mammal burrow.



Photo C-12. Photo of the very dry (likely dead) creosote shrubs present on-site.



Photo C-13. Photo of the desert biological soil crust present on the northeast portion of the site.

APPENDIX E

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



320 North Halstead Street, Suite 120 Pasadena, California 91107 Tel 626.240.0587 Fax 626.568.2958 www.swca.com

TECHNICAL MEMORANDUM

Re:	Rare Plant Survey and Vegetation Mapping Report for the Soda Mountain Solar Project / SWCA Project No. 68347
Date:	June 14, 2024
From:	Shirley Innecken, Lead Natural Resources Project Manager
To:	Soda Mountain Solar, LLC

INTRODUCTION

This report describes the rare plant survey and vegetation mapping 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. Rare plant survey methods included pedestrian surveys during the optimal blooming period for rare plants with potential to occur. This report summarizes the methods and results of the rare plant survey and vegetation mapping survey conducted in April and May 2023 by SWCA for the project. For this report, the study area included the 2,634-acre proposed project site and the proposed gen-tie route (approximately 35.75 acres).

Twelve rare plants were determined to have the potential to occur within the study area based on existing records within the region and the presence of potentially suitable habitat (Table 1): alkali marsh aster (*Almutaster pauciflorus*), small-flowered androstephium (*Androstephium breviflorum*), Borrego milkvetch (*Astragalus lentiginosus* var. *borreganus*), black grama (*Bouteloua eriopoda*), Emory's crucifixion-thorn (*Castela emoryi*), Harwood's eriastrum (*Eriastrum harwoodii*), Utah vine milkweed (*Funastrum utahense*), Wright's jaffueliobryum moss (*Jaffueliobryum wrightii*), ribbed cryptantha (*Johnstonella costata*), winged cryptantha (*Johnstonella holoptera*), Cooper's rush (*Juncus cooperi*), and desert winged rockcress (*Sibara deserti*).



Figure 1. Soda Mountain Solar Project vicinity map.



Figure 2. Project location map.

In general, vegetation on-site includes Mojavaen desert scrub types and desert wash scrub. Soils were found to be mostly composed of sand interspersed with gravel and cobble. Aeolian sand deposits were observed in the southern portion of the study area. The elevation in the project site ranges from 385 to 454 meters above mean sea level (amsl). As a result of a desktop assessment, it was determined that conducting a rare plant survey between April and early May would capture the blooming period of rare plants with potential to occur. The results of the desktop assessment were used to inform the presence/absence determinations of each species with potential to occur (see Table 1).

Species	Status [*]	Habitat Description [†]	Blooming Period	Habitat Suitability
Alkali marsh aster (<i>Almutaster pauciflorus</i>)	CRPR 2B.2	Perennial herb. Occurs in alkaline meadows and seeps. Elevational range: 239 to 800 meters above mean sea level (amsl).	June–October	Absent. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.
Small-flowered androstephium (Androstephium breviflorum)	CRPR 2B.2	Perennial bulbiferous herb. Occurs in desert dunes and sandy to rocky soil in Mojavean desert scrub. Elevational range: 219 to 800 meters amsl.	March–April	High . Some aeolian sand habitat is present in the southern portion of the study area. The species was not observed during the spring 2023 surveys. The nearest record of this species is 4 miles southwest of the study area.
Borrego milkvetch (Astragalus lentiginosus var. borreganus)	CRPR 4.3	Annual herb. Occurs in sandy soils within Mojavean desert scrub and Sonoran desert scrub. Elevational range: 30 to 895 meters amsl.	February-May	Moderate . Suitable habitat is present in the study area. The nearest recent record is 3 miles to the west. No milkvetch (<i>Astragalus</i> sp.) species were found during the spring 2023 surveys.
Black grama (<i>Bouteloua eriopoda</i>)	CRPR 4.2	Perennial stoloniferous herb. Occurs in Joshua tree woodland and pinyon-juniper woodland. Elevational range: 900 to 1,900 meters amsl.	May–August	Absent. Suitable habitat is not present in the study area. The study area is below the known elevational range for the species. The species was not observed during the spring 2023 surveys.
Emory's crucifixion-thorn (<i>Castela emoryi</i>)	CRPR 2B.2	Perennial deciduous shrub. Occurs in gravelly soils within Mojavean desert scrub, washes, playas, and Sonoran desert scrub. Elevational range: 90 to 725 meters amsl.	(April) June–July (September– October)	High . There is suitable habitat in gravelly washes throughout the study area. The nearest record is located 1 mile northeast of the proposed gen-tie route. The species was not observed on-site during the April 2023 survey. Species is a distinct perennial shrub and is identifiable outside of the blooming period.
Harwood's eriastrum (<i>Eriastrum harwoodii</i>)	CRPR 1B.2, BLM_S	Annual herb. Occurs in desert dunes. Elevational range: 124 to 914 meters amsl.	March–June	Low. Marginally suitable aeolian sand habitat is located in the southern portion of the study area. The species was not observed on- site during the April 2023 survey. The nearest occurrence is located 6 miles south of the study area.
Utah vine milkweed (Funastrum utahense)	CRPR 4.2	Perennial herb. Occurs in gravelly (sometimes) and occasionally sandy soils within Mojavean desert scrub and Sonoran desert scrub. Elevational range: 100 to 1,435 meters amsl.	(March) April–June (September– October)	Present . Several individuals were found in and adjacent to the study area along the margins of ephemeral washes.

