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San Luis West Solar and Storage Project



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San Luis West Solar and Storage Project

BIOLOGICAL RESOURCES EVALUATION REVISED REPORT

Fresno County, California
July 2025

EXECUTIVE SUMMARY

A literature review and general biological survey were conducted for the San Luis West Solar and Storage Project (Project). The Project site contains original parcels that were surveyed for biological resources during multiple visits in spring 2023. Three additional parcels, known as the Califland Corp parcels, that were originally part of a separate project were added to the Project site in November 2023; a due diligence survey of these parcels had already been performed in July 2023, and additional surveys of these areas were performed in the spring of 2024 as part of this Project. A gen-tie line was added to the Project site in January 2024; a general biological survey was performed in January 2024. A reduced footprint alternative was selected to be the Project site after January 2024; therefore, some areas have been removed from the original Project site and an additional area within the Woolf Parcel South parcel that was not previously part of the Project site was added to the Project. A due diligence survey was performed in this additional area in July 2025.

In 2023, the following surveys were conducted in addition to the general biological survey in the original parcels: protocol burrowing owl (BUOW, *Athene cunicularia*) habitat assessment/burrow survey; BUOW breeding season surveys; raptor habitat assessment and nest surveys; special-status mammal habitat assessment; Crotch's bumble bee (*Bombus crotchii*) habitat assessment; blunt-nosed leopard lizard (*Gambelia sila*) habitat assessment; rare plant surveys; and jurisdictional wetland delineation.

The following surveys were conducted within the Califland Corp parcels in July 2023: BUOW habitat assessment, special-status mammal habitat assessment; Crotch's bumble bee habitat assessment; and blunt-nosed leopard lizard habitat assessment. In 2024, these surveys were conducted in the Califland Corp parcels: BUOW burrow survey; BUOW breeding season surveys; raptor habitat assessment and nest surveys; and jurisdictional delineation. A winter season BUOW survey was conducted in both the original and Califland Corp parcels in 2024. A general biological survey and BUOW habitat assessment were performed in the gen-tie line in January 2024. The purpose of the gen-tie line general biological survey and BUOW habitat assessment were to identify potential biological resources that may be impacted by installation of the gen-tie line. The exact route of the gen-tie line is currently in development. An additional general biological survey was performed in the Woolf Parcel South Addition in July 2025. Results of the BUOW surveys and wetland delineation are provided in separate reports.

No special-status plants were found within the Project site or surrounding buffer. Suitable BUOW habitat was present on the Project site; a total of four burrows that would be considered suitable for BUOW use and 39 suitable burrow surrogates in the form of culverts and pipes were mapped within the entire Project site and the 150-meter buffer, also known as the Biological Study Area (BSA). One listed animal, Swainson's hawk (SWHA, *Buteo swainsoni*), and four special-status animals, northern harrier (*Circus hudsonius*), California horned lark (*Eremophila alpestris actia*), merlin (*Falco columbarius*), and loggerhead shrike (*Lanius ludovicianus*), were observed during surveys. A total of seven active nests were observed in the BSA in 2023. Six active nests were found in the BSA in 2024, including one active SWHA nest in the 150-meter buffer. A second active SWHA nest was found 2 miles from the Project site in 2024. The other nests found in the BSA in 2023 and 2024 were those of common bird species. No special-status mammals or their sign were observed.

This report includes avoidance and minimization measures recommended to reduce potential Project impacts to special-status species and nesting birds.

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ACRONYMS/ABBREVIATIONS

APN	Assessor's Parcel Number
BIOS	Biogeographic and Information Observation System
BNLL	blunt-nosed leopard lizard
BSA	biological study area
BUOW	burrowing owl
California Aqueduct	Governor Edmund G. Brown California Aqueduct
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
CRPR	California Rare Plant Rank
GIS	Geographic Information System
HCP	Habitat Conservation Plan
HM	habitat management
IBAs	Important Bird Areas
LLC	Limited Liability Company
MBTA	Migratory Bird Treaty Act
MW	megawatt
PG&E	Pacific Gas & Electric
R	Range
S	Section
SJKF	San Joaquin kit fox
SSC	Species of Special Concern
SWHA	Swainson's hawk
T	Township
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1 INTRODUCTION

Tetra Tech has prepared this Biological Resources Evaluation Revised Report which assesses sensitive resources within the revised site for the proposed San Luis West Solar and Storage Project (Project). Origis Development, LLC (Project proponent) proposes to develop approximately 1,265 acres of land (Project site) located in unincorporated Fresno County, California, as a solar energy and storage facility. A literature review and biological field surveys of the Project site and a 150-meter buffer were performed. Together, the Project site and the 150-meter buffer are referred to as the Biological Study Area (BSA). Biologists visited the BSA in 2023, 2024, and 2025 to conduct the following surveys:

- Site-wide (including original parcels and additional parcels):
    - General biological survey and vegetation community mapping.
    - Rare plant surveys.
    - Protocol burrowing owl (BUOW, *Athene cunicularia*) habitat assessment and burrow survey.
    - Protocol BUOW winter season survey.
    - Protocol BUOW breeding season surveys.
    - Raptor habitat assessment and nest surveys.
    - Jurisdictional delineation.
- Gen-tie route:
    - General biological survey, vegetation community mapping, and BUOW habitat assessment to evaluate potential biological resources that may be impacted by gen-tie line installation.
- Additional area of Woolf Parcel South added in June 2025:
    - General biological survey and vegetation community mapping.
    - Protocol burrowing owl (BUOW, *Athene cunicularia*) habitat assessment and burrow survey.

The purpose of this Biological Resources Evaluation Report is to:

- Document the methods and results of the literature review and biological field surveys.
- Summarize the existing biological resources and conditions within the Project site and vicinity.
- Assess the potential presence of special-status biological resources.
- Recommend pre-construction surveys and avoidance and minimization measures.

The methods and results of the BUOW surveys and jurisdictional delineation are provided in separate reports.

1.1 Project Site Location, Ecoregion, and Setting

1.1.1 Project Site Location

The Project site, which encompasses all parcels within the Project, is located on approximately 1,265 acres of privately-owned agricultural land within the Great Valley, also called the Central Valley. The Project Footprint, the area where ground disturbance is anticipated to occur, is located on approximately 770 acres of land within the Project site. The proposed Project is in rural unincorporated southwestern Fresno County, California, immediately adjacent to the Governor Edmund G. Brown California Aqueduct (California Aqueduct) (Figures 1 and 2). The Project site is about 3 miles southeast of the City of Huron, 8 miles northeast of Interstate 5, 10 miles northwest of Kettleman City, and about 38 miles south-southwest of the City of Fresno. The Project site is in the United States Geological Survey (USGS) *Huron* 7.5-Minute

Topographic Quadrangle Map (Figure 3). The Project site is within the following Townships (T), Ranges (R), and Sections (S), Mount Diablo Principal Meridian:

- Township 21S, Range 17E, Sections 02 and 03,
- Township 21S, Range 18E, Section 06,
- Township 20S, Range 18E, Section 31, and
- Township 20S, Range 17E, Section 35.

The Project site is comprised of multiple parcels grouped into six Project areas. Three additional parcels that were previously included in a separate project were added to the Project site in November 2023 and the gen-tie line was added in January 2024. An additional area within Woolf Parcel South that was not previously part of the Project site was added when the revised footprint alternative was selected as the new Project site. The original and additional parcels include the following:

- Original parcels:
    - Woolf Parcel North (Assessor's Parcel Numbers [APN]: 07507054S)
    - Woolf Parcel South (APN: 08505001S)
    - Sageberry parcel (APN: 07808055)
    - Parcel 5 (APNs: 07806085S)
- Additional parcels:
    - Califland Corp parcels (APNs: 08505047S, 085055048S, 08505084S)
    - Gen-tie line
    - Woolf Parcel South Addition: (APN: 08505001S)

The Project site also contains three Subareas, which are made up of the following parcels:

- Subarea A: Woolf Parcel South (including Woolf Parcel South Addition), Califland Corp Parcels
- Subarea B: Woolf Parcel North
- Subarea C: Sageberry Parcel, Parcel 5

Each parcel shares one boundary with West Jayne Avenue (Figure 2). Woolf Parcel North and Parcel 5 are located on the north side of West Jayne Avenue. Sageberry, Woolf Parcel South, and Califland Corp parcels are located on the south side. The proposed Project site spans across about 4.3 miles from the southwest corner of Woolf Parcel South and the northern edge of Parcel 5.

Each parcel boundary is bordered by unnamed, dirt roads on each side, except for Woolf Parcel North, Woolf Parcel South, and the Califland Corp parcels. Woolf Parcel North is bound by a paved road, Lassen Avenue, on its west side. Woolf Parcel South is bound by West Jayne Avenue on its north side. The Califland Corp parcels are bound by Lassen Avenue on their east side. Woolf Parcel South is directly across the street from Pacific Gas & Electric's (PG&E) Gates Substation, which is located at the intersection of South Trinity Avenue and West Jayne Avenue.

The proposed gen-tie line is split into three sections. The western section of the gen-tie line runs along Lassen Avenue adjacent to Woolf Parcel North and spans two unnamed dirt roads, connecting Woolf Parcel North and Woolf Parcel South. The southeastern section of the gen-tie line runs along the southern half of West Jayne Avenue, connecting Woolf Parcel North to Sageberry parcel. The northeastern section of the gen-tie is located along an unnamed dirt road in between Woolf Parcel North

and the southern portion of Parcel 5 (Figure 1). These areas are the potential routes that the gen-tie line route may follow; the final route will likely be shorter than what is depicted in Figure 1.

1.1.2 Ecoregion

California can be divided up into 11 Geomorphic Provinces. The Project site is located within the Great Valley Geomorphic Province, which is a broad, flat, alluvial plain about 50 miles wide and 400 miles long in the central part of California between the Sierra Nevada in the east and the Coast Ranges in the west. The Central Valley is composed of two valleys: 1) the northern and smaller valley, known as the Sacramento Valley, which is drained by the Sacramento River; and 2) the southern and larger valley, known as the San Joaquin Valley, which is drained by the San Joaquin River (California Department of Conservation, California Geological Survey 2002). The Project site is located within the San Joaquin Valley subregion of the Great Valley (Jepson Flora Project [eds.] 2025).

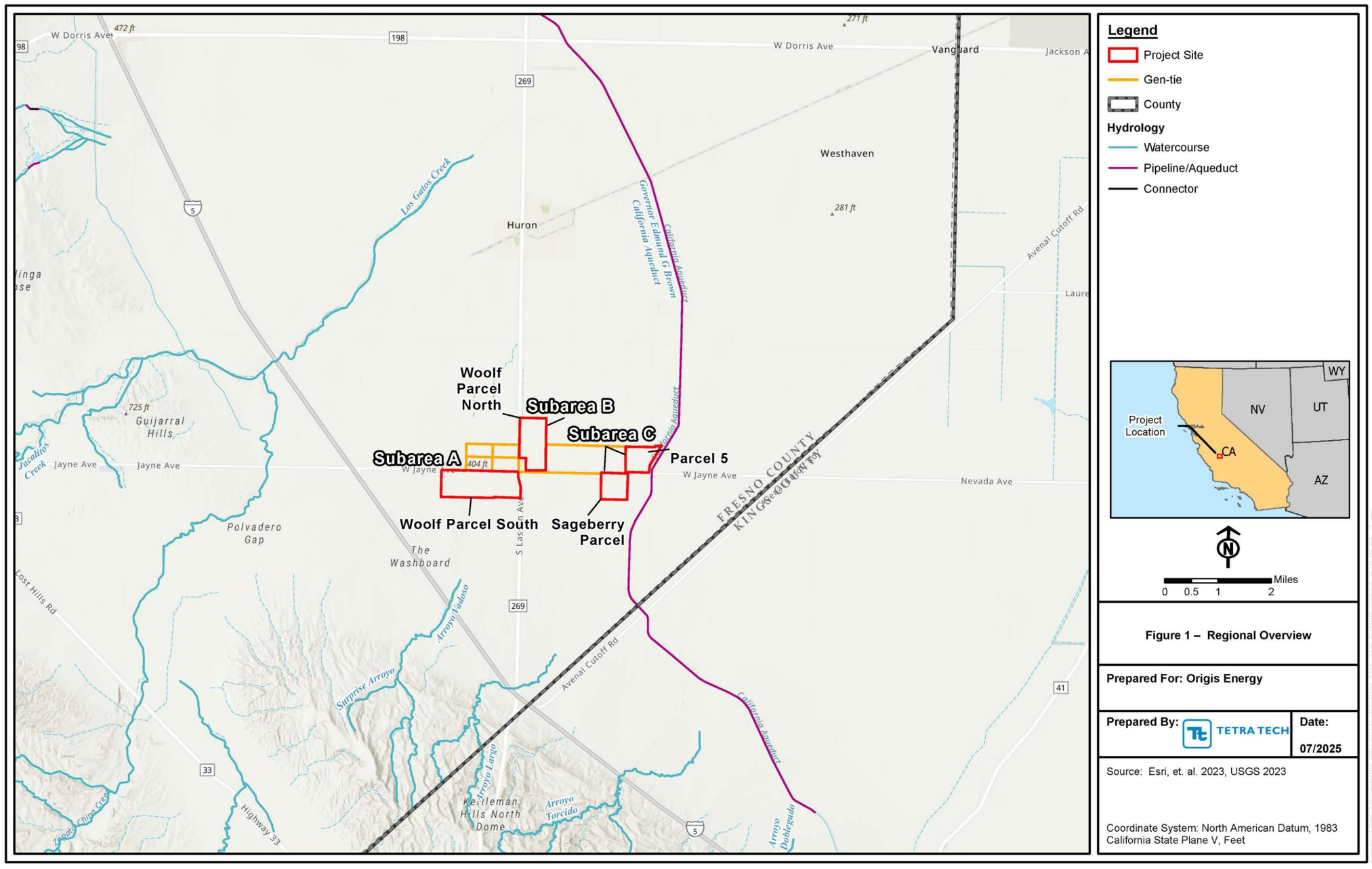

Figure 1 – Regional Overview

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 07/2025

Source: Esri, et. al. 2023, USGS 2023

Coordinate System: North American Datum, 1983 California State Plane V, Feet

Not for Construction

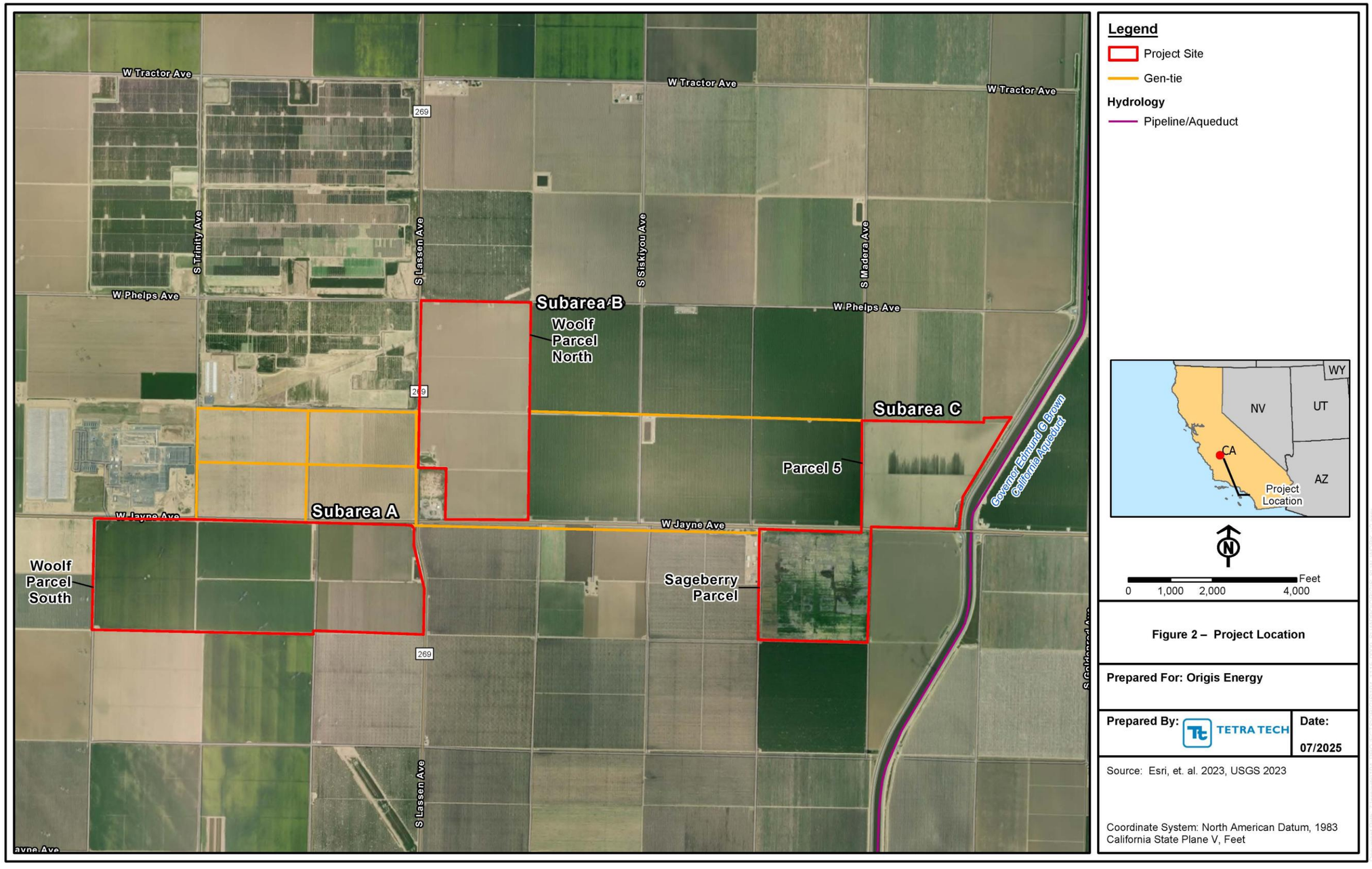

Figure 2 – Project Location

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 07/2025

Source: Esri, et. al. 2023, USGS 2023

Coordinate System: North American Datum, 1983 California State Plane V, Feet

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2 PROJECT DESCRIPTION

The proposed Project consists of constructing and operating a 125-megawatt (MW) alternating current photovoltaic solar electricity generating facility, a 30-MW energy storage system, and associated infrastructure. The photovoltaic portion of the facility will produce electricity for injection into the electrical grid operated by PG&E, while the battery energy storage system will store electricity either generated by the facility or absorbed from the PG&E grid. The energy storage system will make the stored electricity available for discharge during peak periods of electrical load. The Project would include the construction of:

- Photovoltaic solar panels on rotating metal racks.
- Electrical inverters (convert direct current to alternating current).
- Electrical transformers.
- Medium-voltage (34.5 kilovolt) collection system, either overhead or underground.
- A new electric substation.
- 230-kilovolt gen-tie line.
- Operations and maintenance building.
- Perimeter security fencing.
- Access road improvements.
- Lighting.
- Lithium-ion cell batteries for the battery energy storage system.

