

Biological Resource Assessment

for

PV Byron EG-1 Project

APN 001-021-012
Contra Costa County, California



Prepared for

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Cover Page: Drone aerial photo of Study Area captured during May 13, 2021 surveys.

SYNOPSIS

- This report describes the study of biological resources on an 84.6-acre site (Study Area) in Contra Costa County, California. The Study Area is a portion of Assessor's Parcel Number (APN) 001-021-012.
- The proposed project (Project) entails construction and operation of a 6.5-megawatt (MW) solar generation facility with an 8-megawatt hour (MWh) battery storage system. Approximately 34 acres of solar arrays are proposed using photovoltaic (PV) panels on a dual-axis tracker system. Minimal grading is proposed based on the pile-driven foundational design for installing racking system support mounts.
- Field surveys were conducted in May and June 2021 to delineate and document biological resources in the Study Area which included habitat mapping and surveys for special status plants and wildlife species.
- Habitat types identified and mapped within the Study Area are California annual grassland, developed, and wetland.
- Botanical surveys identified 63 species of vascular plants in the Study Area. There are 18 special status plants with some potential to occur in the Study Area. No special status plants were detected.
- Wildlife surveys detected 14 animal species in the Study Area. There are 23 special status animals with some potential to occur in the Study Area. Burrowing owls (and active owl dens) and potential American badger dens were observed and mapped during May and June 2021 surveys. One den observed during surveys met criteria for San Joaquin kit fox. No other special status animals were observed directly in the Study Area, however special status birds that included a pair of Swainson's hawks and one loggerhead shrike were observed within one mile of the Study Area to the northeast and north, respectively.
- Biological resources that could be impacted by the Project include California annual grassland habitat, nesting birds, California red-legged frog, California tiger salamander, San Joaquin coachwhip, special status birds, burrowing owl, American badger, and San Joaquin kit fox. Mitigation recommendations are provided to reduce potential impacts to sensitive biological resources.

1 INTRODUCTION

1.1 Purpose

This report provides information regarding biological resources associated with the PV Byron EG- 1 project (Project) located on an 84.6-acre Study Area in unincorporated Contra Costa County (County), California (Figure 1). Results include a habitat assessment, botanical and wildlife inventory, a discussion of special status species that have potential to occur within the Study Area, and an analysis of potential impacts to biological resources from the proposed Project. Mitigation recommendations for potential impacts to biological resources are also provided.

1.2 Project Location

The Study Area is in southeastern Contra Costa County, immediately south of Byron Hot Springs Road, approximately 1.5 miles southeast of Vasco Road (Figure 2). The site is in Assessor's Parcel Number (APN) 001-021-012. Location coordinates are 37.79687°N, 121.64205°W (WGS 84) in the Byron Hot Springs United States Geological Survey (USGS) 7.5-minute topographic quadrangle. The Study Area is governed by the Agriculture Land (AL) use designation in the County's General Plan, and the General Agriculture (A-2) zone designation in the County Municipal Code (CCCo 2021).

1.3 Local and Regional Context

The Study Area is situated in the southeastern portion of Contra Costa County, approximately four miles south of Byron. The southern boundary borders Alameda County. The Study Area is currently used for cattle grazing and wind energy production. The surrounding region is rural and generally undeveloped with limited agricultural uses. The property to the north is owned by the East Bay Regional Park District and is used for limited ranching activities and contains irrigation canals and a water pond; the property to the south is undeveloped; the property to the west is used for limited ranching activities; and the property to the east contains irrigation canals but is otherwise vacant.

The Study Area contains gentle to moderate undulating hills throughout most of the site, with a moderate to steeply sloped saddle in the southwestern quadrant. Elevations range from approximately 350 feet above mean sea level (amsl) to 830 feet amsl.

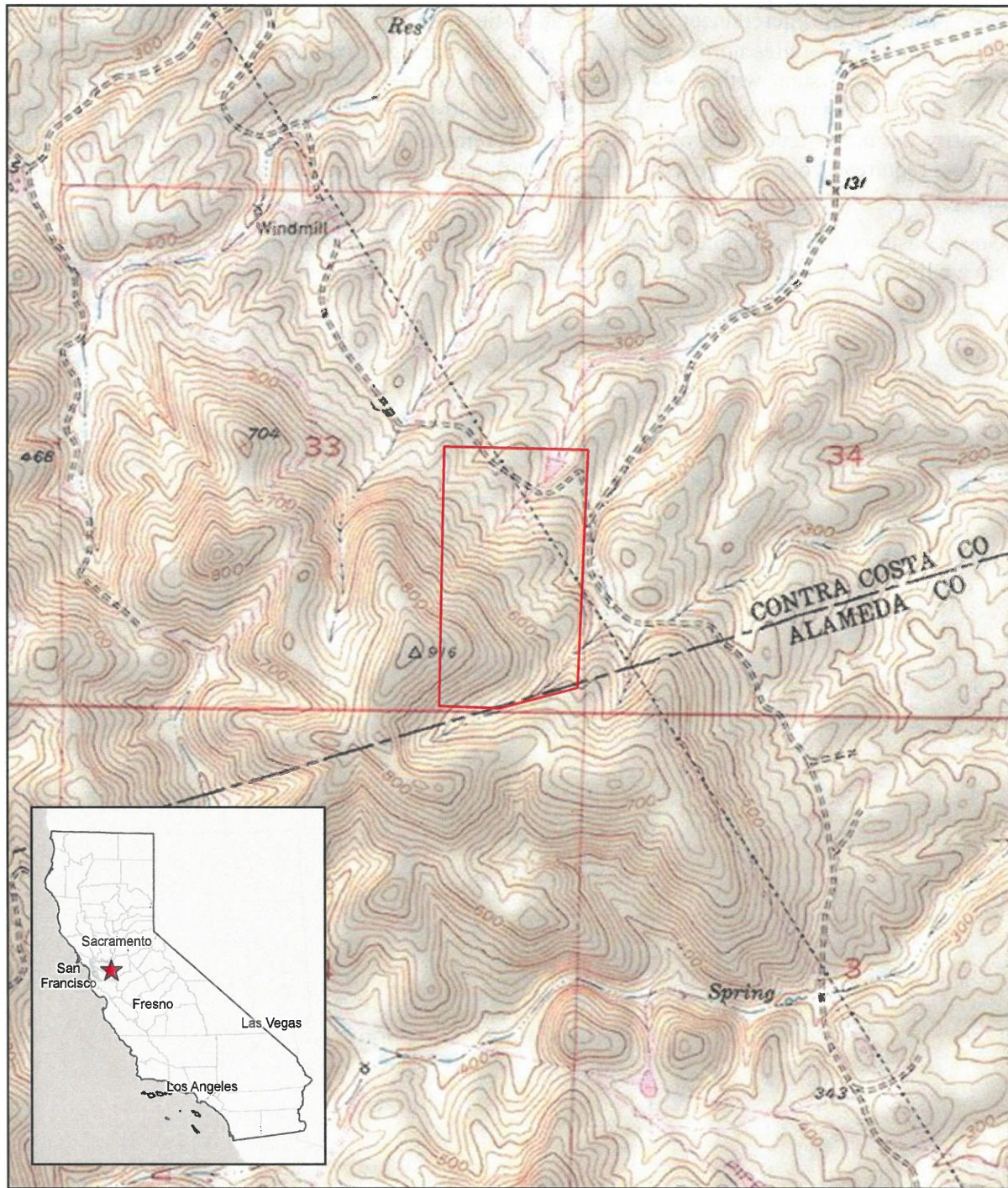
1.4 Project Description

The Project is for the construction and operation of a 6.5-megawatt (MW) solar generation facility and 8-megawatt hour (MWh) battery storage system. Project components primarily consist of 34 acres of solar arrays consisting of photovoltaic (PV) panels on a mounted dual-axis tracker system. A series of module arrays will be mounted on racking systems typically supported by a pile-driven foundation design. Each mounted solar array is approximately four feet tall above grade, depending on slope. Electrical connections from a series of PV arrays will be channeled to approximately 20 inverters mounted on trackers throughout the solar field. Inverters will be consolidated in areas to minimize cable routing, trenching, and electrical losses.

The Project will interconnect via generation-tie (gen-tie) lines to the Herdlyn Substation, approximately 2.4 miles northeast along Byron Hot Springs Road and Holey Road. An 8-MWh battery storage system with 2 MW output is proposed in the northeastern portion of the Study Area. The battery storage units will be placed on a 40-feet-by-40-feet concrete pad. The existing security perimeter fence will be improved with remote sensor security cameras. The proposed Project requires a zone change to be included within the Solar Energy Generation (SG) combining district.

Once construction has completed and the Project is fully operational, the Project is anticipated to have a lifespan of approximately 35 years. A Site Plan is provided in Appendix A, for reference.

Figure 1. United States Geological Survey Topographic Map



Legend

 Study Area



0 1,000 2,000 Feet

PV Byron EG-1
Map Center: 121.64369°W 37.79812°N
Contra Costa County, California

USGS Quadrangle: Byron Hot Springs



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Map Updated:
February 24, 2022 10:53 AM by SAF

Figure 2. Aerial Photograph



Legend

 Study Area (84.6 acres)



0 250 500 Feet

PV Byron EG-1
Map Center: 121.64358°W 37.79872°N
Contra Costa County, California

Imagery Source: Althouse and Meade, Inc., 05/13/2021



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Map Updated:
February 24, 2022 11:30 AM by SAF

1.5 Regulatory Framework

Standards for environmental protection and restoration, in the form of laws and regulations, are created within three different organizational levels of government: Federal, State, and Local. Entities exist within each level to create and enforce regulations that help ensure protection of specific and pertinent regional issues threatening ecosystems and environments. The following regulations are applicable to the proposed Project.

1.5.1 Federal Law and Regulations

Clean Water Act. The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into waters of the United States and regulating quality standards for surface waters. The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permitting is required for filling waters of the U.S. (including wetlands). Permits may be issued on an individual basis or may be covered under approved nationwide permits.

Section 404 of the CWA authorizes the United States Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to wetlands and other waters of the United States. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States (e.g., jurisdictional wetlands), unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

The term “waters of the United States” encompasses resources described by the Environmental Protection Agency (EPA) and the Corps regulations, 40 Code of Federal Regulations (CFR) § 120.2(1) and 33 CFR § 328.3(a). The geographic limits of relevant federal jurisdiction for non-tidal waters of the U.S. are defined at 33 CFR § 328.4(c).

EPA defines wetlands as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (EPA regulations at 40 CFR § 120.2(3); USACE regulations at 33 CFR § 328.3(b)). Wetlands are considered “special aquatic sites” under EPA’s CWA Section 404(b)(1) guidelines, 40 CFR § 230.3, used in evaluating activities regulated under CWA Section 404. Special aquatic sites receive special attention under the 404(b)(1) Guidelines, including a more stringent alternatives analysis and an emphasis on avoiding and mitigating any impacts to wetlands.

The USACE asserts jurisdiction over wetlands that exhibit hydrology, hydric soil, and hydrophytic vegetation (three parameters) by the standard set forth in the Arid West Regional Supplement. Under the current regulatory framework, wetlands must also exhibit a significant nexus to a Traditional Navigable Water (TNW). For non-wetland water features (e.g. tributaries), USACE jurisdiction is limited to the Ordinary High Water Mark (OHWM). Due to ongoing rulemaking efforts by the EPA and USACE as well as a recent court decision, the precise limits of the USACE’s regulatory jurisdiction over adjacent wetlands and certain tributaries to TNWs (e.g., intermittent and ephemeral streams) is in a state of flux. Below we describe the recent events impacting the scope of jurisdictional waters under the CWA and the agencies’ current interpretation of waters of the United States.

Navigable Waters Protection Rule (rescinded August 30, 2021). On April 21, 2020, the Trump administration's EPA and USACE promulgated the Navigable Waters Protection Rule (NWPR) redefining "waters of the United States." The previous definition of "waters of the United States" set forth in 2015 Clean Water Rule (2015 Rule) under the Obama administration was repealed in 2020 as part of the EPA's and USACE's rulemaking efforts leading up to the NWPR. The NWPR narrowed the definition of waters of the United States compared to the 2015 Rule and the pre-2015 regulatory regime. The NWPR defined categories of jurisdictional non-wetland waters based on stream classifications and specifically excluded ephemeral streams as jurisdictional tributaries (USACE 2020). When determining jurisdictional status of wetlands, the scope of *adjacency* was reduced to wetlands with only certain surface water connections to other jurisdictional waters under the NWPR. This excluded wetlands formed by artificial berms, for instance, which were considered adjacent under the pre-2015 regulatory regime and the 2015 Rule regardless of the presence or absence of a hydrologic surface connection (85 FR 22250). On June 9, 2021, the Biden administration's EPA and USACE announced their intent to repeal the NWPR and revise the definition of "waters of the United States" (85 FR 22250; EPA 2021b). The Biden administration is expected to release its proposed definition within the next several months.

Current Implementation of Waters of the United States (March 2022). On August 30, 2021, the NWPR was invalidated and vacated by a U.S. District Court in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency* (D. Az. 2021). Pursuant to this court decision, EPA and USACE are interpreting WOTUS consistent with the pre-2015 regulatory regime until further notice (EPA, Current Implementation of Waters of the United States; 40 CFR 230.3(s) (1986)). As noted above, the pre-2015 regulatory regime is broader than the NWPR, and, in particular, likely covers adjacent wetlands and certain tributaries that were not considered jurisdictional under the NWPR. Under the agencies' current interpretation, the following definitions are provided for the term waters of the U.S. (EPA 2021c):

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;

6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA (EPA 2021c, 58 Fed. Reg. 45008, 45037 (1993)).

While EPA and USACE work on rulemaking efforts to revise the definition of "waters of the United States", the agencies will use the following regulatory guidance established in 2008, *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States - December 2, 2008* ("2008 Rapanos Guidance):

2008 Rapanos Guidance. The EPA and USACE under the Bush Administration issued the 2008 Rapanos Guidance based on the 2006 court case *Rapanos v. United States* (Rapanos), 126 S. Ct. 2208 (2006), in which the Court failed to reach agreement on the scope of CWA jurisdiction. In *Rapanos*, a plurality of four Justices signed onto an opinion, authored by the late Justice Antonin Scalia, that interpreted "waters of the United States" as covering "relatively permanent" waters as well as wetlands with a "continuous surface connection" to such water bodies (EPA 2021a). In contrast, Justice Anthony Kennedy, who cast the deciding fifth vote in the case—but wrote a separate concurring opinion—concluded that CWA jurisdiction extends to all waters, including wetlands, that possess a "significant nexus" to TNWs (regardless of the existence or absence of a surface connection).