Table 1.	Occurrence	Potential for	Special	Status	Plants i	in the	Study	Area
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Species	Status*	Habitat Description [†]	Blooming Period	Habitat Suitability
Wright's jaffueliobryum moss (Jaffueliobryum wrightii)	CRPR 2B.3	Moss. Occurs in dry openings, rock crevices, and carbonate substrates within alpine dwarf scrub, Mojavean desert scrub, and pinyon-juniper woodland. Elevational range: 160 to 2,500 meters amsl.	n/a	Absent. Suitable habitat is not present within the study area. The nearest records are 3 miles from the study area.
Ribbed cryptantha (<i>Johnstonella costata</i>)	CRPR 4.3	Annual herb. Occurs in sandy soils within desert dunes, Mojavean desert scrub, and Sonoran desert scrub. Elevational range: 28 meters below mean sea level (bmsl) to 500 meters amsl.	February–May	High . Suitable habitat is present throughout the study area. The species was not observed during the spring 2023 survey. The nearest record is 3 miles north of the study area.
Winged cryptantha (Johnstonella holoptera)	CRPR 4.3	Annual herb. Occurs in gravelly to rocky soils, washes, slopes, ridges Mojavean desert scrub, and Sonoran desert scrub. Elevational range: 100 to 1,690 meters amsl.	March–April	Moderate . Suitable habitat is present throughout the study area. The species was not observed during the spring 2023 survey. The nearest record is 7 miles northeast of the study area.
Cooper's rush (Juncus cooperi)	CRPR 4.3	Perennial herb. Occurs in meadows and seeps. Elevational range: 100 meters bmsl to 1,769 meters amsl.	April-May(August)	Absent. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 survey.
Desert winged rockcress (<i>Sibara deserti</i>)	CRPR 4.3	Annual herb. Occurs in washes, steep hillsides, dry flats, scree, calcareous rubble, rocky bluffs, and exposed crevices in Mojavean desert scrub. Elevational range: 344 to 1,300 meters amsl.	March–April	Moderate . Suitable habitat is present in the study area. The species was not observed during the spring 2023 survey. The nearest record is 7 miles northeast of the study area.

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

CRPR Ranking:

1B: Rare, threatened, or endangered in California and elsewhere.

2B: Rare, threatened, or endangered in California, but more common elsewhere.

4: Watch List Plants of limited distribution.

0.2: Fairly threatened in California.

0.3: Not very threatened in California

BLM_S: Bureau of Land Management sensitive.

⁺Habitat descriptions are direct quotes from CNPS, consisting of the general and microhabitat descriptions of the corresponding element.

METHODS

Desktop Review

Prior to the field survey, a desktop review of all potential rare plants was conducted, and the likelihood of occurrence was established. The following resources were reviewed and were used to guide the rare plant surveys described in this report:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) RareFind 5 (CDFW 2023a)
- Calflora: Information on California plants for education, research and conservation (Calflora 2023)
- California Native Plant Society (CNPS) Rare Plant Inventory (RPI) (CNPS 2023a)
- Consortium of California Herbaria (2023)

• *Biological Resources Technical Report for Soda Mountain Solar Project* (Panorama Environmental, Inc. 2013).

No overlapping sensitive plant species were documented in the study area based on a review of CNDDB, Calflora, and CNPS. A review of the *Biological Resources Technical Report for Soda Mountain Solar Project* determined that two special-status plants were found within and the immediate vicinity of the study area (Panorama Environmental, Inc. 2013): Emory's crucifixion-thorn and Utah vine milkweed. These surveys were conducted in 2009 and 2012. The area where Emory's crucifixion-thorn was found is no longer part of the project footprint and study area.

Reference Populations

On April 10, 2023, CNDDB reference populations for small-flowered androstephium (EONDX 28) and Emory's crucifixion-thorn (EONDX 88732) were visited to assess their bloom status and habitat conditions. These reference populations are in close proximity to the study area, and both species were determined to have high potential to occur based on the desktop review.

Field Surveys

SWCA biologists Ryan Myers, Paris Krause, Lauren Strong, Minerva Lara, Luis Aguilar, Tamara Kramer, and Chennie Castanon conducted a field survey from April 10 through May 2, 2023. Conditions were mostly sunny and warm, with temperatures between 54 and 94 degrees Fahrenheit, and wind speeds from 0 to 20 miles per hour.

The survey was conducted in a manner consistent with the methods and guidance in the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). The biologists walked parallel transects up to 30 m apart throughout the study area. Portions of the project site deemed to have higher potential for rare plants, including sandy washes and areas with aeolian sands, were surveyed more intensely with parallel transects up to 10 m apart. Plant species or subspecies were identified to the highest taxonomic level possible when encountered. Plants that could not be identified in the field were collected and later identified using *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012) and Jepson eFlora (Jepson Flora Project 2023). Rare plants encountered were recorded using a Geode GPS unit with submeter accuracy.

Vegetation alliances were mapped using *A Manual of California Vegetation* (Sawyer et al. 2009) and *A Manual of California Vegetation Online* (CNPS 2023b). CDFW's *California Natural Community List* was also reviewed to determine the presence or absence of sensitive associations on-site (CDFW 2023b). Vegetation communities were mapped using a minimum mapping unit of 1 acre or 0.25 acre for sensitive natural communities encountered.

RESULTS

Reference Populations

At the small-flowered androstephium reference population site, approximately 10 individuals of the target species were found on a west-facing slope with a sparse coverage of creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and desert lily (*Hesperocallis undulata*). The substrate included mostly aeolian sands interspersed with gravel. Only one plant was found to be flowering; the remaining were in bud or in a vegetative state.

At the Emory's crucifixion-thorn reference site, approximately five individual shrubs of the target species were found along the margins of a drainage growing with creosote bush and white bursage. None of the plants were blooming; however, the distinct shrub is identifiable at any phenological stage. Similar habitat was determined to be present on-site for both small-flowered androstephium and Emory's crucifixion-thorn.

Rare Plants

One special-status plant species was observed within the study area: Utah vine milkweed (Figure 3, Photograph A-1; see Table 1). Three Utah vine milkweed individuals were near the proposed gen-tie route northwest of the study area. These locations are consistent with the locations of the observations made during the 2009 and 2012 surveys. The plants were generally found at the interface of Creosote Bush – White Bursage Scrub (*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance) and Cheesebush – Sweetbush Scrub (*Ambrosia salsola – Bebbia juncea* Shrubland Alliance), along the margins of an ephemeral wash. Additional individuals were found outside of the study area.

Common Species Observed

Common shrubs identified on-site included white bursage, burrobrush (*Ambrosia salsola*), desert holly (*Atriplex hymenelytra*), allscale saltbush (*Atriplex polycarpa*), woolly brickellia (*Brickellia incana*), rayless encelia (*Encelia frutescens*), California joint fir (*Ephedra californica*), little leaved ratany (*Krameria erecta*), and creosote bush. Common herbaceous species included pincushions (*Chaenactis* spp.), devil's spineflower (*Chorizanthe rigida*), desert dodder (*Cuscuta denticulata*), Booth's desert primrose (*Eremothera boothii* ssp. *desertorum*), desert lily, snake's-head (*Malacothrix coulteri*), desert dandelion (*Malacothrix glabrata*), distant phacelia (*Phacelia distans*), desert plantain (*Plantago ovata*), desert nest straw (*Stylocline micropoides*), and other nonnative herbs and grasses. Representative photographs of the survey results can be found in Attachment A. A complete list of plant species encountered is provided in Attachment B.