The Project site plans are provided in Appendix A.

3 LITERATURE REVIEW METHODS AND RESULTS

This section describes the literature review methods and results used to initially evaluate the biological resources within the BSA and Project vicinity. Relevant literature, databases, Geographic Information System (GIS) data, and aerial imagery were reviewed.

3.1 Topography

Methods

The USGS 7.5-Minute Topographic Map *Huron* Quadrangle, as well as aerial and historical imagery, were reviewed. Topography describes the physical features of an area of land. The topographic features looked at include natural landforms, aquatic features, developed lands, agricultural lands, undeveloped lands, and terrain. Natural landforms are natural physical features on the surface of the land, such as mountains, hills, and canyons.

Results

Overall, the Project site has been cleared for agricultural use and is flat and treeless besides two large Athel tamarisk (*Tamarix aphylla*) trees that occur on Woolf Parcel North, oleander (*Nerium oleander*) hedgerows bordering the northern and western portions of the Califland Corp parcels, and a single 10-foot tree of heaven (*Ailanthus altissima*) within a retention basin on Woolf Parcel South. Disturbed retention basins and drainage ditches also occur on the border of multiple Project parcels and within the 150-meter buffer. The frequent disturbances related to tilling and farming have removed all naturally occurring vegetation communities and habitats from the farmed areas of the Project site. Surrounding land use within a 3-mile radius of the Project site consists of active agricultural fields and solar photovoltaic facilities. Natural landforms are absent from the Project site. The elevational range of the Project site is approximately 315 to 405 feet above mean sea level.

3.2 Sensitive Natural Communities

Methods

The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW 2025a) was used to identify sensitive natural communities that may exist within the USGS *Huron* Quadrangle and surrounding quadrangles.

Results

The CNDDB identified one sensitive natural community: Great Valley mesquite scrub. This sensitive community has not been documented on the Project site.

3.3 Special-status Plant and Wildlife Species

Methods

Plant and wildlife species protected by federal agencies, state agencies, and local conservation agencies and organizations, such as the California Native Plant Society (CNPS), are collectively referred to as special-status species in this report. Tetra Tech conducted a literature review by reviewing CDFW's CNDDB RareFind 5 online database to identify special-status plant and wildlife species that may exist

within a USGS 9 Quadrangle search, which was later refined to a 2-mile buffer around the Project site (CDFW 2025a). The CNPS database was searched within the *Huron* quadrangle (CNPS 2025a), the eBird database was searched within a 2-mile buffer (eBird 2025), and the Bumble Bee Watch database was searched for records of special-status bumble bee species within Fresno County (Xerces Society for Invertebrate Conservation 2025).

Results

Based on this desktop review, several special-status species have been historically documented in the vicinity of the BSA, including American badger (*Taxidea taxus*), blunt-nosed leopard lizard (BNLL, *Gambelia sila*), BUOW, Crotch's bumble bee (*Bombus crotchii*), loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), San Joaquin kit fox (SJKF, *Vulpes macrotis mutica*), Swainson's hawk (SWHA, *Buteo swainsoni*), Tulare grasshopper mouse (*Onychomys torridus tularensis*), and rare plants (CDFW 2025a).

All CNDDB occurrences within a 2-mile buffer around the Project site are shown in Figure 3. The potential for each species to occur has been reviewed and updated based on the results of the field surveys and is provided in the special-status species results section of this report.

3.4 Critical Habitat

Methods

The United States Fish and Wildlife Service (USFWS) Critical Habitat Portal was reviewed to identify federal threatened and endangered species designated final and proposed Critical Habitat within the Project site and vicinity (USFWS 2025).

Results

The literature review determined that the BSA is not located within or near designated or proposed Critical Habitat for listed plant or wildlife species.

3.5 Wildlife Movement

Methods

The Essential Connectivity Map on the CDFW Biogeographic and Information Observation System (BIOS) Habitat Connectivity Viewer was reviewed to determine whether the Project site is located within or near a CDFW designated Natural Landscape Block or Essential Connectivity Area (CDFW 2025b). Additional resources reviewed include aerial imagery, Audubon (Audubon California 2025), and the USFWS *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998).

Results

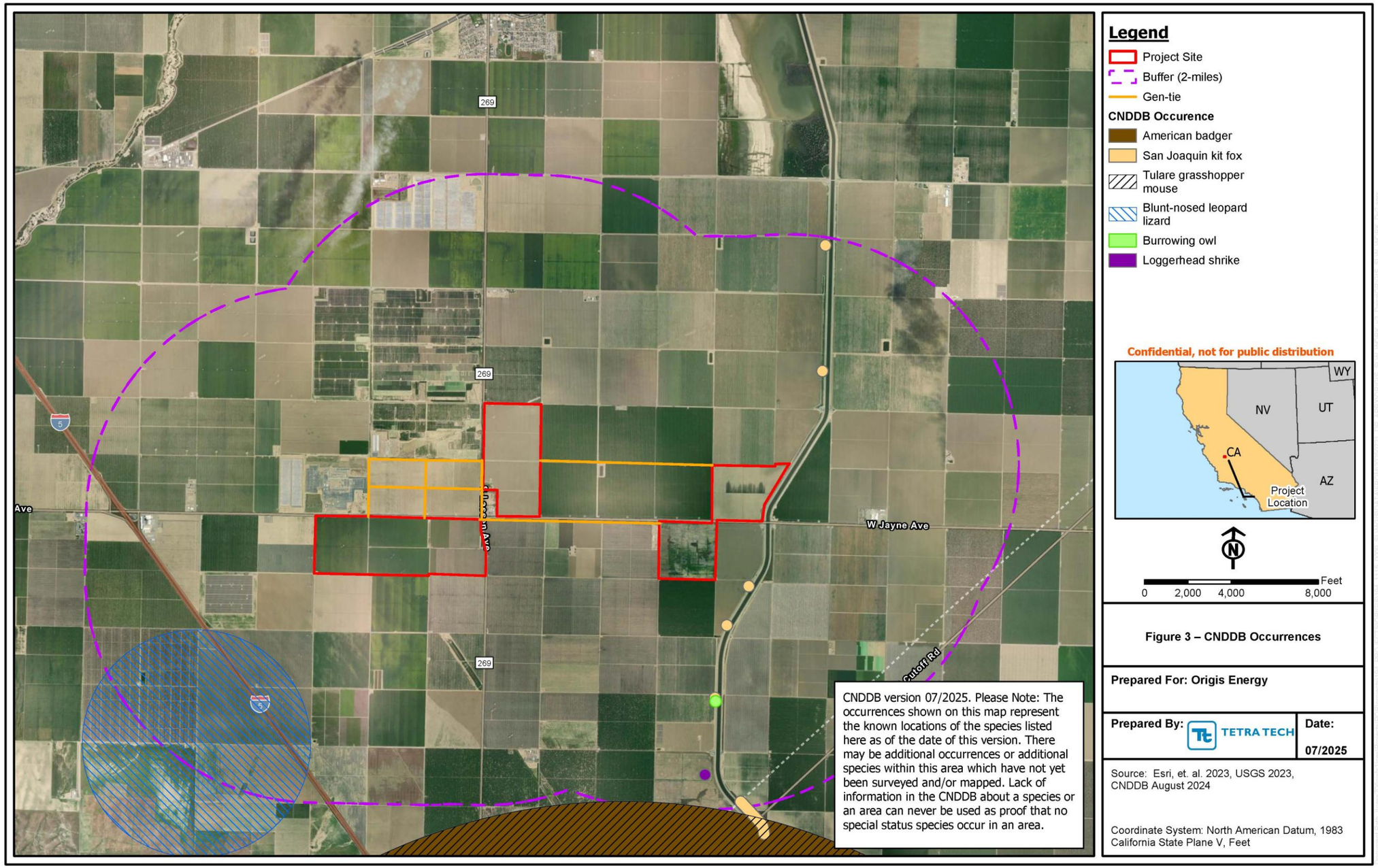
Per the BIOS Habitat Connectivity Viewer, the Project site is not located within a Natural Landscape Block or Essential Connectivity Area. The closest Essential Connectivity Area is approximately 3 miles south of the Project site, and the closest Natural Landscape Block is approximately 3 miles southwest of the Project site (CDFW 2025b). The Project site is located within the Pacific Flyway, which is a significant north-south flight path route that stretches 4,000 miles from the Arctic to South America. Millions of birds annually migrate along the Pacific Flyway and stop along the way at sites for nesting, wintering, resting, and foraging, which are known as Important Bird Areas (IBAs). However, no designated IBAs occur within

or near the Project site (Audubon California 2025). The closest Important Bird Area, Sand Ridge – Tulare Lake Bed, is approximately 14 miles southeast of the Project site. The Project site is not located near the San Joaquin River, the Kings River, or the North Kings Deer Herd migration corridor and fawn production areas. In addition, the Project site is not located within a corridor or linkage described in the USFWS *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998).

While the Arroyo Pasajero Westside Detention Basin is located about 2.5 miles north of the Project site and contains native habitats that support abundant wildlife, it is located across West Gale Avenue that is a heavily used paved road and acts as a potential barrier to migration for some nonvolant species. Disturbed drainage ditches that occur on the Project site are used for agricultural irrigation, have no connectivity to offsite areas, and are bound on either side by heavily used paved roads (West Gale Avenue and West Jayne Avenue). The Project site does not contain or function as a wildlife movement corridor for the following reasons:

- It is heavily disturbed by agriculture, which has removed native habitat and limits opportunities for habitat continuity and wildlife movement.
- It does not contain wildlife travel routes (e.g., riparian strip, ridgeline, drainage, waterway) or wildlife crossings (e.g., tunnel, culvert, underpass) that connect open space areas.
- It does not provide connectivity between large areas of open space on a local or regional scale.
- It does not contain suitable cover or forage to attract or support wildlife species.

The Project site is thus unlikely to provide a significant movement corridor for wildlife species.



Not for Construction

4 FIELD SURVEY METHODS

Field surveys were conducted during daylight hours and not during abnormal or excessive cold, heat, wind, rain, or other inclement weather. Surveys were conducted on foot and by vehicle. Regional field guides and aerial maps were used during the field survey. In addition, an Eos Arrow 100 sub-meter Global Positioning System unit and device with the Esri ArcGIS Field Maps application were used to collect locational data and record relevant attributes of features or species encountered. Photographs that were taken during the field surveys are provided in Appendix B.

4.1 General Biological Survey

A general biological survey was conducted in the original parcels on March 19 and 20, 2023, in the Califland Corp parcels on July 12, 2023, along the gen-tie line on January 10, 2024, and in the Woolf Parcel South Addition on July 10, 2025. Biologists characterized the existing land cover and surveyed for the presence of sensitive vegetation communities within the BSA (i.e., the Project site and 150-meter buffer). Vegetation communities were mapped in accordance with the Manual of California Vegetation, Online Edition (CNPS 2025b). Vegetation was mapped to the alliance level, which is defined by plant species composition and identified by the most dominant tree, shrub, or herb in the vegetation community.

The BSA was surveyed for common plants and for the presence of special-status plant species and their habitats. All observed plants were recorded. If found, numbers of special-status plants were counted or estimated, and population boundaries were mapped using a sub-meter receiver.

Similarly, the BSA was surveyed for common wildlife and for the presence of special-status wildlife species and their habitats. Any signs of wildlife, including tracks, burrows, dens, nests, nest sites, scat, or remains were recorded. Wildlife species or sign encountered visually or audibly during the survey were identified and recorded. If found, special-status wildlife species were mapped using a sub-meter receiver.

4.2 Special-Status Species Surveys

Additional rare plant surveys were conducted within the original parcels for plants that bloom from March through July. Intensive agricultural practices within the BSA and Project vicinity have resulted in limited available habitat for rare plants, and only two rare plant species, California jewelflower (*Caulanthus californicus)* and San Joaquin woollythreads (*Monolopia congdonii),* have been documented occurring within the Project vicinity. California jewelflower and San Joaquin woollythreads both bloom from February to May. The rare plant surveys were conducted during the BUOW breeding season surveys and focused on the natural vegetation communities, drainage ditches, and retention basins on the Project site. Rare plant surveys were not conducted within the gen-tie, Califland Corp parcels, or the Woolf Parcel South Addition due to a lack of habitat for rare plants within these areas.

BNLL habitat in the BSA was evaluated. To assess BNLL habitat, the presence of small mammal burrows, washes and playas, vegetation and debris cover, friable soils, prey items, and anthropogenic disturbance of the Project site was evaluated. Important BNLL habitat features include washes, playas, and a relative abundance of small mammal burrows (CDFW 2019). BNLL are also often seen in streambeds, washes, roads, etc. (CDFW 2019). Protocol surveys for BNLL were not performed.

The potential for presence of Crotch's bumble bee within the BSA was assessed during the general biological surveys. Wildflowers and sources of nectar were documented and the presence of potential nesting and overwintering resources such as rodent burrows were evaluated. Characteristics of the agricultural use of the Project site that may impact the presence of Crotch's bumble bee were also assessed. Protocol surveys for Crotch's bumble bee were not performed.

A protocol BUOW habitat assessment was conducted with the general biological surveys in the original parcels in March 2023, the Califland Corp parcels in July 2023, the gen-tie line in January 2024, and the Woolf Parcel South Addition in July 2025. A protocol burrow survey was conducted in the original parcels in March 2023, the Califland Corp parcels in April 2024, and the Woolf Parcel South Addition in July 2025. During the habitat assessments and burrow surveys, 100 percent visual coverage of the ground surface was performed by walking no more than 20 meters apart in areas that were not actively disturbed by agricultural activities. For the habitat assessment in the gen-tie line, a windshield survey were performed along the gen-tie route. Protocol breeding season surveys and a winter season BUOW survey were conducted in all parcels, excluding the Woolf Parcel South Addition and gen-tie corridor. All surveys were conducted in accordance with the guidelines in the *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012). A BUOW report detailing survey methods has been provided under separate cover.

A raptor habitat assessment was conducted in the Project site and surrounding 2-mile buffer during the general biological survey in March 2023. Follow-on nest surveys were also conducted during the raptor breeding season between April and July 2023 and, given the addition of the Califland Corp parcels, between April and June 2024. A raptor habitat assessment to identify any new raptor nesting habitat was performed within the Woolf Parcel South Addition in July 2025. During the raptor breeding season, windshield surveys were performed to visually identify nests and perched raptors using binoculars to survey trees and other features such as transmission poles. Notes were recorded on any raptor observations (e.g., species, number of individuals observed, behavior) and nest status (e.g., active, inactive). Any evidence of chicks or fledglings as well as foraging behaviors were also recorded. In addition, any territorial displays, courtship displays, and/or vocal communications were recorded.

The Project site was assessed for potential use by special-status large mammals, including SJKF and American badger, during the BUOW habitat assessments. Protocol and/or focused surveys for SJKF and American badger were not performed within the Project site. Potential SJKF and American badger dens were mapped if found during the protocol BUOW burrow surveys that required 100 percent visual coverage of the ground surface. Any signs of SJKF or American badger were also recorded if found during the BUOW breeding season surveys. Dens that could be used by American badger include soil dens measuring 8 to 12 inches wide and 6 to 10 inches long. Potential SJKF dens are defined as follows based on the USFWS *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011):

- Any suitable underground hole that has entrances of appropriate dimensions (5 to 8 inches in diameter).
- Any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that has appropriate dimensions for kit fox use.
- Atypical dens such as pipes, culverts, canal banks, and other man-made features.

The Project site was also assessed for use by special-status small mammals such as Nelson's antelope squirrel, Tulare grasshopper mouse, and roosting bats. While potential burrows for Nelson's Antelope Squirrel and Tulare grasshopper mouse were not mapped, the Project site was assessed for potential use by these species. Suitable habitat for special-status small mammals was documented. Focused surveys for Nelson's antelope squirrel, Tulare grasshopper mouse, and roosting bats were not performed within the Project site.

