ZETA SOLAR AND BATTERY ENERGY STORAGE SYSTEMS PROJECT
Biological Resources Assessment

December 4, 2023

Prepared for:

Longroad Energy Management, LLC
125 High Street
High Street Tower, Suite 1705
Boston, MA 02110

Prepared by:
Stantec Consulting Services inc.
601 SW 2nd Avenue, Suite 1400
Portland, Oregon 97204

Table of Contents

List of Tables

List of Figures

List of Appendixes

Acronyms and Abbreviations

APLIC	Avian Power Line Interaction Committee
BESS	Battery Energy Storage System
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
ESA	Endangered Species Act
gen-tie	Generation-Tie
I-5	U.S. Interstate 5
MCV	Manual of California Vegetation
PG&E	Pacific Gas and Electric
PV	Photovoltaic
Project	Zeta Solar and Battery Energy Storage System (BESS) Project
SJKF	San Joaquin Kit Fox
Stantec	Stantec Consulting Services Inc.
USFWS	U.S. Fish and Wildlife Service

1 Introduction

1.1 Project Description

Longroad Development Company, LLC, proposes to develop the Zeta Solar and Battery Energy Storage System (BESS) Project (project), located approximately 9 miles south of Los Banos in Merced County, California (Figure 1). The project would consist of a photovoltaic (PV) solar power generation facility with a BESS and on-site project substation. The project is located on all or portions of several contiguous parcels, totaling approximately 650 acres (the project site), plus an additional 1,700-foot generation-tie (gen-tie) line corridor to deliver power from the project to Pacific Gas and Electric's (PG&E's) existing Mercy Springs Substation (the point of interconnection) in unincorporated Merced County.

Poleline Road abuts the southwestern project site boundary. The California Aqueduct and U.S. Interstate 5 (I-5) run parallel to the southwest project boundary about 300 feet and 800 feet to the west of the project site, respectively. An unpaved private road (First Lift Canal Road) lies along the western boundary of the project site, and the eastern boundary abuts an unnamed dirt/gravel road. The project site consists of fallow agricultural lands, and there has been no agricultural production on the project site for more than 10 years. Land uses surrounding the project site primarily consist of undeveloped active agricultural lands to the north, south, and east, in addition to a small (0.15-acre) developed area to the south housing a cell tower and undeveloped, hilly grasslands used for cattle grazing to the west. The Vega Solar project site and Dos Amigos Pumping Plant are located 1,200 feet north and 0.5-mile northwest of the project site, respectively.

1.2 Purpose and Scope

Stantec Consulting Services Inc. (Stantec) conducted preliminary desktop and field analyses of aquatic, botanical, and wildlife resources for the project to inform early coordination with Merced County, the California Department of Fish and Wildlife (CDFW), and the U.S. Fish and Wildlife Service (USFWS). Stantec designed the analyses to identify baseline information that will aid in determining the need for additional or species-specific analyses to support California Environmental Quality Act (CEQA) documentation as well as other county, state, and/or federal regulations or policies.

1.3 Physical Conditions

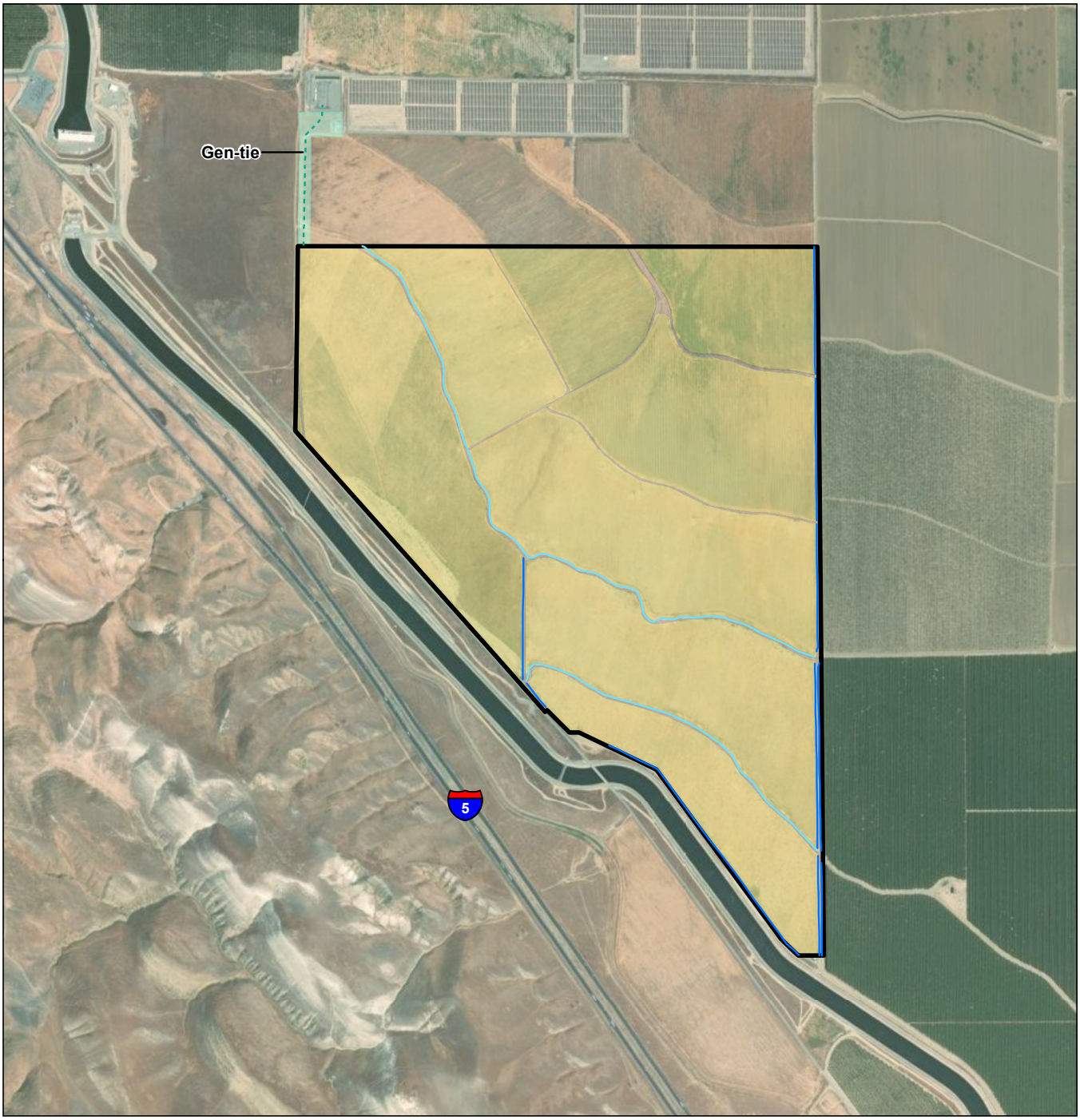
The project site is relatively flat with the terrain gently sloping from southwest to northeast and elevations ranging from 210 feet to 320 feet above mean sea level. The geology of the project site consists of Pliocene and Pleistocene-aged unconsolidated nonmarine and older alluvial deposits of the Tulare Formation that were derived from erosion of the Sierra Nevada and the Coast Ranges. Three soil map units occur in the project site, as described in the Soil Survey of Merced County, California, Western Part (NRCS 2023). These map units are summarized in Table 1.

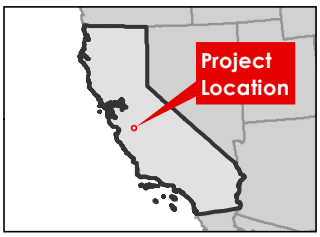
Table 1. Soil Map Units within the Project Site.

Soil Map Unit	Map Symbol	Drainage Class	Landform	Hydric Soil
Deldota clay, partially drained	167	Somewhat poorly drained	Terraces	No
Paver clay loam, 2–5% slopes	230	Well drained	Alluvial fans	No
Woo clay, 0–2% slopes	280	Well drained	Alluvial fans	No

The northern San Joaquin Valley region has a semi-arid climate that is characterized by hot, dry summers and cool, dry winters. Most of the annual precipitation occurs from November through April. The average minimum and maximum annual temperatures are 48.0 degrees Fahrenheit (°F) and 76.4 °F, respectively, although it is not unusual for the temperature to exceed 100 °F in summer (SLWD 2021) . California has experienced three declared droughts in the last three decades. In 1976, the state received an average of 7.4 inches of rain. Until recently, the drought of 1987–1992 was considered the most severe drought in California's history. However, the severity of that drought period has been eclipsed by the historic drought experienced from 2011–2016, and the most recent drought that occurred from 2020–2022. Conversely, these drought periods are often offset by periods of intense rainfall that can lead to flooding as witnessed in Winter and Spring 2023. This extreme climatic variability is common throughout California.

V:\18571\Active\185705411\03_data\gis_cad\gis\mxd\Bio\Fig_1_Project_Overview_8_5x11P.mxd Revised: 2024-07-09 By: pglendening





Project Site (650 acres)

Gen-tie

Gen-tie Corridor

Concrete Ditch

Earthen Ditch

Vegetation Types

Developed

Ripgut Brome and Wild Oats Annual Grassland

0 1,000 2,000 Feet

1:20,000 (at original document size of 8.5x11)

N

Stantec

Project Location
T12SN, R11E, S06-07
Merced Co., CA

185705411
Prepared by PG on 2024-07-09
Technical Review by SE on 2024-07-10

Client/Project
Longroad Energy Management, LLC
Zeta Solar and Battery Energy Storage System Project

Figure No.
1

Title
Project Overview

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

2 Aquatic Resources

Wetlands and other waters of the United States are protected under Section 404 of the Clean Water Act. Any activity that involves any discharge of dredged or fill material into waters of the U.S., including jurisdictional wetlands, is subject to regulation by the U.S. Army Corps of Engineers. Waters of the U.S. are defined to encompass navigable waters; interstate waters; all other waters where their use, degradation, or destruction could affect interstate or foreign commerce; tributaries of any of these waters; and wetlands that have a continuous surface connection to any of these waters or their tributaries[1].

Waters of the State are protected under the Porter-Cologne Water Quality Control Act and Sections 1600–1603 of the California Fish and Game Code. Any activity that involves any discharge of dredged or fill material into waters of the State, including wetlands, is subject to regulation by the Regional Water Quality Control Board (RWQCB) and/or CDFW. The RWQCB takes jurisdiction over all waters defined as "wetlands" under the U.S. Army Corp of Engineers three-parameter requirement, including isolated features. They also take jurisdiction over waters defined as "drainages" based upon the presence of ordinary high water mark and/or bed-and-bank; connectivity is not a consideration. In addition, isolated open waters or impoundments are generally considered under their jurisdiction. CDFW generally takes jurisdiction over all waters with defined bed-and-bank; however, features that no longer carry water or support small fish or other aquatic life don't fall under CDFW jurisdiction.

Stantec wetland specialist Sheryl Creer conducted a delineation of aquatic resources on the project site, including the gen-tie corridor, on September 21 and 22, 2021. The biologists collected data in sufficient detail to inform the jurisdictional assessment for each relevant agency on a feature-by-feature basis.

Aquatic resources within the project site are part of an abandoned irrigation system, with two excavated earthen ditches, five concrete-lined ditches, four abandoned concrete impoundments, and 23 pipe culverts, totaling 2.4 acres and 29,026 linear feet (Figure 1). All these features were observed to be ephemeral. The concrete impoundments are located where ditches previously converged. Many of the culverts were crushed or plugged with debris, sediment, and tumbleweeds (*Salsola tragus*). All irrigation gates on the project site were no longer functional, and the connectivity between the aquatic features on the project site and features on adjacent land parcels had been severed. Therefore, with no connectivity to a traditional navigable water and these features being ephemeral, these drainages would not fall under the jurisdiction of the U.S. Army Corp of Engineers. The project received an Approved Jurisdictional Determination from the U.S. Army Corp of Engineers, and they concurred that none of the aquatic features on the project site fall under their jurisdiction. These drainages would not fall under the jurisdiction of the Regional Water Quality Control Board because they are human-excavated irrigation ditches located in uplands that do not replace or relocate a natural feature.

[1] Sackett v. EPA, 598 U.S. (2023). Decided May 25, 2023. This Supreme Court decision amended the "Revised Definition of Waters of the United States" and became effective September 8, 2023.

2 Aquatic Resources

In addition, because the ditches no longer carry water or support fish and other aquatic life, there is likely no CDFW jurisdiction. Stantec did not identify any wetlands on the project site.

The methods and results of the delineation are summarized in this report because the presence (or absence) of aquatic resources informs the suitability of the project site for some special-status species. The reader should refer to the project's *Aquatic Resources Survey Report* for detailed accounts of methods and results and a preliminary jurisdictional assessment.

3 Botanical Resources

Stantec biologists, led by senior botanist and wetland specialist Sheryl Creer, evaluated the following botanical resources on the project site and gen-tie corridor: vegetation communities, special-status plants, and invasive plants.

3.1 Vegetation Communities

3.1.1 METHODS

Prior to conducting the field survey, the biologists identified and classified several vegetation communities within the project site using the California Native Plant Society (CNPS) *Manual of California Vegetation* (MCV), Online Edition (CNPS 2023a); Google Earth aerial imagery dating back to 1989; and CDFW spatial data (CDFW 2011; Schwenkler and Hickson 2018). The results of this desktop exercise served as a preliminary vegetation map to support the field survey.

The biologists mapped vegetation communities on the project site and gen-tie corridor on September 21 and 22, 2021, following the technical approach and vegetation alliance classification system described in the MCV (CNPS 2023a). The biologists mapped vegetation in the field by walking transects through the project site and assessing vegetative cover within stands. The biologists visited the full extent or a representative portion of all vegetation communities mapped during the preliminary desktop exercise. They classified vegetation communities to the level necessary (i.e., alliance or association) to determine sensitivity and collected plant species composition, stand structure, regional occurrence, and other notable characteristics. After completing the surveys, the biologists refined the preliminary desktop vegetation community map with field observations. They checked each vegetation community for sensitivity against the California Natural Community List (CDFW 2023a).