The agencies' *2008 Rapanos Guidance* was intended to address the confusion caused by the differing opinions in *Rapanos*. It said that the agencies would assert jurisdiction over waters that met either Justice Scalia's or Justice Kennedy's jurisdictional tests, and explained how the agencies would apply those tests in the field. In particular, the agencies established a significant nexus test to determine connectivity to TNWs which consisted of a multiple step process and establishment of specific analyses to determine that a significant nexus occurs. In 2008, the USACE offered the option for a "Preliminary Jurisdictional Determination" (PJD) to applicants seeking a Clean Water Act permit. The purpose of the PJD is to provide a "written indication that there may be waters of the United States, including wetlands, on a parcel" but does not exclude any wetlands or "waters" based on the *Rapanos* decision or the Supreme Court's prior landmark decision addressing the scope of "waters of the United States" in *Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers*.¹ Evaluation factors used to determine a "significant nexus" may include one or more of the following (USACE 2008c):

¹ In *Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) the Court ruled that the long controversial "migratory bird rule," used by the Corps of Engineers to interpret its authority over "isolated wetlands," exceeded the agency's authority under the CWA. In 2001 and again in 2003, the agencies developed guidance to address the definition of "waters of the United States" following the SWANCC Supreme Court decision.

- OHWM present in field;
- Site photos showing geographic features, bed and bank, etc.;
- Culverts to pass flow present (if applicable);
- USGS contours;
- Watershed size and specific drainage area;
- Frequency and duration of flow (known or estimated);
- Observable on aerial photography;
- Presence of fish and other aquatic life;
- Wetlands are adjacent to tributary (considered cumulatively);
- TMDL, 303(d), watershed associations, drinking water intakes, etc. Hydrologic Flow intakes, etc. Hydrologic Flow and pollutant transport models predict flow and pollutant discharge;
- Relevant literature on the functions and values of similar tributaries.

Migratory Bird Treaty Act. All migratory, non-game bird species that are native to the U.S. or its territories are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13), as amended under the Migratory Bird Treaty Reform Act of 2004. The MBTA makes it illegal to purposefully take (pursue, hunt, shoot, wound, kill, trap, capture, or collect) any migratory bird, or the parts, nests, or eggs of such a bird, except under the terms of a valid Federal permit. Migratory non-game native bird species are protected by international treaty under the federal MBTA.

1.5.2 State Law and Regulations

California Environmental Quality Act (CEQA). CEQA defines a “project” as any action undertaken from public or private entity that requires discretionary governmental review (a non-ministerial permittable action). All “projects” are required to undergo some level of environmental review pursuant to CEQA, unless an exemption applies. CEQA’s environmental review process includes an assessment of existing resources, broken up by categories (i.e., air quality, aesthetics, etc.), a catalog of potential impacts to those resources caused by the proposed project, and a quantifiable result determining the level of significance an impact would generate. The goal of environmental review under CEQA is to avoid or mitigate impacts that would lead to a “significant effect” on a given resource; section 15382 of the CEQA Guidelines defines a “significant effect” as

a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment, but may be considered in determining whether the physical change is significant.

Public agencies are required to implement CEQA and execute jurisdiction to determine when applicable activities are or are not subject to CEQA. A public agency with the most prominent nexus and jurisdiction to a project is called the lead agency. The lead agencies determine the scope of what is considered an impact and what constitutes a “significant effect”. “Biological resources” is one of the varying categories considered during environmental review through

CEQA. A lead agency can require a biological assessment to be prepared to report on existing biological resources and recommended mitigation measures that will reduce or lessen potential negative impacts to those biological resources. The questions listed in CEQA's Appendix G: Biological Resources section, which are used to guide assessment of impacts to biological resources are as follows:

- *Does the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*
- *Does the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?*
- *Does the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*
- *Does the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*
- *Does the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*
- *Does the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

The lead agency has the final determination over whether a project is or is not permissible, based upon the environmental review, completed requirements and environmental documentation, and their judgement that the project will not have a significant effect on the environment, or that all significant effects have been mitigated for.

Natural Community Conservation Planning (NCCP) Act of 1991. The NCCP Act is designed to conserve natural communities at the ecosystem scale while accommodating compatible land use. The California Department of Fish and Wildlife (CDFW) is the primary state agency that implements the NCCP. The NCCP plan provides for the comprehensive management and conservation of multiple wildlife species. It identifies and provides for regional protection of natural wildlife diversity while allowing for compatible and appropriate development and growth.

California Fish and Game Code (CFGC). The California Fish and Game Code (CFGC) is one of the 29 legal codes that form the general statutory law of California. A myriad of statutes regarding fish and game are specified in the CFGC; the following codes are specifically relevant to the proposed Project:

California Native Plant Protection Act. Sections 1900-1913 of the California Fish and Game Code contain the regulations of the Native Plant Protection Act of 1977. The intent of this act is to help conserve and protect rare and endangered plants in the state. The act allowed the CFGC to designate plants as rare or endangered.

Lake or Streambed Alteration Agreement. Section 1602 of the CFGC requires any person, state, or local governmental agency to provide advance written notification to CDFW prior to initiating any activity that would: 1) divert or obstruct the natural flow of, or substantially change or remove material from the bed, channel, or bank of any river, stream, or lake; or 2) result in the disposal or deposition of debris, waste, or other material into any river, stream, or lake. The state definition of

“lakes, rivers, and streams” includes all rivers or streams that flow at least periodically or permanently through a well-defined bed or channel with banks that support fish or other aquatic life, and watercourses with surface or subsurface flows that support or have supported riparian vegetation.

Nesting Birds. Sections 3503, 3503.5 and 3513 of CFGC states that it is “unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto,” and “unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird” unless authorized.

Regional Water Quality Control Board. The Regional Water Quality Control Board (RWQCB) regulates impacts to water quality in federal waters of the U.S. under Section 401 of the Clean Water Act, but they also regulate any isolated waters that are impacted under the state Porter Cologne Act utilizing a Waste Discharge Requirement. Pursuant to Section 401 of the Clean Water Act, discharge of fill material into waters of the State not subject to the jurisdiction of the USACE may require authorization pursuant to the Porter Cologne Act through application for waste discharge requirements or through waiver of waste discharge requirements.

1.5.3 Contra Costa General Plan

The **Conservation Element** of the County’s General Plan is concerned with issues regarding the identification, preservation and management of natural resources in the unincorporated County. The most significant ecological resources are located within areas that contain rare, threatened and endangered species; unique natural areas; and wetlands and marshes.

Vegetation and wildlife goals are broadly defined in the County’s Conservation Element and seeks to protect ecologically significant lands, wetland, plant and wildlife habitats, sensitive plants and wildlife, significant plant communities, trees, and important wildlife. County Implementation Measures for significant ecological resources will be inventoried (items 8 -a to 8 -c) and reviewed (items 8 -d to 8 -i). Implementation Measures specific to wetland areas are defined in items 8 -j to 8 -n. Other implementation measures are defined in items 8 -p to 8 -u. (CCCo 2005).

Of these Implementation Measures the following may be applicable to this Project:

- 8-a *As funding becomes available, prepare a detailed inventory of ecologically significant resource areas which include unique natural areas, wetland areas, habitats of rare, threatened, endangered and other uncommon and protected species. The inventory shall include buffer zones around the identified resource areas in order to take into account for periodic, seasonal, or ecological changes. The maps shall be revised on a regular basis to reflect the availability of new information from other agencies, changes in definition, or any other changes.*
- 8-c *In cooperation with other public and private agencies, prepare a detailed inventory of biological and archeological resources in the Southeast County area, to be used in project review.*
- 8-f *Prepare a list of standard mitigation measures from which the County could select appropriate measures to mitigate the impacts of projects in or adjacent to significant ecological resource areas.*

- 8-g *Require the environmental impact analysis of all significant grassland land sites proposed for development to include an early spring site reconnaissance to determine the presence of vernal pools and rare species associated with vernal pools and document the use of any seasonal wetlands by water bird species. A general observation of such sites during the dry portion of the year shall be deemed insufficient for environmental review. Significant grasslands include generally parcels of more than 40 acres which are located in an area dominated by native or introduced grass species.*
- 8-j *A setback from the edge of any wetland area may be required for any new structure. The breadth of any such setback shall be determined by the County after environmental review examining (a) the size and habitat value of the potentially affected wetland, and (b) potential impacts on the wetland, and adjacent uplands, arising out of the development and operation of the new structure. Unless environmental review indicates that greater or lesser protection is necessary or adequate, setbacks generally will be between 50 and 100 feet in breadth. Expansions or other modifications of non-habitable agriculturally related structures existing as of 1990 shall be exempt from this setback requirement. Parcels which would be rendered un-buildable by application of this standard shall also be exempt.*
- 8-l *The County shall require avoidance, minimization and/or compensatory mitigation techniques to be employed with respect to specific development projects having a potential to affect a wetland. In evaluating the level of compensation to be required with respect to any given project, (a) on-site mitigation shall be preferred to off-site and in-kind mitigation shall be preferred to out-of-kind, (b) functional replacement ratios may vary to the extent necessary to incorporate a margin of safety reflecting the expected degree of success associated with the mitigation plan, and acreage replacement ratios may vary depending on the relative functions and values of those wetlands being lost and those being supplied.*
- To the extent permitted by law, the County may require 3:1 compensatory mitigation of any project affecting a "Significant Wetland".*
- 8-r *Encourage the revegetation of native grass species on lands which have been modified for agriculture, where appropriate.*

1.5.4 Zoning Ordinance

Chapter 88-30 Solar Energy Facilities establishes the purpose, definitions, permit requirements, and development standards for commercial solar energy facilities (Ordinance 2020-07; CCCo 2020). The following Articles are applicable to this Project (but not limited to):

Article 602 Location Requirement. A commercial solar energy facility may be established on any lot in a general commercial (C), light industrial (L-I), or heavy industrial (H-I) district, or in a planned unit (P-I) district with an underlying general plan land use designation of commercial or industrial, or in a solar energy generation (-SG) combining district (Ordinance 2020-07; CCCo 2020).

Article 614 Habitat Avoidance. *A commercial solar energy facility may not be located within 75 feet of any creek or within 50 feet of any other aquatic habitat unless a land use permit is issued and the zoning administrator determines: that there will be no impact to the aquatic habitat; or that mitigation measures are available to minimize or offset any impacts to the aquatic habitat and*

the zoning administrator requires the mitigation measures as a condition of permit approval (Ordinance 2020-07; CCCo 2020).

1.5.5 East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan

The East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) is a regional plan (Plan) that covers approximately 175,000 acres of land within eastern Contra Costa County. The Plan implements a coordinated approach to project development that streamlines the permit process for endangered species and wetland regulations. Under the Plan, (1) acquisition of conservation land focuses on preservation of wildlife links between existing public land and protecting wildlife corridors; (2) project permits for covered projects such as new homes/business, and public infrastructure would be streamlined. Covered projects or 'covered activities' excludes high-quality habitat and are in urban development areas, or where rural infrastructure projects are located outside of the urban limit line. Rural infrastructure projects are divided into three categories: transportation, flood protection, and utility. The Plan considered activities encompassing up to 933 acres for rural infrastructure projects, described within the Plan's EIR (Jones and Stokes 2006); however only projects that were well-defined at the time of Plan approval are included as covered activities.

Plan implementation for solar facilities is governed by Ordinance No. 2020-07, Solar Energy Facilities. In 2021, the East Contra Costa County Habitat Conservancy, the entity charged with management of the HCP/NCCP, adopted an Implementation Policy Regarding Installation of Solar Energy Facilities Outside of the Urban Development Area. The Implementation Policy clarifies that the HCP/NCCP can only be utilized for solar energy facility projects that are currently within the County's existing Solar Generation (SG) overlay zone.

There are twenty-eight sensitive and rare species covered in the Plan:

- | | | | |
|----------------------------|-------------------------------|------------------------------|------------------------------------|
| • Mt. Diablo manzanita | • Diablo helianthella | • Giant garter snake | • Western pond turtle |
| • Brittscale | • Brewer's dwarf flax | • CA tiger salamander | • Tricolored blackbird |
| • San Joaquin spearscale | • Showy madia | • CA red-legged frog | • Western burrowing owl |
| • Big tarplant | • Adobe navarretia | • Midvalley fairy shrimp | • Swainson's hawk |
| • Mt. Diablo fairy lantern | • Longhorn fairy shrimp | • N. CA legless lizard | • Golden eagle |
| • Recurved larkspur | • Vernal pool fairy shrimp | • Alameda whipsnake | • San Joaquin kit fox |
| • Round-leaved filaree | • Foothill yellow-legged frog | • Vernal pool tadpole shrimp | • Townsend's western big-eared bat |

1.6 Special Status Species and Sensitive Habitat Regulations

For purposes of this Biological Resource Assessment, special status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the FESA; those listed or proposed for listing as rare, threatened, or endangered by the CDFW under the CESA; animals designated as "Species of Special Concern," "Fully Protected," or "Watch List" by the CDFW; and plants with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4. In the following sections, further details are provided to highlight the different guidelines and qualifications that are used to help identify special status species in this report. In Sections 3.5 and 3.6, the various qualifications are listed in the special status species tables (Table 3 and Table 5) for each species with potential to occur in the project area.

1.6.1 California Natural Diversity Database (CNDDDB)

"Special Plants" and "Special Animals" are broad terms used to refer to all the plant and animal taxa inventoried by the CNDDDB, regardless of their legal or protection status (CDFW 2021b, CDFW 2021c). The Special Plants list includes vascular plants, high priority bryophytes (mosses, liverworts, and hornworts), and lichens. The Special Animals list is also referred to by CDFW as the list of "species at risk" or "special status species."

According to the CNDDDB, Special Plants and Animals lists include: taxa that are officially listed or proposed for listing by California or the Federal Government as Endangered, Threatened, or Rare; taxa which meet the criteria for listing, as described in Section 15380 of CEQA Guidelines; taxa deemed biologically rare, restricted in range, declining in abundance, or otherwise vulnerable; population(s) in California that may be marginal to the taxon's entire range but are threatened with extirpation in California; and/or taxa closely associated with a habitat that is declining in California at a significant rate. Separately, the Special Plants List includes taxa listed in the California Native Plant Society's Inventory of Rare and Endangered Plants of California, as well as taxa determined to be Sensitive Species by the Bureau of Land Management, U.S. Fish and Wildlife Service (USFWS), or U.S. Forest Service. The Special Animals List distinctively includes taxa considered by the CDFW to be a Species of Special Concern (SSC) and taxa designated as a special status, sensitive, or declining species by other state or federal agencies.

1.6.2 Federal and State Endangered Species Listings

The Federal and California Endangered Species Acts are the regulatory documents that govern the listing and protection of species, and their habitats, identified as being endangered or threatened with extinction. Possible listing status under both Federal and California ESA includes Endangered and Threatened (FE, FT, CE, or CT). Species in the process of being listed are given the status of

either Proposed Federally Endangered/Threatened, or Candidate for California Endangered/Threatened (PE, PT, CCE, or CCT). The CESA has one additional status: Rare (CR).