4.3 Field Survey Schedule

Table 1 lists the field surveys that were conducted in 2023-2025 and their respective timing.

Table 1. Field Survey Schedule

Survey	Parcels	Dates	Notes
General biological survey	Original	March 19-20, 2023	None.
General biological survey	Califland Corp	July 12, 2023	None.
General biological survey	Gen-Tie	January 10, 2024	None.
General biological survey	Woolf Parcel South Addition	July 10, 2025	None.
Protocol BUOW habitat assessment and burrow survey*	Original	March 19-20, 2023	Conducted concurrently with general biological survey in the original parcels.
Protocol BUOW habitat assessment and burrow survey*	Califland Corp	July 12, 2023 April 1, 2024	None.
Protocol BUOW habitat assessment and burrow survey*	Woolf Parcel South Addition	July 10, 2025	None.
Protocol BUOW habitat assessment*	Gen-Tie	January 10, 2024	None.
Protocol breeding season BUOW surveys*	Original	March 19-20, 2023 April 19, 2023 May 15, 2023 July 11, 2023	None.
Protocol breeding season BUOW surveys*	Califland Corp	April 1, 2024 April 24, 2024 May 30, 2024 June 26, 2024	None.
Protocol winter season BUOW survey*	Original, Califland Corp	January 10, 2024	None.
Raptor habitat assessment	Original, Califland Corp	March 19-20, 2023	Conducted concurrently with general biological survey in the original parcels.
Raptor habitat assessment	Woolf Parcel South Addition	July 10, 2025	Conducted concurrently with general biological survey in the Woolf Parcel South Addition.
Raptor nest surveys	Original, Califland Corp	April 19, 2023 May 15, 2023 July 11, 2023 April 1-2, 2024	None.

Survey	Parcels	Dates	Notes
		April 4, 2024 April 24-25, 2024 May 30, 2024 June 25-26, 2024	
BNLL habitat assessment/ Crotch's bumble bee habitat assessment	Original	March 19-20, 2023	Conducted concurrently with general biological survey in the original parcels.
BNLL habitat assessment/ Crotch's bumble bee habitat assessment	Califland Corp	July 12, 2023	Conducted concurrently with general biological survey in the Califland Corp parcels.
BNLL habitat assessment/ Crotch's bumble bee habitat assessment	Woolf Parcel South Addition	July 10, 2025	Conducted concurrently with general biological survey in the Woolf Parcel South Addition.
Special-status mammal habitat assessment	Original	March 19-20, 2023	Conducted concurrently with general biological survey in the original parcels. Also assessed during 2023 breeding season BUOW surveys.
Special-status mammal habitat assessment	Califland Corp	July 12, 2023	Conducted concurrently with general biological survey in the Califland Corp parcels. Also assessed during 2024 breeding season BUOW surveys.
Special-status mammal habitat assessment	Woolf Parcel South Addition	July 10, 2025	Conducted concurrently with general biological survey in the Woolf Parcel South Addition.
Rare plant surveys	Original	March 19-20, 2023 April 19, 2023 May 15, 2023 July 11, 2023	Conducted concurrently with the 2023 general biological survey and breeding season BUOW surveys in the original parcels.
Jurisdictional delineation*	Original, Califland Corp	April 17, 2023 January 10, 2024	Focused delineation at potential jurisdictional features.

* Results of the BUOW surveys and jurisdictional delineation are provided in separate reports.

5 FIELD SURVEY RESULTS

5.1 Vegetation Communities

Vegetation communities within the BSA were mapped during the surveys (Figure 4). No CDFW sensitive natural communities were found. Table 2 lists the vegetation communities found and their acreage within either the Project site or 150-meter buffer. Descriptions of the communities are provided below.

Table 1. Vegetation Communities

Vegetation Communities	Acres within Project Site	Acres within 150-meter buffer
Disturbed	883.4	205.3
Tamarix spp. Shrubland Semi-Natural Alliance	0.1	0.7
Retention Basin	3.6	0.7
Developed	104.8	78.5
Cultivated Row Crop	0.0	58.0
Cultivated Tree Orchard	124.1	551.2
Cultivated Vineyard	148.7	3.2
Oleander Hedgerow	0.0	0.4
Total	**1,264.7**	**898.0**

All Project parcels are used for active agricultural production. Throughout the season, the fallow fields in the original parcels were mowed of weeds, topsoil was disced, crops were planted, and then the crops were harvested. Areas used for agricultural production are labeled in Figure 4 and Table 2 as disturbed. Only one small natural vegetation community, *Tamarix* spp. Shrubland Semi-Natural Alliance, was found within the BSA. Retention basins and drainage ditches were also found bordering most agricultural fields. Transmission towers and poles were present within the Project site.

A majority of the 150-meter buffer was comprised of agricultural fields with disced topsoil, cultivated trees, and cultivated row crops. Retention basins and drainage ditches also occurred. A portion of the 150-meter buffer included developed areas of commercial and residential use. Transmission towers, transmission poles, and ornamental trees over 10 feet were also present in the 150-meter buffer.

The text below describes the vegetation communities observed in more detail.

Disturbed. Areas of recent or consistent topsoil disturbance were mapped as disturbed. The following text summarizes the disturbed areas within the BSA.

Woolf Parcel North: In March 2023, the disturbed area was a bare and disced field. In July, this area had been planted with rows of cultivated tomatoes (*Solanum lycopersicum*) lined with ditches. Each ditch had irrigation pipes installed. The tomato fields surround a graded dirt pad with a radio tower.

Woolf Parcel South: In March 2023, this area had over 100-percent cover of non-native species, with California mustard (*Callanthus lasiophilus*) and charlock (*Sinapis arvensis*) present as dominants. In July 2023, cultivated wheat (*Triticum* sp.) was being harvested from the same area. The wheat fields are surrounded by agricultural ditches with irrigation pipes and connected by culverts. These ditches routinely sprout weeds after harvest and have been treated with glyphosate.

Sageberry Parcel: In March 2023, this area was a bare, disced field with sparse coverage of cheeseweed (*Malva parviflora*). During the May 2023 survey, this parcel had been planted with row crops that were being irrigated.

Parcel 5: In March 2023, this parcel was overgrown with non-native species such as London rocket (*Sysimbrium irio*) and common groundsel (*Senecio vulgaris*) while others in the surrounding area

were completely bare. In July 2023, the field had disced topsoil and was left devoid of vegetation.

Califland Corp Parcels: Disturbed areas included a 4 to 5-foot-tall berm and a graded pad with stored equipment and groundwater pumps surrounding a retention basin. The walls of the berm were compact; two burrows were found in the berm.

Woolf Parcel South Addition: In July 2025, this disturbed area consisted of a bare and disced field.

Gen-Tie: One area was mapped as disturbed along the proposed gen-tie line. This area was located directly next to a dirt road and consisted of a fenced solar field.

150-meter buffer: Within the 150-meter buffer, disturbed areas consisted of recently plowed fields, dirt access roads, graded pads, and ruderal roadside areas. Plowed fields were primarily bare, with some presence of early-colonizing non-natives such as London rocket and common groundsel. Wall barley (*Hordeum murinum*) and other annual non-native species were also growing along road margins and on graded pads. Along Jayne Avenue (north of Califland Corp parcels and Woolf Parcel South Addition) there are bare areas and non-native weeds sprouting, and along Lassen Avenue (east of Califland Corp parcels) there is compacted topsoil with no vegetation cover.

***Tamarix* spp. Shrubland Semi-Natural Alliance.** This alliance was observed within the southwest corner of Woolf Parcel North and the gen-tie line and consisted of an approximately 600-foot-long stand of athel tamarisk (*Tamarisk aphylla*) with sparse eucalyptus (*Eucalyptus* sp.). The ground beneath the athel tamarisk canopy was covered by non-native, annual grasses and debris. In July 2025, no tamarisk trees were observed within this area.

Retention Basin. Two retention basins were located within the Woolf Parcel North: one in the southeast corner and one centered along the eastern boundary. Each basin was mostly unvegetated and held at least 1 inch of water during the surveys.

There were two retention basins in the northeast corner of the Woolf Parcel South. These two retention basins were connected by a pipe and cover a combined total length of about 0.2 miles. There was a single 10-foot tree of heaven (*Ailanthus altissima*) in the southern basin. Both basins had low vegetation cover (approximately 10 percent) and standing water. Plant species observed in the basins included cheeseweed, wall barley, London rocket, and shepard's purse (*Capsella bursa-pastoris*). The sloped walls of the northern retention basin had active and collapsed small-mammal burrows.

In addition, Woolf Parcel North and South each had one retention basin within the 150-meter buffer. Each basin was approximately 0.1 acres in size and had varying levels of standing water and vegetation cover. Ruderal vegetation such as Russian thistle (S*alsola tragus*) and cheeseweed was present in the basins.

One retention basin was observed in the Califland Corp parcels, centered on the eastern boundary (on the west side of Lassen Avenue). The retention basin was surrounded by a 4- to 5-foot-tall berm and a graded pad with stored equipment and groundwater pumps; these areas were mapped as disturbed. At the northern and southern ends of the retention basin were sparse clusters of bulrush (*Typha latifolia*) and sorghum grass (*Sorghum* sp.). A pump was adding water to the retention basin during the survey in July 2023. In January 2024, the pump had been turned off and the retention basin had no standing water.

Developed. Developed areas consisted of buildings, hardened dirt or paved roads, and other infrastructure. Bordering the southwest corner of Woolf Parcel North was fenced-off private property. This area was covered by concrete and gravel pads. No burrows or burrow surrogates were observed in this area. Within the 150-meter buffer of Woolf Parcel South and the Woolf Parcel South Addition are Jayne Avenue and the PG&E Gates substation that were also mapped as developed. Outside of the western

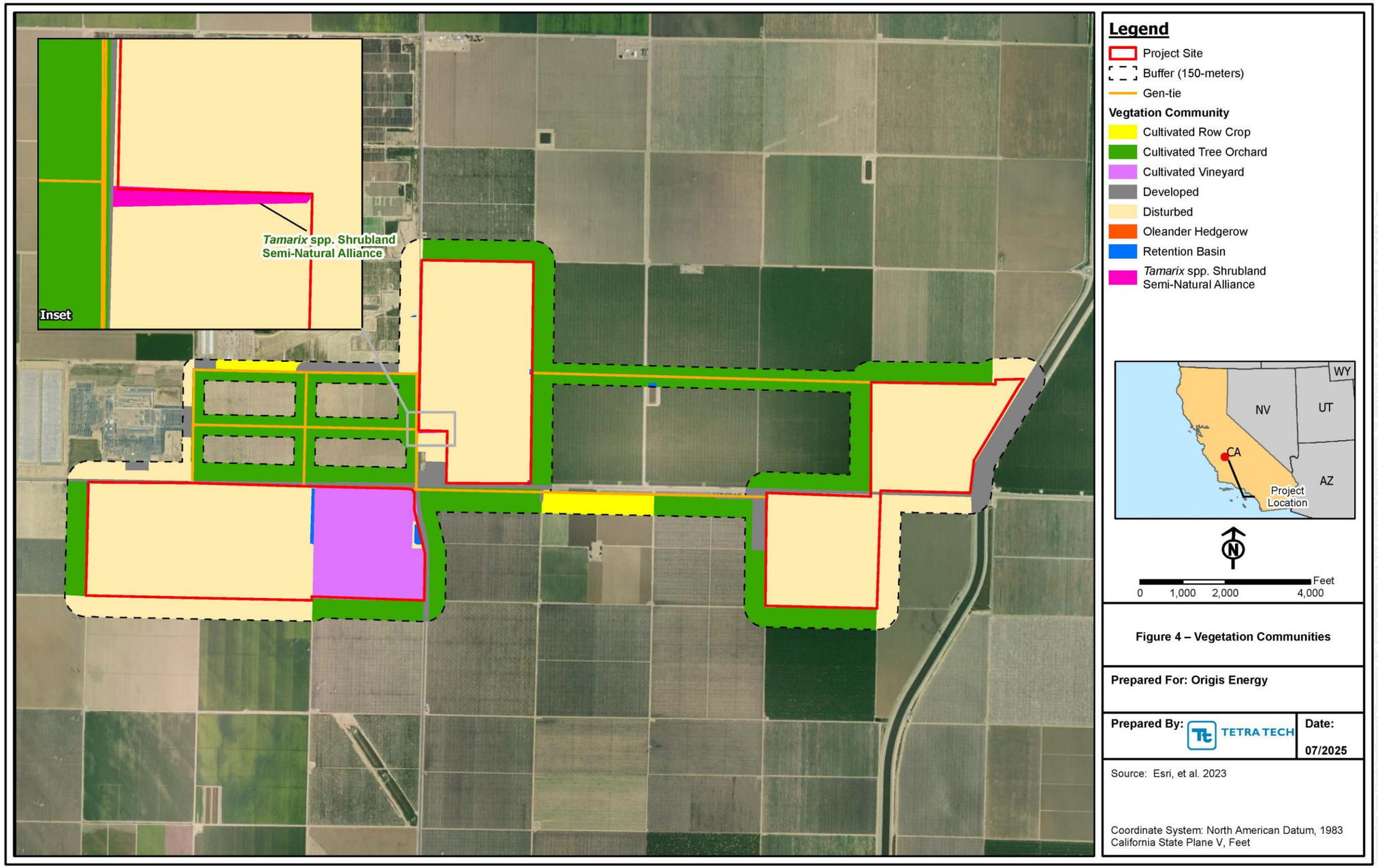
border of the Sageberry Parcel along the gen-tie line was a residential area and vehicle staging area with 10- to 15-foot-tall ornamental trees. In the northeastern corner of the 150-meter buffer of the Califland Corp parcels was private property that was fenced off. This area was covered by concrete and gravel pads and did not provide plant or wildlife habitat.

Cultivated Row Crops. Cultivated row crops occurred to the southeast of Woolf Parcel North. Underneath the row crops were several species of non-native weeds covering the ground, including prickly lettuce (*Lactuca serriola*) and wall barley. In the Califland Corp parcels, this community was comprised of fields of cultivated wheat that were being harvested into hay bales at the time of survey in July 2023. These fields in the Califland Corp parcels had agricultural ditches connected by culverts and pipes. One section of the gen-tie line between the Woolf Parcel North and Sageberry parcel consisted of allium row crops. These fields were treated with glyphosate to control weeds.

Cultivated Tree Orchards. Cultivated tree orchards occurred around each Project parcel and along each section of the gen-tie. This community consisted of rows of tangerine (*Citrus deliciosa*), carob (*Ceratonia siliqua*), almond (*Prunus dulcis*), and pistachio (*Pistacia vera*) trees under current agricultural production. These orchards used drip or sprinkler irrigation and were not surrounded by irrigation pipes or agricultural ditches.

Cultivated Vineyard. Cultivated vineyards bordered Woolf Parcel South to the east and were under current agricultural production. Cultivated vineyards also covered the majority of the Califland Corp parcels and consisted of wine grape row crops. The vineyards in the Woolf Parcel South and the Califland Corp parcels used drip-line irrigation and did not have irrigation ditches.

Oleander Hedgerow. In the Califland Corp parcels, oleander hedgerows bordered the northern and western portions of the site. This area provided suitable habitat for shrub-nesting bird species.


Tamarix spp. Shrubland Semi-Natural Alliance
Inset
Legend
Project Site
Buffer (150-meters)
Gen-tie
Vegtation Community
Cultivated Row Crop
Cultivated Tree Orchard
Cultivated Vineyard
Developed
Disturbed
Oleander Hedgerow
Retention Basin
Tamarix spp. Shrubland Semi-Natural Alliance
WY
NV
UT
CA
AZ
Project Location
N
Feet
0
1,000
2,000
4,000
Figure 4 – Vegetation Communities
Prepared For: Origis Energy
Prepared By:
TETRA TECH
Date:
07/2025
Source: Esri, et al. 2023
Coordinate System: North American Datum, 1983 California State Plane V, Feet
Not for Construction

5.2 Special-Status Species

5.2.1 Rare Plants

No special-status or rare plants were found during the surveys. Given the predominantly agricultural or ruderal landcovers within the Project site, it is unlikely to support rare plants. The properties within 3 miles of the Project site are used for agriculture or solar energy generation. Therefore, it is unlikely that there are nearby populations of rare plants that could colonize the Project site.

5.2.2 Blunt-Nosed Leopard Lizard

BNLL was not incidentally observed during 2023-2025 surveys. BNLL is a federally endangered and state fully protected species. BNLL has been previously documented approximately 1 mile southwest of the Project site, across Interstate 5 in 1968 (CDFW 2025a). The habitat where this previous observation was made has since been converted to agricultural land, and this population is listed as possibly extirpated (CDFW 2025a). BNLL are known to occur in sparsely vegetated saltbush scrub habitat in areas of low topographic relief. The Project site and surrounding parcels are very disturbed by active agricultural practices. Few to no prey sources and small-mammal burrows are available onsite. The scarcity in suitable small mammal habitat and preferred prey items indicates that the Project site provides low quality BNLL habitat. The level of habitat fragmentation surrounding the BSA and lack of suitable habitat on the Project site also does not likely support the presence of BNLL.

5.2.3 Crotch's Bumble Bee

Crotch's bumble bee was not incidentally observed during the 2023-2025 surveys. This species is a candidate for listing under the California Endangered Species Act (CESA). Crotch's bumble bee has been previously recorded approximately 9 miles east of the site in 1996 and 3 miles north of the site in 1971 (CDFW 2025a). There are no records of Crotch's bumble bee within 50 miles of the Project site in the Bumble Bee Watch database (Xerces Society for Invertebrate Conservation 2025).