3.1.2 RESULTS

The project site and gen-tie corridor are located almost entirely within fallow agricultural fields, where vegetation has been highly disturbed by historical human activity, such as clearing, grading, and extensive alteration of hydrology. The project site was actively being grazed by sheep and goats during the September 2021 survey. Noxious weeds and other non-native plants were prevalent, and remnant common wheat (*Triticum aestivum*) crops remained. Stantec biologists mapped one vegetation community on the project site, which is described below.

Ripgut Brome and Wild Oats Annual Grassland (Bromus diandrus – Avena spp. Herbaceous Semi-Natural Association)

This non-native vegetation association covered nearly all of the project site and gen-tie corridor (Figure 1). From 2012–2018, dryland plants were planted on the project site as a weed control measure, but these plants were not irrigated. The land lay fallow for three years between 2018–2020. Grazing sheep and goats have been used on the project site periodically since 2021 as a weed control measure. The

project site is undeveloped and consists largely of patches of common wheat (not grown for harvest), along with other non-native grass species that are dominant, with greater than 30 percent relative cover. Dominant grass species observed include wild oats, ripgut brome, and foxtail barley (*Hordeum murinum*). Dominant non-native forbs include perennial pepperweed (*Lepidium latifolium*), Russian thistle (*Salsola tragus*), and prickly lettuce (*Lactuca serriola*). Scattered individual tamarisk (*Tamarix ramosissima*) shrubs are also present. The biologists observed senesced fiddleneck (*Amsinckia* spp.), a native forb, at low cover (less than 2 percent) throughout the project site. The CDFW does not consider Ripgut Brome and Wild Oats Annual Grassland a sensitive natural community. Refer to Appendix A for representative photographs.

Developed Areas

Developed areas make up the remaining portion of the project site and include unvegetated areas, such as unpaved roads, paved roads, and sections of riprap (Figure 1).

3.2 Special-Status Plants

3.2.1 METHODS

Stantec biologists conducted a desktop review of the special-status plants within 5 miles of the project site using data downloaded from the California Natural Diversity Database (CNDDB) (CDFW 2023b). The biologists queried the CNPS inventory for special-status plants that may occur in the Charleston School, California, U.S. Geological Survey 7.5-minute quadrangle and surrounding nine quadrangles (CNPS 2023b). They also queried the USFWS Information for Planning and Consultation tool for Endangered Species Act (ESA)–listed species known or potentially occurring in the area (USFWS 2023). Stantec biologists also looked for special-status plants incidental to their primary objectives during April and September 2021 field surveys but did not conduct targeted special-status plant surveys. Focused botanical surveys were conducted by Stantec botanists on April 25–26 and June 15–16, 2023. Surveys conducted in 2023 occurred after an above average rainfall; therefore, site conditions were favorable to identify potential species.

The focused botanical surveys were conducted during the appropriate bloom period for all potentially occurring special-status plant species. The botanical field survey was conducted in accordance with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). The field survey was floristic in nature and consisted of identifying each species observed to the taxonomic level necessary to determine whether the plant is a special-status species. Plant taxonomy followed Baldwin et al. (2012), including applicable errata and supplements (Jepson Flora project 2023). Prior to surveys within the project site, Stantec botanists visited plant reference sites to determine the appropriate blooming period for special-status plants. Stantec botanists then performed surveys within the project site by walking meandering transects through microhabitats with the potential to support special-status plants. The reader should refer to the project's *Botanical Resources Survey Report* for detailed accounts of methods and results.

Special-status species include plants that are listed, candidates, or proposed for listing under the ESA or California Endangered Species Act (CESA); plants listed as rare or endangered under the California Native Plant Protection Act; and plants considered by the CNPS to be rare, threatened or endangered in California (California Rare Plant Ranks 1A, 1B, 2A, and 2B) (CNPS 2023c).

Stantec classified the potential for special-status plant species to occur within the project area under one of five categories as described below.

- **Present:** The species has been confirmed present during project surveys.
- **High:** The species has been documented within 5 miles of the project site in the last 25 years, and potential habitat for the species is present.
- **Medium:** The project site is within the species range, and suitable habitat is present. Records of the species within 5 miles, if any, are more than 25 years old.
- **Low:** The project site is located within the range of the species, but only low quality or marginal potential habitat is present.
- **Absent:** The project site is located outside the species range, and/or potential habitat to support the species is absent.

3.2.2 RESULTS

Table 2 lists the special-status plants potentially occurring on the project site and gen-tie corridor based on database query results, and Figure 2 depicts the special-status plant occurrence data within 5 miles of the project site from the CNDDB (CDFW 2023b). Biologists determined the potential for each species to occur on the project site based on available data sources (e.g., CNDDB), field survey results, and the presence or absence of suitable habitat. No special-status plant species were detected within the project site during the April or June 2023 botanical surveys. Based on field observations, the project site provides only low quality habitat for special-status plant species.

Table 2. Special-Status Plant Species Potentially Occurring on the Project Site

Common Name	Scientific Name	CNPS Status[1,2]	Flowering Period	Potential to Occur Within Project Site[3]
Heartscale	*Atriplex cordulata* var. *cordulata*	1B.2	Apr. – Oct.	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by competition with non-native plants, which dominate the project site. There are no known CNDDB occurrences within 5 miles of the project site.

Common Name	Scientific Name	CNPS Status[1,2]	Flowering Period	Potential to Occur Within Project Site[3]
Lost Hills crownscale	*Atriplex oronate* var. *vallicola*	1B.2	Apr. – Sep.	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by agricultural conversion and grazing, which have historical and current practices, respectively, on the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Lesser saltscale	*Atriplex minuscula*	1B.1	May. – Oct.	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by agriculture, which is a historical land practice on the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Lemmon's jewelflower	*Caulanthus lemmonii*	1B.2	Feb. – May	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by grazing, which is a current land practice on the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Hispid salty bird's-beak	*Chloropyron molle* ssp. *Hispidum*	1B.1	June – Sep.	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by agricultural conversion and grazing, which have historical and current practices, respectively, on the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Recurved larkspur	*Delphinium recurvatum*	1B.2	Mar. – June	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by agricultural conversion, grazing, and non-native plants, which are the key factors in the current condition of the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Spiny-sepaled button-celery	*Eryngium spinosepalum*	1B.2	Apr. – June	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by agricultural conversion and grazing, which have historical and current practices, respectively, on the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Alkali-sink goldfields	*Lasthenia chrysantha*	1B.1	Feb. – Apr.	**Absent.** One documented CNDDB occurrence (1937) on the west side of I-5. There is no suitable vernal pool habitat within or adjacent to the project site.
Munz's tidy-tips	*Layia munzii*	1B.2	Mar. – Apr.	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by competition with non-native plants, which dominate the project site. One documented CNDDB occurrence (1936) on the west side of I-5.

Common Name	Scientific Name	CNPS Status[1,2]	Flowering Period	Potential to Occur Within Project Site[3]
Panoche pepper-grass	*Lepidium jaredii* ssp. *album*	1B.2	Feb. – June	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by grazing, which is a current land practice on the project site. One documented CNDDB occurrence (1935) on the west side of I-5.
Showy golden madia	*Madia radiata*	1B.1	Mar. – May	**Low.** There are no CNDDB occurrences of this species within 5 miles of the project site, and marginal habitat is present in the project site in the non-native grassland in the fallow agricultural fields.
Prostrate vernal pool navarretia	*Navarretia prostrata*	1B.1	Apr. – July	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by grazing and non-native plants, which are key factors in the current condition of the project site. There are no known CNDDB occurrences within 5 miles of the project site.
California alkali grass	*Puccinellia simplex*	1B.2	Mar. – May	**Low.** Annual grasslands provide suitable habitat, but this species is threatened by agricultural conversion and grazing, which have historical and current practices, respectively, on the project site. There are no known CNDDB occurrences within 5 miles of the project site.
Sanford's arrowhead	*Sagittaria sanfordii*	1B.2	May – Oct.	**Low.** There are no CNDDB occurrences of this species within 5 miles of the project site, and marginal habitat is present in the project site in the non-native grassland in the fallow agricultural fields.
Chaparral ragwort	*Senecio aphanactis*	2B.2	Jan. – Apr.	**Absent.** There are no CNDDB occurrences of this species within 5 miles of the project site, and there is no suitable habitat within the project site.
Arburua Ranch jewelflower	*Streptanthus insignis* ssp. *lyonii*	1B.2	Mar. – May	**Low.** There are no CNDDB occurrences of this species within 5 miles of the project site, and marginal habitat is present in the project site in the non-native grassland in the fallow agricultural fields.
Wright's trichocoronis	*Trichocoronis wrightii* var. *wrightii*	2B.1	May – Sep.	**Low.** There are no CNDDB occurrences of this species within 5 miles of the project site, and marginal habitat is present in the project site in the non-native grassland in the fallow agricultural fields.

Sources: CDFW 2023b; CNPS 2023b
Notes: [1] No federal or state threatened or endangered plants are expected to occur on the project site.
[2.] CNPS Rare Plant Rank: Indicates the California Native Plant Society list to which the taxon is assigned.
List 1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California.
List 1B.2: Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California.
List 2B.1: Plants rare, threatened, or endangered in California but common elsewhere; seriously threatened in California.
List 2B.2: Plants rare, threatened, or endangered in California but common elsewhere; fairly threatened in California.
[3.] Occurrence data reviewed within 5 miles of the project site.
Key: CNPS = California Native Plant Society

Confidential – Please Contact Merced County for more information

3.3 Invasive Plants

Stantec biologists noted incidental observations of invasive plants on the project site and gen-tie corridor while conducting their primary objectives of mapping vegetation communities and delineating aquatic resources on September 21–22, 2021, and during the botanical surveys on April 25–26 and June 15–16, 2023. They did not conduct targeted surveys of invasive plants. Table 3 lists non-native plants documented on the project site and includes their California Invasive Plant Council (Cal-IPC) rating. The Cal-IPC (2021) rating categorizes non-native plants that threaten California's natural areas.

Table 3. Non-Native Plant Species Documented During September 2021 Field Survey and 2023 Botanical Survey

Common Name	Scientific Name	Cal-IPC Rating
Pigweed amaranth	*Amaranthus albus*	—
Wild oats	*Avena fatua*	Moderate
Slim oat	*Avena barbata*	Moderate
Black mustard	*Brassica nigra*	Moderate
Ripgut brome	*Bromus diandrus*	Moderate
Soft chess	*Bromus hordeaceus*	Limited
Foxtail chess, foxtail brome	*Bromus madritensis*	—
Slender flowered thistle	*Carduus tenuiflorus*	Limited
Yellow starthistle	*Centaurea solstitialis*	High
Lamb's quarters	*Chenopodium album*	—
Nettle-leaf goosefoot	*Chenopodium murale*	—
Field bindweed	*Convolvulus arvensis*	—
Barnyard grass	*Echinochloa crus-galli*	—
Tall wheat grass	*Elymus ponticus*	—
Whitestem filaree	*Erodium moschatum*	—
Flax-leaved horseweed	*Erigeron bonariensis*	—
Tropical horseweed	*Erigeron sumatrensis*	—
Spotted spurge	*Euphorbia maculata*	—
Bristly ox-tongue	*Helminthotheca echioides*	Limited
Mustard	*Hirschfeldia incana*	Moderate
Seaside barley	*Hordeum marinum*	—
Barley	*Hordeum marinum* ssp. *Gussoneanum*	—
Farmer's foxtail	*Hordeum murinum* ssp. *Leporinum*	—
Common barley	*Hordeum vulgare*	—

Common Name	Scientific Name	Cal-IPC Rating
Prickly lettuce	*Lactuca serriola*	—
Perennial pepperweed	*Lepidium latifolium*	High
Glossy privet	*Ligustrum lucidum*	Limited
Dwarf mallow	*Malva neglecta*	—
Cheeseweed	*Malva parviflora*	—
Alfalfa	*Medicago sativa*	—
Annual yellow sweetclover	*Melilotus indicus*	—
Harding grass	*Phalaris aquatica*	Moderate
Russian thistle	*Salsola tragus*	Limited
Common groundsel	*Senecio vulgaris*	—
Milk thistle	*Silybum marianum*	Limited
London rocket	*Sisymbrium irio*	Moderate
Horse nettle	*Solanum elaeagnifolium*	—
Spiny sowthistle	*Sonchus asper*	—
Tamarisk	*Tamarix ramosissima*	High
Puncture vine	*Tribulus terrestris*	Limited
Common wheat	*Triticum aestivum*	—
Annual stinging nettle	*Urtica urens*	—

Source: Cal-IPC 2021

4 Wildlife Resources

4.1 Methods

Stantec biologists Don Wardwell (senior biologist and Certified Wildlife Biologist) and Scott Elder (biologist) evaluated special-status wildlife and their habitats on and around the project site and gen-tie corridor through desktop research. In addition, Stantec biologists conducted site visits from 2021–2023 (see Table 4 for survey dates).