Vegetation Communities

Five vegetation communities were identified on-site (Table 2, Figures 4–13, Photographs A-2–A-7): Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida* – *Geraea canescens* Desert Pavement Sparsely Vegetated Alliance), California Joint Fir – Longleaf Joint-fir Scrub (*Ephedra californica* – *Ephedra trifurca* Shrubland Alliance), Cheesebush – Sweetbush Scrub, Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance), and Creosote Bush – White Bursage Scrub. Additionally, maintained dirt roads, and other disturbed sites were mapped as Developed/Disturbed landcover type.

No sensitive alliance-level vegetation communities were mapped on-site. However, two sensitive association were identified on-site: Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida–Geraea canescens* Desert Pavement Association) and California Joint Fir – Longleaf Joint-fir (*Ephedra californica – Ambrosia salsola* Association). Neither of these associations mapped on-site have a state rank (SR) rarity (see Table 2; see Figures 4–5, 8–10, and 12–13).

Table 2	Vegetation	Communities	and Land	Cover	Types
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Vegetation Alliance (Association) or Cover Type	Global Rank*	State Rank [†]	Acres within the Project Site
Creosote Bush – White Bursage Scrub Larrea tridentata – Ambrosia dumosa Shrubland Alliance	G5	S5	2,459
Creosote Bush Scrub Larrea tridentata Shrubland Alliance	G5	S5	145

Vegetation Alliance (Association) or Cover Type	Global Rank*	State Rank [†]	Acres within the Project Site
Rigid Spineflower – Hairy Desert Sunflower Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance (Chorizanthe rigida – Geraea canescens Desert Pavement Association)	G4	S4 (Sensitive Association)	32
Cheesebush – Sweetbush Scrub <i>Ambrosia salsola – Bebbia juncea</i> Shrubland Alliance	G4	S4	8.2
California Joint Fir – Longleaf Joint-fir Ephedra californica – Ephedra trifurca Shrubland Alliance (Ephedra californica – Ambrosia salsola Association)	G5	S4 (Sensitive Association)	1.2
Developed/Disturbed	N/A	N/A	25

*Global Rank (NatureServe 2023):

G4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres

G5 = Demonstrably secure because of its worldwide/statewide abundance [†]State Rank (NatureServe 2023):

S4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres

S5 = Demonstrably secure because of its worldwide/statewide abundance

DISCUSSION

Rare Plants

Rare annual plant species may not emerge or bloom every year, and their growth is dependent on specific environmental cues, particularly temperature and precipitation. For the 2023 rain year thus far (October 1, 2022–July 1, 2023), Barstow-Daggett Airport, which is the nearest reporting station with monthly precipitation data available, received 2.71 inches. Mean annual rainfall totals for the same location measure 3.26 inches (National Oceanic and Atmospheric Administration 2023). Additionally, mean temperatures were also generally below normal for winter and spring 2023. Conditions for annual plant detection were considered optimal based on the above-average rainfall and below-normal temperatures.

SWCA is highly confident that only Utah vine milkweed is present within the study area and that the other 11 special-status species evaluated are absent from the study area, including all CRPR 1 and 2 plants considered sensitive, pursuant to CEQA. No federally or state-listed plant species were determined to have potential to occur on-site. The results are also consistent with the rare plant surveys conducted in 2009 and 2012.

Vegetation Communities

Two sensitive associations were documented on-site: Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens* Desert Pavement Association) and California Joint Fir–Longleaf Joint-fir (*Ephedra californica – Ambrosia salsola* Association). Potential impacts to sensitive natural communities may require mitigation.



Figure 3. Utah vine milkweed individuals found within and near the study area.



Figure 4. Vegetation community and land cover types, overview.



Figure 5. Vegetation communities and land cover within the gen-tie area.



Figure 6. Vegetation communities and land cover east of I-15, northwestern corner.



Figure 7. Vegetation communities and land cover east of I-15, northeastern corner.



Figure 8. Vegetation communities and land cover east of I-15, west-central portion.



Figure 9. Vegetation communities and land cover east of I-15, central portion.



Figure 10. Vegetation communities and land cover east of I-15, east-central portion.



Figure 11. Vegetation communities and land cover east of I-15, southwestern corner.


Figure 12. Vegetation communities and land cover east of I-15, south-central portion.



Figure 13. Vegetation communities and land cover east of I-15, southeastern corner.

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ATTACHMENT A

Site Photographs



Photograph A-1. Utah vine milkweed observed on April 19, 2023. This individual was found in the northern portion of the study area, west of I-15.



Photograph A-2. Creosote Bush – White Bursage Scrub in the northwestern portion of the study area, April 25, 2023; view facing southwest.



Photograph A-3. Creosote Bush Scrub in the southeastern corner of the study area, April 20, 2023; view facing northeast.



Photograph A-4. 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, April 18, 2023; view facing east.



Photograph A-5. Cheesebush – Sweetbush Scrub in the northeastern portion of the study area, April 13, 2023; view facing west.



Photograph A-6. California Joint fir – Longleaf Joint-fir (*Ephedra californica* – *Ambrosia salsola* Association) in the southeast corner of the study area, April 20, 2023; view facing north.



Photograph A-7. Example of aeolian sands where tighter transects were conducted, south end of study area.

ATTACHMENT B

Flora Compendium

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	
Stylocline micropoides	desert nest straw	annual herb	

Scientific Name	Common Name	Life Form				
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)						
<i>Spergularia</i> 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 sandmata	annual herb				
Euphorbia polycarpa	smallseed sandmat	perennial herb				

Scientific Name	ntific Name Common Name					
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			
<i>Tamarix</i> 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)			
<i>Muilla</i> sp.	muilla	perennial herb	

Note: *non-native species

APPENDIX F

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



320 North Halstead Street, Suite 120 Pasadena, California 91107 Tel 626.240.0587 Fax 626.568.2958 www.swca.com

TECHNICAL MEMORANDUM

Re:	Crotch's Bumble Bee Focused Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347
Date:	June 14, 2024
From:	Shirley Innecken, Lead Natural Resources Project Manager
То:	Soda Mountain Solar, LLC

INTRODUCTION

This report summarizes the results of the Crotch's bumble bee (*Bombus crotchii*) habitat assessment and focused 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 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 the Crotch's bumble bee surveys was to determine the presence or absence of Crotch's bumble bees within the project site and along the gen-tie option. The survey results summarized in this report serve to support environmental analysis of the project pursuant to the California Environmental Quality Act (CEQA).