Crotch's bumble bee inhabits grassland and scrub habitats in the Great Valley and its preferred food plant genera includes snapdragon (*Antirrhinum* sp.), phacelia (*Phacelia* sp.), clarkia (*Clarkia* sp.), tree poppy (*Dendromecon* sp.), poppy (*Eschscholzia* sp.), and buckwheat (*Eriogonum* sp.) (Koch et al. 2012). Crotch's bumble bee also utilizes landscaped and non-native nectar and pollen sources in addition to wildflowers. Out of these genera, only buckwheat is known to occur within the BSA and was mainly located very sparsely within the 150-meter buffer in disturbed and mostly bare areas adjacent to Jayne Avenue and the PG&E Gates Substation. Crotch's bumble bee is also known to prefer willows (*Salix* sp.), which occur in the BSA. Landscaped and non-native nectar sources occur within the vicinity of the Project site and could serve as a foraging resource for Crotch's bumble bee. Plants within the Project site that could serve as foraging resources for bumble bees include bristly fiddleneck (*Amsinckia tessellata*), California lilac (*Ceanothus* sp.), bindweed (*Convolvulus arvensis*), toyon (*Heteromeles arbutifolia*), oleander (*Nerium oleander*), willow weed (*Persicaria lapathifolia*), common pea (*Pisum sativum*), rosemary (*Rosemarinus officinalis*), weeping willow (*Salix babylonica*), black sage (*Salvia mellifera*), charlock (*Sinapis arvensis*), cultivated tomato (*Solanum lycopersicum*), fava bean (*Vicia faba*), and spring vetch (*Vicia sativa*). However, due to the level of topsoil disturbance on the Project site, the number of these flowering plants on the site (aside from species cultivated within agricultural fields, such as tomatoes and peas) is likely insufficient to support native bee colonies. In addition to minimal foraging opportunities, pesticides are used on the Project parcels and domestic honeybees (*Apis mellifera*) are used to pollinate nearby cultivated tree crops. Each of these factors have negative impacts on native bee populations (Hatfield et al. 2018) and ultimately reduce the likelihood of Crotch's bumble bee occurring within the Project site.

While little is known about the nesting and overwintering habits of Crotch's bumble bee, bumble bee experts from the Xerces Society for Invertebrate Conservation have confirmed that observed Crotch's bumble bee nests are often located in rodent burrows close to trees. There are few rodent burrows due to frequent discing and even fewer trees available for native bee ground-nesting in the Project site. One tree of heaven within a retention basin in the Califland Corp parcel could potentially serve as nesting and overwintering habitat, but the retention basin is consistently used for irrigation in the Project site and the tree is partially submerged during the Crotch's bumble bee active nesting season from April to August (CDFW 2023). Rodent burrows were observed within this retention basin in 2023 and 2024. Two large Athel tamarisk trees as well as an oleander hedgerow are also located on the Project site, and the vicinity around them could serve as nesting and overwintering habitat for Crotch's bumble bee.

5.2.4 Burrowing Owl

No BUOW individuals or their sign were observed during 2023-2025 surveys. The Project site is in the known distributional range of the BUOW, and the site contains suitable BUOW habitat due to low-growing vegetation. BUOW is a CDFW Species of Special Concern (SSC) and California Endangered Species Act candidate species. This species breeds and lives in burrows in valley and foothill grassland habitats, as well as agricultural areas or any open dry area with low vegetation. A total of 43 features suitable for BUOW use occur in the Project site, gen-tie, and 150-meter buffer: four burrows and 39 burrow surrogates in the form of culverts and pipes. Although no BUOW individuals or BUOW-specific sign were observed during the 2023-2025 surveys, whitewash was observed at two burrow surrogates in 2023. However, whitewash could be from any bird species utilizing the site. During the 2021 surveys of adjacent parcels, BUOW sign (i.e., pellets and whitewash) was observed at burrows/burrow surrogates adjacent to the California Aqueduct, within 1 mile of Parcel 5 (Tetra Tech 2022). BUOW is reliant on ground squirrels for burrow excavation, and no ground squirrels were incidentally observed during any surveys within the Project site. Ground squirrel and small mammal occupancy of the site is likely low due to frequent discing and other disturbances from agricultural practices. However, BUOW may attempt to colonize the existing burrows/burrow surrogates, or other suitable burrow habitat that becomes available, prior to the commencement of construction activities. Non-breeding season (1 September to 31 January) surveys may provide information on burrowing owl occupancy, but do not substitute for breeding season surveys because results are typically inconclusive. Results of the 2023-2025 BUOW surveys are detailed in the BUOW survey report, provided under separate cover.

5.2.5 Special-status Birds and Nests

One State threatened species, SWHA; two CDFW Species of Special Concern, northern harrier (*Circus hudsonius*) and loggerhead shrike; and two CDFW Watch List species, California horned lark (*Eremophila alpestris actia)* and merlin, were observed during the 2023-2025 surveys (Figure 5).

During spring surveys in 2023, adult SWHA individuals were observed perching in Woolf Parcel North and Sageberry Parcel. These individuals were not associated with a nest. While no SWHA nests were observed within 2 miles of the Project site in 2023, two active SWHA nests were found in 2024 within the 2-mile buffer. One nest was located within the 150-meter buffer in a stand of tamarisk trees adjacent to the southwestern portion of Woolf Parcel North, while the second nest was located in a tall, old orchard tree 2 miles south of the Project site on the boundary of the 2-mile buffer. No SWHA nests or individuals were observed during the 2025 survey, and the stand of tamarisk trees with a SWHA nest documented in 2024 was no longer present. SWHA is a state threatened species and is known to occur in valley and foothill grassland habitats. This species nests in California between April 1 and September 15. SWHA has been previously documented nesting about 3 miles north of the Project site in the Arroyo Pasajero Westside Detention Basin from 2005 to 2011 (CDFW 2025a). This species could forage on small mammals and invertebrates in disced fields within the BSA. There is potential for SWHA nesting on

transmission poles and towers in the Project site. SWHA nesting on poles and towers is not documented often, but it does occur in areas with limited options for preferred nesting habitat (e.g., riparian and isolated trees).

Northern harrier was not observed on the Project site but was observed during surveys within the 2-mile buffer. Northern harrier is a CDFW SSC. Northern harriers nest on the ground predominantly within patches of dense, often tall, vegetation and will use valley and foothill grassland, as well as weed fields and croplands. Harrier nesting appears to be associated with areas of undisturbed habitat of mixed-grass pasture, shortgrass pasture, and shrub-steppe (Slater 2005). This species has been observed in adjacent parcels during surveys conducted for other similar projects (Tetra Tech 2022). No nests of this species have been observed during previous surveys. The Project site consists of agricultural land that could be used by this species if fields remained untilled during the nesting season and supported tall vegetation; however, these areas are regularly disced. Therefore, there is no available nesting habitat for this species on the Project site.

Loggerhead shrike was observed within the 2-mile survey buffer during the surveys. The loggerhead shrike is a CDFW SSC. This species nests in trees and shrubs and uses arid scrub habitats. This species has been observed within the 150-meter buffer of the Project site during previous surveys of the Project vicinity in 2021 (Tetra Tech 2022). The athel tamarisk stand in Woolf Parcel North provides nesting habitat for this species.

California horned lark was observed foraging within the 2-mile buffer during the surveys. During the 2024 general biological survey, a small flock of California horned larks was observed foraging in the Califland Corp parcels and surrounding dirt roads. In California, California horned lark is a CDFW Watch List species. This species generally occupies open spaces such as grasslands, agricultural fields, airfields, and pastures. The disced fields in the BSA provide nesting habitat for this species.

One merlin was observed in the Sageberry Parcel during the surveys. In California, the merlin is not listed as an endangered or threatened species under CESA; however, it is a CDFW Watch List species (wintering). This species and its nests are also protected by various federal regulations, such as the Federal Migratory Bird Treaty Act (MBTA). Merlins do not nest in the San Joaquin Valley but are known to migrate through the region (CDFW 2005). During migration, merlins move through various habitats to find food and roost as they make their way to wintering grounds or breeding areas. This species could forage and roost on the Project site.

Raptors are protected under California State law (California Fish and Game Code, Sections 3503, 3503.5, 3505 and 3513, and California Code of Regulation, Title 14, Sections 251.1, 652 and 783-786.6). In 2023, active raptor nests were observed in the North and South Woolf Parcels. Native birds and their nests are protected under the MBTA. Three common raven (*Corvus corax*) nests were observed on transmission towers in the Project site. Two red-tailed hawk (*Buteo jamaicensis*) nests and two common raven nests were observed on transmission towers in the 150-meter buffer. Within the 2-mile buffer, a total of 38 active nests were found in 2023 (27 common raven, five great-horned owl, and six red-tailed hawk). Three inactive nests were observed in the BSA, and 15 inactive nests were found within the 2-mile buffer. Nest locations from 2023 are shown in Figure 6a. Additional information on these nests is provided in Section 5.4 and Table 6.

In 2024, one great-horned owl and two common raven nests were observed on transmission towers in the Project site. Two common raven nests and one Swainson’s hawk nest were found within the 150-meter buffer. One active nest of an unknown species and one inactive nest of an unknown species were found within the 150-meter buffer. Within the 2-mile buffer, 21 common raven nests, six red-tailed hawk nests,

four great-horned owl nests, and one Swainson's hawk nest were found. Six active nests of an unknown species and five inactive nests of an unknown species were found in the 2-mile buffer. Nests categorized as active nests of an unknown species had unidentifiable individuals within the nest, while no individuals were observed during any 2024 surveys at inactive nests of an unknown species. Nest locations from 2024 are shown in Figure 6b. No raptor nests or raptor nesting habitat was observed in the Woolf Parcel South Addition in 2025. Additional information on these nests is provided in Section 5.4 and Table 6.

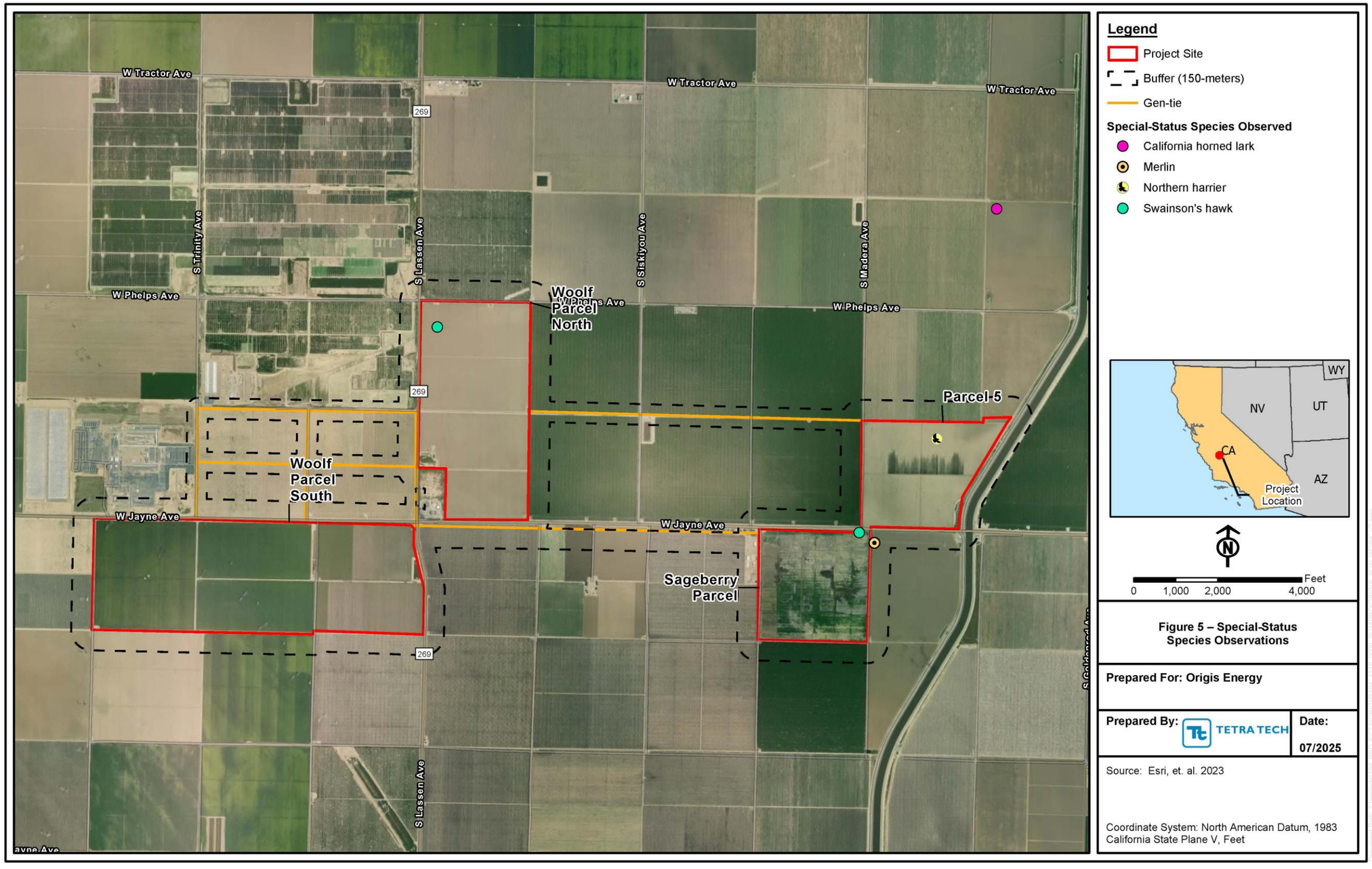
5.2.6 Special-status Mammals

The soils on the Project site are heavily disturbed by agricultural practices and are not considered suitable for special-status mammals, including the SJKF, Nelson's antelope squirrel, American badger, or Tulare grasshopper mouse. However, the Project site may provide foraging habitat for these species. SJKF is federally listed as endangered and state listed as threatened, Nelson's antelope squirrel is state listed as threatened, and American badger and Tulare grasshopper mouse are CDFW SSC. Additional information on these special-status mammals and roosting bats is provided in Section 5.5.

5.2.7 Summary of Special-status Species

Based on the 2023-2025 survey results, the potential to occur for each special-status plant and wildlife species documented in the vicinity of the BSA has been reviewed and updated. These species are presented in Table 3. Potential to occur determinations for each species are defined as follows:

- Low: recent records of the species do not exist in the vicinity of the Project site and there is limited suitable habitat on-site.
- Moderate: recent records of the species exist in the vicinity of the Project site or suitable habitat is present on-site.
- High: recent records of the species exist in the vicinity of the Project site and suitable habitat is present on-site.
- Observed: the species or its sign was observed during Project-specific surveys.