Table 4. Wildlife Survey Dates

Date	Survey
April 19, 2021	Wildlife survey (including Swainson's hawk and other raptor nests)
September 21–22, 2021	Wildlife survey/burrow mapping (including Swainson's hawk and other raptor nests)
September 8 and 14, 2022	Round one San Joaquin kit fox (SJKF) monitoring
September 28 and October 3, 2022	Round two SJKF monitoring
April 25–26, 2023	Wildlife survey/burrow mapping (including Swainson's hawk and other raptor nests)
May 18 and 24, 2023	Round three SJKF monitoring
June 5 and 12, 2023	Round four SJKF monitoring

Key:
SJKF = San Joaquin Kit Fox

Stantec biologists categorized the strength of each species' potential to occur (Table 5) based, in part, on the availability of potential habitat. The biologists largely relied on the aquatic resources delineation and vegetation community mapping described in Chapters 2 and 3, respectively. However, habitat suitability is dependent on more than aquatic resources and/or vegetation for many of the potential special-status wildlife. The biologists reviewed the life histories and habitat requirements of each special-status wildlife species, and also the protocols for surveys of three special-status wildlife species: burrowing owl (*Athene cunicularia*), SJKF (*Vulpes macrotis mutica*), and Swainson's hawk (*Buteo swainsoni*). The reviews were used to inform habitat reconnaissance survey methods (USFWS 1999; Swainson's Hawk Technical Advisory Committee 2000; CDFW 2012), including documenting potential raptor nests, potential nest substrates, and the presence of burrows and the relative size of their openings (i.e., small or large).

On September 21–22, 2021, September 8 and 14, 2022, and April 25–26, 2023, Stantec biologists surveyed potential nesting substrates on and around the project site and gen-tie corridor, including trees, poles, and towers with high-powered (e.g., 8x or 10x) binoculars. The biologists described any nests found and species identification where possible. The biologists only scanned substrates visible from the project site or the bordering roads. They also documented burrow presence, relative size of openings,

and associated wildlife signs on the project site. The biologists walked transects across the project site wide enough to achieve complete coverage and recorded locations of special-status species observed.

In September and October 2022 and May and June 2023, Stantec biologist Scott Elder conducted SJKF monitoring on the project site and gen-tie corridor. Monitoring consisted of four rounds, using trail cameras placed near large burrows on the project site. Surveys occurred from September 8–14, 2022, September 28 to October 3, 2022, May 18–24, 2023, and June 5–12, 2023. During each monitoring event, six wildlife cameras were installed on-site facing large burrows that could potentially be used by SJKF (i.e., approximately 8 inches or greater at the burrow entrance, in accordance with the USFWS SJKF survey protocol [USFWS 1999]). Figure 3 shows the locations of the cameras and large burrows and burrow complexes on the project site. The cameras were attached to wooden stakes that were placed approximately 5–10 feet from the burrow entrances. During the first round of monitoring, cameras were placed approximately 18 inches off the ground; and during the second, third, and fourth rounds of monitoring, they were placed approximately 6 inches off the ground. Cameras were left on-site for at least five consecutive nights and were set to record 10-second videos when motion was detected.

In 2022 and 2023, Stantec biologists conducted additional biological surveys, including resurveys of burrowing owl burrows and raptor nests recorded in 2021 and new surveys for burrowing owl burrows and raptor nests. Burrowing owl burrows were first observed via binoculars, and then individual burrows were checked for signs of burrowing owls (e.g., feathers, pellets, whitewash). The biologists surveyed for raptor stick nests within 0.5-mile of the project site and gen-tie corridor.

In addition, to better understand the availability of foraging habitats for Swainson's hawks near the project, biologists conducted a desktop review of potentially suitable foraging habitat for Swainson's hawk within 10 miles of the project site in November 2023.

4.1.1 SPECIAL-STATUS SPECIES

Stantec biologists conducted a desktop review of the special-status wildlife recorded within 5 miles of the project site using CNDDB data (CDFW 2023b) and eBird (2023). The biologists also queried the USFWS Information for Planning and Conservation tool for ESA-listed species known or potentially occurring in the area (USFWS 2023). Stantec biologists documented special-status wildlife species incidental to their primary objectives during the April and September 2021 and April 2023 wildlife surveys. In addition, during these wildlife surveys, biologists mapped burrows and burrow complexes throughout the project site. In September and October 2022 and May and June 2023, a Stantec biologist conducted San Joaquin kit fox (SJKF) camera monitoring on the project site. Special-status species include wildlife that are listed, candidates, or proposed for listing under the ESA or CESA and species designated by the CDFW as fully protected or as a species of special concern. Stantec biologists classified the potential for special-status species to occur within the project site under the same five categories as described for special-status plants in Section 3.2.1.

Table 5 lists the special-status wildlife potentially occurring on the project site and gen-tie corridor using the same potential to occur criteria as for special-status plants (in Section 3.2.1). Figure 2 depicts the special-status wildlife CNDDB occurrence data within 5 miles of the project site (CDFW 2023b). Figure 3 depicts the special-status wildlife incidental observations recorded during the 2021–2023 field surveys.

Table 5. Special-Status Wildlife Species Known or Potentially Occurring on the Project Site

Common Name	Scientific Name	Federal Status	State Status	Potential to Occur Within Project Site[1,2]
American badger	*Taxidea taxus*	—	Species of Special Concern	**Medium**. One documented CNDDB occurrence within 5 miles, west of I-5 more than 25 years old (1928). Suitable friable soils and burrows large enough to support the species are present on-site. No individuals or signs observed during surveys.
Blunt-nosed leopard lizard	*Gambelia sila*	Endangered	Endangered, Fully Protected	**Low.** Three documented CNDDB occurrences within 5 miles, more than 25 years old. Project site is at the end of the species' range. Suitable small mammal burrows are present on-site. However, during the 2023 surveys, dense non-native vegetation was growing throughout the site and was approximately 4 to 5 feet tall. This species prefers open, patchy vegetated areas. No individuals or signs observed during surveys.
Burrowing owl	*Athene cunicularia*	—	Species of Special Concern	**Present.** Six documented CNDDB occurrences and two eBird occurrences within 5 miles. One individual recorded on the project site in September 2021 and one in 2022. Burrows large enough to support the species are present in various locations on the project site.
California red-legged frog	*Rana draytonii*	Threatened	Species of Special Concern	**Low.** No documented CNDDB occurrences within 5 miles. No suitable waterbodies or wetlands on the project site. Marginal upland/dispersal habitat possible. But project site was historically crop fields, and there is no suitable breeding habitat within 2 miles of the project site. No individuals or signs observed during surveys.
California tiger salamander	*Ambystoma californiense*	Threatened	Threatened	**Low.** No documented CNDDB occurrences within 5 miles. No suitable waterbodies or wetlands on the project site. Marginal upland/dispersal habitat possible. But project site was historically crop fields, and there is no suitable breeding habitat within 2 miles of the project site. No individuals or signs observed during surveys.
Crotch's bumble bee	*Bombus crotchii*	—	Candidate Endangered	**Low.** No documented CNDDB occurrences within 5 miles; however, there is one historical CNDDB occurrence (1952) located approximately 9.6 miles northeast of the project site. The project site provides suitable nesting and foraging habitat for this species, with small mammal burrows and herbaceous flowering plants present on-site. No individuals or signs observed during surveys.
Delta smelt	*Hypomesus transpacificus*	Threatened	Endangered	**Absent.** Occurs only in the San Francisco Estuary.

Common Name	Scientific Name	Federal Status	State Status	Potential to Occur Within Project Site[1,2]
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	Endangered	Endangered	**Absent.** No known populations within Merced County. No CNDDB occurrence records within 5 miles.
Giant gartersnake	*Thamnophis gigas*	Threatened	Threatened	**Absent.** One documented CNDDB occurrence (unknown date) within 5 miles. Species uses agricultural wetlands (e.g., rice fields) and waterways (e.g., irrigation/drainage ditches with emergent wetland vegetation). No suitable aquatic habitat on project site. Irrigation ditches/canals on the project site no longer hold water. Active ditches/canals adjacent to the project site lacked emergent wetland vegetation needed for cover and foraging. No individuals or signs observed during surveys.
Giant kangaroo rat	*Dipodomys ingens*	Endangered	Endangered	**Absent.** One documented CNDDB occurrence within 5 miles, overlaps the southern tip of the project site (1932). The project site has friable soils for burrowing, and small mammal burrows are present. However, current distribution is not believed to include Merced County. Surveys of the area in 1989 resulted in no detections. No individuals or signs observed during recent surveys.
Golden eagle	*Aquila chrysaetos*	—[3]	Fully Protected	**Low**. One documented CNDDB occurrence (1987) within 5 miles. Numerous eBird records within 5 miles recorded during winter months. Nesting habitat (cliff faces/outcrops) not present near the project site, but the project site provides marginal foraging habitat (species typically avoids areas of heavy human activity). No individuals observed during surveys.
Loggerhead shrike	*Lanius ludovicianus*	—	Species of Special Concern	**Present.** Numerous eBird occurrences within 5 miles. Multiple observations during 2021 and 2023 surveys. Evidence of potential breeding (recently fledged young). The species could forage across the entire project site and use nearby trees or shrubs for nesting and perching.
Nelson's antelope squirrel	*Ammo-spermophilus nelsoni*	—	Threatened	**Low**. One documented CNDDB occurrence (1920) within 5 miles—a generalized polygon that overlaps the southern tip of the project site. The project site was historically crop fields but has been fallow in recent years. The non-native grassland provides low quality habitat but has suitable-sized burrows. However, this species competes with grazing sheep for vegetation and California ground squirrels which were observed on-site. No individuals or signs observed during surveys.

Common Name	Scientific Name	Federal Status	State Status	Potential to Occur Within Project Site[1,2]
Northern California legless lizard	*Anniella pulchra*	—	Species of Special Concern	**Low.** One documented CNDDB occurrence (1942) within 5 miles, on the west side of I-5. The project site has soils suitable for burrowing but also has limited moisture and very few shrubs or trees to provide leaf litter, which are preferred habitat characteristics. Project site provides marginal habitat. No individuals or signs observed during surveys.
Northern harrier	*Circus hudsonius*	—	Species of Special Concern	**Present.** Several eBird occurrences but no CNDDB occurrences within 5 miles. One individual recorded on the project site in September 2021. Species uses treeless, open habitats with good prey base, which the project site provides.
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	—	Species of Special Concern	**Medium.** Two documented CNDDB occurrences (1980s) within 5 miles. The species generally occupies open, treeless areas and uses mammal burrows for refuge. No individuals or signs observed during surveys.
San Joaquin kit fox	*Vulpes macrotis mutica*	Endangered	Threatened	**Low.** Three documented CNDDB occurrences within 5 miles, including one record that overlaps the western portion of the project site; however, these records range from 1920–1975. The Vega Solar project approximately 0.25 miles to the north of the project site received a no-take statement for this species. The project site has friable soils for burrowing and burrows large enough to support the species that are present. This species occupies human-modified open habitats, including non-native grasslands like those on the project site. Species was not observed during the 2022–2023 burrow camera monitoring or other surveys.
Swainson's hawk	*Buteo swainsoni*	—	Threatened	**Present**. Sixteen documented CNDDB nesting occurrences (1994–2018) and numerous eBird occurrences within 10 miles. Based on aerial imagery, eight of the CNDDB occurrences have had the nesting trees removed. A pair of Swainson's hawks was observed foraging and courting during the April 25–26, 2023, surveys. No nests were observed during this and four subsequent site visits in May and June 2023. This species will not nest on the project site as there are no trees or other nest substrates. However, numerous trees in the surrounding landscape, including the neighboring orchards, provide potential nesting substrates. The project site is more likely to provide foraging habitat for area breeding birds. The Vega Solar project documented Swainson's hawks foraging on its project site during preconstruction surveys.

Common Name	Scientific Name	Federal Status	State Status	Potential to Occur Within Project Site[1,2]
Tricolored blackbird	*Agelaius tricolor*	—	Threatened, Species of Special Concern	**Low.** Three documented CNDDB records for nesting colonies (2010–2011) within 5 miles. Nesting typically occurs in emergent wetlands and ponds and they have adapted to nesting in agricultural grain fields. The project site may provide marginal foraging habitat; however, it does not provide suitable wetlands or grain fields for nesting. No individuals observed during surveys.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Threatened	—	**Absent.** No documented CNDDB occurrences within 5 miles and no suitable habitat (i.e., elderberry along rivers or streams). No elderberry shrubs observed during surveys.
Vernal pool tadpole shrimp	*Lepidurus packardi*	Endangered	—	**Absent**. No documented CNDDB occurrences within 5 miles and no vernal pools on the project site.
Western spadefoot	*Spea hammondii*	Proposed Threatened	Species of Special Concern	**Low.** No documented CNDDB occurrences within 5 miles. No suitable waterbodies or wetlands, including vernal pools, on the project site. Marginal upland/dispersal habitat possible. But project site was historically crop fields, and there is no suitable breeding habitat within 2 miles of the project site. No individuals or signs observed during surveys.

Sources: USFWS 1998; Merced County 2013a; Billerman et al. 2021; CDFW 2023b; CSU 2021; eBird 2023; Nafis 2021; University of Michigan 2021; USFWS 2023
Notes:
1. Potential to occur criteria are the same as for special-status plants, described in Section 3.2.1.
2. Occurrence data reviewed within 5 miles of the project site.
3. Species is protected federally by the Bald and Golden Eagle Protection Act.
Key: — means no status.

Confidential – Please Contact Merced County for more information

4.2 Results

Burrows

Stantec biologists primarily observed burrows and burrow complexes along the irrigation ditches and access roads within the project site (Figure 3). The largest concentration of burrows was in the south-central portion of the project site, where both small mammal-sized burrows and large burrows suitable for species like burrowing owls and American badgers were present. Most large burrows were surrounded by four to eight small burrows, on average. Several large burrows were about 8–10 inches wide at the opening, with the same width extending down into the burrow about 2–3 feet. Burrows were uncommon in the northern half of the project site, and the biologists observed only one large burrow along the gen-tie right-of-way.

The biologists recorded an adult burrowing owl in 2021 within one of the concentrated areas of large and small burrows in the south-central portion of the project site (Figure 3). The owl was perched adjacent to a large burrow entrance along the irrigation ditch bank. The biologists found burrowing owl feathers within one large burrow near the location of the owl observation and apparent barn owl (*Tyto alba*) remains at the entrance of another nearby large burrow, which were most likely prey remains from coyotes (*Canis latrans*).