1.6.3 Global and State Ranks

Global and State Ranks reflect an assessment of the condition of the species or habitats across its entire range. Basic ranks assign a numerical value from 1 to 5, respectively for species with highest risk to most secure. Other ranking variations include rank ranges, rank qualifiers, and infraspecific taxon ranks. All Heritage Programs, such as the CNDDB use the same ranking methodology, originally developed by The Nature Conservancy and now maintained and recently revised by NatureServe. Procedurally, state programs such as the CNDDB develop the State ranks. The Global ranks are determined collaboratively among the Heritage Programs for the states/provinces containing the species. Rank definitions, where G represents Global and S represents State, are as follows:

- **G1/S1:** Critically imperiled globally/in state because of extreme rarity (5 or fewer populations).
- **G2/S2:** Imperiled globally/in state because of rarity (6 to 20 populations).
- **G3/S3:** Vulnerable; rare and local throughout range or in a special habitat or narrowly endemic (on the order of 21 to 100 populations).
- **G4/S4:** Apparently secure globally/in state; uncommon but not rare (of no immediate conservation concern).
- **G5/S5:** Secure; common, widespread, and abundant.
- **G#G#/S#S#:** Rank range - numerical range indicating uncertainty in the status of a species, (e.g., G2G3 more certain than G3, but less certain that G2).
- **G/S#?:** Inexact numeric rank
- **Q:** Questionable taxonomy - Taxonomic distinctiveness of this entity is questionable.
- **T#:** Infraspecific taxa (subspecies or varieties) – indicating an infraspecific taxon that has a lower numerical ranking (rarer) than the given global rank of species.

1.6.4 California Rare Plant Ranks

Plant species are considered rare when their distribution is confined to localized areas, their habitat is threatened, they are declining in abundance, or they are threatened in a portion of their range. The California Rare Plant Rank (CRPR) categories range from species with a low threat (4) to species that are presumed extinct (1A). All but a few species are endemic to California. All of them are judged to be vulnerable under present circumstances, or to have a high potential for becoming vulnerable. Threat ranks are assigned as decimal values to a CRPR to further define the level of threat to a given species. The rare plant ranks and threat levels are defined below.

- **1A:** Plants presumed extirpated in California and either rare or extinct elsewhere
- **1B:** Plants rare, threatened, or endangered in California and elsewhere
- **2A:** Plants presumed extirpated in California, but common elsewhere

- **2B:** Plants rare, threatened, or endangered in California, but more common elsewhere
- **4:** Plants of limited distribution - a 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)
- **0.3:** Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

1.6.5 California Department of Fish and Wildlife Animal Rank

CDFW assigns one of three ranks to Special Animals: Watch List (WL), Species of Special Concern (SSC), or Fully Protected (FP). Unranked species are referred to by the term Special Animal (SA).

Animals listed as Watch List (WL) are taxa that were previously designated as SSC, but no longer merit that status, or taxa that which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

Animals listed as California Species of Special Concern (SSC) may or may not be listed under California or federal Endangered Species Acts. They are considered rare or declining in abundance in California. The Special Concern designation is intended to provide the CDFW biologists, land planners, and managers with lists of species that require special consideration during the planning process to avert continued population declines and potential costly listing under federal and state endangered species laws. For many species of birds, the primary emphasis is on the breeding population in California. For some species that do not breed in California but winter here, emphasis is on wintering range. The SSC designation thus may include a comment regarding the specific protection provided such as nesting or wintering.

Animals listed as Fully Protected (FP) are those species considered by CDFW as rare or faced with possible extinction. Most, but not all, have subsequently been listed under the CESA or FESA. Fully Protected species may not be taken or possessed at any time and no provision of the California Fish and Game code authorizes the issuance of permits or licenses to take any Fully Protected species.

1.6.6 Sensitive Habitats

Sensitive Natural Community is a state-wide designation given by CDFW to specific vegetation associations of ecological importance. Sensitive Natural Communities rarity and ranking involves the knowledge of range and distribution of a given type of vegetation, and the proportion of occurrences that are of good ecological integrity (CDFW 2019a). Evaluation is conducted at both the Global (G) and State (S) levels, resulting in a rank ranging from 1 for very rare and threatened to 5 for demonstrably secure. Natural Communities with ranks of S1-S3 are considered Sensitive Natural Communities in California and may need to be addressed in the environmental review processes of CEQA and its equivalents.

2 METHODS

2.1 Literature and Data Review

Althouse and Meade conducted a data search from the CNDDDB and the California Native Plant Society (CNPS) On-line Inventory of Rare and Endangered Plants of California on June 18, 2021 (CDFW 2021a, CNPS 2021). Supplemental occurrence data included online herbarium records maintained by the Consortium of California Herbaria (CCH 2021). The search area included the Byron Hot Springs USGS 7.5-minute quadrangle and the 8 surrounding quadrangles (Altamont, Antioch South, Brentwood, Clifton Court Forebay, Livermore, Midway, Tassajara, and Woodward Island). Biologists used the compiled data to determine the potential for each sensitive plant and wildlife species to occur within the Study Area. The complete list of species and determinations is provided in Appendix B and Appendix C.

2.2 Sensitive Species Evaluation

Special status species lists produced by database and literature searches were cross-referenced and analyzed according to the described habitat types in the Study Area in order to identify all potential special status species that could occur in or near the Study Area. After review of the literature, and completing site visits, the following criteria were used to determine the potential for special-status species to occur within the Study Area:

- **Present:** The species was observed in the Study Area during field surveys.
- **High Potential:** Highly suitable habitat and CNDDDB or CNPS occurrence records indicate the species is likely to occur in the Study Area or the immediate vicinity. Individuals may not have been observed during field surveys; however, the species likely occurs in or immediately adjacent to the Study Area and (for wildlife) could move into the Study Area in the future.
- **Moderate Potential:** Moderately suitable habitat is present in the Study Area and CNDDDB occurrences or surveys have recorded the species in the vicinity of the Study Area. Individuals were not observed during field surveys, but the species could be present, at least seasonally or as a transient.
- **Low Potential:** Marginally suitable habitat is present in the Study Area, and there are no occurrence records or other historical (i.e., 50 years or older) records in the vicinity of the Study Area. Individuals were not observed during surveys and are not expected to be present.
- **No Potential:** Suitable habitat for the species is not present in the Study Area, and/or the species is not known to occur in the region.

Each special status species that could occur in or near the Study Area is individually discussed in Sections 3.5.1 and 3.6.1.

2.3 Soils

A soil report was created by importing the Study Area as an Area of Interest (AOI) into the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) via their online portal. The resulting soil report was reviewed, and a map was created using the U.S. Department of Agriculture (USDA) NRCS Soil Survey GIS data (USDA 2021). Soils data is summarized in Section 3.2.

2.4 Jurisdictional Wetland Evaluation

A jurisdictional wetland evaluation is based on three determination factors: hydrology, hydrophytic vegetation, and hydric soils. The presence or absence of wetland hydrology field indicators was assessed by reviewing the high-water table, site topography, drift lines, drainage patterns, sediment deposits, inundation, observation of wet conditions during the growing season, and saturation of soils. Presence/absence surveys of hydrophytic vegetation were determined according to the indicator status of plants in the *National Wetland Plant List* (USACE 2018) and the *Wetland Plants of Specialize Habitats in the Arid West* (USACE 2007). Soil pits were dug during wetland and water investigations conducted in May and June 2021 by Althouse and Meade, Inc. wetland specialists Kristen Andersen and Jason Dart (Althouse and Meade, Inc. 2021). Soils were examined according to methodology presented in the 2008 Arid West Supplement and 1987 Manual. Hydric soil indicators are recognized by soil characteristics from the USDA-NRCS publication, *Field Indicators of Hydric Soils in the United States* (USDA-NRCS 2010) and the National Technical Committee for Hydric Soils (NTCHS) definition of hydric soils.

2.5 Surveys

On May 12 and 13, 2021, Althouse and Meade, Inc. Principal Biologist Jason Dart, Botanist Kristen Andersen, and Biologist Dustin Groh conducted a pedestrian survey to inventory plant and wildlife species, describe habitat types, and to collect photographic and drone imagery of the Study Area. A late-season botanical and wildlife survey was also conducted on June 30, 2021, by Kristen Andersen. Each habitat type was field inspected and described by species composition, as interpreted in Section 3.3. All plant and animal species observed in the field were identified and documented in Sections 3.5.2 and 3.6.2.

TABLE 1. BIOLOGICAL SURVEYS

Survey Date	Biologist(s)	Weather Observations	Activities
5/12/2021	Jason Dart Kristen Andersen Dustin Groh	65-93°F, clear, sunny, winds 5 to 15 mph	Wildlife and botanical surveys, habitat mapping, drone imagery, preliminary wetland boundary identification
5/13/2021	Jason Dart Kristen Andersen Dustin Groh	59-86°F, clear, sunny, winds 5 to 10 mph	Wildlife and botanical surveys, habitat mapping, drone imagery, wetland delineation
06/30/2021	Kristen Andersen	68-85°F, clear, sunny, high winds 10 to 25	Late-season botanical survey, wetland delineation

2.5.1 Botanical

Each habitat type occurring within the Study Area was inspected, described, and catalogued. All plant species observed were identified and recorded by a qualified botanist. Identification of botanical resources included field observations and laboratory analysis of collected material. Botanical surveys were conducted on May 12, 13, and June 30, 2021, according to guidelines (USFWS 2000, CDFW 2018, and CNPS 2001). This survey was floristic in nature and followed a complete survey protocol which consists of a 100 percent visual examination of the site using pedestrian transects which ranged between 10 and 30 meters in width. Transects were meandering with an emphasis on locating habitat appropriate for special status plants. Transects were also utilized to map boundaries of different vegetation types, describe general conditions and dominant species, compile species lists, and evaluate potential habitat for special status species. Botanical surveys were appropriately timed to identify all special status plant species known from the region (refer to Table 3) that have potential to occur in the Study Area. Botanical nomenclature used in this document follows biodiversity data provided by the participants of the Consortium of California Herbaria (CCH 2021).

2.5.2 Wildlife

Identification of wildlife resources were made by direct observations or by visual signs of animal presence such as burrows/dens, vocalization, tracks, and/or scat. Wildlife observations were recorded during Study Area field surveys (refer to Table 6). Birds were identified by sight, using 10-power binoculars, or by vocalizations. Reptiles were identified by sight, often using binoculars; traps were not used. Recorded mammals were identified by sight, burrow/dens, scat, and tracks. Wildlife surveys were appropriately timed to identify all special status animal species known from the region (refer to Table 5) that have potential to occur in the Study Area. Wildlife nomenclature for birds is in accordance with the American Ornithological Society Checklist (Chesser et al. 2019) and Revised Checklist of North American Mammals North of Mexico (Baker et al. 2003).

2.6 Maps

An unmanned aerial vehicle (UAV, drone) was deployed to reconstruct fine-scale topographic features within the Study Area. Part 107 certified pilot Dustin Groh acquired aerial photographs on May 12, 2021, using a DJI Matrice 200 V2 drone. A georeferenced orthomosaic image and digital elevation model of the Study Area were generated from the aerial photographs using photogrammetry software, Agisoft Metashape. All flight operations were conducted within visual line of sight and below a maximum altitude of 400 feet above-ground level. The Study Area occurs within Class G airspace, and flight operations were conducted with prior permission from the property owner.

Habitat boundaries were drawn using a drone-derived elevation model, aerial imagery, and field notes. Existing datasets such as the NHD and the USGS topographic maps were also considered during mapping. Field data collection utilized Samsung Galaxy Tab 4 tablets equipped with Garmin GLO GPS Receivers and GIS collection software, AimgoCloud. Field data were imported into Esri ArcGIS, and maps were produced at a minimum scale of 1 map inch to 400 feet on the ground.

3 RESULTS

3.1 Existing Conditions

The Study Area is agriculturally zoned and is currently used for cattle grazing and wind energy production. Site entry is located from a private windmill service road via Byron Hot Springs Road, which enters at the northeastern corner of the site. Other existing development in the northeast corner is a man-made stock pond, an unoccupied and dilapidated trailer residence surrounded by ornamental trees, the 230kV Pacific Gas and Electric (PG&E) transmission line and associated substation (Photo 1). Two 1-MW wind turbines are on a south-facing hillslope in the southwestern portion of the Study Area, operated by Buena Vista Energy, LLC (Photo 2).



Photo 1. PG&E 230 kV transmission line and substation, view northeast. May 12, 2021.



Photo 2. Wind turbines located onsite, view north. May 12, 2021.

Four ephemeral drainages transect the Study Area with flows moving in a southwest to northeast direction. The drainages extend downslope toward Brushy Creek and the California Aqueduct, and eventually to Clifton Court Forebay. Annual grassland is the dominant habitat type on site, comprised of non-native bromes (*Bromus* spp.) and barley (*Hordeum* spp.), with occasional patches of native purple needlegrass (*Stipa pulchra*). Several man-made rock piles are present in the grasslands along the upper slopes in the west end of the Study Area.

The surrounding region is rural and generally undeveloped with limited agricultural uses. The property to the north is owned by the East Bay Regional Park District and is used for limited ranching activities, irrigation canals, and a water pond; the property to the south is undeveloped; the property to the west is used for limited ranching uses and additional wind farms; and the property to the east contains irrigation canals but is otherwise vacant.

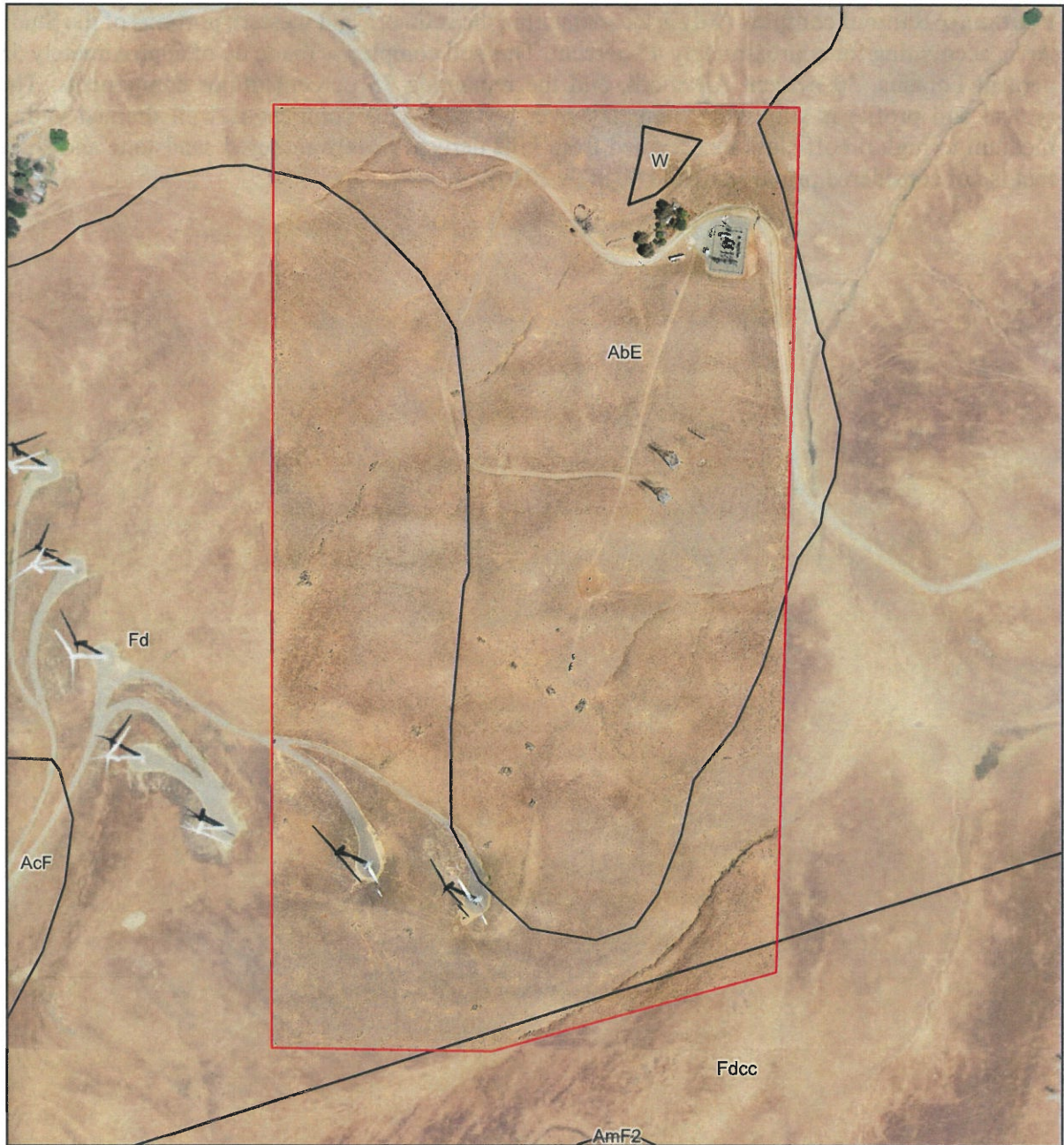
3.2 Soils

Much of the site is comprised of two soil map units: Altamont clay 15 to 30 percent slopes MLRA 15, and Fontana-Altamont complex (USDA 2021, Figure 3).