Species Background

The Crotch's bumble bee is a candidate for listing as an endangered species in the State of California as defined by Section 2068 of the Fish and Game Code (CDFW 2023a). This species occurs predominantly within California throughout coastal areas, the Central Valley, the margins of the Mojave Desert, and Sierra foothills around most of the southwestern part of the state. Historically, the Crotch's bumble bee was common in much of the Central Valley of California, though it now appears to be absent from most of its historic range (Hatfield et al. 2018). According to recently published CDFW survey considerations, the study area falls outside of the current and historical range for Crotch's bumble bee (CDFW 2023b).



Figure 1. Soda Mountain Solar Project vicinity map.

Natural History

The Crotch's bumble bee inhabits warm, dry scrub and open grassland habitat. Similar to other bumble bee species, Crotch's bumble bee is a generalist forager and visits a variety of flowering plants. It is a short-tongued bumble bee and is therefore best suited to forage on open flowers with short corollas (Hatfield et al. 2018). Plant families most commonly associated with Crotch's bumble bee records in California include those in the Apocyanaceae (Dogbane), Asteraceae (Composite), Boraginaceae (Forget-me-not), Fabaceae (Pea), Hydrophyllaceae (Waterleaf), and Lamiaceae (Mint) families (Hatfield et al. 2018). Other reports commonly associate Crotch's bumble bee with plants in the genera *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia*, and *Salvia* (Williams et al. 2014).

The flight period for Crotch's bumble bee queens in California is from late February to late October; the peak is early April, and there is a second pulse in July. The flight period for workers and males in California extends from late March through September; worker and male abundance peaks in early July (Thorp et al. 1983). The Crotch's bumble bee nests in late February through late October. This species prefers to nest underground and will utilize abandoned rodent burrows; however, it occasionally nests aboveground and has been recorded using abandoned bird nests, undisturbed bunch grasses, rock piles, or dead tree cavities as nesting sites (ForestWatch 2013). Little is known regarding the overwintering habitat used by this species, but it is speculated based on the habits of other bumble bee species that the Crotch's bumble bee uses soft disturbed soils or leaf litter as overwintering sites.

Threats

Like other bumble bee species, the Crotch's bumble bee has experienced recent population declines. Factors that have been identified as a substantial threat to the survival and reproduction of Crotch's bumble bee include loss of habitat due to human landscape modifications (agricultural intensification, livestock grazing, urban development), increased use of herbicides and pesticides, competition with nonnative bee species, climate change, genetic factors, and disease and pathogen spillover (Hatfield and Jepsen 2021; Hatfield et al. 2015)

METHODS

For the purposes of this report, the study area includes the 2,634-acre proposed project site and the proposed gen-tie route (approximately 35.75 acres), plus a 50-foot buffer (Figure 2). Prior to conducting the field surveys, a review of the CDFW California Natural Diversity Database (CNDDB) was performed to determine the nearest recorded locations of Crotch's bumble bee within the vicinity of the study area. Additionally, a desktop habitat assessment was conducted prior to visiting the study area to identify portions of the study area that were most likely to be suitable for Crotch's bumble bees. The desktop assessment considered the requirements for nesting, foraging, and overwintering. Additionally, data collected during the spring 2023 rare plant, desert tortoise, and burrowing owl surveys were used to inform study area survey efforts, where appropriate. SWCA analyzed this information to assess the study area for areas that were likely to contain suitable habitat for the Crotch's bumble bee and co-occurring pollinator species (e.g., high floristic diversity and abundance of suitable nectar sources, adequate nesting and overwintering features, and potential dispersal movement corridors informed by previously documented occurrences). Special attention was paid to natural areas serving as flight corridors between urban/developed areas, including roads and drainages.



Figure 2. Soda Mountain Solar Project Crotch's Bumble Bee study area.

Project-specific focused survey methods were developed in coordination with CDFW. Per CDFW guidance, the May 2023 survey was conducted in accordance with 2019 U.S. Fish and Wildlife Service (USFWS) survey guidelines (version 2.2) for the rusty patched bumble bee (*Bombus affinis*), adjusting for differences between the rusty patched and Crotch's bumble bees (USFWS 2019). On June 6, 2023, after SWCA had already completed the desktop review, habitat assessment, and one focused survey, CDFW published new survey guidance for Crotch's bumble bee (CDFW 2023b). Following the publication of survey guidelines, subsequent surveys were conducted in accordance with the CDFW's *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bees* (CDFW 2023b).

Focused surveys were conducted during the 2023 season by qualified biologists experienced and skilled in the identification and ecology of the Crotch's bumble bee and other California native and nonnative bumble bees. Consistent with the rusty patched bumble bee survey guidelines, four equally spaced focused surveys were conducted during the colony active period (April–August) for the highest detection probability of Crotch's bumble bee. The CDFW June 2023 guidelines call for at least three focused surveys (CDFW 2023b).

SWCA biologists Sharif Durzi, Christina Torres, Nathan Kolberg, Rebecca Wang, Lee BenVau, and Marisol Sanchez conducted four Crotch's bumble bee focused surveys during a 13-week period from May 22 through August 16, 2023. Surveys were focused on the detection of foraging Crotch's bumble bee individuals and active nests. During the first survey, the biologists walked 10-meter-wide pedestrian transects throughout 100% of the areas in the study area that had been deemed potentially suitable foraging habitat according to the desktop habitat assessment (251.5 acres (Figure 4)). When a suitable flowering nectar plant was encountered, the biologists recorded the nectar resource using a GPS-enabled device. In areas of high nectar plant abundance, primarily within the large ephemeral washes, surveys were conducted with increased emphasis per CDFW survey considerations (CDFW 2023b). No bumble bees were captured or handled during survey efforts.

The results of the first focused survey were used to further refine the searchable area of the study area where Crotch's bumble bee would most likely be encountered for the remaining three surveys. Surveys 2 through 4 focused on 53.4 acres within the 251.5 acres of potentially suitable habitat in which floral resources were observed (Figure 5).

Surveys were conducted during the day, at least 1 hour after sunrise and at least 2 hours before sunset. The surveys were conducted during ideal survey conditions as much as possible, which are defined as between 9 a.m. and 1 p.m. when temperatures are between 60- and 90-degrees Fahrenheit (°F), with wind speeds below 8 miles per hour (mph). Table 1 summarizes survey timing, weather conditions, and personnel for each survey.