Stantec biologists reviewed 2022 and 2023 trail camera videos for all rounds of monitoring, and no SJKF were observed. Species observed included burrowing owl, coyote, striped skunk (*Mephitis mephitis*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), and California pocket mouse (*Chaetodipus californicus*). The burrowing owl observed through trail cameras during the September 2022 monitoring event was potentially the same owl observed during the September 2021 wildlife survey. The burrowing owl was perched outside a burrow entrance and would occasionally enter the burrow; and by mid-morning, the burrowing owl left the burrow site and did not return during the observation period. The burrowing owl was not seen on any other trail cameras and was only observed on one day. The 2022 occupied burrowing owl burrow was about 900 feet south of the 2021 occupied burrow (Figure 3). Burrowing owls were not observed during 2023 surveys. Striped skunks were the most frequently observed animal and were seen entering and exiting burrows in multiple locations. The other species were observed walking past the burrows. Refer to Appendix A for representative photographs of burrows, burrowing owls, and raptor stick nests.

Raptor Nest Substrates

The biologists observed nine active and inactive raptor-sized stick nests within the 0.5-mile survey buffer and no stick nests within the project site. Six of these nests were located on electric transmission towers/poles north of the project site near the Vega Solar facility and Mercy Springs Substation (Figure 3). Three nests were located on electric transmission towers west of I-5. During the April 2021 survey, one nest was located on a radio tower at the southeastern edge of the project site and was occupied by common ravens (*Corvus corax*). The recorded stick nests were approximately 1–2 feet in diameter. Stantec biologists also documented potential nesting substrates for raptors within the project site and adjacent land parcels that did not have nests during the surveys. One dead tree stands just outside the

project site between the southern boundary and Poleline Road. Almond orchards adjacent to the project site to the east and northwest of the Mercy Springs Substation stand about 10–15 feet tall and provide potential nesting substrate. In addition, transmission poles and radio towers in the vicinity of the project site are suitable for raptor nest building.

During the 2022 SJKF monitoring, the biologists observed two additional stick nests approximately 0.3 mile north of the project site. Both nests were located on power poles adjacent to a dirt road and were inactive at the time of the observation. During the 2023 wildlife surveys, the biologist observed three stick nests approximately 0.4 mile west and one stick nest 0.2 mile north of the project site. The nests west of the project site were located on electric transmission towers west of I-5, and all three were occupied by common ravens. The nest north of the project site is located on a radio tower within the substation and is occupied by common ravens as well.

During the 2023 wildlife surveys and SJKF monitoring, Stantec biologists observed a pair of Swainson's hawks foraging, courting, and soaring above the project site. During the April 25, 2023, survey, one adult was observed carrying nesting material and perched on the dead tree where the other one was. However, the biologist did not observe any nest starts within the dead tree, located approximately 120 feet from the project site. During the May and June 2023 SJKF monitoring, the biologist observed the same pair of Swainson's hawks soaring above and foraging on the project site. No active Swainson's hawk nests were observed within or adjacent to the project site during these site visits.

4.2.1 INCIDENTAL WILDLIFE OBSERVATIONS

Table 6 lists the wildlife species observed incidentally by Stantec biologists during an April 2021 site reconnaissance survey, September 2021 biological and aquatic resource surveys, April 2023 wildlife surveys, and 2022 and 2023 SJKF monitoring. The biologists observed four special-status species—burrowing owl, loggerhead shrike, northern harrier, and Swainson's hawk—the shrikes having been recorded during the 2021 and 2023 surveys, burrowing owls recorded during 2021 and 2022 surveys, and Swainson's hawks recorded during the 2023 surveys.

Table 6. Incidental Wildlife Observations on or Near the Project Site

Common Name	Latin Name	Site Visit Date
Birds		
American kestrel	*Falco sparverius*	September 2021
Black phoebe	*Sayornis nigricans*	September 2021
Burrowing owl[1]	*Athene cunicularia*	September 2021 and 2022
Common raven	*Corvus corax*	April 2021
Eurasian collared-dove	*Streptopelia decaocto*	September 2021
House finch	*Haemorhous mexicanus*	April 2021
Loggerhead shrike[1]	*Lanius ludovicianus*	April and September 2021 and April, May, and June 2023

4 Wildlife Resources

Common Name	Latin Name	Site Visit Date
Northern harrier[1]	*Circus hudsonius*	September 2021
Savannah sparrow	*Passerculus sandwichensis*	April 2021
Swainson's hawk[2]	*Buteo swainsoni*	April, May, and June 2023
Western meadowlark	*Sturnella neglecta*	April and September 2021
Mammals		
Black-tailed jackrabbit	*Lepus californicus*	September 2021
California ground squirrel	*Otospermophilus beecheyi*	April and September 2021
California pocket mouse	*Chaetodipus californicus*	June 2023
Coyote	*Canis latrans*	April 2021 and September 2022
Striped skunk	*Mephitis mephitis*	September and October 2022
Reptiles		
Western fence lizard	*Sceloporus occidentalis*	September 2021

Notes:
1. California Species of Special Concern
2. State Threatened

5 CEQA Impact and Mitigation Summary

Stantec biologist evaluated the project's impacts on sensitive biological resources including special-status wildlife and migratory bird species. For any potentially significant impacts, mitigation measures are proposed to reduce impacts, to the greatest extent feasible. Below is a summary of impacts on biological resources and associated mitigation measures.

5.1 Special-Status Plants

The project would involve ground-disturbing construction and operational activities, including vegetation clearing; grading; trenching; installation of solar panels and support structures; and construction of the BESS, access roadways, and other needed infrastructure and improvements that could result in impacts on special-status plant species. Thirteen special-status plant species were identified within 5 miles of the project site in the literature review and database search. No special-status plant species were detected on the project site or gen-tie corridor during the April or June 2023 botanical surveys. The project site has been highly disturbed by historical human activity and sheep and goat grazing for noxious weed control purposes. Noxious weeds and other non-native plants are prevalent on the site, as well as remnant common wheat. Because the project site provides only low quality habitat for potential special-status plant species, and because none were observed during focused surveys within the appropriate blooming periods or are expected to occur, impacts on special-status plant species would be less than significant.

5.2 Special-Status Wildlife

The project would involve ground-disturbing construction activities that could result in impacts on special-status wildlife species if they are present during construction. Ground disturbances would include vegetation clearing; grading; trenching; installation of solar panels and support structures; and construction of the BESS and substation, access roads, and other needed infrastructure and improvements. These activities could result in impacts on special-status wildlife species from removal and/or degradation of habitat, thereby reducing its availability to local wildlife populations. Wildlife also could be affected by interactions with on-site personnel, traffic, and equipment operation. Injury or mortality of wildlife could occur from vehicle collisions, entrapment in trenches, crushing by equipment or stockpiled materials, and burial in collapsed burrows.

Impacts on special-status species could also occur during operation of the project, such as collisions with powerlines or other project components, or electrocution. In addition, project operation could result in indirect impacts to wildlife near the project if nighttime lighting is used during operation.

Special-status wildlife species were observed on the project site and gen-tie corridor during the 2021, 2022, and 2023 field surveys. These species included Swainson's hawk, burrowing owl, northern harrier, and loggerhead shrike. These species were observed flying through and foraging within the project site and gen-tie corridor; however, no active nests were recorded within or immediately adjacent to the project site. Additionally, the project site provides suitable habitat for American badger, San Joaquin coachwhip, and SJKF. Individual discussions for species determined to have the potential for significant impacts are

provided below. These impacts would be reduced to a less-than-significant level by implementing Mitigation Measures BIO-1 through BIO-8.

5.2.1 NESTING AND MIGRATORY BIRDS

Numerous bird species, including several special-status species protected under the California Fish and Game Code and Migratory Bird Treaty Act, were observed on and adjacent to the site and gen-tie corridor during project surveys. Construction -related impacts on nesting birds unrelated to collision could include mortality of individuals by crushing and destruction of nests and eggs through clearing and grading activities. The direct removal or disturbance to active nests is prohibited under California Fish and Game Code Sections 3503 and 3503.5. Additional impacts could include interference with reproductive success and nest abandonment brought on by increased noise levels during construction within the breeding season (i.e., February 1 through August 31 for most species, and through September 15 for Swainson's hawk), which is also prohibited under Fish and Game Code. Furthermore, the Project would include external safety lighting for both normal and emergency conditions at the main Project gate, the Project substation, the BESS area, and the O&M area. The external lighting could impact migrating birds flying at night by attracting them to the lighted areas because of abundance of prey including insects as further described in Section 5.2.3.

Based on the existing plant community observed, historical agricultural practices, and active grazing by sheep and goats within the project site to control noxious weeds, nesting birds are not likely to occur on-site. However, there is still a potential for birds to nest on or adjacent to the project site; and resulting impacts on migratory birds and raptors, including direct and indirect impacts, could be significant. These impacts would be reduced to a less-than-significant level by implementing Mitigation Measures BIO-4 through BIO-8. Mitigation Measure BIO-4 would require preconstruction nesting bird surveys, if construction occurs during the nesting season, and establishment of a no-disturbance buffer around any active nest. Mitigation Measures BIO-5 would require preconstruction burrowing owl surveys to be conducted and establishment of no-disturbance buffers if active burrowing owl nests are found. BIO-6 would reduce bird electrocutions and collisions by following Avian Power Line Interaction Committee (APLIC) guidance for transmission line and electrical component design. Mitigation Measure BIO-7 would reduce bird collisions within the photovoltaic array by requiring panels to be placed in a close to nearly vertical position at the end of each day. Mitigation Measure BIO-8 would reduce impacts on birds from nighttime lighting during operation because it would require lighting to be downward facing, motion or manually activated, or shielded to focus illumination in the immediate area.

Swainson's Hawk

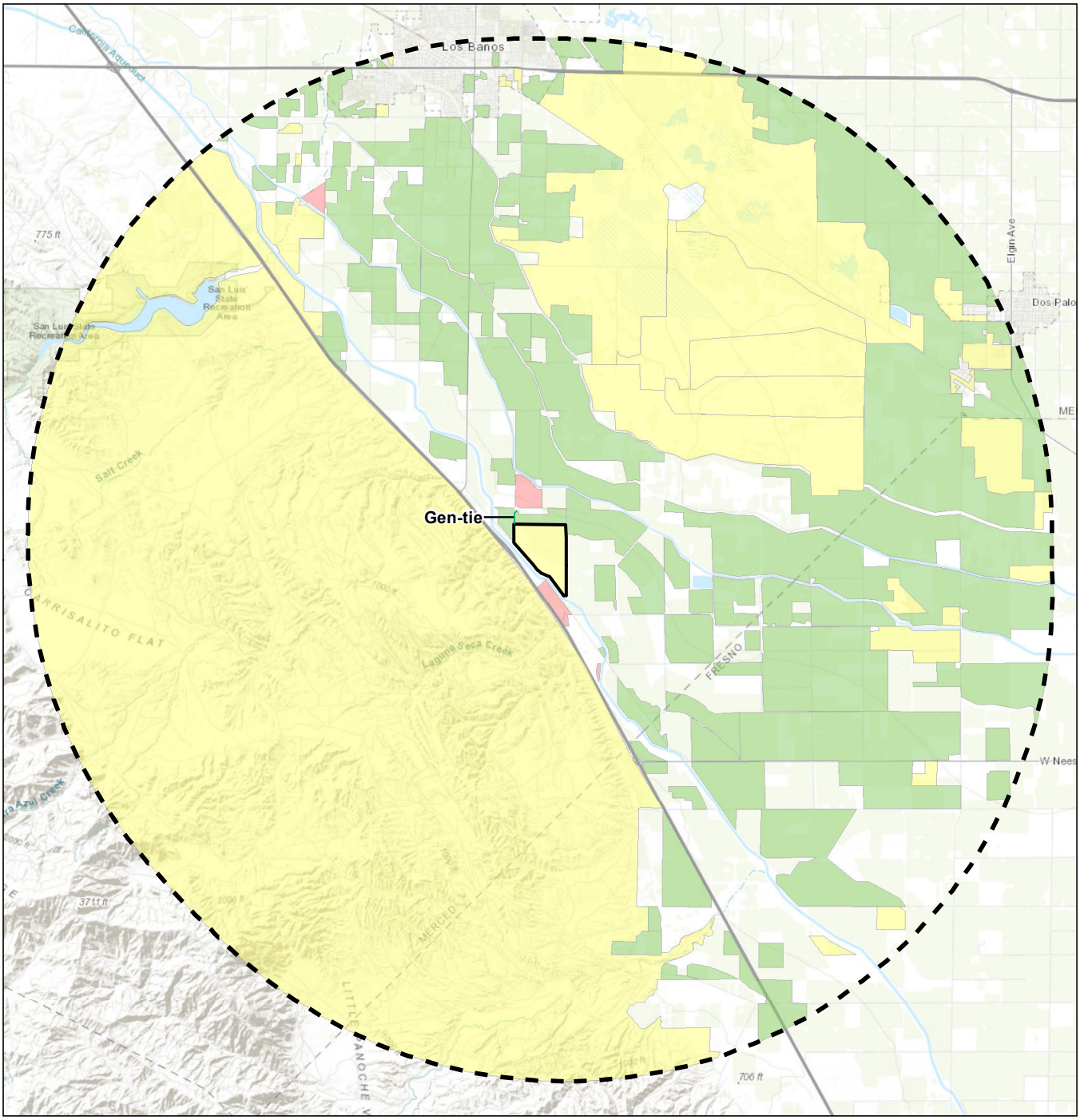
Although there is suitable nesting substrate within 0.5-mile of the project site, no active Swainson's hawk nests were observed during the 2021, 2022, and 2023 field surveys. There are 16 CNDDB nesting occurrences within 10 miles of the project site, ranging from 1994–2018 (Figure 4). After conducting a desktop review of each of these locations, it has been determined that eight of the nesting trees were removed and no longer provide nesting substrates for Swainson's hawks. The other eight CNDDB nesting occurrences still had nesting trees present, but these are all over 5 miles from the project site. No direct impacts on nesting Swainson's hawks would occur. However, impacts could occur during construction if

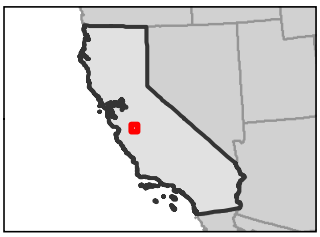
Swainson's hawks nest within 0.5 mile of the project site, which could disrupt the breeding cycle and result in nest abandonment or failure. Implementation of Mitigation Measure BIO-4 requires preconstruction nesting surveys within 0.5 mile of the project site if construction occurs during the nesting season, and establishment of no-disturbance buffers around active nests. If an active nest is found and construction activities would need to occur within the no-disturbance buffer, CDFW would be consulted to discuss the option for a modified or a reduced buffer, and ensuring the buffers are appropriate to avoid or sufficiently reduce the risk of take. No work would occur within the no disturbance buffer prior to discussion with CDFW and their approval of a modified or a reduced buffer.. Implementation of these measures would reduce potential impacts on Swainson's hawk nests to a level that is less than significant.