Altamont clay 15 to 30 percent slopes MLRA 15 (AbE) is represented in the northeastern portion of the Study Area, accounting for over 50 percent. The typical soil profile is clay (0 to 39 inches) over silty clay (39 to 48 inches). The Altamont clay soil class is considered well drained with a high runoff class that formed from mountain and hillslopes derived from weathered sandstone and shale that is not considered prime farmland (USDA 2020).

Fontana-Altamont complex (Fd) is located within the southern and western portions of the Study Area, accounting for approximately 45 percent. This soil complex is made up of approximately 55 percent Fontana, 30 percent Altamont, and the remaining 15 percent minor components. The typical soil profile is silty clay loam/clay over bedrock. This complex is well drained with a medium to high runoff class that formed from hills derived from weathered sandstone and shale that is not considered prime farmland (USDA 2020).

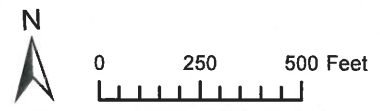
Figure 3. USDA Soil Survey



Soil Type	Study Area
AbE - Altamont clay	55%
Fd - Fontana-Altamont complex	42%
Fdcc - Fontana-Altamont complex	2%
W - Water	1%

Legend

- Study Area (84.6 acres)
- NRCS Soils



PV Byron EG-1
 Map Center: 121.64355°W 37.79866°N
 Contra Costa County, California

Data Source: USDA NRCS Soil Survey
 Imagery Sources: Althouse and Meade, Inc., 05/13/2021



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Map Updated:
 February 24, 2022 11:19 AM by SAF

3.3 Habitat Types

Table 2 lists three habitat types described and mapped within the Study Area (Figure 4). Most of the site, approximately 81.1 acres, is mapped as California annual grassland habitat. Approximately 3.0 acres of developed land is dedicated to wind energy production with a small area for onsite residential occupancy (although the site is currently unoccupied). Approximately 0.51-acre of wetland habitat occurs within onsite ephemeral drainages. Each habitat type is described below.

TABLE 2. HABITAT TYPES

Habitat Type	Approximate Area (Acres)
California Annual Grassland	81.1
Developed	3.0
Wetland	0.5
TOTAL	84.6

3.3.1 California Annual Grassland

Approximately 81.1 acres of the Study Area consists of California annual grassland habitat, which conforms to the Annual Brome Grasslands (*Avena* spp. - *Bromus* spp. Herbaceous Semi-Natural Alliance) classification defined by the Manual of California Vegetation (CNPS 2021), where red brome (*Bromus rubens*) and soft chess brome (*Bromus hordeaceus*) are dominant grasses (Photo 3). Purple needlegrass, a native bunchgrass, occurs sporadically throughout the grassland habitat in predominantly low densities. Various forbs occur within the grassland habitat, including perennial herbs San Joaquin milk vetch (*Astragalus asymmetricus*) and Great Valley gumplant (*Grindelia camporum*; Photo 4). Associate herbaceous annuals were also noted in grassland habitat, to include rose clover (*Trifolium hirtum*), California poppy (*Eschscholzia californica*), slender hareleaf (*Lagophylla ramosissima*), chick lupine (*Lupinus microcarpus*) and filaree (*Erodium botrys*, *E. cicutarium*).

Open grasslands offer suitable denning habitat for potential special status species such as burrowing owl (*Athene cunicularia*), American badger (*Taxidea taxus*), and San Joaquin kit fox (*Vulpes macrotis mutica*). An abundant prey base of California ground squirrels (*Otospermophilus beecheyi*) is present in the grassland habitat, providing excellent foraging habitat for birds of prey.



Photo 3. Heavily grazed annual grassland habitat with upstream rock piles and cattle, view northeast. June 30, 2021.



Photo 4. Grassland habitat with perennial herb San Joaquin milk vetch, view north. May 13, 2021.

3.3.2 Developed

Developed land occurs in areas of disturbance and includes the onsite wind farm, substation (Photo 5), unoccupied residence, overhead power lines, and access road, totaling approximately 3.0 acres of the Study Area (Figure 4). Ornamental trees surrounding the residential trailer (Photo 6) provide nesting and perching habitat for raptors and common bird species. No raptor nests were observed but a red-tailed hawk (*Buteo jamaicensis*) was observed perched in a Eucalyptus tree and great horned owl (*Bubo virginianus*) pellets were abundant in the understory. Confirmed nesting species include mourning dove (*Zenaida macroura*), Bullock's oriole (*Icterus bullockii*), and western kingbird (*Tyrannus verticalis*). Other structures, such as the substation, could also provide nesting substrate for birds. Structural eaves and tree crevices/foliage present in developed habitat could provide roosting habitat for special status and/or common bat species.



Photo 5. Existing substation within developed habitat surrounded by heavily grazed annual grassland, view southeast. May 12, 2021.



Photo 6. Ornamental trees surrounding unoccupied trailer residence in developed habitat, view southeast. May 12, 2021.

3.3.3 Wetland

Wetland habitat comprises approximately 0.51-acre and occurs as inclusions within two of the four ephemeral drainages (Photo 7 through Photo 9; Figure 4). Three-parameter wetlands with connectivity or adjacency to ephemeral streams are considered jurisdictional Non-wetland Waters of the State. Approximately 0.40 acre of wetland habitat (Pond Wetland) is present at the terminus of the northern central drainage, which conveys seasonal flow toward the Pond Wetland and existing residential structure (Photo 7 and Photo 8). This impounded aquatic feature is mapped by the National Wetland Inventory (NWI) as a freshwater pond with an unconsolidated bottom and is modified by a man-made berm on the east end that obstructs the outflow of surface water. This feature is a seasonal stock pond that is used by cattle and lacks wetland vegetation, likely due to prolonged inundation. A second wetland feature of approximately 0.11 acre (Seep Wetland) occurs as an inclusion within the southernmost ephemeral drainage (Photo 9). This Seep Wetland feature supports hydrophytic vegetation and may contain ponded water at a depth of one foot during the wet season. Standing water at a depth of approximately two to three inches was present during May 2021 surveys. Within the Study Area, the Pond Wetland is potential breeding habitat for California tiger salamander (CTS; *Ambystoma californiense*), California red-legged frog (CRLF; *Rana draytonii*), and fairy shrimp (*Branchinecta* spp.). The Seep Wetland is not suitable breeding

habitat for these species but is a source of fresh water for birds and wildlife moving through the area.



Photo 7. View northeast of Pond Wetland feature from upstream along Drainage B. June 30, 2021.



Photo 8. Pond Wetland with saturated soils, hoof alterations, and low percent vegetation cover, view northwest. June 30, 2021.



Photo 9. Seep Wetland feature in southern drainage, view upstream and west. June 30, 2021.

Figure 4. Biological Resources



Legend

Study Area (84.6 acres)

Habitats

Annual Grassland (81.1 acres)

Developed (3.0 acres)

● American Badger Den (Inactive)

● Burrowing Owl Den

Wetlands and Waters (Avoided)

Federal and State Wetlands (0.1 acre)

Federal and State Wetlands (Potential CTS Breeding Habitat) (0.4 acre)

Waters of the U.S. (0.62 acre; 2,612 LF)

Waters of the State (1.3 acres; 2,612 LF)

Waters and Wetlands of the State Setback (75 feet)



0 250 500 Feet

PV Byron EG-1

Map Center: 121.64358°W 37.79863°N
Contra Costa County, California

Imagery Sources: USDA NAIP, 05/25/2020
Althouse and Meade, Inc., 05/13/2021



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Map Updated:
February 24, 2022 12:07 PM by SAF

3.4 Potential Jurisdictional Wetlands and Waters

Althouse and Meade, Inc. performed a wetland delineation for the Study Area on May 12-13, and June 30, 2021 (Althouse and Meade, Inc. 2021). This work resulted in delineation of 0.51 acre of wetland habitat that meets federal and state definitions (refer to Sections 1.5.1 and 1.5.2 above; SWRCB 2020). Wetland habitat occurs as downstream inclusions within two ephemeral drainages mapped in the Study Area (Figure 4). An additional 2,612 linear feet of jurisdictional non-wetland waters were also determined within the Study Area, where 0.62 acres (27,023 square feet) meet the definition for waters of the U.S. (to the OHWM) and 1.34 acres (58,370 square feet) meet waters of the state definitions (to TOB; Figure 4). The four mapped drainages are ephemeral streams that are dry most of the year, demonstrating surface flow only in direct response to precipitation. Onsite drainages occur in the lower elevational saddles between rolling hills, transporting stormwater in a northeast direction across the Study Area and offsite. Drainages eventually outlet to various streams and reservoirs within the California Aqueduct water system.

3.5 Botanical Resources

Research on special status plant occurrences conducted within the designated search area (see Methods) determined 61 special status plant species are known to occur in the region (Appendix B, CDFW 2021b, CNPS 2021). Figure 5 and Figure 7 depict the current GIS data for special status plants mapped near the Study Area by the CNDDDB and USFWS Critical Habitat.

3.5.1 Special Status Plant Species

Based on an analysis of known ecological requirements for the special status plant species reported from the region, and the habitat conditions that were observed in the Study Area, it was determined that 18 special status plant species have some potential to occur within the Study Area. One special status plant species has a high potential to occur (brittlescale), four species have a moderate potential to occur (big tarplant, Congdon's tarplant, spiny-sepaled button-celery, and shining navarretia), and 13 species have a low potential to occur (large-flowered fiddleneck, California androsace, big-scale balsamroot, small-flowered morning-glory, Delta button-celery, diamond-petaled California poppy, San Joaquin spearscale, stinkbells, Diablo helianthella, hogwallow starfish, woolly rose-mallow, Tehama navarretia, and adobe navarretia). Three species (palmate-bracted bird's-beak, Contra Costa goldfields, and Antioch dunes evening primrose), which are listed under the FESA and/or CESA and occur within the nine-quad search area, have no potential to occur within the Study Area due to lack of suitable habitat and/or soils. Each of the 18 species with potential to occur within the Study Area are discussed below and summarized in Table 3.

1. **Large-flowered Fiddleneck** (*Amsinckia grandiflora*) is a federal and California-listed endangered species with a CRPR 1B.1 rank. It is an annual herb endemic to California with occurrences documented only in northern California counties, including Contra Costa, Alameda, San Joaquin, and Napa, though it is suggested to have become extirpated in Contra Costa County. It is known to occur in foothill and valley grassland habitat, particularly on grassy slopes, below 300-meters elevation. Large-flowered fiddleneck has a typical bloom period between March and May. The closest known record is from 1992 approximately 7.0 miles west of the Study Area (CNDDDB #10). Sloping grassland habitat in the Study Area is suitable for this species, though the marginally disturbed condition reduces the likelihood for large-flowered fiddleneck to be present. Due to the lack of occurrences in the vicinity and

disturbed conditions of the site, there is low potential for this species to occur on the site. Large-flowered fiddleneck was not detected during appropriately timed botanical surveys conducted in May and June 2021.

2. **California Androsace** (*Androsace elongata* subsp. *acuta*) is a CRPR 4.2 species native to California, Nevada, Baja California, and Oregon, with an elevational range of less than 1,200 meters. It is an annual herb in the family Primulaceae with a bloom period between March and June, and is known to occur on dry, grassy slopes. The closest known record is from approximately 2.1 miles southwest of the Study Area (CCH DAV189751; UCD84947) in 2010. Suitable sloping grassland habitat is present in the Study Area; however, the disturbed quality of grassland is not preferred by this species and therefore we determined California androsace has a low potential to occur on site. California androsace was not detected during appropriately timed botanical surveys conducted in May and June 2021.
3. **Brittlescale** (*Atriplex depressa*) is a CRPR 1B.2 species endemic to California. It is known to occur on open playas within shadscale scrub, alkali sink, valley grassland, or wetland-riparian habitats, with alkaline or clay soils. It is not known to occur above 320-meters elevation. Its bloom period is between April and October. Suitable clay soils are present on the site, and the nearest occurrence is 0.8 miles north of the Study Area (CNDDDB #43) in 2000, with numerous additional occurrences in the vicinity. Open playa habitat is not present in the Study Area, however there are several occurrences in the vicinity of the Study Area within expansive wetland flats and there is high potential for this species to occur in wetland or grassland habitat on the site. Brittlescale was detected at an adjacent reference site visited on June 30, 2021 in wetland habitat, but this species was not detected in the Study Area during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur.
4. **Big-scale Balsamroot** (*Balsamorhiza macrolepis*) is a CRPR 1B.2 species native to California and western North America. This species is known to occur in habitat with open grassy or rocky slopes at generally less than 1,400 meters elevation. It is a perennial herb with a bloom period between March and July. The closest known record is over 10 miles to the southeast (CNDDDB #13) in 1993. Big-scale balsamroot has a high affinity for ultramafic soils, which are not present in the Study Area, however sloping grassland habitat with rock outcrops is present and this species has low potential to occur in the Study Area. Big-scale balsamroot was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur on the site.
5. **Big Tarplant** (*Blepharizonia plumosa*) is a CRPR 4.2 species endemic to California. It is an annual herb known to occur on dry, grassy slopes in foothill woodland, chaparral, and valley grassland habitats, generally below 500-meters elevation. Big tarplant has a bloom period between July and November. This species can be identified outside of its bloom period in vegetative state by the presence of one large, central stem with branches arched or ascending and with notable tack-shaped glands scattered throughout. The closest known occurrence is approximately 1.5 miles west of the Study Area (CNDDDB #62) in 2007 where it was observed in annual grassland habitat, similar to habitat conditions present in the Study Area. Appropriate grassland habitat with clay loam soils is present in the Study Area, however the site has been heavily grazed for years, and this species has moderate potential to occur. Big tarplant was not detected during appropriately timed botanical surveys conducted in May and June 2021.