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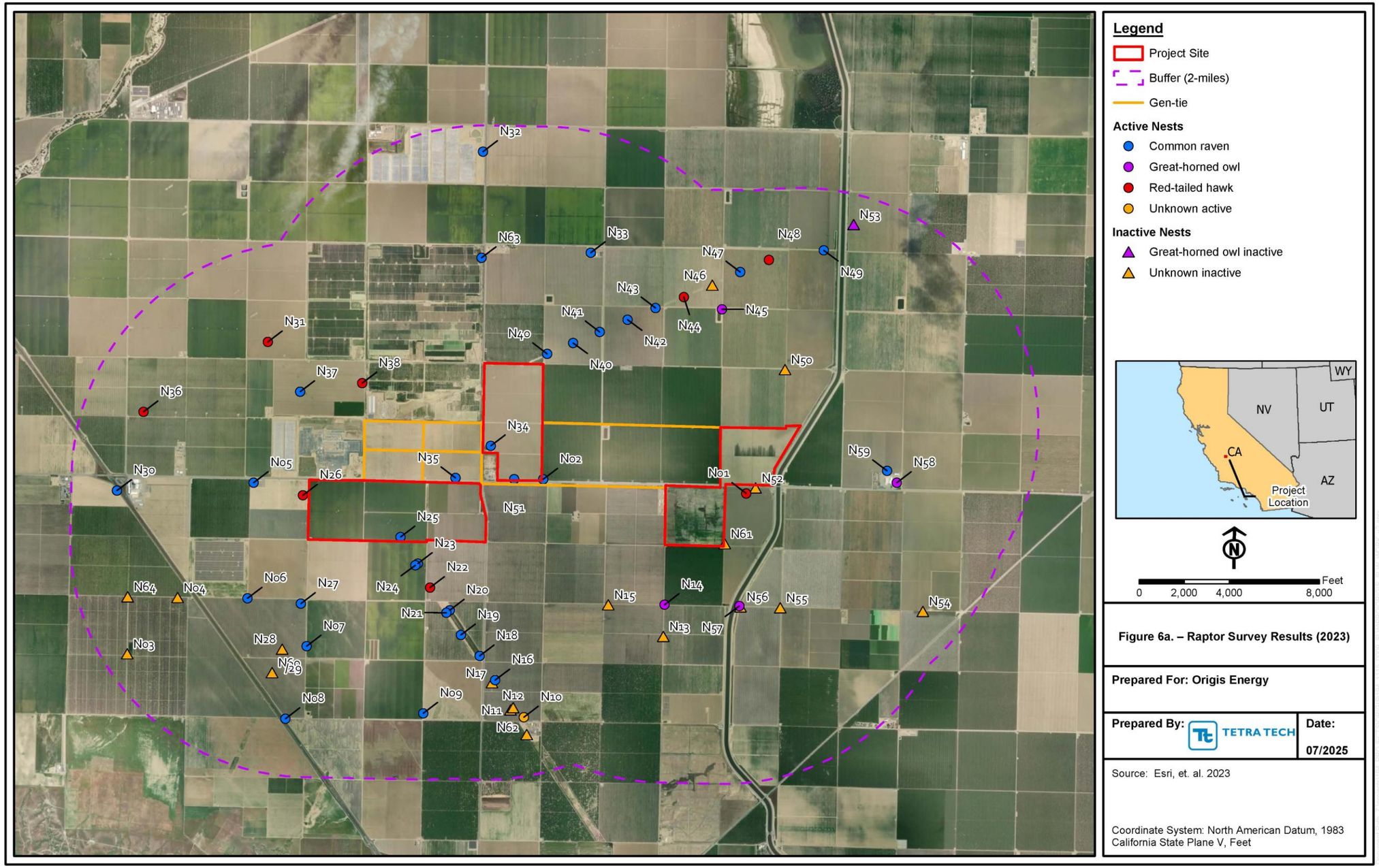

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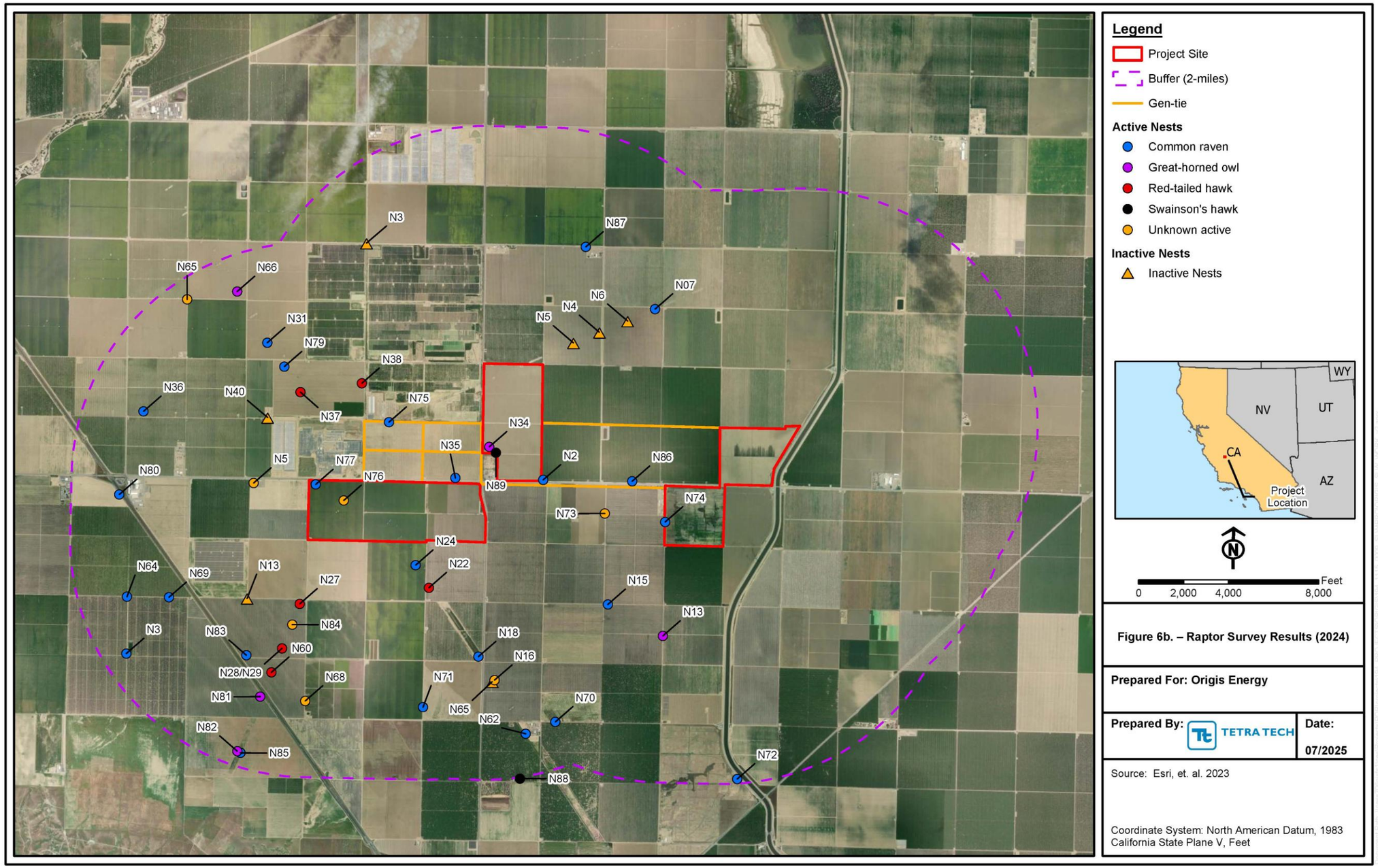

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Table 3. Special-status Species with Potential to Occur on the Project Site

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Potential to Occur
Plants					
Caulanthus californicus	California jewelflower	Endangered	Endangered, CRPR 1B.1	This plant species was not observed during surveys. The nearest existing population of this species was last observed in 2010 and is about 11 miles southwest from the Project site (CDFW 2025a). California jewelflower occurs in non-alkaline grasslands. Due to the level of disturbance on the Project site and distance from the nearest population, this plant is not expected to be found on the site.	Low
Monolopia congdonii	San Joaquin woollythreads	Endangered	CRPR 1B.2	This plant species was not observed during surveys. The nearest existing population was last observed in 2018 and is about 3 miles to the southwest of the site in the Kettleman Hills (CDFW 2025a). San Joaquin woolly-threads occurs in non-native grassland, valley saltbush scrub, and coast range saltbush scrub habitats. Due to the level of disturbance on the Project site and distance from the nearest population, this plant is not expected to be found on the site.	Low
Insects					
Bombus crotchii	Crotch's bumble bee	None	Candidate Endangered	Crotch's bumble bee was not incidentally observed during the 2023-2025 surveys. Crotch's bumble bee has been previously recorded approximately 9 miles west of the site in 1996 and 3 miles north of the site in 1971 (CDFW 2025a). Crotch's bumble bee inhabits grassland and scrub habitats in the Great Valley and its preferred food plant genera includes snapdragon, phacelia, clarkia, tree poppy, poppy, and buckwheat (Koch et al. 2012). Crotch's bumble bee also utilizes landscaped and non-native nectar and pollen sources in addition to wildflowers. Out of these genera, only buckwheat is known to occur minimally within the BSA. Crotch's bumble bee is also known to prefer willows, which do occur in the BSA. Landscaped and non-native nectar sources occur within the vicinity of the Project site and could serve as a foraging resource for Crotch's bumble bee. However, due to the level of topsoil disturbance on the Project site, the number of these flowering plants on the site (aside from species cultivated	Moderate

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Potential to Occur
				within agricultural fields, such as tomatoes and peas) is likely insufficient to support native bee colonies. In addition to minimal foraging opportunities, pesticides are used on the Project parcels and domestic honeybees are used to pollinate nearby cultivated tree crops. While little is known about the nesting and overwintering habits of Crotch's bumble bee, bumble bee experts from the Xerces Society for Invertebrate Conservation have confirmed that observed Crotch's bumble bee nests are often located in rodent burrows close to trees. Several locations with rodent burrows near trees and in retention basins could serve as nesting and overwintering habitat for this species in the BSA. Due to the availability of foraging and nesting/overwintering habitat, although limited, there is a moderate potential for Crotch's bumble bee to occur in the BSA.	
Reptiles					
Gambelia sila	blunt-nosed leopard lizard	Endangered	Endangered, FP	BNLL was not incidentally observed during the 2023-2025 surveys. BNLL has been previously documented approximately 1 mile southwest of the Project site, across Interstate 5 in 1968 (CDFW 2025a). The habitat where this previous observation was made has since been converted to agricultural land, and this population is listed as possibly extirpated (CDFW 2025a). The Project site and surrounding areas are very disturbed by active agricultural practices. The scarcity in suitable small mammal burrows and preferred prey items onsite indicates that the Project site provides low quality BNLL habitat.	Low
Birds					

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Potential to Occur
Athene cunicularia	burrowing owl	None	Candidate, SSC	While no BUOW individuals or BUOW-specific sign were observed during the 2023-2025 surveys, whitewash was observed at two burrow surrogates in 2023. However, whitewash could be from any bird species utilizing the site. BUOW is known to use agricultural areas or any open and dry area with low-lying vegetation. The nearest recorded observation of this species is approximately 1 mile south from the Project site in 2004 (CDFW 2025a). During surveys of adjacent parcels for other similar projects in 2021, BUOW sign was found near small mammal burrows about 0.5 mile east of Parcel 5 adjacent to the California Aqueduct (Tetra Tech 2022). Potential burrows/burrow surrogates that could be used by this species were found on all survey parcels. This species is unlikely to use actively cultivated or disced areas, but it could use adjacent areas.	Moderate for overwintering, foraging, and nesting
Buteo swainsoni	Swainson's hawk	None	Threatened	During the surveys in 2023, adult SWHA were observed perching in the North Woolf and Sageberry Parcels. Two active SWHA nests were found in 2024 within the 2-mile buffer. One nest was located within the 150-meter buffer in a stand of tamarisk trees adjacent to the southwestern portion of Woolf Parcel North, while the second nest was located in an old orchard tree 2 miles south of the Project site on the boundary of the 2-mile buffer. SWHA has been previously documented nesting approximately 3 miles north of the Project site in 2011 (CDFW 2025a). This species could forage for small mammals and invertebrates in cultivated and disced fields in the Project site. SWHA could nest on the transmission poles or transmission towers standing in the Project site.	Observed nesting within 150-meter buffer and 2-mile buffer; observed foraging onsite

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Potential to Occur
Circus hudsonius	northern harrier	None	SSC	Northern harrier was not observed on the Project site during the surveys but was observed within the 2-mile survey buffer. No northern harrier nests were observed during the surveys. The Project site lacks undisturbed habitat of mixed-grass pasture, shortgrass pasture, and/or shrub-steppe preferred by northern harriers for nesting (Slater 2005). Therefore, this species is unlikely to nest in the Project area.	Observed within 2-mile buffer (non-nesting); high potential for foraging onsite, no potential to nest onsite
Eremophila alpestris actia	California horned lark	None	WL	California horned lark was observed foraging in a disced field in Parcel 5 and Califland Corp parcels. No nests of this species were observed during surveys. There are no previous records for this species in the vicinity of the Project site in the CNDDB (CDFW 2025a). This species generally nests in open habitats, such as tilled agricultural fields. There is the possibility that this species could nest and forage within the freshly disced fields of the BSA.	Observed onsite (non-nesting); moderate potential for nesting
Falco columbarius	merlin	None	WL	This species was observed migrating through the Project site during the surveys. Merlin has been previously observed on several occasions within 3 miles of the Project site in 2005, 2015, 2017, and 2024 (CDFW 2025a; eBird 2025). This species does not breed in California, but it may forage within or near the Project site.	Observed onsite (non-nesting); no potential for nesting
Lanius ludovicianus	loggerhead shrike	None	SSC	Loggerhead shrike was observed in the 2-mile buffer during the 2023 surveys. This species has been documented approximately 2 miles south of the Project site in 2001 and has been observed within the 150-meter buffer of the site during previous nearby surveys (CDFW 2025a; Tetra Tech 2022). This species is most likely to nest or forage near patches of spined, saltbush shrubs (*Atriplex* sp.) and chain-link fencing. Loggerhead shrike could nest in the naturalized athel tamarisk habitat on Woolf Parcel North. This species could also forage throughout the entire Project site.	Observed within 2-mile buffer (non-nesting); high potential for foraging and nesting onsite

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Potential to Occur
Mammals					
Ammospermophilus nelsoni	Nelson's antelope squirrel	None	Threatened	Nelson's antelope squirrel or its sign was not incidentally observed during the 2023-2025 surveys. The nearest record of this species is about 2 miles west of the Project site, across Interstate 5, in 1944 (CDFW 2025a). Nelson's antelope squirrel inhabits grassland and shrubland habitat. During nearby BUOW surveys in 2021, small mammal scat was found at the entrance of dens in a berm bordering the California Aqueduct (about 0.5 mile from Parcel 5) (Tetra Tech 2022). This scat could not be attributed to a particular species of squirrel. Although it is possible for this species to be present within the Project site, it is unlikely due to the lack of suitable habitat as well as frequent discing and other active agricultural practices occurring on the site and surrounding areas.	Low
Onychomys torridus tularensis	Tulare grasshopper mouse	None	SSC	Tulare grasshopper mouse was not incidentally observed during the 2023-2025 surveys. This species has been previously observed about 2 miles south of the Project site in 1931 (CDFW 2025a). Tulare grasshopper mouse lives in underground burrows and requires an abundant source of invertebrates and seeds to sustain its diet. Suitable habitat for this species consists of grassland and shrubland communities. Frequent discing within the agricultural land in the Project site does not allow for suitable habitat for Nelson's antelope squirrel. Suitable habitat is not found on the Project site and few small mammal burrows were observed. Due to the high level of human disturbance and lack of suitable habitat, this species is not likely to occur in the Project site.	Low
Taxidea taxus	American badger	None	SSC	American badger or its sign was not incidentally observed during the 2023-2025 surveys. This species has been previously documented before 1950, approximately 3 miles south and north of the Project site (CDFW 2025a). American badgers can have expansive home ranges to meet foraging and shelter requirements. This species is also known to occupy disturbed agricultural fields, such as wheat fields (Ramey and Bourassa 2005). Therefore,	Low potential for foraging or denning

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary	Potential to Occur
				American badgers could forage on the site. However, due to the high level of disturbance from agricultural practices and a lack of suitable dens within the BSA and surrounding areas , this species is unlikely to den on the Project site.	
Vulpes macrotis mutica	San Joaquin kit fox	Endangered	Threatened	SJKF or its sign was not incidentally observed during the 2023-2025 surveys. Old scat, originating from a small canid, was observed at the entrance of a den during surveys in 2021 of adjacent parcels for other similar projects (Tetra Tech 2022). These observations were made along the California Aqueduct, which is less than 0.5 miles from Parcel 5. There are also six previously recorded observations of SJKF within 2 miles of the Project site from 1981 (CDFW 2025a). Within the Central Valley, SJKF are known to forage within 1 to 2 miles of their dens in disturbed habitats. These disturbed habitats include land that has been modified by row crops and orchards (Warrick et al. 2007). Since the Project site is actively disturbed by discing for agricultural purposes, which limits the amount of dens within the Project site, and because the burrow surrogates (culverts and pipes) are being actively used for agricultural irrigation, SJKF dens are unlikely to be established prior to Project implementation. However, since Parcel 5 and the Sageberry Parcel are within 2 miles of known SJKF dens, there is potential for this species to forage on the Project site.	Moderate for foraging; Low for denning

* Closest occurrence records are from the CNDDB (CDFW 2025a).

Federally listed endangered: an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Federal delisted: an animal or plant species that has been delisted from endangered or threatened status for reasons such as recovery, extinction, new evidence of additional populations, and other reasons.

State-listed endangered: “endangered species” means a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease (Fish and Game Code § 2062).

State-listed threatened: "threatened species" means a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts (Fish and Game Code § 2067).

State candidate endangered: As a candidate for listing, the species is temporarily afforded the same protections as a state-listed endangered species.

SSC = CDFW Species of Special Concern: “Species of Special Concern” means a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following criteria:

- Is extirpated from the State or, in the case of birds, is extirpated in its primary season or breeding role;
- Is federally listed, but not State-listed, as threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;
- Is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; and/or
- Has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status.

WL = CDFW Watch List: animal taxa that were previously designated as SSC but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

CRPR = California Rare Plant Rank:

1B = Plants rare, threatened, or endangered in California and elsewhere.
2B = Plants rare, threatened, or endangered in California but more common elsewhere.
3 = Plants about which more information is needed (Review List).
4 = Plants of limited distribution (Watch List).
0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat).
0.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat).

5.3 Plants and Wildlife

Plant and wildlife species observed in the BSA during the surveys were recorded. These species are listed in Tables 4 and 5. Observed special-status species are indicated with bold text.