Date	Surveyors [*]	Start Time	End Time	Temperature (°F)	Wind Speed (mph)	Conditions
5/22	SD, CT, RW, NK	09:00	15:30	85–94	0–5	Sunny
5/23	SD, CT, RW, NK	08:40	14:15	85–97	0–11	Sunny
5/24	SD, CT, RW, NK	07:25	14:15	73–96	1–7	Sunny
5/25	SD, CT, RW, NK	07:30	12:00	69–86	3–6	Partly cloudy
6/15	SD, CT, LB, MS	07:45	14:45	78–97	0–3	Sunny
6/16	CT, LB, MS	08:00	13:45	77–95	0–6	Cloudy
7/17	SD, CT, LB, MS	06:55	09:10	93–102	3–6	Cloudy
7/18	SD, CT, LB, MS	06:40	08:40	86–99	0–6	Sunny

Table 1. Survey Conditions and Personnel

Date	Surveyors [*]	Start Time	End Time	Temperature (°F)	Wind Speed (mph)	Conditions
8/15	SD, LB, MS	07:15	15:00	67–94	1–4	Sunny
8/16	SD, LB, MS	07:15	13:30	63–90	2–10	Sunny

* SD = Sharif Durzi, CT = Christina Torres, RW = Rebecca Wang, NK = Nathan Kolberg, LB = Lee BenVau, MS = Marisol Sanchez

Survey Limitations

As described in the 2023 CDFW survey guidelines, surveys should occur within the colony active period for Crotch's bumble bee which commences in April. Focused surveys initiated at the end of May, immediately following a period of peak blooming, which may have contributed to the detection probability for Crotch's bumble bee individuals and nests. Additionally, as noted in the 2023 CDFW survey guidelines, ideal survey temperatures are between 60 and 90°F when activity of pollinating bumble bees is presumed to be highest. High summer desert temperatures at the study area made surveying within the temperature range difficult to achieve while adhering to the temporal survey window during the colony active period. High daytime temperatures may have reduced the detection probability of Crotch's bumble bee individuals and nest, particularly during the July field survey. In addition, wind speeds exceeded 8 mph on two survey dates (May 23rd and August 16th, see Table 1). Suboptimal wind conditions on these dates may have also reduced the detection of Crotch's bumble bee individuals.

RESULTS

Desktop Assessment

Prior to the field surveys, SWCA conducted a desktop-based habitat assessment to determine the availability of potential suitable nesting, foraging, and overwintering habitat within the survey site and the likelihood for Crotch's bumble bee occurrence based on historical records and species' habitat preference. Results of the desktop assessment showed the closest known historical occurrence of Crotch's bumble bee is approximately 21 miles north of the study area and was recorded in 1995 (CDFW 2023c). This occurrence is an isolated record that is significantly detached in distance and ecological context from the usual known species' habitat of coastal and central California. The study area was found to be more than 50 miles east of the current range of the Crotch's bumble bee as published in recent CDFW survey guidelines (Figure 3) (CDFW 2023b). SWCA identified 251.5 acres of potentially suitable habitat for Crotch's bumble bee foraging (see Figure 4).



Figure 3. Current and historic species range map for Crotch's bumble bee, from 2023 CDFW survey guidelines. Study Area denoted by red star.



Figure 4. Potentially suitable foraging habitat based on the desktop assessment.



Figure 5. Study area for surveys 2 through 4 focused on 53.4 acres of potentially suitable habitat in which floral resources were observed.

Habitat Assessment

Foraging Habitat

Conditions during surveys were optimal for plant growth, given the above-average rainfall accompanied by below-normal temperatures during the previous winter and spring, causing the proliferation in annual wildflower species in the Mojave Desert. Potential nectar sources in bloom were observed from May through August. The most frequently encountered flowering nectar plants included desert milkweed (*Asclepias erosa*), rush milkweed (*Asclepias subulata*), sandpaper plant (*Petalonyx thurberi*), blue palo verde (*Parkinsonia florida*), and desert trumpet (*Eriogonum inflatum*). Desert milkweed, rush milkweed, sandpaper plant, and blue palo verde were actively blooming from May through August and hosted a wide array of pollinator species. Figure 5 shows the distribution of potentially suitable foraging habitat determined by the location of available nectar plants.

Potentially suitable foraging habitat was restricted to the areas of flowering nectar sources, largely concentrated along the ephemeral riparian systems that run throughout the study area. While flowering nectar sources were documented throughout each survey day, the abundance of flowering desert milkweed, rush milkweed, and desert trumpet diminished as the conditions became drier in the later summer months. The gen-tie route had few locations of flowering nectar sources, except for a few isolated locations of desert milkweed, rush milkweed, blue palo verde, and desert trumpet.

Nesting and Overwintering Habitat

The study area contained an abundance of rodent burrows of potentially suitable condition for bumble bee nesting and overwintering, although no hymenopteran (the order Hymenoptera includes bees, wasps, and ants) species were seen occupying these burrows. In addition to the rodent burrows, SWCA biologists also encountered thatched annual grasses and brush piles in potentially suitable conditions for nesting and overwintering throughout the study area. The abundance and wide distribution of nesting and overwintering substrate leads to the conclusion that the entire study area has potential to be suitable for nesting and overwintering populations of Crotch's bumble bees if they were to occur on-site.

Focused Survey Results

No foraging individuals or nests of Crotch's bumble bee or other *Bombus* species were encountered during any of the four focused surveys. Other pollinating hymenopteran (i.e., bees and wasps) and dipteran (flies) species were regularly documented on the actively flowering nectar sources, suggesting that survey efforts were conducted in accordance with seasonal pollinator activity. Reference photographs are included in Attachment A, and a full invertebrate species compendium is provided in Attachment B. Conditions during the survey were generally conducive for the detection of Crotch's bumble bee, with appropriate temperatures and conditions at least partly observed on each survey day (see Table 1).

Other pollinator species frequently observed on-site included Centridine bees (*Centris* spp.), Thisbe's tarantula-hawk wasp (*Pepsis thisbe*), Tiphiid wasps (*Paratiphia* sp.), Ashmead's digger wasp (*Sphex ashmeadi*), and various species of hover flies (family Syrphidae). Eusocial bee species observed within the study area included the western honey bee (*Apis mellifera*).



Figure 6. Potentially suitable nectar sources observed in the field and incidental potential bee observations.