6. **Congdon's Tarplant** (*Centromadia parryi* subsp. *congdonii*) is a CRPR 1B.1 subspecies endemic to mesic habitats from Contra Costa County south to San Luis Obispo County. It is known to occur on alkaline soils in grassland habitat between 0- and 230-meters elevation and is also known to occur alongside roads in wetland habitat or where water tends to accumulate or flow. It is annual herb that typically blooms between May and October (November). The closest documented record is approximately 3.4 miles southwest of the Study Area (CNDDDB #68) in 2004 where it was observed at the junction of Altamont Pass and Dryer Road. Congdon's tarplant was also observed in flower in a wetland ditch along Byron Hot Springs Road by Althouse and Meade, Inc. biologists during May 2021 surveys, approximately 2.7 miles northeast of the Study Area. The heavy clay soils and wetland habitat in the Study Area is suitable for this species and there is moderate potential for it to occur on the site. Congdon's tarplant was not detected during appropriately timed botanical surveys conducted in May and June 2021.
7. **Small-flowered Morning-Glory** (*Convolvulus simulans*) is a CRPR 4.2 species that is known from scattered localities from eastern San Francisco Bay area south to Baja California. It is known to occur on clay or serpentine soils in openings in chaparral, grassland, coastal scrub, and seep habitats between 30- and 740-meters elevation. It is an annual herb that typically blooms between March and July. The closest known record is approximately 2.9 miles northwest of the Study Area (CCH #JEPS100237) in 1990. The open grassland habitat with clay soils in the Study Area is suitable for this species, though the grazing regime has homogenized much of the site and therefore this species has low potential to occur. Small-flowered morning glory was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur.
8. **Delta Button-celery** (*Eryngium racemosum*) is a CRPR 1B.1 species endemic to California that is known to occur in seasonally flooded clay depressions in floodplains between 3- and 30-meters elevation. It is an annual or perennial herb with a bloom period between June and August. The closest known record is approximately 7.5 miles northwest of the Study Area (CNDDDB #33) in 1998. The common species *Eryngium castrense* was observed along the access road just southeast of the Study Area during May 2021 surveys. The clay soils and wetland habitat in the Study Area are suitable for this species, however the site is above the typical elevational range for Delta button-celery and there is low potential for it to occur. Delta button-celery was not detected during appropriately timed botanical surveys conducted in May and June 2021.
9. **Spiny-sepaled Button-celery** (*Eryngium spinosepalum*) is a CRPR 1B.2 species endemic to California. It is known to occur in vernal pool and vernal wetland habitats between 100- and 1,270-meters elevation. It is an annual or perennial herb that typically blooms in April to July. The closest known record is approximately 1.5 miles of the Study Area (CNDDDB #93) in 2007 in wetland habitat adjacent to Byron Hot Springs Road. The common species *Eryngium castrense* was observed along the access road just southeast of the Study Area during 2021 surveys. Wetland habitat in the Study Area could support this species and there is moderate potential for it to occur on the site. Spiny-sepaled button-celery was not detected during appropriately timed botanical surveys conducted in May and June 2021.
10. **Diamond-petaled California Poppy** (*Eschscholzia rhombipetala*) is CRPR 1B.1 species that occurs in valley grassland habitat but can also occur in fallow fields or open places, generally below 300-meters elevation. It is an annual herb with a bloom period between March and April.

This species is easily detectable (even outside of its bloom period) by its small stature, barrel-shaped receptacle between 0- and 0.3-mm, and both basal and cauline leaves. Suitable grassland habitat with clay soils is present in the Study Area; however, nearest occurrences are historic (from 1888), with one recent occurrence approximately 2.3 miles southwest of the site (CNDDDB #12) in 2015. This species has low potential to occur. Diamond-petaled California poppy was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect this species to occur on the site.

11. **San Joaquin Spearscale** (*Extriplex joaquinana*) is a CRPR 1B.2 species endemic to California known to occur in meadow habitat within shadscale scrub or valley grasslands with alkaline soils, generally below 840-meters elevation. It is an annual herb with a bloom period between April and September. The closest known record is 0.6 miles from the Study Area (CNDDDB #19) in 2015 where it was abundantly growing in alkaline meadow habitat. Numerous occurrences have been documented in the vicinity of the Study Area where this species is part of the vast wetland meadow habitat that the existing access road parallels prior to accessing the site. The grassland habitat with clay soils in the Study Area could support this species; however, the lack of specific meadow habitat with alkaline soils reduces the potential for this species to occur. San Joaquin spearscale was not detected during appropriately timed botanical surveys conducted in May and June 2021.
12. **Stinkbells** (*Fritillaria agrestis*) is a CRPR 4.2 species native and endemic to California. It is known to occur on clay, often vertic, and occasionally serpentine in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grasslands at elevations lower than 500 meters. It is a perennial herb that typically blooms between March and June. The closest known record is approximately 3.8 miles northwest of the Study Area (CNDDDB #4) in 1989. Other nearby occurrences are historic. The clay soils within sloping, grassland habitat in the Study Area are suitable for this species and there is low potential for it to occur on the site. *Fritillaria* is an easily detectable species that can be identified when fruiting or in seed. Stinkbells was not detected during appropriately timed botanical surveys conducted in May and June 2021.
13. **Diablo Helianthella** (*Helianthella castanea*) is a CRPR 1B.2 species endemic to California where most known records occur in Alameda and Contra Costa Counties. This species typically occurs in open, grassy sites, often in riparian habitat, between 200- and 1,300-meters elevation. It is an annual herb with a bloom period between April and June. All occurrences in the nine-quad search are west of Los Vaqueros Reservoir on south/southwest facing slopes in chaparral and oak woodland habitat. The closest known record is approximately 6.0 miles directly west of the Study Area (CNDDDB #14) in 2003. Though wetland and grassland habitats are present, there are no nearby occurrences within five miles and there is low potential for this species to occur. Diablo helianthella was not detected during appropriately timed botanical surveys conducted in May and June 2021.
14. **Hogwallow Starfish** (*Hesperervax caulescens*) is a CRPR 4.2 species endemic to California. It is known to occur on clay soils and mesic sites in grassland and vernal pool habitats between 0- and 505-meters elevation. It is an annual herb that typically blooms between March and June. The closest known recent record is approximately 6.7 miles southeast (CCH DAV212141; UCD160257) in 2014. All other occurrences in the vicinity are historic. Wetland habitat with clay soils in the Study Area is suitable to support this species, however due to no recent records nearby this species has low potential to occur on the site. Hogwallow starfish

was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur.

15. **Woolly Rose Mallow** (*Hibiscus lasiocarpus* var. *occidentalis*) is a CRPR 1B.2 species that is native to California, known to occur in freshwater-marsh and wetland habitats, including wet banks and riparian habitats. It is a perennial herb with a bloom period between June and November. This species is threatened by riverbank alteration. The closest known record is approximately 3.2 miles northeast of the Study Area (CNDDDB #152) in 2009, where it was observed growing within the California Aqueduct, northeast of the Delta Fish Protective facility, on the west side of Clifton Court Forebay. Limited wetland and wet stream bank habitat is present in the southeast portion of the Study Area and this species has low potential to occur on the site. Woolly rose mallow was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur.
16. **Tehama Navarretia** (*Navarretia heterandra*) is a CRPR 4.3 species native to California and also found in Oregon. It is known to occur in heavy soils of vernal pool and wetland habitat at an elevation of up to 1,100 meters. Heavy clay soils and limited wetland habitat are present in the Study Area, though nearest occurrence is over 13 miles northwest of the Study Area (CCH JEPS116947) in 2008. Due to the lack of nearby occurrences this species has low potential to occur on the site. Tehama navarretia was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur.
17. **Adobe Navarretia** (*Navarretia nigelliformis* subsp. *nigelliformis*) is a CRPR 4.2 subspecies endemic to California known to occur in wetland or riparian habitat, often in vernal pools or in clay depressions, and occasionally in non-wetlands. It is an annual herb with a bloom period between April and June. The closest known record is approximately 3.2 miles northeast of the Study Area (Calflora ID eb2263) in 1994 in the Byron Hot Springs area. Limited wetland habitat with clay soils in the Study Area is suitable for this species; however, due to the lack of CNDDDB records in the nine-quad search area, there is low potential for this species to occur. Adobe navarretia was not detected during appropriately timed botanical surveys conducted in May and June 2021, and we do not expect it to occur.
18. **Shining Navarretia** (*Navarretia nigelliformis* subsp. *radians*) is a CRPR 1B.2 subspecies endemic to California, primarily occurring in central California. It is known to occur in vernal pools, grassland, and cismontane woodland habitats, often on clay and alkaline sites between 65- and 1,000-meters elevation. It is an annual herb that typically blooms between March and July. The closest known record is approximately 2.3 miles southeast of the Study Area (CNDDDB #80) in 2015, where it was observed growing on a dry, clay hill slope in sparsely vegetated annual brome grassland. Grassland habitat with clay soils in the Study Area is suitable for this species and there is moderate potential for it to occur on the site. Shining navarretia was not detected during appropriately timed botanical surveys conducted in May and June 2021.

TABLE 3. SPECIAL STATUS PLANT LIST

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
1. <i>Amsinckia grandiflora</i>	Large-flowered fiddleneck	FE/CE G1/S1 1B.1	Mar-May	Grassy slopes	Low. The disturbed quality of grassland habitat in the Study Area is marginally suitable and nearest occurrences are either extirpated or historic.
2. <i>Androsace elongata</i> subsp. <i>acuta</i>	California androsace	-/ G5?T3T4/S3S4 4.2	Mar-Jun	Dry grassy slopes	Low. Dry, grassy slopes are present in the Study Area, however disturbed quality of grassland habitat is not preferred. Nearest occurrence is 2.1 miles southwest of the Study Area (CCH DAV189751; UCD84947) in 2010.
3. <i>Atriplex depressa</i>	Brittlescale	-/ G2/S2 1B.2	Apr-Oct	Alkaline or clay soils	High. Suitable clay soils are present, and the nearest occurrence is 0.8 miles north of the Study Area (CNDDDB #43) in 2000, with numerous occurrences in the vicinity.
4. <i>Balsamorhiza macrolepis</i>	Big-scale balsamroot	-/ G2/S2 1B.2	Mar-Jul	Open grassy or rocky slopes, valleys	Low. Suitable grassy slope habitat is present in the Study Area, though nearest occurrence is over 10 miles to the southeast (CNDDDB #13) in 1993.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
5. <i>Blepharizonia plumosa</i>	Big tarplant	-/ G1G2/S1S2 1B.1	Jul-Oct	Dry slopes in grassland	Moderate. Appropriate grassland habitat with clay loam soils is present in the Study Area.
6. <i>Centromadia parryi</i> subsp. <i>congdonii</i>	Congdon's tarplant	-/ G3T1T2/S1S2 1B.1	May-Nov	Grassland, disturbed sites. Terraces, swales, floodplains, Alkaline, heavy clay soil <300 m.	Moderate. Wetland habitat occurs within grassland habitat and suitable clay soils are present in the Study Area.
7. <i>Convolvulus simulans</i>	Small-flowered morning-glory	-/ G4/S4 4.2	Mar-Jul	Clay substrates, occasionally serpentine, annual grassland, coastal-sage scrub, chaparral	Low. Open grassland habitat with clay soils is present, though disturbed quality of grassland reduces potential to occur. Nearest occurrence is 2.9 miles northwest of the Study Area (CCH # JEPS100237) in 1990.
8. <i>Eryngium racemosum</i>	Delta button-celery	-/CE G1/S1 1B.1	Jun-Oct	Seasonally flooded clay depressions in floodplains	Low. Clay soils are present and nearest occurrence is 7.5 miles northwest of the Study Area (CNDDB #33).
9. <i>Eryngium spinosepalum</i>	Spiny-sepal button-celery	-/ G2/S2 1B.2	Apr-Jun	Vernal pools, swales, roadside ditches	Moderate. Wetland and swale habitat is present, and this species is known to occur in wetland habitat within 1.5 miles of the Study Area (CNDDB #93).