Table 4. Plant Species Observed Within BSA

Scientific Name	Common Name	Native / Non-Native
Ailanthus altissima	Tree of heaven	Non-native
Allium cepa	Cultivated onion	Non-native
Allium fistulosum	Cultivated scallion	Non-native
Amaranthus blitoides	Mat amaranth	Native
Amsinckia tessellata	Bristly fiddleneck	Native
Baccharis pilularis	Coyote brush	Native
Brassica oleracea	Cultivated mustards	Non-native
Bromus diandrus	Ripgut brome	Non-native
Bromus madritensis	Foxtail chess	Non-native
Bromus rubens	Red brome	Non-native
Caulanthus lasiophyllus	California mustard	Native
Callistemon citrinus	Crimson bottlebrush	Non-native
Capsella bursa-pastoris	Shepherd's purse	Non-native
Ceanothus sp.	California lilac	Native
Ceratonia siliqua	Carob tree	Non-native
Citrus deliciosa	Tangerine	Non-native
Convolvulus arvensis	Bindweed	Non-native
Datura stramonium	Jimsonweed	Non-native
Echinochloa crus-galli	Barnyard grass	Non-native
Erigeron bonariensis	Flax-leaved horseweed	Non-native
Erigeron canadensis	Horseweed	Native
Eriogonum sp.	Buckwheat	Native
Erodium sp.	Filaree	Non-native
Eucalyptus sp.	Eucalyptus	Non-native
Heteromeles arbutifolia	Toyon	Native
Hordeum murinum	Wall barley	Non-native
Lactuca serriola	Prickly lettuce	Non-native
Leptochloa fusca	Sprangletop	Native
Malva parviflora	Cheeseweed	Non-native
Nerium oleander	Oleander	Non-native
Opuntia sp.	Prickly pear	Native
Persicaria lapathifolia	Willow weed	Native
Pistacia vera	Cultivated pistachio	Non-native
Pisum sativum	Common pea	Non-native
Polypogon monspeliensis	Annual beard grass	Non-native
Prunus dulcis	Cultivated almond	Non-native
Rosemarinus officinalis	Rosemary	Non-native
Salix babylonica	Weeping willow	Non-native
Salsola tragus	Russian thistle	Non-native
Salvia mellifera	Black sage	Native
Senecio vulgaris	Common groundsel	Non-native
Sinapis arvensis	Charlock	Non-native
Solanum lycopersicum	Cultivated tomato	Non-native
Sonchus olareasis	Common sow thistle	Non-native
Sisymbrium irio	London rocket	Non-native
Tamarix aphylla	Athel tamarisk	Non-native
Tamarix ramosissima	Salt cedar	Non-native
Tribulus terrestris	Puncture vine	Non-native
Triticum aestivum	Common wheat	Non-native
Typha latifolia	Bulrush	Native
Vicia faba	Fava bean	Non-native

Scientific Name	Common Name	Native / Non-Native
Vicia sativa	Spring vetch	Non-native
Vitis vinifera	Cultivated wine grape	Non-native
Washingtonia robusta	Mexican fan palm	Non-native

Table 5. Wildlife Species Observed Within BSA

Scientific Name	Common Name	Federal/ State Status	Location Observed
Invertebrates			
Aedes sp.	Mosquito	None	BSA
Apis mellifera	Domestic honeybee	None	BSA
Eleodes sp.	Darkling beetle	None	BSA
Enallagma sp.	American bluet	None	BSA
Libellula sp.	Skimmer	None	BSA
Myrmecocystus sp.	Honeypot ant	None	BSA
Pogonomyrmex sp.	Harvester ant	None	BSA
Sympetrum sp.	Meadowhawk	None	BSA
Amphibians			
Pseudacris sierra	Sierran treefrog	None	BSA
Reptiles			
Sceloporus occidentalis biseriatus	San Joaquin fence lizard	None	BSA
Birds			
Agelaius phoeniceus	Red-winged blackbird	None	BSA
Anas platyrhynchos	Mallard	None	2-mile buffer
Aphelocoma californica	California scrub jay	None	BSA
Bombycilla cedrorum	Cedar waxwing	None	BSA
Bubo virginianus	Great-horned owl	None	2-mile buffer
Buteo jamaicensis	Red-tailed hawk	None	BSA
Buteo swainsoni	**Swainson's hawk**	**Threatened**	**BSA (non-nesting)**
Catharus guttatus	Hermit thrush	None	BSA
Charadrius vociferus	Killdeer	None	BSA
Chondestes grammacus	Lark sparrow	None	BSA
Circus hudsonius	**Northern harrier**	**SSC**	**2-mile buffer (non-nesting)**
Corvus corax	Common raven	None	BSA
Eremophila alpestris actia	**California horned lark**	**SSC**	**BSA (foraging)**
Euphagus cyanocephalus	Brewer's blackbird	None	BSA
Falco columbarius	**Merlin**	**WL**	**BSA (non-nesting)**
Falco sparverius	American kestrel	None	2-mile buffer
Haemorhous mexicanus	House finch	None	BSA
Himantopus mexicanus	Black-necked stilts	None	2-mile buffer
Lanius ludovicianus	**Loggerhead shrike**	**SSC**	**2-mile buffer (non-nesting)**
Mimus polyglottos	Northern mockingbird	None	BSA
Passer domesticus	House sparrow	None	BSA
Petrochelidon pyrrhonota	Cliff swallow	None	2-mile buffer
Quiscalus mexicanus	Great-tailed grackle	None	BSA
Sayornis nigricans	Black phoebe	None	BSA
Sialia mexicana	Western bluebird	None	BSA
Streptopelia decaocto	Eurasian collared dove	None	BSA
Sturnella neglecta	Western meadowlark	None	BSA
Sturnus vulgaris	European starling	None	BSA
Turdus migratorius	American robin	None	BSA
Tyrannus verticalis	Western kingbird	None	BSA
Tyto alba	Barn owl	None	BSA
Zenaida macroura	Mourning dove	None	BSA
Zonotrichia leucophrys	White-crowned sparrow	None	BSA
Mammals			
Canis latrans *	Coyote *	None	BSA
Didelphis virginiana *	Opossum *	None	BSA

Scientific Name	Common Name	Federal/ State Status	Location Observed

* Only sign of this species was observed.

5.4 Raptor Habitat Assessment and Nest Surveys

A raptor habitat assessment and nest surveys were conducted on and within 2-miles of the Project site in 2023 and 2024. Potential raptor habitat on the Project site consists of transmission poles and towers. Nests that were observed in 2023 but not 2024 could not be located during the raptor surveys in 2024. Five active common raven nests were found in the Project site in 2023 and 2024 on several of these transmission towers, one of which was a great-horned owl nest in 2024 (refer to N25, N34, N51, N74, and N75 in Figure 6a, Figure 6b, and Table 6).

Within the 2-mile buffer, nesting raptor habitat consists of transmission poles, transmission towers, a grove of eucalyptus and salt cedar (*Tamarix ramosissima*) trees, cottonwood trees (*Populus fremontii*) in the Arroyo Pasajero Detention Basin, and several isolated trees over 10-feet tall. These tree habitats are located outside of the BSA. Numerous active red-tailed hawk, active great-horned owl, active common raven, and inactive nest structures were observed within the 2-mile buffer. Two active Swainson's hawk nests were found in 2024; one located within the 150-meter buffer and the second located approximately 2 miles from the Project site, on the 2-mile buffer boundary.

Details on all nests found during the survey are provided in Table 6 and locations are shown in Figure 6.

Table 6. Raptor Survey Results

Nest ID	Location	Scientific Name	Common Name	Year Observed	Notes (Year Observed)
N1	150-meter buffer	*Buteo jamaicensis*	Red-tailed hawk	2023	Successfully fledged (2023).
N2	150-meter buffer	*Corvus corax*	Common raven	2023; 2024	Successfully fledged (2023). Active nest (2024).
N3	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
		Corvus corax	Common raven	2024	Active nest (2024).
N4	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
N5	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Unknown		2024	Active nest with unknown adult in nest during early April survey. No individuals observed in nest during late April, May, and June surveys (2024).
N6	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Unknown		2024	Inactive nest during early April survey, nest abandoned by May survey (2024).
N7	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N8	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N9	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N10	2-mile buffer	Unknown		2023	No birds observed, but nest apparently constructed this year (2023).
N11	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
N12	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
N13	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
		Bubo virginianus	Great-horned owl	2024	Active nest with one great-horned owl on nest (2024).
N14	2-mile buffer	*Bubo virginianus*	Great-horned owl	2023	Active nest (2023).

Nest ID	Location	Scientific Name	Common Name	Year Observed	Notes (Year Observed)
N15	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
		Corvus corax	Common raven	2024	Active nest (2024).
N16	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Unknown		2024	No individuals observed in nest in April and May. Unknown raptor flew out of nest in June (2024).
N17	2-mile buffer	Unknown		2023; 2024	Inactive stick nest during all surveys (2023 and 2024).
N18	2-mile buffer	*Corvus corax*	Common raven	2023; 2024	Active nest (2023 and 2024).
N19	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N20	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N21	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N22	2-mile buffer	*Buteo jamaicensis*	Red-tailed hawk	2023; 2024	Active nest. Nest is degraded (2023). Active nest with one red-tailed hawk on nest (2024).
N23	2-mile buffer	*Corvus corax*	Common raven	2023	Nest likely to have successfully fledged. Three juvenile ravens were observed below the nest in the transmission tower (2023).
N24	2-mile buffer	*Corvus corax*	Common raven	2023; 2024	Nest likely to have successfully fledged. Three juvenile ravens were observed in the adjacent transmission tower (2023). Three active raven nests (2024).
N25	Project site	*Corvus corax*	Common raven	2023	Active nest (2023).
N26	150-meter buffer	*Buteo jamaicensis*	Red-tailed hawk	2023	Active nest (2023).
N27	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Buteo jamaicensis	Red-tailed hawk	2024	Active nest with one red-tailed hawk on nest (2024).
N28/N29	2-mile buffer	Unknown		2023	Two inactive stick nests in the same transmission tower (2023).
		Buteo jamaicensis	Red-tailed hawk	2024	Active nest with one red-tailed hawk on nest (2024).
N30	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N31	2-mile buffer	*Buteo jamaicensis*	Red-tailed hawk	2023	Active nest. Hawk was observed incubating the nest (2023).
		Corvus corax	Common raven	2024	Active nest (2024).
N32	2-mile buffer	*Corvus corax*	Common raven	2023	Successfully fledged (2023).
N33	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N34	Project site	*Corvus corax*	Common raven	2023	Successfully fledged (2023).
		Bubo virginianus	Great-horned owl	2024	Active nest with one great-horned owl in nest (2024).
N35	2-mile buffer	*Corvus corax*	Common raven	2023; 2024	Active nest (2023 and 2024).
N36	2-mile buffer	*Buteo jamaicensis*	Red-tailed hawk	2023	Active nest (2023).
		Corvus corax	Common raven	2024	Active nest (2024).
N37	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest. Raven was observed incubating the nest (2023).

Nest ID	Location	Scientific Name	Common Name	Year Observed	Notes (Year Observed)
		Buteo jamaicensis	Red-tailed hawk	2024	Active nest with one red-tailed hawk in nest (2024).
N38	2-mile buffer	*Buteo jamaicensis*	Red-tailed hawk	2023; 2024	Successfully fledged (2023). Active nest with two red-tailed hawks in nest (2024).
N39	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N40	150-meter buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Unknown		2024	Inactive stick nest during all surveys (2024).
N41	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Unknown		2024	Inactive stick nest during all surveys (2024).
N42	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
		Unknown		2024	Inactive stick nest during all surveys (2024).
N43	2-mile buffer	*Corvus corax*	Common raven	2023; 2024	Active nest (2023 and 2024).
N44	2-mile buffer	*Buteo jamaicensis*	Red-tailed hawk	2023	Active nest (2023).
N45	2-mile buffer	*Bubo virginianus*	Great-horned owl	2023	Active nest. Nest was observed to have a fledgling and adult present (2023).
N46	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
N47	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N48	2-mile buffer	*Buteo jamaicensis*	Red-tailed hawk	2023	Successfully fledged (2023).
N49	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N50	Project site	Unknown		2023	Inactive stick nest (2023).
N51	Project site	*Corvus corax*	Common raven	2023	Active nest (2023).
N52	150-meter buffer	Unknown		2023	Inactive stick nest (2023).
N53	2-mile buffer	*Bubo virginianus*	Great-horned owl	2023	Active nest. Nest was destroyed on May 15, 2023 (2023).
N54	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
N55	2-mile buffer	Unknown		2023	Active nest. Nest was removed and is no longer present (2023).
N56	2-mile buffer	Unknown		2023	Active nest. Nest is degraded (2023).
N57	2-mile buffer	*Bubo virginianus*	Great-horned owl	2023	Nest was observed to have a fledgling and adult present (2023).
N58	2-mile buffer	*Bubo virginianus*	Great-horned owl	2023	Active nest (2023).
N59	2-mile buffer	*Corvus corax*	Common raven	2023	Active nest (2023).
N60	2-mile buffer	Unknown		2023	Inactive stick nest (2023).
		Buteo jamaicensis	Red-tailed hawk	2024	Active nest with two red-tailed hawks in nest (2024).
N61	150-meter buffer	Unknown		2023	Inactive stick nest (2023).
N62	2-mile buffer	*Corvus corax*	Common raven	2023; 2024	Successfully fledged (2023). Active (2024).
N63	2-mile buffer	Unknown		2023	Nest was removed and is no longer present (2023).
N64	2-mile buffer	*Corvus corax*	Common raven	2023; 2024	Active nest (2023 and 2024).
N65	2-mile buffer	Unknown		2024	Unknown adult observed in nest during early April survey. No individuals observed in

Nest ID	Location	Scientific Name	Common Name	Year Observed	Notes (Year Observed)
					nest during other surveys (2024).
N66	2-mile buffer	*Bubo virginianus*	Great-horned owl	2024	Active nest. One great-horned owl on nest in power tower (2024).
N67	2-mile buffer	Unknown		2024	Stick nest in willow tree, suspected red-tailed hawk nest. Two red-tailed hawks perched nearby. Nest inactive in May and June (2024).
N68	2-mile buffer	Unknown		2024	Unknown adult observed in nest during early April survey. Nest no longer present during May survey (2024).
N69	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N70	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N71	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N72	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N73	2-mile buffer	Unknown		2024	Unknown adult observed in nest during early April survey. No individuals observed in nest during all other surveys (2024).
N74	Project site	*Corvus corax*	Common raven	2024	Active nest (2024).
N75	Project site	*Corvus corax*	Common raven	2024	Active nest (2024).
N76	150-meter buffer	Unknown		2024	Unknown adult observed in nest during May survey. No individuals observed in nest during all other surveys (2024).
N77	150-meter buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N78	2-mile buffer	Unknown		2024	Inactive stick nest in early April. Nest gone in late April (2024).
N79	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N80	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N81	2-mile buffer	*Bubo virginianus*	Great-horned owl	2024	Active nest. One great-horned owl on nest in power tower (2024).
N82	2-mile buffer	*Bubo virginianus*	Great-horned owl	2024	Active nest. One great-horned owl on nest in power tower (2024).
N83	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N84	2-mile buffer	Unknown		2024	One unknown adult observed during late April and May surveys, unable to identify due to lack of visibility. No individuals observed in nest during June survey (2024).
N85	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N86	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N87	2-mile buffer	*Corvus corax*	Common raven	2024	Active nest (2024).
N88	2-mile buffer	*Buteo swainsoni*	Swainson's hawk	2024	Active nest in tall orchard tree, observed during late April survey. Two adult Swainson's hawks observed, one incubating nest and second nest guarding from a

Nest ID	Location	Scientific Name	Common Name	Year Observed	Notes (Year Observed)
					nearby tree or power pole in April and May. One nestling observed in June. Success of nest was not observed (2024).
N89	150-meter buffer	*Buteo swainsoni*	Swainson's hawk	2024	Active nest in tamarisk (*Tamarix* sp.) tree stand with at least one successful fledgling, one Swainson's hawk observed landing in nest. One adult and one juvenile Swainson's hawk were observed competing with a red-tailed hawk by the stand of trees in June, nest was not discovered until this event during the June survey (2024).

5.5 Special-Status Mammal Habitat Assessment

No SJKF, American badger, Nelson's Antelope squirrel, Tulare grasshopper mouse, roosting bats, or their sign were incidentally observed during surveys within the BSA. Most of the Project site supports row crops that are actively irrigated. Saturated soils are not suitable for burrowing mammals. Suitable habitat for burrowing mammals is present within the disturbed areas of the BSA, particularly the retention basins found in the BSA. However, retention basins in the BSA were found to consistently contain water during the spring and summer seasons of 2023 and 2024 between April and July, further reducing the amount of suitable habitat in the BSA for special-status mammals.

SJKF and American badger can have expansive home ranges within foothill and grassland communities. Within the Central Valley, SJKF are known to forage in habitats that have been modified by row crops and orchards within 1 to 2 miles of their dens (Warrick et al. 2007). American badger is known to forage on the outskirts of cultivated wheat fields (Ramey and Bourassa 2005). Two soil dens and 29 den surrogates, including 10 culverts and 19 pipes, were found in the BSA that are an appropriate size for SJKF. Although no natural dens were found during 2023-2025 surveys that were the appropriate size for American badger, both SJKF and American badger could migrate through the BSA and dig dens at any time. However, active agricultural practices within the BSA have resulted in regular ground disturbance from discing, weed mowing, digging or filling ditches, and grading access roads. Any dens dug by SJKF or American badger would likely be negatively affected by agricultural practices which may discourage denning on the site by these species. Several den surrogates present in the BSA that could serve as SJKF den surrogates were used for irrigation and were partially buried in mud, so were unsuitable for SJKF denning. American badger is not known to use den surrogates, so no suitable American badger dens were observed in the BSA. Given this high level of human activity, it is unlikely that SJKF or American badger would den at the site. There is potential for SJKF to forage on the site because previously recorded dens are within 2 miles of the Sageberry Parcel and Parcel 5 (CDFW 2025a). Potential dens found during the surveys that could be used by SJKF or American badger are included in Table 7. Locations and photos of the potential dens are also provided in the BUOW report.