Incidental Observations

During a nighttime acoustic bat survey, SWCA biologist Mason Townley reported encountering an unknown bumble bee species on 16 August at 7:40 p.m., approximately 0.36-mile northwest of the gen-tie (see Figure 5) and outside of the study area. No photographs were taken of this individual, and thus the identification of this potential *Bombus* sp. is not possible. A second potential *Bombus* sp. was documented during another nighttime acoustic bat survey by SWCA biologist Marisol Sanchez on 29 August at 6:55 p.m., approximately 0.53-mile northwest of the gen-tie (see Figure 5) and outside of the study area. This individual was reported to have a yellow stripe along the abdomen and possessed a flight pattern consistent with *Bombus* spp. No photograph was taken of this potential *Bombus* sp., and thus identification is not possible.

DISCUSSION

Across the four surveys, no Crotch's bumble bee individuals or nest sites were found. Potentially suitable foraging habitat was documented throughout the study area, primarily within the ephemeral washes. Potentially suitable nesting and overwintering habitat was determined to be present throughout the entirety of the study area. Overall, the quality of habitat at the study area was low for Crotch's bumble bee habitation. The dry climatic conditions and sparsely vegetated desert environment of the study area make the occurrence of Crotch's bumble bee in the future unlikely. For the purposes of this study, the species is considered absent from the study area.

The closest known historical occurrence of Crotch's bumble bee in the CNDDB is approximately 21 miles north of the study area and was recorded in 1995 (CDFW 2023c). The study area is more than 50 miles outside of the known current and historical range for this species, as outlined in recent CDFW survey guidelines (CDFW 2023b) and shown in Figure 3.

Typical habitat for this species consists of warm, dry scrub and open grassland habitat. Crotch's bumble bee colonies prefer to nest underground and will often utilize abandoned rodent and small mammal burrows, which were common throughout the study area. Crotch's bumble bees are generalist foragers with short tongues; therefore, their nectar sources are usually open flowers with short corollas and include plants from the genera *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia*, and *Salvia* (Williams et al. 2014). Desert milkweed and rush milkweed were encountered within the study area; however, the restricted blooming time and generally unfavorable climatic conditions of the study area's desert environment make the occurrence of Crotch's bumble bee unlikely.

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Attachment A Photographs



Photograph 1. Tiphiid wasps (*Paratiphia* sp.) foraging on a flowering desert milkweed. Photographed May 22, 2023.



Photograph 2. Red-legged oil-digger bee (*Centris rhodopus*) foraging on a flowering desert milkweed. Photographed May 22, 2023.



Photograph 3. Centridine bee (*Centris* sp.) and tiphiid wasps foraging on a flowering desert milkweed. Photographed May 22, 2023.



Photograph 4. Oil digger bee (*Centris* sp.) foraging on a flowering blue palo verde. Photographed May 24, 2023.



Photograph 5. Tarantula-hawk wasp (*Pepsis thisbe*) foraging on a flowering desert milkweed. Photographed June 15, 2023.



Photograph 6. Striped sweat bee (*Agapostemon* sp.) on a desert milkweed seed pod. Photographed June 15, 2023.



Photograph 7. Urbane digger bee (*Anthophora urbana*) foraging on a flowering desert milkweed. Photographed June 16, 2023.



Photograph 8. A gray hairstreak (*Strymon melinus*) on a flowering desert milkweed. Photographed June 15, 2023.



Photograph 9. Western honey bee (*Apis mellifera*) foraging on blooming sandpaper plant. Photographed June 15, 2023.



Photograph 10. Sandpaper plant still in bloom during Survey 4. Photographed August 16, 2023.



Photograph 11. Flowering desert milkweed within ephemeral drainage during Survey 1. Photographed May 22, 2023.



Photograph 12. Desert milkweed plant pictured in Photograph 11 in seed during Survey 3. Photographed July 18, 2023.

Attachment B

Invertebrate Species Compendium
Table A-1. Invertebrate Species Compendium

Scientific Name	Common Name					
INSECTS						
Acrididae	Short-horned Grasshoppers					
Trimerotropis pallidipennis	pallid-winged grasshopper					
Apidae	Cuckoo, Carpenter, Digger, Bumble, and Honey Bees					
Anthophora urbana	urbane digger bee					
Apis mellifera	western honey bee					
<i>Centris</i> sp.	Centridine bee					
Centris sp.	digger bee					
Centris rhodopus	red-legged oil-digger					
Ericrocis lata	ericrocidine cuckoo bee					
Andrenidae	Miner, Fairy, Allied Panurgine, and Oxaeine Bees					
Perdita sp.	fairy bee					
Aeshnidae	Darners					
Anax junius	common green darner					
Asilidae	Robber Flies					
Saropogon sp.	robber fly					
Cerambycidae	Longhorn Beetles					
Plionoma rubens	longhorn beetle					
Coccinellidae	Lady Beetles					
Coccinella septempunctata	seven-spotted lady beetle					
Hippodamia convergens	convergent lady beetle					
Crambidae	Crambid Snout Moths					
Achyra rantalis	garden webworm moth					
Formicoidea	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	Skippers					
Burnsius albescens	white checkered-skipper					
Heliopetes ericetorum	northern white-skipper					
Libellulidae	Skimmers					
Sympetrum corruptum	variegated meadowhawk					
Lycaenidae	Blues, Coppers, Hairstreaks, Harvesters					
Brephidium exilis	western pygmy-blue					
Echinargus isola	Reakirt's blue					

Scientific Name	Common Name	
Hemiargus ceraunus	Ceraunus blue	
Leptotes marina	marine blue	
Strymon melinus	gray hairstreak	
Mutillidae	Velvet Ants	
Dasymutilla sp.	velvet ant	
Nymphalidae	Brush-footed Butterflies	
Danaus gilippus	Queen butterfly	
Pieridae	Whites, Sulphurs, Yellows	
Abaeis nicippe	sleepy orange	
Pontia protodice	checkered white	
Pompilidae	Spider Wasps	
Pepsis thisbe	Thisbe's tarantula-hawk wasp	
Pterophoridae	Plume Moths	
Anstenoptilia marmarodactyla	sage plume moth	
Sphecidae	Thread-waisted Wasps	
Ammophila aberti	thread-waisted wasp	
Palmodes or Prionyx sp.	thread-waisted wasp	
Prionyx parkeri	thread-waisted wasp	
Sphex ashmeadi	Ashmead's digger wasp	
Sphingidae	Sphinx Moths	
Hyles lineata	white-lined sphinx moth	
Syrphidae	Hover Flies	
Syrphidae sp.	hover fly	
Thomisidae	Crab Spiders	
Misumena vatia	goldenrod crab spider	
Tiphiidae	Tiphiid Wasps	
Paratiphia sp.	Tiphiid wasp	
Vespidae	Yellowjackets, Hornets, and Paper Wasps	
Euodynerus sp.	potter wasp	
Pterocheilus pimorum	potter wasp	