The project site provides suitable foraging habitat Swainson's hawk, and a pair were observed foraging on-site during the 2023 field surveys. The site consists of fallow agricultural habitat dominated by annual grasslands and invasive weeds, which is considered moderate quality foraging habitat, in comparison to certain agricultural fields (CDFW 2016). Installation of the project's solar panel arrays and associate facilities could reduce the amount of available habitat for foraging. Although this loss would not be permanent, as it would last for the duration of the operation phase of the project (approximately 40 years), it is considered a potentially significant impact.

To better understand the availability of foraging habitats for Swainson's hawks near the project, biologists conducted a desktop review of potentially suitable foraging habitat for Swainson's hawk within 10 miles of the project site. Based on this review, there are approximately 186,218 acres of potentially suitable foraging habitat within 10 miles, with approximately 56,664 acres considered high quality foraging habitat, 129,091 acres moderate quality foraging habitat, and 463 acres of low quality foraging habitat (Figure 5). With natural foraging habitats being converted to agriculture, Swainson's hawks have adapted to foraging within certain types of agricultural fields. High quality foraging habitat includes low-growing row crops such as alfalfa, wheat, tomatoes, and beets. Moderate quality foraging habitat includes irrigated and non-irrigated pastures, annual grasslands, and other annually rotated crops (CDFW 2016). Low quality foraging habitat includes grasslands with dense shrubs growing throughout. The project site provides approximately 631 acres of moderate quality foraging habitat, which is approximately 0.3 percent of all the foraging habitat within 10 miles. Non-suitable foraging habitat within 10 miles included developed areas, orchards, ponds, and flooded wetlands. Approximately 30 percent of the foraging habitat within 10 miles consists of low-growing row and field crops, which is considered high quality, and most of the remaining foraging habitat consists of moderate quality annual grasslands and pastures. With the large amount of higher quality foraging habitat within 10 miles of the project, and because the expected loss of forging habitat due to the project would be approximately 0.3 percent of the available foraging habitat within 10 miles, the project impact on foraging habit would be very low; however, this impact would still be potentially significant.

Confidential – Please Contact Merced County for more information





Project Site

Gen-tie

10-Mile Radius

Swainson's Hawk Foraging Habitat

High Quality (56,664.04 acres)

Moderate Quality (129,091.39 acres)

Low Quality (463.19 acres)

0 2 4 Miles

1:200,000 (at original document size of 8.5x11)

N

Stantec

Project Location
T12SN, R11E, S06-07
Merced Co., CA

185705411
Prepared by PG on 2024-07-09
Technical Review by SE on 2024-07-10

Client/Project
Longroad Energy Management, LLC
Zeta Solar and Battery Energy Storage System Project

Figure No.
5

Title
Swainson's Hawk Foraging Habitat within 10 Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Impacts on Swainson's hawk foraging habitat would be reduced to less than significant with implementation of Mitigation Measure BIO-2. Mitigation Measure BIO-2 requires preparation and implementation of a Vegetation and Soil Management Plan, which would include reseeding at the end of construction and maintaining low-stature annual grasses and other plants with annual maintenance and weed control during operation. Mitigation Measure BIO-2 also outlines the considerations for application of pesticide, herbicide, and fungicide application to control noxious weeds. Suitability for Swainson's hawk foraging is driven by accessibility of prey from the air (Estep 1989). Maintaining the site with low-stature vegetation would allow Swainson's hawk to detect rodents and other prey species and continue to use the site for foraging.

Burrowing Owl

A burrowing owl was observed on the project site in September 2021 and 2022 during field surveys, but no burrowing owls were observed during the Spring 2023 field surveys. The project site provides suitable nesting and foraging habitat for this species, with several small and large burrows occurring in portions of the site. The project's solar panel arrays would eliminate most or all nesting potential but would only reduce foraging potential on the project site. This impact would last for the duration of the operation phase of the project (approximately 40 years). This impact on burrowing owl nesting and foraging habitat may be considered potentially significant. However, impacts on burrowing owl would be reduced to a less-than-significant level by implementing Mitigation Measures BIO-2 and BIO-5. Mitigation Measure BIO-2 requires implementing general measures for the avoidance and protection of biological resources, such as speed limits, clearly flagged sensitive areas, and worker environmental awareness training during construction. Mitigation Measure BIO-5 requires preconstruction burrowing owl surveys to be conducted and establishment of no-disturbance buffers if active burrowing owl nests are found.

On March 5, 2024, a petition was submitted to the California Fish and Game Commission to list burrowing owl as either endangered or threatened under CESA. Mitigation Measure BIO-5 includes consultation with CDFW if, at the commencement of project construction, burrowing owl is listed as threatened or endangered under CESA.

Potential Bird Interactions with Power Lines

All bird species, especially raptors and other large birds, are susceptible to collisions with power lines based on their physical and behavioral characteristics, such as a bird's body size and weight; wing shape; flight behavior; and perching, roosting, and nesting habits (APLIC 2012). Birds of prey are generally understood to have the ability to avoid obstacles; however, their collision risk increases when they are engaged in territorial defense and pursuing prey (APLIC 2012). Although Merced County is traversed by multiple high-voltage transmission lines, the project would introduce new collision hazards to the site during operation with the installation of a new 1,700-foot aboveground powerline to connect the project to the point of interconnection. During both daytime and nighttime activity, special-status birds may collide with project infrastructure from the moment when structures are erected and continuing until the infrastructure is removed during decommissioning, causing injury or mortality to raptors due to collision and electrocution.

Collisions can occur when powerline wires have poor visibility. Electrocution can occur when phase conductors are separated by less than wrist-to-wrist distance (the wrist being the joint toward the middle of the leading edge of a bird's wing); less than the head-to-foot distance of a bird; or when the distance between grounded hardware and any energized phase conductor is less than the wrist-to-wrist or head-to-foot distance of a bird (ALPIC 2006). In addition, grounding conductors and bonded hardware without appropriate coverings can cause electrocution. Injury or mortality from electrocution would be a significant impact.

Impacts on protected raptors and other bird species would be reduced to a less-than-significant level by implementing Mitigation Measure BIO-6. Mitigation Measure BIO-6 would reduce collisions and electrocution impacts on bird species by designing, installing, and maintaining transmission lines and electrical components in accordance with APLIC guidance to reduce the likelihood of large bird electrocutions and collisions (APLIC 2006, 2012).

Potential Bird Collisions with Solar Facilities

Much of what is assumed about collision-related bird injuries and mortality associated with solar PV facilities in California is based on 2014 preliminary bird monitoring data from the Desert Sunlight Solar Farm, a PV project built in the Mojave Desert. Existing data in this context are based on incidental opportunistic observations rather than monitoring and collection conducted in accordance with standardized or agency-approved methods. Such data do not have the scientific rigor to support conclusions about how many birds of which species would be affected by any solar PV project. The causes of bird injuries and fatalities at commercial-scale solar projects are continuing to be evaluated by USFWS, CDFW, and others. Nonetheless, available information, including USFWS's National Forensic Laboratory's Spring 2014 report, *Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis* (NFWFL 2014), is helpful to Merced County's consideration of potential significant impacts of the project and related uncertainties.

The numbers or species of birds that may be affected from collisions with solar panels or other infrastructure cannot be known with confidence, although monitoring data from the Desert Sunlight Solar Farm suggest that a broad ecological variety of birds may be susceptible to injury and mortality at PV solar farms (NFWFL 2014). As stated above, the project site provides foraging habitat for common and special-status bird species. Any common or special-status bird species on the project site has the potential to collide with project infrastructure. Because the numbers and varieties of such birds cannot be known with certainty, it is possible that the project could cause a significant impact due to collision-related bird injuries and mortality.

Solar PV panels have a strong polarization signature, an element thought to mimic water. As a result, some biologists have theorized that PV panels can attract species that mistake the panels for bodies of water (Randall et al. 2010), potentially leading to increased risks of collisions, being stranded within site fencing once they land, or other forms of distress. The phenomenon is sometimes referred to as the "lake effect." The strongest evidence for the lake effect is mortality of water-dependent species found at PV solar farms in desert environments with no natural waterbodies in the region (Kosciuch et al. 2021). Recent studies have shown that some species of birds that use aquatic habitats could be attracted to

solar PV panels; however, it is unlikely that all aquatic birds at all times would be attracted to the panels (Kosciuch et al. 2021). The potential for this effect also depends on the regional context and the availability of natural waterbodies near the solar site. There are large waterbodies within 10 miles of the project site, including San Luis Reservoir, Los Banos Reservoir, O'Neill Forebay, and duck ponds; but there are no large waterbodies within or directly adjacent to the project site. Therefore, the potential for aquatic birds to collide with solar PV panels due to "lake effect" is very small.

At night, the panels would be positioned where they last tracked the sun or pre-positioned toward the east to capture sunrise (i.e., panels would be in a close to vertical position). This may reduce the risk of birds attempting to land on a PV array at sunset or sunrise by mistaking it for water. Bird collisions with solar facilities could potentially be a significant impact, but this impact would be reduced to a less-than-significant level by implementing Mitigation Measure BIO-7. Mitigation Measure BIO-7 would reduce impacts on bird species by requiring panels to be placed in a close to vertical position at the end of each day.

5.2.2 POTENTIAL BAT COLLISIONS WITH SOLAR FACILITIES

During operation, the project has the potential to attract bats that could mistake the grouped panels for a body of water, as discussed above. The attraction of bats to the project site as a source of drinking water could result in mortality from a collision with the panels. Bats are able to detect water by aiming their echolocation calls straight down to determine whether there is a flat, even surface below them (Greif and Siemers 2010). Greif and Siemers (2010) have shown that bats can mistake water for other horizontally placed flat, smooth surfaces, such as metal, plastic, and wood that are as small as 20 square feet. Theoretically, solar panels could have the same effect if they are oriented horizontally; however, the solar arrays at the project site would not be situated in a fixed horizontal plane. The solar arrays would be angled based on the position of the sun during a given time of year and would track the sun throughout the day. At night, the panels would be positioned where they last tracked the sun or pre-positioned toward the east to capture sunrise (i.e., panels would be in a close to vertical position) as required by Mitigation Measure BIO-7. Therefore, the solar arrays would have a less-than-significant impact on bats.

Additionally, there are no CNDDB occurrences for special-status bats within 5 miles of the project site, and no potential bat roost structures are present in or directly adjacent to the project site. There may be potential suitable roosting habitat for common bat species in the vicinity of the project site (underpasses on I-5, large trees, old barns, etc.) and the project site contains marginal foraging habitat for bats. The project's solar panel arrays would only reduce foraging potential on the project site for bats. Therefore, impacts to bat foraging habitat would be less than significant..

5.2.3 LIGHTING

During operation, the project would have low-level lighting at the main project gate, the project substation, the BESS area, and the operation and maintenance area. Lighting would be designed to provide the minimum illumination needed to achieve safety and security. Nighttime lighting would typically not be needed. The lights would be downward facing, motion or manually activated, and shielded to focus illumination in the immediate area. The project design would minimize the effects of lighting on wildlife.

The project may have a potentially significant impact to wildlife movement; but with the implementation of Mitigation Measure BIO-8, the project's impacts would be less than significant. Mitigation Measure BIO-8 would reduce lighting impacts on species by providing the minimum illumination needed to achieve safety and security, with the lights downward facing, motion or manually activated, and shielded to focus illumination in the immediate area.

5.2.4 IMPACTS ON INVERTEBRATES

There is potential for Crotch's bumble bee to use the project site for nesting in burrows that provide suitable nesting habitat and foraging in flowering herbaceous species growing throughout the site. However, active sheep and goat grazing that occurs on-site to control weeds reduces the amount of suitable foraging habitat by reducing the availability of flowering herbaceous vegetation. Further, no individuals or other signs of Crotch's bumble bee use were observed during surveys. There is a potential for this species to occur on the project site and be impacted by construction during clearing and grading activities.

The Crotch's bumble bee has a statewide distribution in a variety of habitats and agricultural fields, including but not limited to grasslands and chaparral shrublands, small mammal burrows, bunch grasses, thatch, brush piles, old bird nests, or dead trees. As such, there is an abundance of suitable habitat surrounding the project site and in the region. However, impacts on foraging habitat are considered potentially significant.