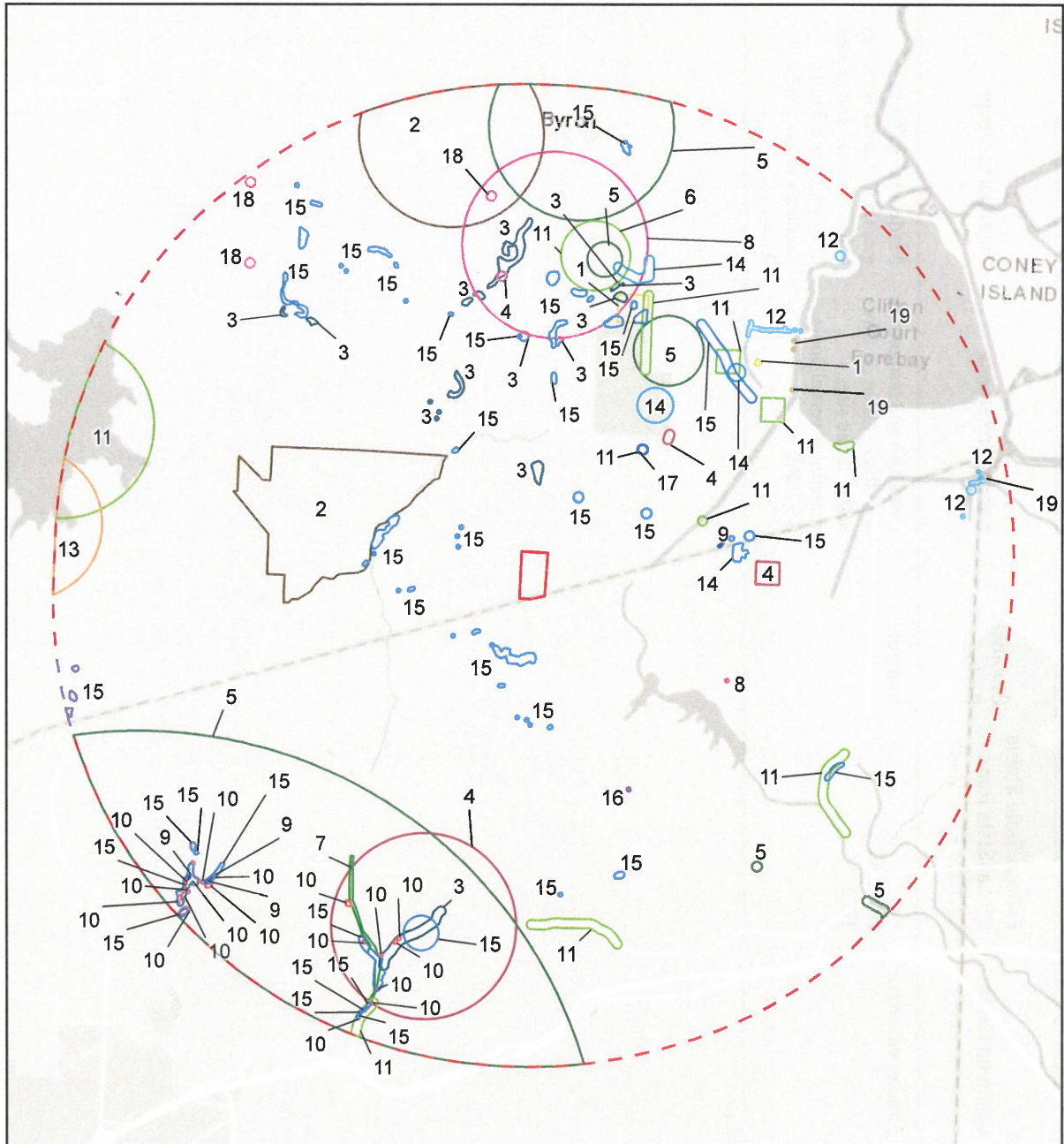
Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
10. <i>Eschscholzia rhombipetala</i>	Diamond-petaled California poppy	-/ G1/S1 1B.1	Mar-Apr	Fallow fields, open places	Low. Suitable grassland habitat with clay soils is present in the Study Area; however, nearest occurrences are historic (from 1888), with one recent occurrence approximately 2.3 miles southwest of the site (CNDDB #12) in 2015.
11. <i>Extriplex joaquinana</i>	San Joaquin spearscale	-/ G2/S2 1B.2	Apr-Oct	Alkaline soils	Low. Alkaline conditions are not present in the Study Area, but nearest occurrence is 0.6 miles from the site (CNDDB #19) and grassland habitat with clay soils could support this species.
12. <i>Fritillaria agrestis</i>	Stinkbells	-/ G3/S3 4.2	Mar-Jun	Clay, often vertic, occasionally serpentine	Low. Grassland habitat with clay soils is present in the Study Area and numerous occurrences are in the vicinity.
13. <i>Helianthella castanea</i>	Diablo helianthella	-/ G2/S2 1B.2	Mar-Jun	Open, grassy sites	Low. Appropriate grassland habitat is present in the Study Area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
14. <i>Hesperovax caulescens</i>	Hogwallow starfish	-/ G3/S3 4.2	Mar-Jun	Declining. Drying shrink- swell clay of vernal pools, flats, steep slopes (sometimes serpentine)	Low. Wetland habitat with clay soils is present though nearest occurrence is historic. More recent occurrence is 6.7 miles southeast (CCH DAV212141; UCD160257) in 2014.
15. <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	Woolly rose- mallow	-/ G5T3/S3 1B.2	Jun-Sep	Freshwater wetlands, wet banks, marshes	Low. Limited wetland habitat is present in the study Area and nearest occurrence is 3.2 miles northeast (CNDDDB #152) in 2009.
16. <i>Navarretia heterandra</i>	Tehama navarretia	-/ G4/S4 4.3	Apr-Jun	Heavy soil, vernal pools, wet or drying flats	Low. Heavy clay soils and limited wetland habitat are present, though nearest occurrence is over 13 miles northwest of the Study Area (CCH JEPS116947) in 2008.
17. <i>Navarretia nigelliformis</i> subsp. <i>nigelliformis</i>	Adobe navarretia	-/ G4T3/S3 4.2	Apr-Jun	Vernal pools, clay depressions	Low. Suitable clay soils in wetland habitat are present in the Study Area, though no known occurrences have been documented in the area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
18. <i>Navarretia nigelliformis</i> subsp. <i>radicans</i>	Shining navarretia	-/- G4T2/S2 1B.2	Mar-Jul	Grassland and cismontane woodland. Often on clay and alkaline sites, sometimes vernal pools. 65-1,000 m.	Moderate. Suitable grassland habitat with clay soils is present and nearest occurrence is 2.3 miles southeast of the Study Area.

See section 1.6 for status and rank definitions

Figure 5. California Natural Diversity Database Plant Records



Label	Common Name	Label	Common Name
1	Alkali milk-vetch	11	Long-Styled Sand Surrey
2	Big tarplant	12	Mason's Lileopsis
3	Brittlescale	13	Mt. Diablo Fairy-Lantern
4	California Alkali Grass	14	Recurved Larkspur
5	Caper-fruited Tropidocarpum	15	San Joaquin Spearscale
6	Chaparral Ragwort	16	Shining Navarretia
7	Congdon's Tarplant	17	Spiny-Sepaled Button-Celery
8	Diamond-petaled California Poppy	18	Stinkbells
9	Heartscale	19	Wolly Rose-Mallow
10	Lesser Saltscale		

Legend

Study Area (84.6 acres) 5-Mile Buffer



PV Byron EG-1
Map Center: 121.64355°W 37.79869°N
Contra Costa County, California

CNDDDB GIS Data Last Updated: June 2021



ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
February 24, 2022 11:57 AM by SAF

3.5.2 Botanical Survey Results

Botanical surveys conducted on May 12 and 13, and June 26, 2021, identified 63 species, subspecies, and varieties of vascular plant taxa in the Study Area (Table 4). The list includes 26 species native to California and 37 introduced (naturalized or planted) species. Native plant species account for approximately 41 percent of the Study Area flora; introduced species account for approximately 59 percent. No special status plants were identified in the Study Area.

TABLE 4. VASCULAR PLANT LIST

Scientific Name	Common Name	Special Status	Origin
Trees - 6 Species			
<i>Eucalyptus polyanthemos</i>	Silver dollar gum	None	Planted
<i>Ficus carica</i>	Fig	None	Planted
<i>Morus</i> sp.	Mulberry	None	Planted
<i>Olea europaea</i>	Olive	None	Planted
<i>Pinus</i> sp.	Pine	None	Planted
<i>Salix babylonica</i>	Weeping willow	None	Planted
Forbs – 43 Species			
<i>Achillea millefolium</i>	Yarrow	None	Native
<i>Asclepias fascicularis</i>	Narrow-leaved milkweed	None	Native
<i>Astragalus asymmetricus</i>	San Joaquin milk vetch	None	Native
<i>Atriplex argentea</i>	Silverscale saltbush	None	Native
<i>Brassica nigra</i>	Black mustard	None	Introduced
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus</i>	Italian thistle	None	Introduced
<i>Centaurea calcitrapa</i>	Purple star thistle	None	Introduced
<i>Centaurea melitensis</i>	Tocolote	None	Introduced
<i>Chenopodium murale</i>	Pigweed	None	Introduced
<i>Chlorogalum</i> <i>pomeridianum</i>	Amole	None	Native
<i>Cirsium vulgare</i>	Bull thistle	None	Introduced
<i>Cressa truxillensis</i>	Alkali weed	None	Native
<i>Croton setiger</i>	Doveweed	None	Native
<i>Deinandra fasciculata</i>	Clustered tarweed	None	Native

Scientific Name	Common Name	Special Status	Origin
<i>Deinandra lobbia</i>	Threeray tarweed	None	Native
<i>Dittrichia graveolens</i>	Stinkwort	None	Introduced
<i>Erodium botrys</i>	Longbeak storksbill	None	Introduced
<i>Erodium cicutarium</i>	Redstem filaree	None	Introduced
<i>Eryngium castrense</i>	Great valley button celery	None	Native
<i>Eschscholzia californica</i>	California poppy	None	Native
<i>Extriplex californica</i>	California orach	None	Native
<i>Foeniculum vulgare</i>	Fennel	None	Introduced
<i>Frankenia salina</i>	Alkali heath	None	Native
<i>Geranium carolinianum</i>	Carolina geranium	None	Native
<i>Grindelia camporum</i>	Gumweed	None	Native
<i>Hirschfeldia incana</i>	Wild mustard	None	Introduced
<i>Holocarpha obconica</i>	San Joaquin tarweed	None	Native
<i>Holocarpha virgata</i>	Narrow tarplant	None	Native
<i>Lagophylla ramosissima</i>	Slender hareleaf	None	Native
<i>Lupinus microcarpus</i>	Chick lupine	None	Native
<i>Lysimachia arvensis</i>	Scarlet pimpernel	None	Introduced
<i>Malvella leprosa</i>	Alkali mallow	None	Native
<i>Marah fabacea</i>	California man-root	None	Native
<i>Marrubium vulgare</i>	Horehound	None	Introduced
<i>Medicago polymorpha</i>	California burclover	None	Introduced
<i>Melilotus indicus</i>	Annual sweetclover	None	Introduced
<i>Nasturtium officinale</i>	Common watercress	None	Native
<i>Polygonum aviculare</i>	Prostrate knotweed	None	Introduced
<i>Solanum nigrum</i>	Black nightshade	None	Introduced
<i>Torilis nodosa</i>	Knotted hedge parsley	None	Introduced
<i>Trifolium hirtum</i>	Rose clover	None	Introduced
<i>Veronica peregrina</i> subsp. <i>xalapensis</i>	Speedwell	None	Native

Scientific Name	Common Name	Special Status	Origin
<i>Vicia sativa</i>	Common vetch	None	Introduced
Graminoids – 14 Species			
<i>Avena fatua</i>	Wild oat	None	Introduced
<i>Bromus hordeaceus</i>	Soft chess brome	None	Introduced
<i>Bromus rubens</i>	Red brome	None	Introduced
<i>Bromus sterilis</i>	Poverty brome	None	Introduced
<i>Cynodon dactylon</i>	Bermuda grass	None	Introduced
<i>Distichlis spicata</i>	Saltgrass	None	Native
<i>Elymus triticoides</i>	Creeping wild rye	None	Native
<i>Festuca bromoides</i>	Brome fescue	None	Introduced
<i>Festuca myuros</i>	Rattail sixweeks grass	None	Introduced
<i>Festuca perennis</i>	Italian rye grass	None	Introduced
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Barley	None	Introduced
<i>Hordeum murinum</i>	Foxtail barley	None	Introduced
<i>Polypogon monspeliensis</i>	Annual beardgrass	None	Introduced
<i>Stipa puchra</i>	Purple needlegrass	None	Native

See Section 1.6 for status and rank definitions.

3.6 Wildlife Resources

Research on special status animal occurrences conducted within the designated search area (see Methods) determined 53 special status animal species are known to occur in the region (Appendix C; CDFW 2021c). Figure 6 and Figure 7 depict the current GIS data for special status species mapped near the Study Area by the CNDDB and USFWS Critical Habitat.

3.6.1 Special Status Animal Species

Based on an analysis of known ecological requirements for the special-status wildlife species reported or known from the region (Appendix C), and the habitat conditions that were observed in the Study Area, it was determined that 23 special status animal species have some potential to occur within the Study Area. One special status animal, burrowing owl, was documented in the Study Area during spring 2021 surveys. Each of the 23 species with potential to occur in the Study Area is discussed below and summarized in Table 5.

1. **Cooper's Hawk** (*Accipiter cooperii*) is a CDFW Watch List species (for nesting occurrences only) that occurs regularly in California during the winter months and during spring and fall migration (CDFW 2021a). Cooper's hawks frequent oak and riparian woodland habitats, and increasingly urban areas, where they prey primarily upon small birds (Curtis et al. 2006). The closest reported occurrence of nesting Cooper's hawk is located approximately 8.8 miles southwest of the Study Area in 2009 (CNDDB #124). Cooper's hawks have been reported hunting in the area (eBird 2021) with the nearest observation within 1.9 miles of the Study Area, near Bethany Reservoir birding hotspot (Henry 2020). Due to the lack of high-quality nesting habitat, Cooper's hawks have low potential to nest on the site; however, numerous occurrences of foraging Cooper's hawks have been reported in the area (eBird 2021) and this species has moderate potential to hunt in the Study Area, though the prey base of small birds is limited. Cooper's hawks were not observed nesting or foraging in the Study Area during 2021 surveys but could likely be present.
2. **Tricolored Blackbird** (*Agelaius tricolor*) is a California Species of Special Concern (nesting colonies) and is listed as Threatened under the California Endangered Species Act. It has no FESA listing status. Tricolored blackbird occurs predominately in the Central Valley of California and in smaller disjunctive nesting colonies southwest of the Cascade Sierra axis and at higher elevations only in northwestern California (Shuford and Gardali 2008). Within its restricted range, the tricolored blackbird will migrate during the breeding season, moving north after the first nesting efforts, and in winter moving to lower elevations (Shuford and Gardali 2008). The breeding season is generally from April to July, but in the Central Valley there has been active breeding reported in October and November (CDFW 2014). Historically, the tricolored blackbird nested in emergent wetlands, marshes and swamps making their nests in tall, dense cattails, tules, tall herbs, thickets of willows and blackberries. The species also requires foraging space with an abundance of insect prey that can sustain the nesting colony (Weintraub et al. 2016). In a recent study, it was found that the tricolored blackbird had a higher breeding success nesting in non-native invasive vegetation like the Himalayan blackberry (*Rubus discolor*) over the native cattail (*Typha* spp.; Cook and Toft 2005). The closest reported CNDDB occurrence of a tricolored blackbird nesting colony is approximately 3.4 miles north of the Study Area (CNDDB #266) in 1995. Several occurrences of tricolored blackbird sightings are also documented (eBird 2021), particularly to the east as this species relies on water features for foraging and nesting and the California Aqueduct system provides

such habitat. Suitable nesting habitat of emergent wetland vegetation, such as tall reeds, is not present in the Study Area and there is no potential for tricolored blackbirds to nest onsite. However, due to the abundance of occurrences in the area, there is moderate potential for this species to forage in the Study Area. Tricolored blackbirds were not observed during May or June 2021 surveys but could be present seasonally.

3. **California Tiger Salamander** (*Ambystoma californiense*) Central California Distinct Population Segment (DPS) is listed as a threatened species under CESA and FESA. This salamander is found in low elevations (3 to 1,054 m) of central California where it inhabits cismontane and riparian woodland and valley and foothill grasslands (Jennings and Hayes 1994; Loredó et al. 1996; CDFW 2014; CDFW 2018a). Although CTS are adapted to breeding in natural vernal pools and ponds, they now frequently use livestock ponds and other modified ephemeral and permanent ponds (USFWS 2014). Metamorphosis usually occurs by July when the CTS will migrate up to 2.2 kilometers (1.3 miles) to dry-season refuge. Upland habitats surrounding known CTS breeding pools are usually dominated by grassland, oak savanna, or oak woodland (CDFW 2015). Large tracts of upland habitat, preferably with multiple breeding ponds, are necessary for CTS to persist (USFWS 2017b). The preferred dry season habitat has soft, loose soils with an abundance of ground squirrel burrows, fallen debris of logs and leaf litter and small soil crevices (Jennings and Hayes 1994; Orloff 2011; CDFW 2014). CTS larvae feed mainly on zooplankton but will also eat insect larvae, amphipods and mollusks. Adult CTS feed primarily on earthworms, fish, snails and insects (CDFW 2014).