APPENDIX G

Desert Tortoise Survey Report for the Soda Mountain Solar Project



320 North Halstead Street, Suite 120 Pasadena, California 91107 Tel 626.240.0587 Fax 626.568.2958 www.swca.com

TECHNICAL MEMORANDUM

Re:	Desert Tortoise Survey Report for the Soda Mountain Solar Project / SWCA Project No. 68347		
Date:	June 14, 2024		
From:	Shirley Innecken, Lead Natural Resources Project Manager		
То:	Soda Mountain Solar, LLC		

INTRODUCTION

This report describes the Mojave desert tortoise (*Gopherus agassizii*) 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 purpose of this survey was to document tortoises and signs such as carcasses, burrows, and scat within the project site and along each gen-tie option. The survey was conducted according to the guidance in the U.S. Fish and Wildlife Service (USFWS) protocol during the April and May spring survey period (USFWS 2019). In addition to desert tortoise, other special-status species were incidentally recorded as they were encountered.

Species Background

Mojave desert tortoise is listed as threatened pursuant to the federal Endangered Species Act and threatened under the California Endangered Species Act, and is a candidate for endangered under the California Endangered Species Act. This population includes all tortoises north and west of the Colorado River in Arizona, Utah, Nevada, and California. Desert tortoise are impacted by ongoing threats, including loss, degradation, fragmentation of habitat, increased risks of wildfire, disease, road mortality, and predation of their eggs and hatchlings (USFWS 2019).

Desert tortoise spend much of their lives underground in burrows. Tortoises typically emerge from wintering burrows in early spring and remain active until fall. During hot summer weather, they spend significant periods inactive underground, during which they are able to reduce metabolism and water loss and consume very little food.



Figure 1. Soda Mountain Solar Project vicinity map.

Previous Desert Tortoise Surveys

The project site was previously surveyed for Mojave desert tortoise in 2009 and 2012. The 2013 biological resources technical report for the project identified suitable desert tortoise habitat, burrows, carcasses, and scat (Panorama Environmental, Inc. 2013). No desert tortoise individuals were found within the project boundary in either 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). SWCA biologists Gigi Wagnon, Bridget Manjarrez, Lauren Strong, Amy Parlette, Minerva Lara, Alex Jamal, Chennie Castannon, Tamara Kramer, and Danielle Parsons conducted desert tortoise surveys in teams of two to four during a 4-week period from April 5 through May 4, 2023. Aardvark Biological Services LLC biologists Chip Cochran, Jeremy Wright, Youssef Attallah, Alexandria Hamilton, Marty Lewis, Matt Martin, Ben Delancey, Miguel Moutsis, Thomas Nhu, Dalton Stanfield, Sarah Mendez, Karyn Seruka, and Gary Thorunbrugh conducted desert tortoise surveys in teams of four from May 24 through May 29, 2023. The survey was conducted in accordance with the 2017 USFWS survey protocol (USFWS 2019). Conditions were ideal for the detection of live tortoises, with temperatures reaching no more than 94 degrees Fahrenheit on any given day. Table 1 summarizes the conditions throughout the survey period.



Figure 2. Soda Mountain Solar Project study area.

Date	Start Time	End Time	Temperature (°F)	Wind Speed (mph)	Conditions
4/5	07:15	16:25	47–65	1–2	Sunny
4/6	07:15	14:45	47–70	2–3	Sunny
4/7	07:15	13:00	52–71	2	Cloudy
4/10	06:30	14:30	61–90	0–5	Sunny
4/11	06:45	14:30	60–91	2–6	Sunny
4/12	06:15	14:30	63–87	4–6	Cloudy
4/13	07:00	15:00	57–84	2–9	Cloudy
4/14	06:15	14:00	58–77	2	Sunny
4/15	07:15	15:00	67–94	1–4	Sunny
4/17	07:15	13:30	63 -90	2–10	Sunny
4/18	07:00	15:30	58–81	6–9	Cloudy
4/19	06:30	14:30	55–74	2–4	Sunny
4/20	06:30	14:30	58–93	1–4	Cloudy
4/21	06:30	14:30	60–83	3–5	Sunny
4/22	07:00	14:30	60–81	5–7	Cloudy
5/1	06:30	14:30	64–85	0–15	Sunny
5/2	06:30	14:30	54–74	0–7	Cloudy
5/4	06:30	12:00	57–61	5–12	Cloudy
5/24	05:45	12:00	68–93	0–7	Cloudy
5/25	05:50	12:30	69–92	0–5	Cloudy
5/26	06:00	12:00	67–90	0–5	Cloudy
5/27	06:00	12:00	70–93	0–5	Cloudy
5/28	06:00	12:00	71–93	0–5	Sunny
5/29	06:00	12:00	73–92	0–5	Sunny

Table 1. Survey Times and Weather Conditions

The biologists walked 10-meter (m)-wide belt transects throughout the entire study area. In addition to the study area, the biologists also surveyed the proposed gen-tie routes by walking transects spaced 10 m apart on each side of the route.

During the survey, biologists searched for live tortoises and signs of tortoise presence. Signs include scat, carcasses, burrows, drinking depressions, courtship rings, tracks, herbivory, or eggshell fragments. When tortoise sign was found, the biologists determined the approximate age based on the condition of the sign.

Tortoise burrows were identified by the distinctive half-moon shape of the entrance and the walls of the tunnel. When a potential tortoise burrow was encountered, a mirror or bright flashlight was used to view the interior of the burrow. Each burrow was assigned a condition class as described in the USFWS *Desert Tortoise (Mojave Population) Field Manual* (USFWS 2009). The condition classifications are as follows:

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

- Class 4: good condition; possibly desert tortoise
- Class 5: deteriorated condition that includes collapsed burrows; possibly desert tortoise

In addition to burrows excavated by desert tortoise, tortoises are also known to seek shelter under shrubs, within caliche caves, and within burrows excavated by other species. Each non-tortoise burrow or den was classified based on the shape of the entrance, size, and presence of sign, such as scat, claw mark scrapes, owl pellets, whitewash, or prey remains. The biologists also recorded the occupancy status of each burrow or den. The presence of extensive spiderwebs, debris, or partial collapse was taken to indicate that the burrow/den was likely unoccupied. All burrow and den locations were recorded using a GPS unit with submeter accuracy. Lastly, biologists documented the faunal diversity observed within the study area.