Biologists conducted a desktop review of potentially suitable foraging habitat for Crotch's bumble bee within 1 mile of the project site (including the site itself). Based on this review, there are approximately 4,489 acres of potentially suitable foraging habitat within 1 mile, with approximately 2,177 acres considered high quality foraging habitat and 2,313 acres of moderate quality foraging habitat. High quality foraging habitat includes grasslands and fallow fields, and moderate quality foraging habitat includes active agriculture and orchards. In its current state of fallow agricultural fields, including some flowering non-native plants, the project site provides approximately 631 acres of foraging habitat, which is approximately 12 percent of all the foraging habitat within 1 mile. Impacts would be reduced to less than significant with the implementation of Mitigation Measure BIO-2. Mitigation Measure BIO-2 requires implementing general measures for the avoidance and protection of biological resources, such as speed limits, clearly flagged sensitive areas, and worker environmental awareness training. In addition, this mitigation measure will include the preparation of a Vegetation and Soil Management Plan prior to construction that provides a reseeding approach with native and desirable non-native species. Based on the abundance of foraging habitat in the surrounding area and with implementation of Mitigation Measure BIO-2, which requires revegetation of temporarily disturbed areas and limits direct impacts to natural vegetation on the project site where possible, impacts to foraging habitat would be less than significant with mitigation.

It is unlikely Crotch's bumble bee would occur on the project site due to the active sheep and goat disturbances; however, there is still a potential for impacts on this species. If Crotch's bumble bee is present, impacts on the species would be considered potentially significant. However, impacts on this species and its foraging habitat would be reduced to a less-than-significant level by implementing

Mitigation Measures BIO-1, BIO-2, and BIO-3. Mitigation Measure BIO-1 requires a lead biologist or qualified biologist to be on the project site during vegetation clearing, grading, and other construction activities to identify and protect sensitive species. Mitigation Measure BIO-2 requires implementing general measures for the avoidance and protection of biological resources, such as speed limits, clearly flagged sensitive areas, and worker environmental awareness training. In addition, Mitigation Measure BIO-2 includes the preparation of a Vegetation and Soil Management Plan prior to construction that will include a reseeding approach with native and desirable non-native species. Mitigation Measure BIO-3 requires preconstruction surveys in areas with suitable habitat by a qualified biologist for special-status species.

5.2.5 IMPACTS ON REPTILES

There is potential for San Joaquin coachwhip to use burrows on-site for cover or overwintering; however, this species is sensitive to disturbance and does not persist in cultivated areas (Thomson et al. 2016). Given the historical agricultural use of the project site, surrounding areas, and the active sheep and goat grazing that occurs on-site, it is unlikely this species would occur on the project site. Further, no individuals or other signs of the coachwhip were observed during surveys. There is a potential for this species to traverse the project site and be impacted by construction during clearing and grading activities.

Although it is unlikely San Joaquin coachwhip would occur on the project site, there is still a small potential for impacts on this species. Impacts on this species would be reduced to a less-than-significant level by implementing Mitigation Measures BIO-1, BIO-2, and BIO-3. Mitigation Measure BIO-1 requires a lead biologist to be on the project site during vegetation clearing, grading, and other construction activities to identify and protect sensitive species. Mitigation Measure BIO-2 requires implementing general measures for the avoidance and protection of biological resources, such as speed limits, clearly flagged sensitive areas, and worker environmental awareness training. Mitigation Measure BIO-3 requires preconstruction surveys in areas with suitable habitat by a qualified biologist for special-status species.

5.2.6 IMPACTS ON MAMMALS

The project site consists of fallow agricultural fields with burrows and burrow complexes, including small mammal-sized and large burrows, throughout the south-central portion of the site and along the irrigation ditches and access roads.. The large burrows are suitable for special-status species, including SJKF and American badger, which are discussed below.

San Joaquin Kit Fox

There are three documented CNDDB occurrences within 5 miles of the project site, including one record that overlaps the western portion of the project site. However, these records range from 1920–1975, with the occurrence overlapping the project site being from July 1975. As stated above, biologists conducted SJKF monitoring on the project site in September and October 2022 and May and June 2023. Monitoring consisted of four rounds, using trail cameras placed near large burrows on the project site. Cameras were left on-site for at least five consecutive nights during each round and were set to record 10-second videos when motion was detected. During these monitoring events, no SJKF were observed.

The project site provides suitable denning habitat for this species with friable soils for burrowing and burrows large enough to support SJKF. However, it is unlikely this species would occur on-site due to the surrounding fragmented habitat (i.e., active agriculture, California Aqueduct, Vega Solar project, I-5 corridor, Dos Amigos Pumping Plant). Present day movement habitat for SJKF in the region is mostly limited to areas west of I-5, because areas east of I-5, including the project area and surrounding properties, have excluded this species through ongoing agricultural operations and solar development. In addition, the Vega Solar project approximately 0.25 mile to the north of the project site received a no-take statement from USFWS for this species due to the fragmented habitat surrounding the site (Merced County 2013a).

American Badger

The project site provides suitable burrowing habitat for American badger. However, no badgers were observed during surveys or camera monitoring, and biologists did not observe any signs of use by badgers near the mapped burrows.

As with the SJKF, it is unlikely that this species would occur on-site due to the surrounding fragmented habitat (i.e., active agriculture, California Aqueduct). In addition, only one historical CNDDB occurrence (1928) was recorded within 5 miles of the project site.

Although it is unlikely SJKF and American badger would occur on the project site, there is still a potential for impacts to these species during clearing and grading activities. Therefore, impacts on these species would be reduced to a less-than-significant level by implementing Mitigation Measures BIO-1, BIO-2, and BIO-3. Mitigation Measure BIO-1 requires a lead biologist or qualified biologist to be on the project site during vegetation clearing, grading, and other construction activities to identify and protect sensitive species. Mitigation Measure BIO-2 requires implementing general measures for the avoidance and protection of biological resources, such as speed limits, clearly flagged sensitive areas, and worker environmental awareness training. Mitigation Measure BIO-3 requires preconstruction surveys in areas with suitable habitat by a qualified biologist for special-status species.

5.3 Decommissioning

Upon decommissioning of the project, the project site would be disturbed and have some areas of compacted soil (e.g., roads, laydown yards, and structure foundations). As part of decommissioning, the project site would be restored to preconstruction conditions. If special-status plant species have recolonized the project site during operation, decommissioning could have impacts on these species. Decommissioning would only directly impact areas that were previously disturbed during project construction; therefore, direct impacts on native habitats and special-status plants are expected to be less than significant. If special-status wildlife species re-occupy the project site during operation, these species could be directly impacted by decommissioning, similar to the direct impacts described for construction.

Depending on the species and biological resources present within and adjacent to the project site at the time of decommissioning, decommissioning activities could result in significant impacts on biological resources. However, implementation of Mitigation Measures BIO-1 through BIO-5 during

decommissioning would reduce potential impacts to a less-than-significant level. Mitigation Measure BIO-1 requires a lead biologist to be on the project site during decommissioning to identify and protect sensitive species. Mitigation Measure BIO-2 requires implementing general measures for the avoidance and protection of biological resources, such as speed limits, clearly flagged sensitive areas, and worker environmental awareness training. Mitigation Measure BIO-3 requires preconstruction surveys in areas with suitable habitat by a qualified biologist for special-status species prior to decommissioning. Mitigation Measure BIO-4 requires preconstruction nesting bird surveys if decommissioning occurs during the nesting season and establishment of no-disturbance buffers if an active nest is found. Mitigation Measure BIO-5 requires preconstruction burrowing owl surveys to be conducted and establishment of no-disturbance buffers if active burrowing owl nests are found.

5.4 Proposed Mitigation Measures

The following proposed mitigation measures are preliminary, and final wording of these measures will be provided in the final Environmental Impact Report.

MM BIO-1: Lead Biologist During Construction and Decommissioning

- Prior to the issuance of grading or building permits and prior to decommissioning, the project operator will designate a lead biologist with the qualifications (i.e., relevant training and experience with special-status species that could potentially occur on-site) to oversee compliance with protection measures for all listed and other special-status species. The lead biologist or another qualified biologist will be on the project site during initial vegetation clearing and grading.
- After grading is complete, the lead biologist or another qualified biologist will visit the project site at least weekly during construction activities throughout the construction phase, and as-needed during decommissioning.
- The lead biologist and qualified biologists will have the right to halt all activities to avoid impacts on special-status species and to establish no-disturbance buffers. Work will proceed only after hazards to special-status species are removed, and the species is no longer at risk. While on-site, the lead biologist or qualified biologist will carry a copy of all compliance measures and appropriate plans.

MM BIO-2: General Measures for the Avoidance and Protection of Biological Resources

During construction, operation and maintenance, and decommissioning of the facility, the operator or contractor will implement the following general avoidance and protective measures to protect special-status wildlife species:

- Prior to the start of construction, a Vegetation and Soil Management Plan will be prepared for the project that includes an end of construction revegetation approach and operation phase vegetation and soil management practices. The plan will include details on 1) soil testing and soil amendments if deemed necessary by test results; 2) site preparation; 3) the seed mixture to be used on-site, including native and desirable non-native low-stature species, and application

methods; 4) areas to be reseeded; 5) weed identification and control measures; 6) vegetation and soil maintenance procedures; 7) implementation timing; 8) vegetation and soil condition goals and monitoring protocols; 9) adaptive management guidelines and success criteria; and 10) a clear prohibition of the use of toxic rodenticides. During operation, steps will be taken to establish and maintain a ground cover of low-stature (e.g., less than 18 inches tall) native and desirable non-native grasses and other plants. The seed mix will be determined through consultation with a vegetation restoration professional with local knowledge and in consideration of soil test results. Phased seeding may be used if a phased construction approach is used (i.e., the entire site need not be seeded all at the same time). The revegetation of the site will be monitored annually following restoration activities that occur post-construction and post-decommissioning. The monitoring program is intended to help achieve a ground cover of native and desirable non-native low-stature species, where feasible.

- The operator will limit the areas of disturbance to the extent feasible. Parking areas, new roads, staging, storage, excavation, and disposal site locations will be confined to the smallest areas possible. All project disturbance areas will be clearly demarcated with signs, stakes, and/or flagging prior to construction to avoid non-project areas and natural resources where possible.

- Spoils will be stockpiled in disturbed areas that lack native vegetation. BMPs will be employed to prevent erosion in accordance with the project's approved Stormwater Pollution Prevention Plan (SWPPP). All detected erosion will be remedied within two days of discovery or as described in the SWPPP.

- All personnel entering the project site will attend worker environmental awareness training provided by the lead biologist or their designee before beginning work on-site. The primary worker environmental awareness training will occur before construction activities begin and as-needed thereafter. The worker environmental awareness training will include the following topics:

- Information on the potential special-status species and the habitats that may be found within or adjacent to the project site, including (but not limited to) American badger, burrowing owl, Crotch's bumble bee, and SJKF.

- Impact avoidance and reporting requirements of federal and state laws pertaining to potential special-status species. Workers will be instructed to notify the site supervisor and/or lead or qualified biologist right away if any of these species are present on-site.

- Identification of measures implemented to conserve the special-status species and habitats within or adjacent to the project site will occur.

- A fact sheet conveying this information shall be distributed to all personnel who may enter the project site.

- Control on Noxious Weeds: Noxious weed control is important to the success of site stabilization and vegetation management overall and aids in the protection and conservation of native plant

species, as well as improving wildlife habitat. To control noxious weed populations during routine operations, the Applicant shall complete the following:

- Operational personnel will monitor the site for noxious weeds and be trained on identifying common, highly invasive species that are known to occur in the project area.
- Weed control measures will be flexible and adaptive depending on the invasive plants and intensity of the weed infestation. Measures will include a combination of mechanical, manual, and chemical controls.
- To avoid and minimize impacts, herbicides will be applied according to best management practices (e.g., favorable precipitation and wind conditions, when rain is not predicted for 24-48 hours, avoid native vegetation or other sensitive biological resources and active seasons where practicable), and as outlined in the Hazardous Materials Business Plan and Vegetation and Soil Management Plan.
- Performance and success shall be based upon the maintained digital records, including photographs and written summaries, that document compliance and include details about water year and subsequent herbicide application timing.
- To prevent inadvertent entrapment of wildlife during construction, all excavated, steep-walled holes or trenches with a 2-foot or greater depth will be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. All holes and trenches, whether covered or not, will be inspected by workers for trapped wildlife at the start and end of each workday. Before such holes or trenches are filled, they will be thoroughly inspected by workers for trapped animals. If trapped animals are observed, escape ramps or structures will be installed immediately to allow escape. If a common or non-listed special-status species is found trapped, all work in the vicinity of the animal will cease immediately. If the animal is not injured, then the lead biologist or other qualified biologist will directly supervise the provision of escape structures and/or trench modification to allow the trapped animal to escape safely. Work will not resume in the vicinity of the animal, and it will be allowed to leave the work area and project site on its own. If a listed animal or species of special concern is injured, then the lead biologist will immediately contact USFWS and/or CDFW to identify an individual with the appropriate permit or authorization to handle listed species and to determine who will bring the animal to a pre-identified wildlife rehabilitation or veterinary facility for care.
- All construction pipes, culverts, or similar structures with a 4-inch or greater diameter that are stored at a construction site for one or more overnight periods will be thoroughly inspected for special-status wildlife or nesting birds before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If an animal is discovered inside a pipe, that section of pipe will not be moved until the lead or another qualified biologist has been consulted. If the animal is a special-status species, then work will immediately halt in the vicinity, and the animal will be allowed to move from the structure and the work area of its own accord. The lead biologist or qualified biologist will direct work stoppages near the animal to allow it to freely move out of the

pipe and away from the work area. Special-status species will not be handled or captured by anyone without the appropriate permit or authorization. If the animal is not a special-status species, work will halt until the animal has been captured and relocated by the lead biologist or another qualified biologist.