Several known breeding ponds occur in the vicinity of the Project (Photo 10), with the nearest pond (CNDDDB #369) approximately 0.9 miles west of the Pond Wetland in the Study Area (Photo 11). Distance to known breeding ponds to the east and south are over 1.5 miles from the Pond Wetland and are beyond the 1.3 mile (2.2 km) maximum dispersal distance for CTS. The Pond Wetland appears to provide suitable breeding habitat for CTS with late season aquatic habitat holding during most years. Due to the abundance of records in the area and proximity to offsite known breeding ponds within dispersal distance, CTS has a high potential to occur in the Study Area. CTS was not detected during May or June 2021 surveys and focused surveys were not conducted as part of this assessment as the Pond Wetland was dry at the time of these surveys.



Photo 10. Map of known CTS breeding ponds (CNDDDB; yellow polygons) in relation to the Study Area (white boundary)..



Photo 11. Map of nearest known CTS breeding pond (CNDDDB #369; yellow), approx. 0.9 miles west of Pond Wetland (dark blue) within the Study Area (white boundary).

4. **Grasshopper Sparrow** (*Ammodramus savannarum*) is a California Species of Special Concern (nesting occurrences only) with a Global rank of G5 and a State rank of S3. The species is distributed across California west of the Cascade-Sierra Nevada crest, primarily as a summer resident from March to September. It has been seen as far north as Del Norte County, with a single disjunct population in Siskiyou County, and more scattered populations as far south as San Diego County. The grasshopper sparrow has been known to winter in California, but this is rare. The breeding season is generally April to July with the peak being in May and June (CDFW 2014). This bird prefers large dense, dry grasslands on rolling hills, lowland plains, lower mountain slopes and valleys with scattered sage shrubs for perching (CDFW 2014; CDFW 2018a). If the shrub cover is dominant in the area, the grasshopper sparrow has been found to be absent. The bird needs grassland with patches of bare ground which is

important for its foraging behavior (Shuford and Gardali 2008; CDFW 2014). Nests are built in grasses and forbs near the ground (CDFW 2014). It has been found that predation on nests is decreased by increased forb and grass cover (Sutter & Ritchison, 2005). The grasshopper sparrow's main food source is grasshoppers but it also eats other insects and seeds of pigweed, knotweed, campion and oats (Shuford and Gardali 2008). The closest reported CNDDDB occurrence of grasshopper sparrow is located approximately 6.0 miles southwest of the Study Area (CNDDDB #21) in 2016, where this species was observed within wetland and grassland habitat, with no mention of nests. A more recent nearby occurrence was reported in 2012 (Chasin 2012), though most records were documented west of the Study Area with no mention of nest sites near the Project (eBird 2021). Suitable grassland habitat with rock outcrops is present in the Study Area that could support both nesting and foraging grasshopper sparrows. Grazed conditions reduce the attractiveness to these ground nesting birds, but although they are not common in the area they have a moderate potential to occur on site. Grasshopper sparrows were not detected during May or June 2021 surveys but could be present seasonally.

5. **Golden Eagle** (*Aquila chrysaetos*) is designated a Fully Protected species by the CDFW and is federally protected by the Bald and Golden Eagle Protection Act. The species range extends throughout much of North America and in California is found in broadleaved upland and montane coniferous forests, cismontane, pinon and juniper woodlands, coastal prairie, great basin scrub and great basin, valley and foothill grassland habitat types (CDFW 2021a). Most golden eagles in California are residents year-round, but in the winter months this population will be augmented with individuals from other nearby western states. The breeding season in California is generally from late January through August. The golden eagle prefers open habitat and in California it extensively utilizes grazed grasslands and open shrublands for preying on its main food source of hares or rabbits and marmots or ground squirrels (Hunt 1995; Watson 2010). Studies have shown that both the golden eagle's reproduction rate and success declines with a decrease in prey abundance (Driscoll 2010). The golden eagle will even refrain from egg laying when prey numbers are low (Driscoll 2010). In California, the golden eagle nests almost exclusively in trees (82% trees in central California) but in montane regions it also has a preference for cliffs and will avoid nesting in densely forested habitat (Hunt 1995; Pagel et al. 2010). The golden eagle is highly sensitive to anthropogenic presences and will avoid nesting near urban areas (Pagel et al. 2010). Golden eagles will even abandon nests when human activity and development increases in their territory (Driscoll 2010). The closest reported occurrence of nesting golden eagles is located approximately 2.3 miles west of the Study Area in 1990 (CNDDDB #71). This species is common to the area and several occurrences of perched and foraging golden eagles, both juvenile and adult, are reported (eBird 2021), with the nearest occurrence less than one mile west of the Study Area (Chasin 2012). Due to the lack of suitable nesting habitat in the Study Area, golden eagles have no potential to nest on site but have high potential to hunt on the site. Golden eagles were not observed during May or June 2021 site surveys but are likely to be present.
6. **Burrowing Owl** (*Athene cunicularia*) is a California Species of Special Concern. It is a small, rare owl that occupies abandoned mammal holes in the ground, most notably those of the California ground squirrel. In California, the burrowing owl is a year-round resident in the Carrizo Plain, Central Valley, Imperial Valley and the San Francisco Bay region. In the winter months, burrowing owl individuals from other western populations will augment the year-round Californian populations (Shuford and Gardali 2008). The breeding season is generally

from March through August. Suitable habitat types for the burrowing owl are dry, open annual or perennial grasslands and deserts with an abundance of burrows (CDFW 2014; CDFW 2018a). More specifically, the owl is found in coastal prairie, coastal scrub, great basin, Mojavean and Sonoran Desert scrub and great basin, valley and foothill grassland habitats (CDFW, 2018). The burrowing owl commonly nests in abandoned holes in the ground, most notably those of the California ground squirrel, but the owl is also known to inhabit badger and fox dens and man-made holes, such as pipes and culverts. Rarely, it has been known to dig its own burrow in softer soil types (Coulombe 1971; Gervais et al. 2008). Burrows with high horizontal visibility and low vegetation coverage are preferred but burrows with dense vegetation with high perch sites will be used (Green and Anthony 1989). *Orthoptera* are the main food source for the owl but it will also consume other insects, as well as amphibians, carrion, small mammals, reptiles and birds (York et al. 2002; Gervais et al. 2008; CDFW 2014).

A pair of adult burrowing owls were observed in the southwest portion of the Study Area on May 12, 2021, during biological surveys. Both owls flushed from the same burrow that had abundant fresh whitewash on the entrance apron. A CNDDDB submission form for the observation was reported (Appendix D). Aside from onsite observations, burrowing owls are known to occur in the area, with several occurrences in the vicinity of the Project. The closest reported occurrence is approximately 0.6 miles directly south from the Study Area (CNDDDB #554) in 2018. The open grassland with rock outcrops in the Study Area provides suitable burrowing and perching habitat for burrowing owls, and there is an abundant prey base of ground squirrels and other small mammals. Burrowing owl and their sign were observed during May and June 2021 site surveys and are expected to be regular winter residents and spring-summer breeders on site.

7. **Longhorn Fairy Shrimp** (*Branchinecta longiantenna*) is a small freshwater crustacean that is federally listed as endangered and four known populations of this species remain, to include areas within Carrizo Plain National Monument in San Luis Obispo County, areas within the San Luis National Wildlife Refuge Complex in Merced County, within Brushy Peak Preserve in Alameda County, and within the Vasco Caves Preserve, near the town of Byron in Contra Costa County (USFWS 2017a). Longhorn fairy shrimp inhabit clear to rather turbid vernal pools, freshwater depressions in sandstone outcrops, claypan and grass-bottomed pools, and specifically in Soda Lake, San Luis Obispo County. Longhorn fairy shrimp have been collected from late December to late April (USFWS 2017a). It ranges in size from 1.3 to 2 cm (0.5 to 0.8 inch) long. They have delicate elongate bodies, large, stalked compound eyes, no carapaces, and 11 pairs of swimming legs. The shrimp feed on algae, bacteria, protozoa, rotifers and bits of detritus. Female fairy shrimp carry their eggs in a ventral brood sac. The eggs either are dropped to the pool bottom or remain in the brood sac until the mother dies and sinks. When the pool dries out, so do the eggs. They remain in the dry pool bed until rains and other environmental stimuli hatch them. Resting fairy shrimp eggs are known as cysts, which are capable of withstanding heat, cold and prolonged desiccation. When the pools refill, some, but not all, of the cysts may hatch. The cyst bank in the soil may contain cysts from several years of breeding. Hatching can begin within the same week that a pool starts to fill. Average time to maturity is 43 days. (Eriksen and Belk 1999). Habitat loss and fragmentation is the largest threat to the survival and recovery of vernal pool species. Habitat loss generally is a result of urbanization, agricultural conversion, and mining. Habitat loss also occurs in the form of habitat alteration and degradation as a result of changes to natural hydrology, invasive

species, incompatible grazing regimes, including insufficient grazing for prolonged periods, infrastructure projects, recreational activities, erosion, climatic and environmental change, and contamination (USFWS 1994). The Study Area overlaps with a known occurrence for longhorn fairy shrimp (CNDDB #12), reported in 2018 where this species was observed in seasonal ponds formed by depressions in rock outcroppings. The Study Area was not likely examined as part of this occurrence area but does have wetland habitat that could support fairy shrimp. The Pond Wetland feature (Figure 4) is marginally suitable habitat for this species; however focused surveys for fairy shrimp were not conducted as part of this assessment as the Pond Wetland was dry at the time of our May 2021 surveys. The Seep Wetland is not suitable habitat for longhorn fairy shrimp. Longhorn fairy shrimp have moderate potential to occur in the Study Area.

8. **Vernal Pool Fairy Shrimp** (*Branchinecta lynchi*) is a small freshwater crustacean that is federally listed as threatened and occurs in the Central Valley of California from Shasta County to Tulare County and the central and southern Coast Ranges from northern Solano County to Ventura County, California (USFWS 2003). This shrimp is found in grasslands in cool, clear-water sandstone-depression, grassed swale, earth slump and basalt-flow depression pools with a higher occurrence in Redding, Corning and Red Bluff soils (Helm 1998; CDFW 2018a). Preferred pool depth by the shrimp ranges from 2-122 cm. Individuals hatch from cysts during cold-weather winter storms and require water temperatures of 50°F or lower to hatch (Helm 1998; Eriksen and Belk 1999). The time to maturity and reproduction is temperature dependent, varying between 18 days and 147 days, with a mean of 39.7 days. Immature and adult shrimp are known to die off when water temperatures rise to approximately 75°F (Helm 1998). The species is typically associated with smaller and shallower vernal pools (typically about 6 inches deep) that have relatively short periods of inundation (Helm 1998) and relatively low to moderate total dissolved solids (TDS) and alkalinity. The closest reported occurrence of the vernal pool fairy shrimp is located approximately 0.5 mile north of the Study Area (CNDDB #219) in 2017, with several additional occurrences in the vicinity. There is moderate potential for vernal pool fairy shrimp to occur in the Pond Wetland, and no potential to occur in the Seep Wetland.
9. **Midvalley Fairy Shrimp** (*Branchinecta mesoallensis*) is a small freshwater crustacean that is federally listed as threatened and is endemic to a small portion of California's Central Valley. Helm (1998) found midvalley fairy shrimp in less than 0.5 percent of the vernal pools he examined. Based on the few known occurrences, the species' distribution is apparently limited to the Southeastern Sacramento, Southern Sierra Foothill, San Joaquin, and Solano-Colusa Vernal Pool Regions. The midvalley fairy shrimp is characterized by relatively simple male antennae, lacking spines or protuberances. Male midvalley fairy shrimp range in length from 12 to 20 millimeters (0.5 to 0.8 inch), and females range from 7 to 20 millimeters (0.3 to 0.8 inch), measured from the front of the head to the tip of the cercopods (Belk and Fugate 2000). The midvalley fairy shrimp can mature and reproduce very rapidly; it has been observed to reach maturity in as little as 8 days and reproduction was observed in as few as 16 days after hatching (Helm 1998). Under the culturing conditions described in Helm (1998), the midvalley fairy shrimp lived for 147 days, about as long as other Central Valley species observed. Helm (1998) found the midvalley fairy shrimp to be very tolerant of warm water, occurring in pools with water temperatures ranging from 5 to 32 degrees Celsius (41 to 89 degrees Fahrenheit). This temperature is higher than that measured for any other Central Valley fairy shrimp except

for the California fairy shrimp. The midvalley fairy shrimp has only been collected with one other fairy shrimp, the vernal pool fairy shrimp (Eriksen and Belk 1999). Fairy shrimp species are threatened by similar factors because they occupy the same vernal pool ecosystems (refer to longhorn fairy shrimp above, and vernal pool fairy shrimp below). Two occurrences of midvalley fairy shrimp are reported within eastern Contra Costa County, in the vicinity of the Project (USFWS 2017a). However, because this species was described only recently, it is likely additional occurrences will be found in the future (USFWS 2017a). There is moderate potential for midvalley fairy shrimp to occur in the Pond Wetland, and no potential to occur in the Seep Wetland.

10. Ferruginous Hawk (*Buteo regalis*) is a California Watch List tracked by the CDFW due to declining populations throughout its range. It has a Global Rank of G4 (Apparently Secure) and a State Rank of S3S4, meaning it is uncertain whether this species can be considered Vulnerable (S3) or Apparently Secure (S4). Only a very small number of ferruginous hawk nests have in been found in the northeast part of California and the species is considered a winter visitor or migrant to the state. In California the ferruginous hawk is found in great basin, valley and foothill grassland, great basin scrub and pinon and juniper woodlands (CDFW 2018a). The bird prefers large, open grasslands for coursing low in search of prey, and scattered trees, power poles, and shrubs for perching. The ferruginous hawk tends to avoid habitat near human development (Travsky and Beauvais 2005; CDFW 2014). Its main prey sources are ground squirrel, kangaroo rat (*Dipodomys californicus*), cottontail (*Sylvilagus* spp.), northern pocket gopher (*Thomomys talpoides*) and white-tailed jackrabbit (*Lepus townsendii*). They will also eat insects, birds, amphibians and reptiles (Grindrod 1998). The closest reported CNDDDB occurrence of ferruginous hawk is located approximately 2.5 miles east of the Study Area (CNDDDB #27) in February 1993 where an adult was observed hunting for ground squirrels. More recent occurrences have been documented (eBird 2021), with the nearest record within 1.2 miles northeast of the Study Area (Raffel 2020). Though this species has been documented frequently in the area during winter, their breeding range occurs predominantly east of California. Due to the open grassland habitat in the Study Area and surrounding area, ferruginous hawks have a moderate potential to forage within the Study Area, and no potential to nest on the site. The ferruginous hawk was not observed in the Study Area during May or June 2021 surveys but could be present during winter months.