RESULTS

Desert Tortoise

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

Fresh scat (less than 1 day old) from a subadult was found within the northeast corner of the study area (Figure 3, Photograph G-1). The scat was classified as recent due to the retention of dark coloration, intact state, and retention of moisture. The scat was not in the vicinity of any suitable desert tortoise burrows and was exposed to the typical desert elements. An additional scat (less than 1 month old) from a juvenile was found in the northwestern portion of the study area 900 m (0.5 mile) west of the fresh scat and within 250 m south of multiple Class 4 burrows (Photograph G-2; see Figure 3). This scat retained dark coloration and was intact but lacked moisture.

Across the entire study area, 182 burrows were identified as potential tortoise burrows, meaning that they had been originally excavated by desert tortoise, whether or not they were currently suitable for occupancy (see Figure 3). All burrows were identified as Classes 2–5 (Photographs G-3–G-6), and no burrows were classified as Class 1. The eastern and northeastern portions of the project contained the highest concentration of burrows, likely due less rocky substrate in the landscape. The entire study area excluding the gen-tie and the western area was identified as suitable habitat. No other tortoise signs, such as carcasses, pallets, tracks, drinking depressions, courtship rings, or signs of ephemeral plant herbivory, were observed on-site.

The majority of the gen-tie route was found to be unsuitable habitat for desert tortoise due to extensive rocky outcrops. However, two burrows (Class 4 and Class 5) were identified but collapsed.

Weather and Habitat Conditions

Conditions during the survey were good for detecting desert tortoise, with appropriate temperatures and conditions (see Table 1). Based on the 4.1 inches (104 mm) of rainfall recorded in Barstow from October 2022 through July 2023 (National Oceanic and Atmospheric Administration 2023), desert tortoise would have been highly likely to be visible aboveground. USFWS estimates that in years with rainfall exceeding 1.5 inches (40 mm), the probability of desert tortoise being visible is approximately 85%, and the probability of detecting a tortoise if it is visible is approximately 63% (USFWS 2019).

Vegetation communities were mapped in the study area by SWCA biologists in spring 2023, which identified plant communities characteristic of desert tortoise habitat. A diverse array of annual and perennial food plants for desert tortoise were recorded in the study area during the vegetation mapping survey. The conditions during this survey were optimal for detecting annual plants given above average rainfall accompanied by below normal temperatures the previous winter and spring, causing the proliferation in annual wildflower species in the Mojave Desert. Observed forage plants in the study area included red brome (*Bromus madritensis* ssp. *rubens*), Booth's desert primrose (*Eremothera boothii* ssp. *desertorum*), sand blazing star (*Mentzelia involucrata*), Sonoran sandmat (*Euphorbia micromera*), purple desert lupine (*Lupinus shockleyi*), snake's-head (*Malacothrix coulteri*), wire lettuce (*Stephanomeria* spp.), Fremont pincushion (*Chaenactis fremontii*), white stemmed blazing star (*Mentzelia albicaulis*), and devil's lettuce (*Amsinckia tessellata*).

Evidence of anthropogenic disturbance such as off-road vehicle use is present throughout the study area (Photograph G-7). Other evidence of disturbance includes trash from illegal dumping and bullet casings. During the survey, the biologists observed several trucks, dirt bikes, and all-terrain vehicles being driven off-road within or near the study area at the Rasor OHV recreation area. The major highway (Interstate 15) passes directly through the project location, reducing connectivity and exacerbating fragmentation of desert habitat.



Figure 3. Desert tortoise burrows and scat in the study area.

Other Wildlife Observations

In a separate survey for burrowing owl (*Athene cunicularia*), desert kit fox (*Vulpes macrotis arsipus*), and American badger (*Taxidea taxus*), an additional 145 burrows were documented in the study area and determined to be non-tortoise. The results of this survey are reported in *Burrowing Owl, Desert Kit Fox, and American Badger Survey Results for the Soda Mountain Solar Project* (SWCA 2023). These burrows were determined to be non-tortoise due to distinctive markings, shape, and scat of other burrowing wildlife.

Loggerhead shrike (*Lanius ludovicianus*) was detected on-site and is listed as a CDFW species of special concern. Other wildlife species most commonly observed on-site included common raven (*Corvus corax*), desert horned lizard (*Phrynosoma platyrhinos*), desert iguana (*Dipsosaurus dorsalis*), and feral dogs (*Canis lupus familiaris*). Common ravens and feral dogs are known predators of the desert tortoise.

DISCUSSION

During the survey no live tortoises were found, although scat and unoccupied burrows were observed. Other special status species such as burrowing owl, desert kit fox, and loggerhead shrike were confirmed to be present in the study area.

A few tortoises may be present on-site based on the presence of scat, though degraded burrows and no live tortoises or carcasses were observed. Tortoise burrows found were collapsed and/or showed no sign of recent activity. There were only two observations of tortoise scat over a study area of almost 2,670 acres.

Typical desert tortoise habitat consists of alluvial fans and colluvial/bedrock slopes with vegetation communities consisting of creosote bush (*Larrea tridentata*), Joshua tree (*Yucca brevifolia*), and/or saltbush (*Atriplex* spp.) along with a high diversity of food plants such as perennial grasses, woody perennials, cacti, and native annual flowers such as desert sunflower (*Geraea canescens*) and desert dandelion (*Malacothrix glabrata*). Desert tortoise also forage on non-native plant species such as red brome (*Bromus madritensis* ssp. *rubens*) and red-stem filaree (*Erodium cicutarium*), which provide low nutritional value (Avery 1995). While some of the study area is composed of suitable vegetation communities, disturbances and anthropogenic effects in the study area have reduced habitat quality for desert tortoise.

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ATTACHMENT A

Site Photographs



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



Photograph G-2. Less than 1-month-old scat from a juvenile desert tortoise. Photographed May 11, 2023.



Photograph G-3. An example of a Class 2 desert tortoise burrow. Photographed April 7, 2023.



Photograph G-4. An example of a Class 3 desert tortoise burrow. Photographed March 27, 2023.



Photograph G-5. An example of a Class 4 desert tortoise burrow. Photographed March 27, 2023.



Photograph G-6. An example of a Class 5 desert tortoise burrow. Photographed March 28, 2023.



Photograph G-7. An example of off-road vehicle use in the study area. Photographed June 16, 2023.

APPENDIX H

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