- Drivers/operators of vehicles and equipment parked at worksites will inspect the ground beneath the vehicle or equipment for the presence of wildlife prior to moving the vehicle/equipment. If an animal is present, the lead biologist or another qualified biologist will be notified and the animal will be left to move on its own.
- Project vehicles and equipment will use existing routes of travel. Cross-country vehicle and equipment use beyond the demarcated project disturbance areas will be prohibited.
- A speed limit of 20 miles per hour will be enforced within all construction areas.
- A long-term trash abatement program will be established for construction, operation and maintenance, and decommissioning. The plan will be submitted to the County prior to construction. Personal trash and food items will be placed in a central, closed container and removed from worksites daily to reduce the attraction of wildlife, such as common ravens (*Corvus corax*), coyotes (*Canis latrans*), and feral dogs.
- Workers will be prohibited from bringing pets and firearms to the project site and from feeding wildlife in the vicinity.
- Intentional killing or collection of any wildlife species will be prohibited.

MM BIO-3: Preconstruction Surveys and Protective Measures for Special-Status Species

A qualified biologist will conduct preconstruction surveys for special-status species prior to construction and decommissioning activities. No special-status species surveys would be required during operation and maintenance activities. Preconstruction surveys do not need to be conducted for all areas of suitable habitat at one time; they may be phased so that surveys occur prior to disturbance of any particular portion of the project site. The biologist will record observations of all special-status species and establish no-disturbance buffers as appropriate. Species-specific and general details are as follows.

American Badger

- A qualified biologist will conduct a preconstruction survey for American badger no more than 14 days prior to the beginning of ground disturbance related to construction and decommissioning activities, or any other project activity with a potential to impact American badger (such as staging, mowing, vegetation clearing). If no American badger dens are identified on the project site, no further mitigation is necessary. If American badger dens are located within a project work area and cannot be avoided, a qualified biologist will determine if the dens are occupied.
- If unoccupied, the dens will be collapsed under the supervision of the lead biologist. If occupied, the lead biologist will determine if it is a natal/pupping den or a solitary badger den.

- Natal/pupping dens will be avoided by establishment of a no-disturbance buffer around the den, as determined by the lead biologist and based on site-specific conditions, until the young are old enough to leave the den and survive on their own. CDFW must be contacted to determine the appropriate no-disturbance buffer distance.

- A 50-foot, no-disturbance buffer will be established around dens occupied by a solitary badger. For active solitary dens, an on-site passive relocation program will be implemented with prior concurrence from CDFW. This program will consist of excluding badgers from occupied burrows by installation of one-way doors at burrow entrances and monitoring of the burrow for one week to confirm usage has been discontinued.

- After the qualified biologist determines that the badgers have stopped using active dens within the project site, the dens will be collapsed under the supervision of the lead biologist or another qualified biologist.

Crotch's Bumble Bee

- If, at the commencement of project construction, Crotch's bumble bee is still considered a CESA candidate species or has been listed as threatened or endangered under CESA, the project will implement the following measures to avoid, minimize, and offset project impacts to the species:

- A qualified biologist will conduct a preconstruction survey for Crotch's bumble bee and nests in project areas with suitable nesting habitat prior to initial ground-disturbing activities, such as staging, mowing, vegetation clearing. There will be multiple surveys during the nesting season. The surveys can be phased with project build-out. The purpose of the surveys will be to identify active nest colonies inside of permanent and temporary impact areas.

- If active Crotch's bumble bee nests are observed within the project site or within a 50-foot buffer surrounding the site, an appropriate no-disturbance buffer (as determined by a qualified biologist) will be established around the nest to reduce the risk of disturbance or accidental take. The buffer will provide at least 50 feet of clearance around active nest entrances. (Note: inaccessible areas outside of the project site can be surveyed using binoculars from the project edge or from public roads.)

- If establishment of a no-disturbance buffer is feasible, construction activities will not occur within the buffer until a qualified biologist determines that the colony is no longer active (i.e., no Crotch's bumble bees are seen flying in or out of the nest for three consecutive days, indicating the colony has completed its nesting season and the next season's queens have dispersed from the colony). Once the nest has been determined to be inactive, construction activities within the no-disturbance buffer(s) will be allowed to resume.

- If avoidance of a no-disturbance buffer is not feasible, the lead biologist will consult with CDFW regarding potential encroachment into the no-disturbance buffer with other measures implemented. Work would not begin in the no-disturbance buffer without CDFW approval.

- If avoidance of the nest is not feasible, the lead biologist will consult with the CDFW regarding the potential for project activities to result in take of the Crotch's bumble bee and will comply with all avoidance, minimization, and compensatory mitigation requirements set forth in any incidental take permit issued for the project by CDFW.

San Joaquin Kit Fox

- A qualified biologist will conduct a preconstruction survey for SJKF to determine whether potential SJKF dens are present in or within 200 feet of the project site no fewer than 14 days and no more than 30 days prior to beginning of ground disturbance (such as staging, mowing, and vegetation clearing) related to construction and decommissioning activities, or any other project activity with the potential to impact SJKF. (Note: inaccessible areas outside of the project site can be surveyed using binoculars or spotting scopes from the project edge or from public roads.) The surveys will be conducted in all areas of suitable habitat for SJKF. If potential dens are observed and avoidance of the dens is determined to be feasible, then a no-disturbance zone of 100 feet will be established around an active den. If the den is natal/pupping den, USFWS must be contacted to determine the appropriate no-disturbance zone (USFWS 2011).

- Exclusion zone establishment will follow the USFWS *Standardized Recommendations for Protection of the Endangered SJKF Prior to or During Ground Disturbance* (USFWS 2011) under "Exclusion Zones."

- If active, non-natal/pupping dens are found within the project site by the qualified biologist, an on-site passive relocation program will be implemented with prior concurrence from USFWS. This program will consist of excluding SJKFs from occupied burrows by installation of one-way doors at burrow entrances, monitoring of the burrow for one week to confirm usage has been discontinued, and excavation and collapse of the burrow to prevent reoccupation. This would be implemented only during non-breeding season for SJKF (September 1 to February 1). After the qualified biologist determines that the SJKFs have stopped using active dens within the project site, the dens will be excavated by hand with a shovel to prevent foxes from re-using them during construction.

Other Special-Status Species

If other special-status species are detected during preconstruction surveys, the qualified biologist will implement appropriate no-disturbance buffers around the individual animal, burrow, den, or nest, as determined by the biologist and based on site-specific conditions. The buffer will provide at least 50 feet of clearance, or a distance recommended by the appropriate agency from the protected resource. The lead biologist will contact CDFW and/or USFWS to determine appropriate next steps, including identifying an individual with the appropriate permit or authorization to handle a listed species, if that becomes necessary. The applicant will comply with all avoidance, minimization, and compensatory mitigation requirements set forth in any incidental take permit issued for the project by CDFW authorizing take of the species.

MM BIO-4: Nesting Birds Protection Measures

Nesting bird surveys would only be required for construction and decommissioning activities, not during operation and maintenance activities. If construction work is scheduled to take place outside of the bird nesting season (September 16 through January 31), no action would be required to protect nesting birds. To avoid impacts on nesting birds within or near the project site during the bird nesting season (February 1 through August 31, or through September 15 for Swainson's hawk), the following measures will be implemented:

- A qualified wildlife biologist will conduct preconstruction surveys for nesting birds no more than 14 days prior to the beginning of ground disturbance (such as staging and vegetation clearing) related to construction and decommissioning activities. Surveys may be phased as construction is phased so that each work area is surveyed no more than 14 days prior to the start of construction in that area.

- If active nests are found during preconstruction surveys (or during construction by a construction crew), a suitable no-disturbance buffer will be established around the nests until it is determined that all young have fledged or until the recognized nesting season has ended (i.e., generally August 31 except Swainson's hawk which would be September 15). The size of any employed no-disturbance buffers will vary based on the species that is nesting (e.g., 200–300 feet for common raptors; 0.5 mile for Swainson's hawk; 50 feet for passerine species). For species that are not state or federally listed as threatened or endangered, encroachment into the no-disturbance buffer may occur at the discretion of a qualified biologist; however, for state and federally listed species, consultation with CDFW and/or USFWS will occur prior to encroachment into the no-disturbance buffers.

- If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further action is required. Shrubs, trees, and other vegetation within the construction site determined to be unoccupied by nesting birds or that are outside the no-disturbance buffer for active nests can be removed. Vegetation removal will be scheduled for outside of the nesting season, as feasible.

MM BIO-5: Burrowing Owl Protection Measures

A qualified biologist will conduct a preconstruction survey for burrowing owls within 330 feet of the project site in areas with suitable burrowing habitat to locate any occupied burrows (e.g., active breeding burrows or wintering burrows) no more than 14 days prior to the beginning of ground equipment staging or ground-disturbing activities. No burrowing owl surveys would be required during operation and maintenance activities. If, at the commencement of project construction, burrowing owl is present and listed as candidate, threatened, or endangered under CESA, then the lead biologist will consult with CDFW to determine if an incidental take permit is needed for the project, unless avoidance is feasible. To protect burrowing owls, the following conditions will be met prior to construction within each successive work area:

- Surveys will include the project site and areas within 330 feet of the project stie. Inaccessible areas outside of the project site can be surveyed using binoculars or spotting scopes from the project edge or from public roads. The survey methodology will be consistent with the methods outlined in the CDFW (2012) *Staff Report on Burrowing Owl Mitigation*.

- If inactive (unoccupied) burrowing owl burrows are detected any time of the year, the burrows may be excavated with a shovel to prevent burrowing owls from re-using them during construction. The burrow's inactive status will be determined by the approved biologist through monitoring prior to burrow excavation.

- If active (occupied) burrowing owl burrows are detected, no ground-disturbing activities, such as vegetation clearance, grading, or other construction activities, will be permitted within a no-disturbance buffer around the burrow. The size of any employed no-disturbance buffers will be 330 feet from the active burrow if during the breeding season (February 1 to August 31) and 165 feet from the active burrow if during the nonbreeding (winter) season, unless otherwise authorized by a qualified biologist as described below.

- Depending on the level of disturbance, a smaller buffer may be established by a qualified biologist based on the visibility and sensitivity responses of each individual burrowing owl.

- If burrow avoidance is infeasible during the nonbreeding season or during the breeding season where resident owls have not yet begun egg laying or incubation, or where the juvenile burrowing owls are foraging independently and capable of independent survival, a qualified biologist will implement a passive relocation program in accordance with the CDFW (2012) *Staff Report on Burrowing Owl Mitigation*. Exclusion would involve installation of one-way doors at burrow entrances after the qualified biologist has determined that the burrow is not an active nest or that juvenile burrowing owls are not dependent on the burrow. After the authorized biologist has determined through monitoring that the burrows are unoccupied, the burrows may be excavated with a shovel to prevent burrowing owls from re-using them during construction.

MM BIO-6: Reduce Potential for Bird Collisions and Electrocutions with Power Lines

- APLIC guidelines in accordance with *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012) and *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) will be incorporated into the power line design to minimize the likelihood of bird collisions and electrocutions. Transmission lines and all electrical components will be designed, installed, and maintained in accordance with APLIC guidance to reduce the likelihood of large bird collisions and electrocutions. This measure would be implemented during construction and operation and maintenance activities.

MM BIO-7: Reduce Potential for Bird Collisions with Photovoltaic Array.

- At night, the panels will be positioned where they last tracked the sun or pre-positioned toward the east to capture sunrise (i.e., panels should be in a close to vertical position). This measure would be implemented during operation and maintenance activities.

MM BIO-8: Reduce Impacts on Nocturnal Wildlife from Lighting

- Lighting will be designed to provide the minimum illumination needed to achieve safety and security. Lights will be off during the night, which will be the default setting. The lights will be downward facing, motion or manually activated, and shielded to focus illumination in the immediate area. This measure would be implemented during operation and maintenance activities.
- Narrow spectrum bulbs will be used to limit the range of species affected by project lighting.

6 References

APLIC (Avian Power Line Interaction Committee). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C., and Sacramento, CA. Available online at https://www.aplic.org/uploads/files/2643/SuggestedPractices2006(LR-2).pdf. Accessed August 2023.

APLIC (Avian Power Line Interaction Committee). 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*. October 2012. Available online at http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf. Accessed June 2023.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, eds. 2012. *The Jepson Manual: Vascular Plants of California*. 2nd edition. University of California Press. Berkeley, California.

Billerman, S. M., B. K. Keeney, P. G. Rodewald, and T. S. Schulenberg, eds. 2021. *Birds of the World*. Cornell Laboratory of Ornithology, Ithaca, New York. Available online at https://birdsoftheworld.org/bow/home. Accessed October 6, 2021.

California State University (CSU) Stanislaus. 2021. Publications and Reports. Endangered Species Recovery Program. Available online at https://esrp.csustan.edu/publications/pubhtml.php?doc=sjvrp&file=chapter02H00.html. Accessed June 2023.

Cal-IPC (California Invasive Plant Council). 2021. The Cal-IPC Inventory. Available online at https://www.cal-ipc.org/plants/inventory/. Accessed October 8, 2021.

CDFW (California Department of Fish and Wildlife). 2011. Delta Vegetation and Land Use, ds292. Vegetation Classification and Mapping Program, Biogeographic Data Branch. Available online at https://map.dfg.ca.gov/metadata/ds0292.html. Accessed September 2021.

CDFW (California Department of Fish and Wildlife). 2012. Staff Report on Burrowing Owl Mitigation. Appendix D: Breeding and Non-breeding Season Survey and Reports. 34 pp.

CDFW (California Department of Fish and Wildlife). 2016. Status Review: Swainson's Hawk () In California. Five Year Status Report. California Fish and Game Commission. Available online at https://wildlife.ca.gov/Conservation/Birds/Swainsons-Hawk. Accessed October 2023.

CDFW (California Department of Fish and Wildlife). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. California Department of Fish and Wildlife. Available online at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959. Accessed April 24, 2023.

6 References

CDFW (California Department of Fish and Wildlife). 2023a. California Sensitive Natural Communities List. Last Updated Wednesday, August 18, 2021. Available online at https://wildlife.ca.gov/data/VegCAMP/Natural-Communities/Background#sensitive%20natural%20communities. Accessed June 2023.