Nelson's Antelope squirrel is not known to inhabit areas of agricultural cultivation (Harris and Stearns 1991), and use of insecticides has contributed to regional declines of Tulare grasshopper mouse

(California State University Stanislaus 2023). While some small mammal burrows were found in the Woolf parcels, the Califland Corp parcels, and the 150-meter buffer near trees and within retention basins, there is no suitable native habitat to support these species. While rodenticides are not used on the Project parcels, frequent discing and other agricultural practices have greatly limited rodent presence in agricultural areas within the BSA. Habitats surrounding the BSA are fragmented and highly disturbed. Therefore, Nelson's antelope squirrel and Tulare grasshopper mouse are not likely to occur within the BSA.

While roosting bat species have not been documented within the Project vicinity, it is possible for roosting bats to occur in the BSA. Bats are known to roost within trees, caves, mines, and man-made structures. There are no caves or mines within the BSA, as well as few trees. Bats could use the few existing trees as well as buildings and other man-made structures on the BSA as roosting habitat. Foraging habitat for bats includes agricultural land. Bats could forage on the BSA and in the Project vicinity within agricultural fields, orchards, vineyards, hedgerows, and retention basins.

Table 7: Potential Mammal Dens and Den Surrogates

Den ID	Diameter (inches)	Mammal Sign Observed	Size Suitable for Kit Fox	Size Suitable for American Badger	Notes
B01	5" x >59"	No	✓		Three burrows along the inner banks of a retention basin. Most burrows have collapsed due to water erosion (May 15, 2023). There is at least 2 inches of standing water in the basin (July 12, 2023).
B02	5" x >59"	No	✓		Burrow located under cement and gravel (March 20, 2023).
B03[2]	5" x >59"	No			Two burrows inside retention basin meet BUOW size requirements. There is standing water in the retention basin (July 12, 2023). No standing water was present during the winter season BUOW survey (January 10, 2024). Most burrows in the basin are less than 3-inches and are collapsed (January 10, 2024). Water was present in the retention basin but one burrow was visible (April 1, 2024; April 24, 2024; May 30, 2024). Burrow appears to have collapsed (June 26, 2024).
B04[2]	5" x >59"	No	✓		One burrow that meets the size requirement for BUOW inside a retention basin (July 12, 2023). A very small amount of standing water was present during the winter season BUOW survey (January 10, 2024). Water was present in the retention basin but burrow was visible (April 1, 2024; April 24, 2024; May 30, 2024; June 26, 2024).
C01	10" x >59"	No	✓		Culvert was submerged in water (March 20, 2023). Culvert was exposed from water (May 15, 2023). Some standing water and mud filled

Den ID	Diameter (inches)	Mammal Sign Observed	Size Suitable for Kit Fox	Size Suitable for American Badger	Notes
					the bottom of the basin (July 12, 2023).
C02[1]	20" x >59"	No	✓		None.
C03[1]	20" x >59"	No	✓		None.
C04	22" x >59"	No	✓		Water was flowing through the ditch (July 12, 2023). No water was flowing during the winter season BUOW survey (January 10, 2024).
C05[1]	22" x >59"	No	✓		Partially buried with sand (March 20, 2024).
C06[1]	22" x >59"	No	✓		Buried about halfway through with sand (March 19, 2023). Completely filled in with dirt (April 1, 2024).
C07	22" x >59"	No	✓		Standing water present (April 17, 2023). Water was running through this culvert. There is at least 6 inches of standing water in the basin (July 12, 2023 and January 10, 2024).
C08	22" x >59"	No	✓		Pipes lead into a retention basin. Standing water observed (April 17, 2023). Pipe was half-filled with eroded dirt (May 15, 2023). Water was running through the culvert (July 12, 2023). Small pool of water in the culvert opening (January 10, 2024).
C09	22" x >59"	No	✓		Partially buried with eroded soil (March 20, 2023). Standing water observed (April 17, 2023). Ditch and culvert were filled with flowing water (July 12, 2023). No water observed within culvert (January 10, 2024).
C10	22" x >59"	No	✓		Partially buried with eroded soil (March 20, 2023). Standing water observed (April 17, 2023). Irrigated water was running through pipe (July 12, 2023). No water running through culvert (January 10, 2024).
C11[1,2]	22" x >59"	No			Culvert runs through a ditch filled with standing water. Over half of the culvert is buried (July 12, 2023).
C12[2]	22" x >59"	No			Culvert runs through a ditch filled with standing water. Over half of the culvert is buried (July 12, 2023). Culvert blocked by debris (April 1, 2024). Water flowing through culvert (April 24, 2024). Culvert is completely buried, water may be flowing through underground (May 30, 2024). Water flowing through culvert (June 26, 2024).
P01[1]	4.5" x >59"	No			Three pipes total. Canid scat, not from SJKF, at pipe entrance (January 9, 2024).
P02[1]	10" x >59"	No	✓		None.
P03[1]	10" x >59"	No	✓		Two pipes total.
P04	10" x >59"	No	✓		Four pipes total.

Den ID	Diameter (inches)	Mammal Sign Observed	Size Suitable for Kit Fox	Size Suitable for American Badger	Notes
P05	16" x >59"	No	✓		None.
P06	14" x >59"	No	✓		Two pipes total.
P07	10" x >59"	No	✓		Four pipes total.
P08	5" to 10" x >59"	No	✓		Seven pipes total. Water was flowing out of a pipe (July 12, 2023 and January 10, 2024).
P09[1]	20" x >59" 10" x >59"	No	✓		Five pipes total.
P10[1]	10" to 22" x >59"	No	✓		Five pipes total.
P11	4" x >59"	No			Active irrigation at several pipes (January 10, 2024).
P12	10" x >59"	No			Dozens of stored irrigation pipes (March 20, 2023). The stack of pipes was removed (May 15, 2023). Location of pipes moved to several hundred feet away (January 10, 2024).
P13	22" x >59"	Opossum tracks	✓		Two pipes lead into a retention basin. Water was flowing out of the pipe and there was at least 2 inches of standing water in the basin (July 12, 2023).
P14	10" to 12" x >59"	No	✓		Six pipes total. No sign. Whitewash was present on and at pipe entrance. No BUOW-specific sign present (May 15, 2023; July 12, 2023; January 10, 2024).
P15[1]	20" x >59"	No			Pipe entrance closed (July 12, 2023). Water dripping from pipe. Dead mouse in front of pipe opening (January 10, 2024).
P16/17	10" x >59"	No	✓		Long, abandoned irrigation pipe in a dry ditch (July 12, 2023). Two more pipes observed close to P18/19 (January 10, 2024).
P18[2]	5” x 59”	No	✓		Two pipes are sticking out from a berm. The pipes are 3 to 5 feet deep and only open at one end.
P19[2]	10” x >59”	No			A stack of several pipes with whitewash at both ends of the pipes. Pipes are 8 to 10-feet long (July 12, 2023). No whitewash observed during the winter season BUOW survey (January 10, 2024). More pipes have been added to the stack, now is about 40 pipes total (June 26, 2024).
P20[3]	18” x >59”	No	✓		One pipe, open at both ends. Located along the gen-tie line (January 10, 2024).
P21[3]	12” x >59”	No	✓		Long pipe, open at one end (January 10, 2024).
P22[3]	12” x >59”	No			Pipe runs through dirt road and is open at both ends (January 10, 2024). Pipe is gone and could not be located (April 1, 2024).

Den ID	Diameter (inches)	Mammal Sign Observed	Size Suitable for Kit Fox	Size Suitable for American Badger	Notes
P23[1,4]	12” x >59”	No	✓		Approximately 25 pipes in a bare agricultural field (January 10, 2024).
P24	10” x >59”	No			Stack of about 20 pipes, with one pipe fallen into the retention basin (April 1, 2024). Retention basin is filled with water, it is likely that the fallen pipe is submerged (April 24, 2024; May 30, 2024; June 26, 2024).
P25[3]	12” x >59”	No	✓		One pipe suitable for BUOW consisting of a downed transmission pole or piece of substation infrastructure, adjacent to the substation (January 10, 2024).
P26[6]	12” x >59”	No	✓		One long pipe adjacent to PG&E Gates Substation (July 10, 2025).
P27[6]	12” x >59”	No	✓		Two long pipes adjacent to PG&E Gates Substation (July 10, 2025).

[1] Potential den/den surrogates located within the 150-meter buffer.

[2] Mapped during the general biological survey in the Califland Corp parcels.

[3] Mapped during the Gen-Tie survey.

[4] Mapped during the protocol winter season BUOW survey.

[5] Mapped during the 2024 burrow survey within the Califland Corp parcels (April 1, 2024).

[6] Mapped during the 2025 burrow survey within the Woolf Parcel South Addition (July 10, 2025).

* Unless date otherwise noted, sign was first observed during Phase 2 surveys and consistently seen throughout Phase 3 surveys.

6 CONCLUSIONS AND RECOMMENDATIONS

The results of the biological surveys have been used to develop recommendations for pre-construction surveys and avoidance and minimization measures. The recommendations within this report are preliminary and will be refined during the California Environmental Quality Act (CEQA) process as more details about the Project design and schedule are determined.

The Project site is not located within the boundary of and does not contain undeveloped natural lands subject to an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan, or other approved local, regional, or state HCP; therefore, the Project would not conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state HCP.

Given the extensive agricultural disturbances on the Project site, there is no suitable habitat for rare plants. No special-status or rare plants were found during surveys that were conducted during the appropriate blooming periods when the plants would have been detectable. Therefore, no measures are required for special-status or rare plant species.

Use of heavy machinery and ground disturbance during construction activities have the potential to impact BUOW, SWHA, raptors and other nesting birds, SJKF, American badger, or other special-status species, if present. Habitat for special-status species should be avoided to the maximum extent feasible during finalization and implementation of the Project. Most of the burrows and burrow surrogates found at the Project site are already subject to ground disturbance and human activity due to agricultural practices in the BSA. However, construction activities and noise that occurs adjacent to these locations may disturb special-status species if present, including BUOW. Special-status species and habitats observed in the BSA or with either moderate or high potential to occur within the BSA are summarized in Table 8.

Table 8. Special-status Species and Habitat Summary

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary
Invertebrates				
Bombus crotchii	Crotch's bumble bee	None	Candidate Endangered	Crotch's bumble bee was not incidentally observed during the 2023-2025 surveys. Crotch's bumble bee is known to use willows and buckwheat as a foraging resource, which do occur in the BSA. Landscaped and non-native nectar sources occur within the vicinity of the Project site and could serve as a foraging resource for Crotch's bumble bee. However, the number of these flowering plants on the site (aside from species cultivated within agricultural fields, such as tomatoes and peas) is likely insufficient to support native bee colonies. Pesticides are also used on the Project parcels and domestic honeybees are used to pollinate nearby cultivated tree crops. Several locations with rodent burrows near trees and in retention basins could serve as nesting and overwintering habitat for this species in the BSA.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary
Birds				
Athene cunicularia	Burrowing owl	None	Candidate; SSC	BUOW individuals were not observed during the habitat assessment, breeding season surveys, or winter season survey within the Project site. Although no BUOW individuals or BUOW-specific sign were observed during the 2023-2025 surveys, whitewash was observed at three burrow surrogates in 2023. However, whitewash could be from any bird species utilizing the site. Potential burrows/burrow surrogates were found along the Project site boundaries and within 150-meters of the site.
Buteo swainsoni	Swainson's hawk	None	Threatened	Multiple adult SWHA were observed during surveys of the Project site. Two active SWHA nests were found in 2024 within the 2-mile buffer. One nest was located within the 150-meter buffer in a stand of tamarisk trees, while the second nest was located in an old orchard tree 2 miles south of the Project site on the boundary of the 2-mile buffer. While suitable nesting trees are not available on the Project site, SWHA could nest on transmission poles and towers within the Project site. Foraging habitat is also available for SWHA within the Project site.
Circus hudsonius	Northern harrier	None	SSC	This species was observed within the 2-mile buffer of the Project site, but no nests were found. This species is unlikely to nest on the Project site.
Eremophila alpestris actia	California horned lark	None	WL	California horned lark was observed foraging within the 2-mile buffer and in the Califland Corp parcels. No nests have been found on the Project site. Nests of this species could be established prior to Project implementation.
Falco columbarius	Merlin	None	WL	This species has been observed multiple times about 2 miles from the Project site but does not nest in California. This species may forage within or near the Project site.
Lanius ludovicianus	Loggerhead shrike	None	SSC	Loggerhead shrike was observed within the 150-meter and 2-mile buffers. No nests have been found on the Project site. This species has potential to nest on the Project site.
Native raptor and bird nests		Migratory Bird Treaty Act	Migratory Bird Protection Act/California Fish and Game Code, Sections 3503, 3503.5, 3505 and 3513/	Active nests of common raven, red-tailed hawk, great-horned owl, and Swainson's hawk were found in the BSA. Within the 2-mile site buffer, common raven, red-tailed hawk, great-horned owl and Swainson's hawk nests were observed. Additional active nests could be established prior to Project implementation on or near the site.

Scientific Name	Common Name	Federal Status	State Status/ Other Status	Summary
			California Code of Regulation, Title 14, Sections 251.1, 652 and 783-786.6	
Mammal				
Vulpes macrotis mutica	San Joaquin kit fox	Endangered	Threatened	SJKF or its sign was not observed at the Project site. Several soil dens and den surrogates that are suitable for SJKF were observed in the BSA. However, this species has a low potential to den in the BSA due to disturbance from active agricultural practices. This species could forage on areas of the Project site that are within a 1 to 2 mile radius of known dens (e.g., Parcel 5 and Sageberry Parcel).
Roosting bats		None	California Fish and Game Code Section 2126	While roosting bats have not been documented within the Project vicinity, it is possible for roosting bats to occur in the BSA. Bats are known to roost within trees, caves, mines, and man-made structures. There are no caves or mines within the BSA, as well as few trees. Bats could use the few existing trees as well as buildings and other man-made structures on the BSA as roosting habitat. Foraging habitat for bats includes agricultural land. Bats could forage on the BSA and in the Project vicinity within agricultural fields, orchards, vineyards, hedgerows, and retention basins.

SSC = CDFW Species of Special Concern

Crotch's Bumble Bee

Crotch's bumble bee has the potential to forage, nest, and overwinter at or near the Project site. Therefore, the following measures are recommended for this species:

- Areas within the Project site containing one or more of the following habitat requisites shall be surveyed by a qualified biologist between March 1 and June 30: flowering vegetation, potential preferred nectar plants, small mammal burrows, bunch grasses, thatch, brush piles, old bird nests, or dead trees. A minimum of two surveys shall be completed between the hours of 0800 and 1600 when temperatures are between 65°F and 90°F and will not be conducted during inclement weather conditions (e.g., foggy, raining, drizzling, or sustained winds greater than 8 mph). Surveyors will photograph potential Crotch Bumble Bees from various angles to ensure recordation of key identifying characteristics. The survey results shall be submitted to the County within 30-days of completion of the surveys. All detection information collected during survey efforts will be submitted to the CDFW CNDDB and the Xerces Society for Invertebrate Conservation's Bumble Bee Watch

database. Surveys will be valid for the duration of the current season lasting until the beginning of the next season (i.e., through March 1 the following year).

- If Crotch's bumble bees are found during surveys, consultation with CDFW will occur to discuss appropriate avoidance measures or if avoidance is not possible, to obtain an ITP.

Burrowing Owl

Impacts to BUOW during construction activities can be avoided through pre-construction surveys, and if found, the establishment of temporary no-work buffers. Recommendations for BUOW are described in the BUOW survey report, provided under separate cover.

Swainson's Hawk

SWHA has the potential to nest at or near the Project site. Therefore, the following measures are recommended for this species:

- If construction (i.e., equipment staging, vegetation removal, or ground disturbance) is scheduled to commence during the SWHA nesting season (March 1 to September 15), a qualified biologist shall conduct pre-construction surveys of all potential nesting habitat within the Project site. The survey shall focus on potential nest sites on and within a 0.5-mile buffer around the site in areas where access to neighboring properties is available or visible using a spotting scope or binoculars. Pre-construction surveys shall be conducted in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000) and occur no more than 10 days prior to construction activities.
- The surveying biologist must be qualified to determine the status and stage of nesting by SWHA without causing intrusive disturbance. If active SWHA nests are found, a 0.5-mile buffer shall be established by a qualified biologist around active nests and no construction within the buffer shall be allowed until the biologist has determined that the nest is no longer active (e.g., the nestlings have fledged and are no longer reliant on the nest), adult and juvenile SWHA have left the area, or the breeding season has ended. Encroachment into the buffer for SWHA must be authorized by the CDFW.
- If an active SWHA nest is detected, and a 0.5-mile no-disturbance buffer is not feasible, consultation with the CDFW is recommended to discuss how to implement the Project and avoid take. If take cannot be avoided, consultation with CDFW is required to obtain an Incidental Take Permit pursuant to California Fish and Game Code section 2081 subdivision (b) prior to ground disturbing activities in order to comply with CESA.