CDFW (California Department of Fish and Wildlife). 2023b. California Natural Diversity Database. Available online at https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed June 2023.

Center for Biological Diversity, Defenders of Wildlife, Burrowing Owl Preservation Society, Santa Clara Valley Audubon Society, Urban Bird Foundation, Central Valley Bird Club, and San Bernardino Valley Audubon Society. 2024. Petition to List California Populations of the Western Burrowing Owl (*Athene cunicularia hypugaea*) as Endangered or Threatened Under the California Endangered Species Act. Available online at https://fgc.ca.gov/CESA. Accessed May 2024.

CNPS (California Native Plant Society). 2023a. *Manual of California Vegetation,* Online Edition. Available online at http://vegetation.cnps.org. Accessed June 2023.

CNPS (California Native Plant Society). 2023b. Inventory of rare and endangered plants of California. Available online at https://rareplants.cnps.org/Search/Advanced. Accessed June 2023.

CNPS (California Native Plant Society). 2023c. CNPS Rare Plant Ranks. Available online at http://vegetation.cnps.org. Accessed June 2023.

eBird. 2023. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available online at http://www.ebird.org. Accessed June 2023.

Estep, J. 1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-1987. California Department of Fish and Game, Wildlife Management Division, Nongame Bird and Mammal Section, Sacramento, CA.

Greif, S., and B.M. Siemers. 2010. "Innate Recognition of Water Bodies in Echolocating Bats." November 2010. Available online at https://www.nature.com/articles/ncomms1110. Accessed June 2023.

Jepson Flora Project. 2023. Jepson eFlora. Available online at http://ucjeps.berkeley.edu/eflora/. Accessed June 12, 2023.

Kosciuch, K., D. Riser-Espinoza, C. Moqtaderi, W. Erickson. 2021. Aquatic Habitat Bird Occurrences at Photovoltaic Solar Energy Development in Southern California, USA. *Diversity* 2021, 13, 524. Available online at https://www.mdpi.com/1424-2818/13/11/524. Accessed August 2023.

Merced County. 2013a. *Draft Environmental Impact Report, Vega Solar Project*. Prepared by Michael Brandman Associates.

6 References

NFWFL (National Fish and Wildlife Forensics Laboratory). 2014. Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis. April 2014. Available online at https://www.ourenergypolicy.org/wp-content/uploads/2014/04/avian-mortality.pdf. Accessed June 2023.

Nafis, G. 2021. California Herps – A Guide to the Amphibians and Reptiles of California. Available online at http://www.californiaherps.com. Accessed October 5, 2021.

NRCS (Natural Resources Conservation Service). 2023. Web soil survey. Soil Survey of Merced County, California, Western Part. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx Accessed June 26, 2022.

San Luis Water District. 2021. 2020 Water Management Plan (2020 Criteria). Website: https://slwdwater.com/wp-content/uploads/2021/09/2020-WMP-San-Luis-Water-District.pdf.

Randall, J. M., S. S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer, and S. Morrison. 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy. San Francisco, California. Available online at https://www.scienceforconservation.org/assets/downloads/Mojave_Desert_Ecoregional_Assessment_2010.pdf. Accessed July 2023.

Schwenkler, J., and D. Hickson. 2018. Vegetation – Great Valley Ecoregion, ds2632. Available online at https://map.dfg.ca.gov/metadata/ds2632.html. Accessed September 2021.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley. 5 pp.

Thomson, R. C., A. N. Wright, B. H. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. California Department of Fish and Wildlife and University of California Press. Available online at https://wildlife.ca.gov/Conservation/SSC/Amphibians-Reptiles. Accessed July 2023.

University of Michigan. 2021. Animal Diversity Web. Museum of Zoology. Available online at https://animaldiversity.org/. Accessed October 5, 2021.

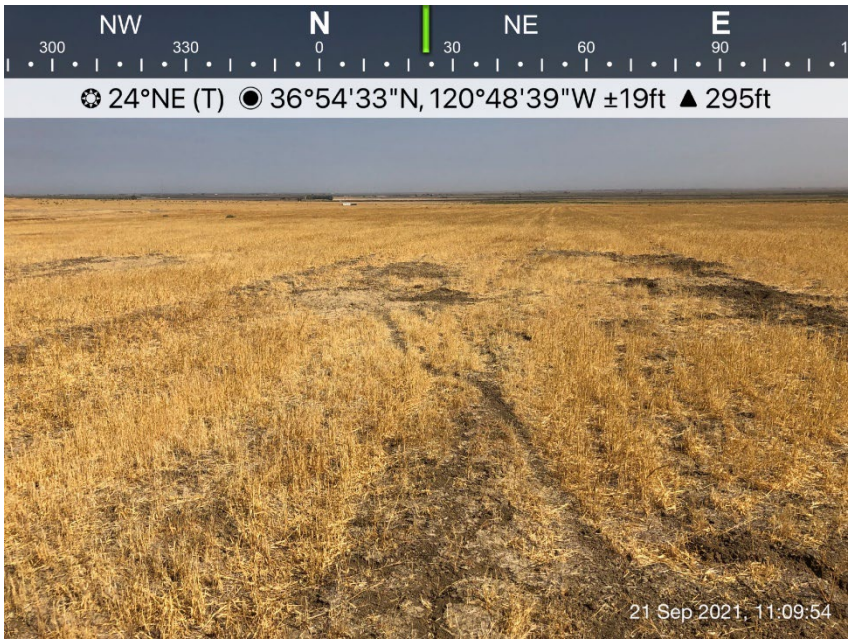
USFWS (U.S. Fish and Wildlife Service). 1998. *Recovery plan for upland species of the San Joaquin Valley, California.* Region 1, Portland, OR. 319 pp.

USFWS (U.S. Fish and Wildlife Service). 1999. *San Joaquin Kit Fox Survey Protocol for the Northern Range*. Sacramento Fish and Wildlife Office. 12 pp.

USFWS (U.S. Fish and Wildlife Service). 2011. *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*. Sacramento Fish and Wildlife Office. Available online at https://www.fws.gov/media/standardized-recommendations-protection-endangered-san-joaquin-kit-fox-prior-or-during-ground. Accessed July 2023.

USFWS (U.S. Fish and Wildlife Service). 2023. Information for Planning and Consultation (IPaC) Resource List. Available online at https://ecos.fws.gov/ipac/. Accessed June 2023.

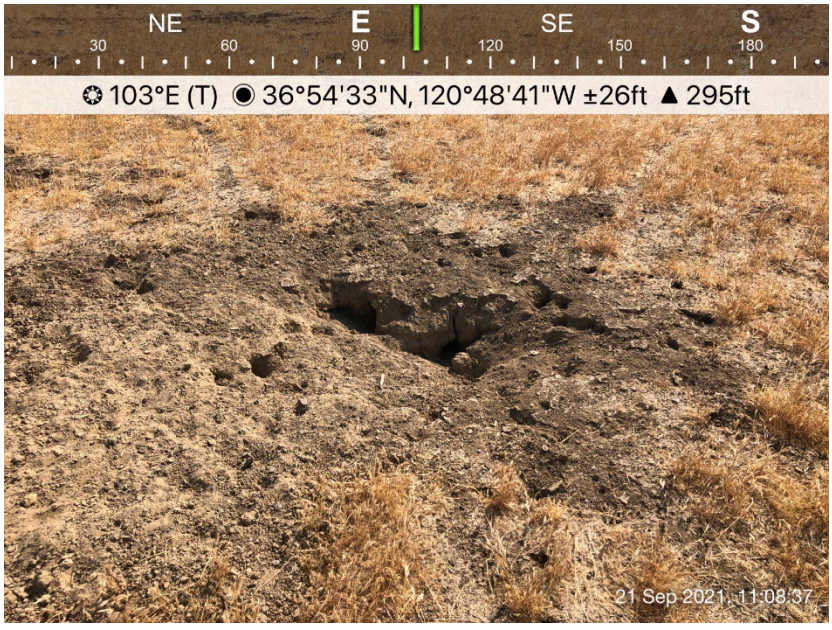
Appendix A Representative Photographs

Photograph #1 **Date:** 9/21/2021 **Photo Direction:** North **Location:** South-central part of the project site. **Comments:** Representative late summer photograph of Ripgut Brome and Wild Oats Annual Grassland that covers the project site.	
Photograph #2 **Date:** 4/19/2021 **Photo Direction:** West **Location:** Northeastern part of the project site. **Comments:** Representative spring photograph of Ripgut Brome and Wild Oats Annual Grassland that covers the project site.	

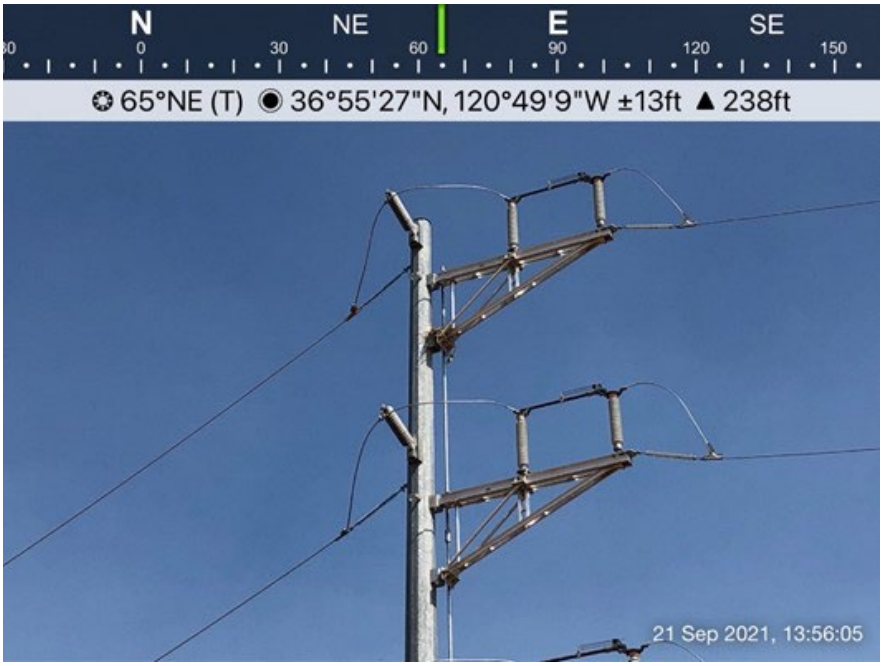
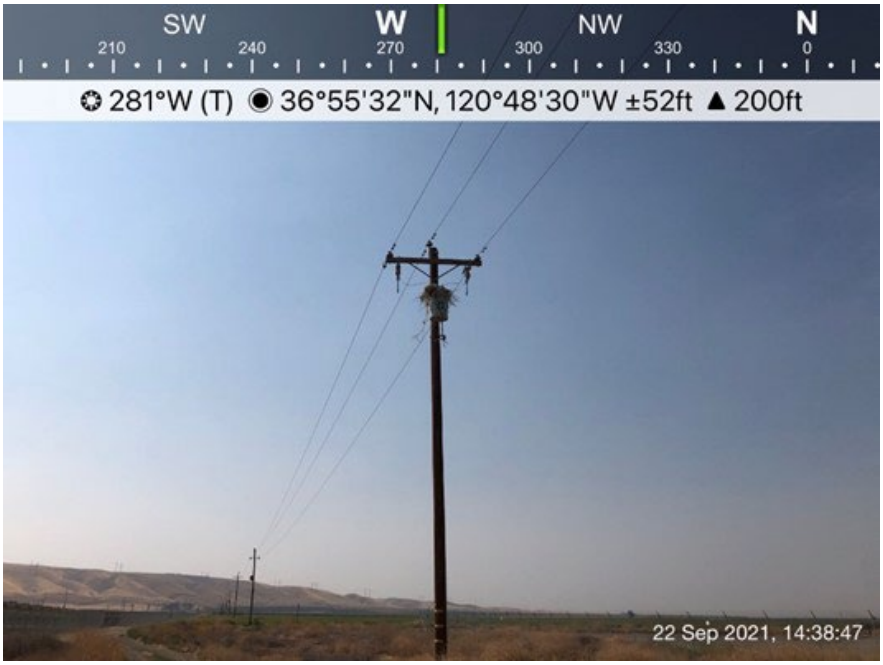
Appendix A. Representative Photographs

Photograph #3 **Date:** 9/21/2021 **Photo Direction:** South **Location:** South-central part of the project site. **Comments:** Representative photograph of an earthen ditch on the project site.	
Photograph #4 **Date**: 4/19/2021 **Photo Direction:** South **Location:** North end of the gen-tie corridor. **Comments:** Representative photograph of a concrete-lined ditch on the project site (left side of photograph).	

Appendix A. Representative Photographs

Photograph #5 **Date:** 9/21/2021 **Photo Direction:** Southeast **Location:** Central part of the project site. **Comments:** Burrowing owl standing on a mound with several burrow entrances.	
Photograph #6 **Date:** 9/21/2021 **Photo Direction:** East **Location:** South-central part of the project site. **Comments:** Representative photograph of a complex with large and small burrow entrances.	

Appendix A. Representative Photographs

Photograph #7 **Date:** 9/21/2021 **Photo Direction:** East **Location:** North end of the gen-tie corridor. **Comments**: Representative photograph of an inactive stick nest on a metal transmission pole.	
Photograph #8 **Date:** 9/21/2021 **Photo Direction:** West **Location:** Vega Solar project north of the project site and east of the gen-tie corridor. **Comments:** Representative photograph of an inactive stick nest in a wooden transmission pole.	

Appendix A. Representative Photographs

Photograph #9	
Date: 9/30/2022	
Photo Direction: South	
Location: Central part of the project site.	
Comments: Burrowing owl standing outside burrow entrance.	