Land uses considered suitable for SWHA foraging include alfalfa hay; irrigated cropland typically cultivated in a rotation of cotton, wheat, and tomatoes, but also including silage crops such as triticale, sorghum, and corn; irrigated pasture; and uncultivated land that has retained some natural soil and vegetation (Estep 2017). Grain crops (other than alfalfa), row crops, and irrigation pasture provide moderate value habitat since they are harvested during the breeding season; however, crops such as corn, cotton, safflower, melons, and vegetables provide low value habitat (Estep 2015). Most of the Project site consists of grain crops, irrigated pasture, and cultivated tomatoes. CDFW would be likely to consider these agricultural fields to be suitable foraging habitat for SWHA. One active SWHA nest was observed within 0.5 miles of the Project site and a second active SWHA nest was found 2 miles from the Project site during the 2024 raptor surveys. In addition to the two nests observed in 2024, SWHA have been documented in the CDFW CNDDB nesting at ten locations within 10 miles of the Project site from 2001 to 2016 (CDFW 2025a). The nearest active SWHA nest was found during 2024 Project surveys in

the 150-meter buffer. Since the project would result in a loss of SWHA foraging habitat within 10 miles from known nest sites, the following compensation is recommended in accordance with CDFW guidelines (California Department of Fish and Game 1994):

- For projects within 1 mile of an active nest or tree, a minimum of 1 acre of habitat management (HM) land for each acre of development; or
- For projects within 1-5 miles of an active nest or tree, a minimum of 0.75 acre of HM land for each acre of development; or
- For projects within 5-10 miles of an active nest or tree, a minimum of 0.5 acre of HM land for each acre of development.

Raptors and Other Nesting Birds

Raptors and other nesting birds have the potential to nest at the Project site. Therefore, the following measure is recommended for these species, which may be combined with the above measure for SWHA based on timing of construction activities:

- Avoid ground-disturbing and vegetation removal activities during the nesting bird season (February 1 to September 15). If these activities must occur during the nesting season, a pre-construction nesting bird survey will be conducted by a qualified biologist on and within 500 feet of the construction area, access permitting. The survey will be conducted no more than 10 days prior to initiation of these activities and repeated between delays of greater than 10 days during the nesting season.
- If active nests are found, it is recommended that a qualified biologist routinely monitor nests once construction begins to detect behavioral changes resulting from the project. If behavioral changes occur, it is recommended that the work causing that change cease and CDFW be notified for additional avoidance and minimization measures.
- If continuous monitoring is not feasible, a minimum no-disturbance buffer of 250 feet around active nests of non-listed bird species and a 500-foot no-disturbance buffer around active nests of non-listed raptors species will be flagged around the nest (this distance may be modified by the qualified biologist based on the bird species found). The qualified biologist will use their best judgement to establish the appropriate size no-disturbance buffer in the event that a listed bird species nest is found. No ground-disturbing or vegetation removal activities will occur within the buffer until the nesting season has ended or the nest is vacated, and juveniles have fledged, as determined by the qualified biologist. Buffer sizes may be modified or encroachment into the buffer may occur at the discretion of a qualified biologist and with notification to CDFW in advance of implementation.

San Joaquin Kit Fox

SJKF has the potential to occur at the Project site. Therefore, the following measures are recommended for this species:

- A qualified biologist will conduct a pre-construction den survey for SJKF no less than 14 days and no more than 30 days prior to any ground disturbance and/or construction activities in accordance with the *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011). The survey will be conducted within and adjacent to the construction area. The survey will search for dens to ensure that SJKF are not present. If the qualified biologist determines that the construction area is unsuitable for denning due to active agriculture or recent discing, then the survey is not required.

- If an active SJKF den is observed within the construction area, the CDFW and USFWS will be contacted prior to ground-disturbing activities within 200 feet of the den to determine the proper course of action. If SJKF activity is not detected, a memorandum will be submitted to CDFW and USFWS within five days after the completion of the pre-construction survey and prior to the start of ground disturbance and/or construction activities. In addition, appropriate USFWS construction and on-going operational requirements from the *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011) will be implemented.
- If SJKF is detected onsite, consultation with USFWS/CDFW is recommended to determine how to avoid take. If take cannot be avoided, consultation with USFWS/CDFW is required to obtain an Incidental Take Permit prior to ground disturbing activities.
- All perimeter fencing will be raised five to seven inches above ground level and knuckled under to allow SJKF movement through the Project site.

Roosting Bats

Roosting bats have the potential to occur at the Project site. Therefore, the following measures are recommended:

- If construction activities must occur during bat breeding periods, a qualified biologist will conduct a pre-construction survey for roosting bats prior to any ground disturbance and/or construction activities. The survey will be conducted within and adjacent to the construction area. All active bat maternity roosts shall be avoided during breeding periods and an appropriate no-work buffer will be implemented based on the qualified biologist's best judgement regarding a necessary buffer for each observed bat species.
- If active bat maternity roosts are found, it is recommended that a qualified biologist routinely monitor maternity roosts once construction begins to detect behavioral changes resulting from the project. If behavioral changes occur, it is recommended that the work causing that change cease and CDFW be notified for additional avoidance and minimization measures.
- If an active special-status bat maternity roost location is proposed to be disturbed, the qualified biologist shall consult with the California Department of Fish and Wildlife and/or the United States Fish and Wildlife Service to identify any additional necessary minimalization measures to be implemented for Project activities.

Worker Education

The following measure for education of onsite construction workers regarding special-status species is recommended:

- All onsite construction workers will attend a training for special-status species prior to working on the Project site. The training will be conducted by a qualified biologist and will include life history information, mitigation measures, and known locations or habitats on the site for special-status species. At a minimum, the training will include the following species: BUOW, SWHA, American badger, SJKF, and other nesting raptors and birds.

7 REFERENCES

Audubon California. 2025. California IBA Interactive Site Map. https://ca.audubon.org/conservation/california-iba-interactive-site-map. Accessed July 2025.

California Code of Regulation. 2024. Title 14, Sections 251.1, 652 and 783-786.6).

California Department of Conservation, California Geological Survey. 2002. California Geomorphic Provinces. Note 36.

California Department of Fish and Game. 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo Swainsoni*) in the Central Valley of California.

California Department of Fish and Game. 2012. Staff Report on Burrowing Owl Mitigation. March.

CDFW (California Department of Fish and Wildlife). 2005. Merlin *Falcon columbarius* Range Map, B128. California Wildlife Habitat Relationships System, California Interagency Wildlife Task Group. Revised by K Hunting 2005.

CDFW. 2019. *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard*. Revised October 2019

CDFW. 2023. Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species. June.

CDFW. 2025a. California Natural Diversity Database (CNDDB). Accessed July 2025.

CDFW. 2025b. Biogeographic Information and Observation System (BIOS) Habitat Connectivity Viewer. Accessed July 2025.

CNPS (California Native Plant Society), Rare Plant Program. 2025a. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org. Accessed July 2025.

CNPS. 2025b. Manual of California Vegetation, Online Edition. https://www.cnps.org/vegetation/manual-of-california-vegetation. Accessed July 2025.

California State University Stanislaus. 1998. *Recovery Plan for Upland Species of the San Joaquin Valley, California: Tulare Grasshopper Mouse*. https://esrp.csustan.edu/publications/pubhtml.php?doc=sjvrp&file=chapter02M05.html#:~:text=--%20Currently%2C%20Tulare%20grasshopper%20mice,San%20Benito%20Counties%20(Williams%20andalert%20Javascript:alert(document.%20lastModified. Accessed July 2023.

eBird. 2025. eBird: An online database of bird distribution and abundance. Cornell Lab of Ornithology, Ithaca, New York. http://www.ebird.org. Accessed July 2025.

Estep, J. 2015. *A Proposed Conservation Strategy for the Swainson's Hawk in Yolo County*. Prepared for the Yolo County Natural Heritage Program. March 20.

Estep, J. 2017. *The Distribution and Abundance of Nesting Swainson's Hawks in the Vicinity of the Proposed RE Mustang 2 Solar Generating Facility*. Prepared by Estep Environmental Consulting, Sacramento, CA, for RE Mustang 2 LLC, San Francisco, CA. January.

Harris, J. Stearns, D. 1991. *Population Density, Census Methods, Habitat Relationships, and Home Range of the San Joaquin Antelope Squirrel*. Prepared for California Department of Fish and Game.

Hatfield, R., Jepsen, M., Vaughan, S., Black, E., Lee-Mader, E. 2018. *An Overview of the Potential Impacts of Honey Bees to Native Bees, Plant Communities, and Ecosystems in Wild Landscapes: Recommendations for Land Managers*. 12 pp. Portland, OR: The Xerces Society for Invertebrate Conservation.

Jepson Flora Project (eds.). 2025. Jepson eFlora. http://ucjeps.berkeley.edu/IJM.html. Accessed July 2025.

Koch, J., Strange, J., Williams, P. 2012. *Bumble Bees of the Western United States*.

Ramey, C. and J. Bourassa. 2005. *Badger Movement Ecology in Colorado Agricultural Areas After a Fire*. Wildlife Damage Management Conferences -- Proceedings.

Slater, G.L. and C. Rock. 2005. *Northern Harrier (Circus cyaneus): a Technical Conservation Assessment*. September 9. United States Department of Agriculture (USDA) Forest Service, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/northernharrier.pdf. Accessed July 2023.

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

Tetra Tech. 2022. *San Luis West Solar Project Biological Resources Evaluation Report*. Prepared for Origis Energy. February.

USFWS (United States Fish and Wildlife Service). 1998. *Recovery Plan for Upland Species of the San Joaquin Valley, California*. Region 1, Portland, OR. 319 pp.

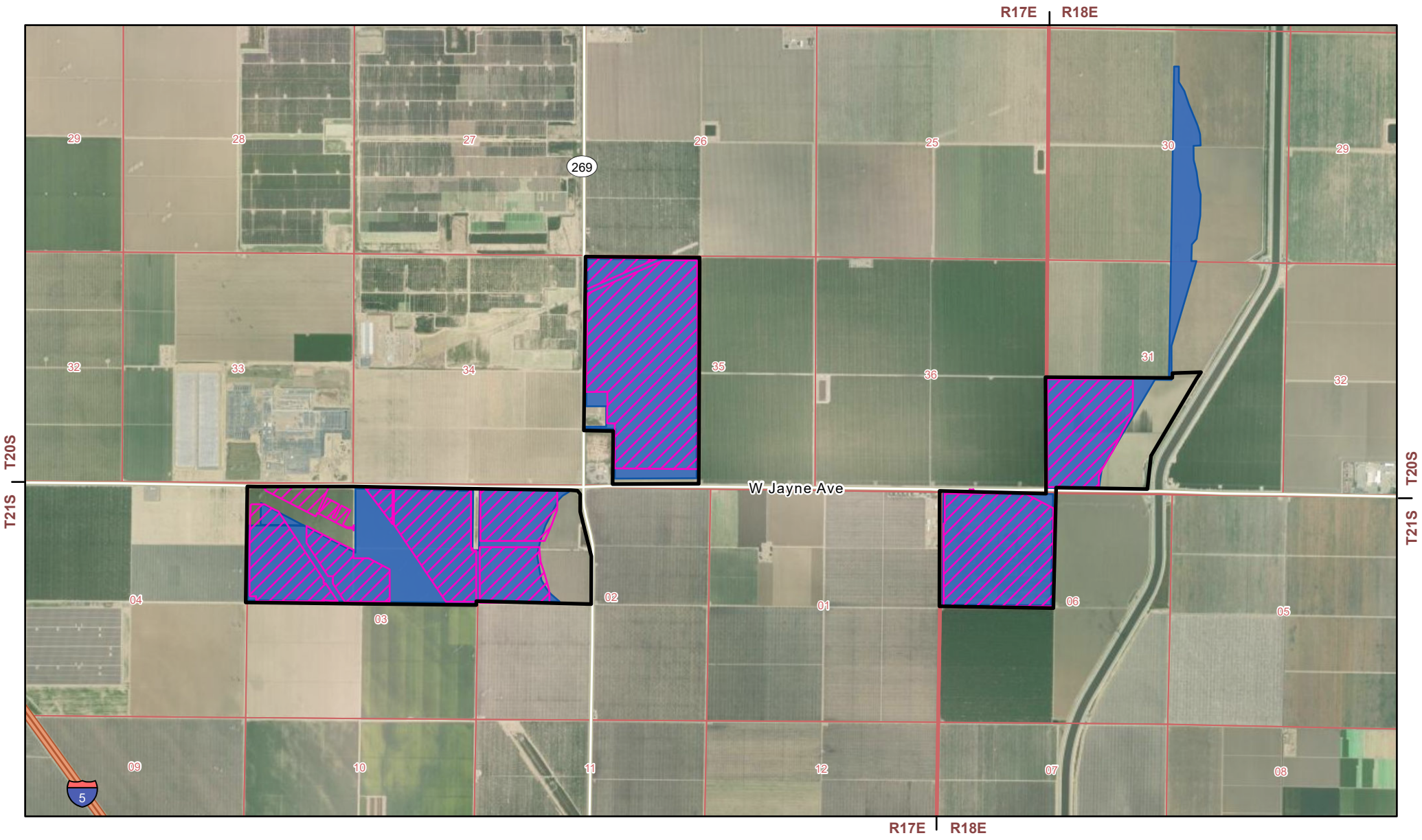
USFWS. 2011. *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*. Prepared by the Sacramento Fish and Wildlife Office. January.

USFWS. 2025. Critical Habitat Portal. https://ecos.fws.gov/ecp/report/table/critical-habitat.html. Accessed July 2025.

Warrick, G. D., Clark, H. O., Kelly, P. A., Williams, D. F., & Cypher, B. L. 2007. *Use of Agricultural Lands by San Joaquin Kit Foxes.* Western North American Naturalist, 67(2), 270–277. http://www.jstor.org/stable/41717604. Accessed July 2023.

Xerces Society for Invertebrate Conservation. 2025. Bumble Bee Watch. Accessed July 2025.

Appendix A: Site Plans





Project Site
Current Project Footprint
Previous Project Footprint
Township/Range
Section

N

0 0.25 0.5
Miles

Source: ESRI (2024)

NOT FOR CONSTRUCTION

TETRA TECH

Appendix A: Project Layout Footprint

San Luis West Solar Project
Fresno County, California

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Appendix B: Photographs

Photograph 1	
Location: Parcel 5	
Notes: Representative photo of recently disced (disturbed) fields within the Project site. Aspect south.	

Photograph 2	
Location: South Woolf Parcel	
Notes: Representative photo of agricultural (disturbed) fields colonized by non-native plant species. Aspect north.	

Photograph 3	
Location: North Woolf Parcel	
Notes: Representative photo of agricultural retention basins onsite. Aspect east.	

Photograph 4	
Location: North Woolf Parcel	
Notes: Representative photo of drainage ditches running along crop fields. Ditches have irrigation pipes and culverts. Aspect north.	

Photograph 5	
Location: North Woolf Parcel	
Notes: Representative photo of *Tamarix* spp. Shrubland Semi-Natural Alliance habitat onsite. Aspect west. An active Swainson's hawk nest was observed in this tree stand in the 150-meter buffer in 2024.	

Photograph 6	
Location: South Woolf Parcel	
Notes: Active wheat harvest on a field that was previously filled with non-native species. The PG&E Gates substation can be seen in the background. Aspect northwest.	

Photograph 7	
Location: 150-meter buffer	
Notes: Representative photo of disturbed ruderal roadside and a developed solar facility. Aspect west.	

Photograph 8	
Location: 150-meter buffer	
Notes: Representative photo of cultivated tree orchard. Aspect south.	

Photograph 9	
Location: 150-meter buffer	
Notes: Representative photo of cultivated vineyard. Aspect east.	

Photograph 10	
Location: South Woolf Parcel	
Notes: Representative photo of Woolf Parcel South Addition.	

Photograph 11	
Location: South Woolf Parcel	
Notes: Potential BUOW surrogates. Aspect south.	

Photograph 12	
Location: North Woolf Parcel	
Notes: Representative burrow of suitable size for BUOW and SJKF use.	

Photograph 13	
Location: 150-meter buffer	
Notes: Red-tailed hawk nest (N1) in a transmission tower. Aspect southeast.	

Photograph 14	
Location: Sageberry Parcel	
Notes: SWHA perched on a transmission pole in the Project site.	

Photograph 15	
Location: 2-mile buffer	
Notes: Photo of Arroyo Pasajero Detention Basin. This area has previously recorded observations of SWHA nesting (CDFW 2023a). Aspect northwest.	

Photograph 16	
Location: Califland Corp parcels	
Notes: Open water habitat within the retention basin on the Project site.	

Photograph 17	
Location: 150-meter buffer, south of Califland Corp parcels	
Notes: Cultivated nut trees border each proposed Project block, including carob trees as shown. Access roads border and bisect each vineyard.	

Photograph 18	
Location: 150-meter buffer, west of Califland Corp parcels	
Notes: The areas surrounding the Project site support active agriculture. The transmission towers that support raptor nests near the PG&E Gates Substation are visible in the background.	

Photograph 19	
Location: 150-meter buffer, west of Califland Corp parcels	
Notes: This retention basin includes culverts and several burrows. These areas provide potential habitat for burrowing owl.	

Photograph 20	
Location: Gen-tie line, west of Woolf Parcel North	
Notes: Cultivated orchard trees are located in the 150-meter buffer surrounding the majority of the western section of the proposed gen-tie line.	

Photograph 21	
Location: Gen-tie line, west of Woolf Parcel North	
Notes: Disturbed areas adjacent to the PG&E Gates Substation, also visible in this photograph, are located within the 150-buffer surrounding the western section of the gen-tie line.	

Photograph 22	
Location: 150-meter buffer adjacent to North Woolf Parcel	
Notes: An active Swainson's hawk nest was observed in this tamarisk tree in the 150-meter buffer in 2024. One adult and one juvenile Swainson's hawk were observed at this nest.	

Photograph 23	
Location: 2-mile buffer	
Notes: Active Swainson's hawk nest approximately 2 miles from the Project site in an old orchard tree in 2024. Two adult Swainson's hawks were associated with the nest and one nestling was observed in June 2024.	