11. Swainson's Hawk (*Buteo swainsoni*) is a CESA-listed threatened species that breeds in California and winters in Mexico and South America. It typically nests in solitary trees near pastures or agricultural fields. In the Central Valley, trees most commonly used for nesting include Fremont's cottonwood (*Populus fremonti*), willows (*Salix* sp.), sycamores (*Platanus* sp.), valley oaks (*Quercus lobata*), and walnut (*Juglans* sp.), with introduced species such as eucalyptus, pines, and redwoods being used occasionally (Woodbridge 1998). Areas within the historical range, particularly along the Central Coast and southern regions, have not been reoccupied, and the Central Valley and Great Basin continue to provide the species its core habitat in California (CDFW 2016). A pair of mating Swainson's hawks were observed copulating offsite, just northeast of the Study Area by approximately 0.8 miles, during May 2021 surveys, although no nest was located. The closest reported occurrence of nesting Swainson's hawk is located approximately 2.0 miles southeast of the Study Area (CNDDDB #2380) in 2009, where an active nest was located in a blue gum (*Eucalyptus globulus*) tree within a small eucalyptus grove surrounded by grazed annual grassland. Grazing does not seem

to affect nesting potential for Swainson's hawk and nesting tree selection can occur in areas with some disturbance. Based on the presence of suitable foraging habitat in the Study Area and known occurrences of both nesting and foraging in the vicinity, there is high potential to for Swainson's hawk forage in the grassland habitat and low potential for them to nest on the site.

12. **Northern Harrier** (*Circus hudsonius*) is a California Species of Special Concern found year-round throughout California (CDFW 2014). They occur in greater numbers during migration and less during the breeding season. Northern harriers are typically found in open habitats such as marshes, fields, and prairies. The species nests on the ground in grasses or wetland vegetation. (Loughman & McLandress, 1994). The closest reported CNDDDB occurrence of the northern harrier is located approximately 5.1 miles east of the Study Area (CNDDDB #45) in 1989. More recent observations of northern harrier are reported (eBird 2021) with the nearest occurrence located approximately 1.4 miles northwest of the Study Area in 2018 (Wills T. and Wills C. 2018). Suitable open grassland habitat in the Study Area could provide abundant forage for northern harriers and they have a moderate potential to hunt on the site. Nesting habitat is limited on the site and there is low potential for northern harriers to nest in the Study Area. The Northern harrier was not observed in the Study Area during May or June 2021 surveys but could be present.
13. **White-tailed Kite** (*Elanus leucurus*) is a CDFW Fully Protected species that can be found throughout California but known to forage and nest in certain areas of California in fluctuating numbers (CDFW 2021a; Lehman 2018). The species nests primarily in evergreen trees, especially coast live oaks, near meadows, marshes, farmlands or grasslands where it forages on small animals, especially voles (Dunk 1995). Communal nocturnal roosts sites, which may shift in location, are often used from early fall to early winter. The closest reported occurrence of nesting white-tailed kite is located approximately 7.9 miles southwest of the Study Area in 1996 (CNDDDB #154). Occurrences of foraging white-tailed kites are documented in closer proximity to the Study Area, particularly around Bethany Reservoir (Dunn 2017), one of several birding hotspots for the area (eBird 2021). Dense woodland canopies are not present to support nesting white-tailed kites; however, due to the presence of suitable foraging habitat and reported local occurrences, foraging white-tailed kites have moderate potential to occur. The white-tailed kite was not observed in the Study Area during May or June 2021 surveys but could occasionally be present.
14. **California Horned Lark** (*Eremophila alpestris actia*) is a CDFW Watch List species known from Sonoma County south to San Diego County, as well as east to the foothills of the Sierra Nevada Mountains. It breeds in opens, flat habitats with short vegetation, including grasslands, alkali flats, fallow grain fields, and meadows. Horned larks are common in the interior areas of California. They are known to make local movements through the seasons and may not breed in all areas they are observed. The closest reported occurrence of the California horned lark is located approximately 2.4 miles east of the Study Area (CNDDDB #13) in 1993. Several California horned lark occurrences are reported (eBird 2021) and due to the presence of open annual grassland habitat, this species has moderate potential to forage and nest on the site. California horned lark was not detected during May or June 2021 surveys but is likely to occur.
15. **Prairie Falcon** (*Falco mexicanus*) is a CDFW Watch List species with a Global Rank of G5 and a State Rank of S4. The species range extends throughout most of the western United States, into southern Canada and portions of Mexico. They are year-round residents in most of

California. The species utilizes a variety of habitat but is primarily associated with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas (CDFW 2014). Nesting sites are usually in a scrape on a sheltered ledge of a cliff overlooking a large, open area. Occasionally the species will use old raven or raptor nests on a cliff. The closest CNDDDB occurrence overlaps with the Study Area (CNDDDB #466) in 2008, where a prairie falcon nest site was located on a bare ledge approximately 22 feet above the base of a 35-foot cliff. Numerous and more recent observations of foraging prairie falcons are reported (eBird 2021), with the nearest occurrence approximately 1.4 miles northwest of the Study Area in 2014 (Bostater 2014). Due to the presence of an abundant prey base and numerous sightings in the area, prairie falcons have moderate potential to forage on the site; however, suitable nesting habitat is not present and there is no potential for this species to nest on site. Prairie falcon was not detected during May or June 2021 surveys.

16. **American Peregrine Falcon** (*Falco peregrinus anatum*) is no longer federally or state listed though it remains on the Watch List of CDFW and is Fully Protected by this agency. It has a Global Rank of G4T4, meaning the status of the infraspecific taxa (subspecies or variety) is the same as the status of the species as a whole, which is Apparently Secure. This species also has a State Rank of S4, meaning it is Apparently Secure in California. American peregrine falcons predominantly occur near wetlands, lakes, rivers, or other water bodies as well as on cliffs, banks, dunes, mounds, and human-made structures. Nests consist of a scrape, depression, or ledge in an open site. The closest reported occurrence of American peregrine falcon is located approximately 5.7 miles west of the Study Area (CNDDDB #456) in 2015, in rock outcrops within rolling chaparral and scrub oak habitats. More recent occurrences of foraging American peregrine falcons have been reported (eBird 2021) with the nearest occurrence in 2020, approximately 1.5 miles east of the Study Area (Lynch 2020). A birding hotspot for foraging American peregrine falcons has also been documented at Clifton Court Forebay, approximately 2.5 miles northeast of the site. Due to the surrounding water systems and abundance of small birds in the area providing a prey base, American peregrine falcon has moderate potential to utilize the site as foraging habitat; however, nesting habitat does not occur within the Study Area and there is no potential for them to nest on the site. American peregrine falcon was not detected in the Study Area during May or June 2021 surveys.
17. **Curved-Foot Hygrotus Diving Beetle** (*Hygrotus curvipes*) has a Global Rank of G1S1 species, meaning this species is Critically Imperiled both globally and in the State of California, where it is known only from Alameda and Contra Costa Counties. This species is an aquatic invertebrate known to occur in shallow waters of temporary pools (i.e., vernal pools), often associated with alkaline vegetation. Generally, little is known about the diving beetle's life cycle. What is known is that the diving beetle has three life stages: larvae, pupae, and adult (Tronstad et al. 2011). The larvae hatch from eggs in an aquatic environment and are predaceous. The predaceous diving beetles pupate on land. The adults return to water and breathe atmospheric air. Larvae are typically restricted to the habitat in which eggs were laid, but the adults can disperse among water bodies because they have wings. Diving beetles seem to exist almost exclusively in small, highly mineralized pools in gulches (Miller 2002; Tronstad et al. 2011). The bottoms of the gulches are generally clay with some larger gravel, and often there exists a species of sedge or considerable plant debris in the pools. (Miller 2002). Water flows in these gulches intermittently; often the gulches flood entirely. Thus, the diving beetle's habitat is subject to unpredictable flooding and drying regimes. The diving beetle is "likely

capable of moving to a new habitat as a stream dries because the adult beetles are probably good fliers” (Tronstad et al. 2011). Limited information is available regarding the life history, distribution, and existing populations of this particular *Hygrotus* species (*H. curvipes*), and this is generally due to threats to wetland habitat that contribute to the decline of the overall genus (Wild Earth Guardians 2013), particularly listed species. Curved-foot hygrotus diving beetle was not detected during May or June 2021 surveys, but could be present in wetland habitat in the Study Area while standing water is present.

18. **Loggerhead Shrike** (*Lanius ludovicianus*) is a California Species of Special Concern and resident in arid regions of California. It requires open areas with appropriate perches for hunting, and shrubby trees or bushes for nesting. They feed on arthropods, reptiles and amphibians, small rodents, and birds, and often store prey for later consumption by impaling it on thorns, plant stems, or barbed wire for storage (Shuford and Gardali 2008). One adult loggerhead shrike was observed in flight, just north of the Study Area, when driving to the site for May 2021 surveys. The closest CNDDDB reported occurrence of the loggerhead shrike is located approximately 5.0 miles south of the Study Area (CNDDDB #113), in 2015. Numerous and more recent occurrences are reported (eBird 2021), with the nearest observation approximately 1.1-mile northwest of the site (Kahle 2018). Due to the abundance of prey in the Study Area and reported occurrences in the vicinity, loggerhead shrikes have a high potential to utilize the site when foraging. However, appropriate nesting habitat is limited to the few ornamental trees, as shrub habitat is not present in the Study Area and loggerhead shrikes have low potential to nest on site.
19. **California Linderiella** (*Linderiella occidentalis*) is neither federally nor state listed but holds a Global Rank of G2G3 and a State Rank of S2S3 (NatureServe 2018d). Both the global and state ranks for this species indicate that it is uncertain whether it should be considered either Imperiled (G2/S2) or Vulnerable (G3/S3) though NatureServe rounds its global status to G2. The reasoning for this ranking is that while it is not as restricted in range as some of the other California fairy shrimp, it is not considered abundant at any site, and its habitat continues to be threatened by urban and agricultural development (USFWS 1992). Its distribution ranges from Shasta County south to Fresno County, across the Central Valley, and the Coast and Transverse Ranges from Willits in Mendocino County south to near Sulfur Mountain in Ventura County. California linderiella measure approximately 0.35 in (male) to 0.39 in (female) and has red eyes, and conical, horn-like antennae appendages (USFWS 2007b). This species inhabits small, seasonal vernal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions throughout Central California. Water in pools occupied by California linderiella has very low alkalinity, conductivity, and total dissolved solids. The closest reported occurrence of California linderiella is located approximately 2.0 miles east of the Study Area in 2010 (CNDDDB #402). An additional occurrence reported in 2012 is located approximately 2.5 miles west of the Study Area, in the Vasco Caves area (CNDDDB #403). The seasonal Pond Wetland in the Study Area has suitable conditions and soils that could support California linderiella and this species has moderate potential to occur.
20. **San Joaquin Coachwhip** (*Masticophis flagellum ruddocki*) is a California Species of Special Concern (CDFW 2018) that has a Global Rank of G5T2T3 (rounded global status of T2 – Imperiled) and a State Rank of S2 (Imperiled). This species occurs in open, dry habitats with little or no tree cover, specifically chenopod scrub and valley and foothill grasslands. It is found in valley grassland and saltbush scrub in the San Joaquin Valley and needs mammal burrows

for refuge and oviposition sites. The closest reported occurrence of San Joaquin coachwhip is located approximately 5.0 miles northwest of the Study Area (CNDDDB #17) in 1980. Though suitable grassland and drainage features are present in the Study Area, few occurrences are within the immediate area and these are relatively outdated, so San Joaquin coachwhip snakes have low potential to be present. The San Joaquin coachwhip was not observed in the Study Area during May or June 2021 surveys.

- 21. California Red-Legged Frog (*Rana draytonii*)** is a federally listed threatened species and a California Species of Special Concern. It occurs in California in the Coast Range, Sierras, the Transverse Range and south below 1,200 meters elevation (CDFW 2014; Sousa 2008). The main habitat types for the CRLF are deep, still or slow-moving sources of water in lowlands and foothills with shrubby, riparian, or vegetative shorelines for cover (CDFW 2014; CNDDDB 2017; Jennings and Hayes 1994). The most suitable vegetation types for cover are cattails (*Typha* sp.), arroyo willow (*Salix lasiolepis*) and bulrushes (*Scirpus* sp.; Jennings and Hayes 1994). Along with its aquatic habitat, the CRLF also utilizes upland habitat for seeking food, shelter and as migration corridors between breeding and non-breeding sites. Bulger et al. (2003) found that during dry summer months, CRLF were nearly always within 5 meters of a pond; however, during summer rain events and early winter rains, frogs moved up to 130 meters from their ponds, and some frogs even traveled up to 2,800 meters to migrate to a different pond. When out of the water the CRLF will shelter under natural or manmade debris and burrow into moist leaf litter or small animal burrows (USFWS 2010). The breeding season for the CRLF is from January to July with a peak in February (CDFW 2014). One major cause of CRLF population decline is the introduction of the bullfrog (*Rana catesbeiana*) which can consume and exhaust CRLF resources (Sousa 2008).

Numerous occurrences of CRLF have been documented in the vicinity, with the nearest occurrence approximately 1.2 miles southeast of the Study Area in 2005 (CNDDDB #264), where CRLF were observed in an unnamed creek that intersects with the California Aqueduct. USFWS-designated Critical Habitat for CRLF occurs directly south of the site (Figure 7). The Pond Wetland in the Study Area does not appear to hold sufficient water into late summer (August to September) during normal rainfall years to support CRLF breeding. The Seep Wetland is too shallow to support breeding. CRLF, if present in the immediate vicinity of the Study Area, have a low potential to occur seasonally in the Pond Wetland or moving through ephemeral drainages during the wet season. Additionally, CRLF can make overland movements between aquatic habitats and therefore have a low potential to move through the Project footprint. California red-legged frogs were not detected in the Study Area during May or June 2021 surveys.

- 22. American Badger (*Taxidea taxus*)** is a California Species of Special Concern with a widespread range across the state (Brehme et. al. 2015; CDFW 2014). It is a permanent but uncommon resident in all parts of California, except for forested regions of the far northwestern corner, and is more abundant in dry, open areas of most shrub and forest habitats (CNDDDB 2021) The American badger requires friable soil in order to dig burrows for cover and breeding. The main food source for the species is fossorial rodents, mainly ground squirrels and pocket gophers (CDFW 2014). The breeding season for badgers is in summer and early fall, and females give birth to litters usually in March and April (CDFW 2014). Potential badger dens were observed and documented in the Study Area during May and June 2021 surveys. Den observations met criteria specific to badger dens and included large entrances of approximately

8- to 12-inches wide with large dirt clods within the surrounding soil apron. The closest reported occurrence of the American badger is located approximately 0.7 mile southeast of the Study Area (CNDDB #65) in 1987, with several more recent occurrences in the vicinity. The open annual grassland provides suitable foraging habitat with an abundant prey base of ground squirrels and small mammals. Due to the presence of friable soils suitable for denning and open grassland foraging habitat in the Study Area, this species has a high potential to occur and is likely present at least periodically through the year.

- 23. San Joaquin Kit Fox (*Vulpes macrotis mutica*; SJKF)** is federally listed as endangered and state listed as threatened. The SJKF is one of two subspecies of the kit fox, *Vulpes macrotis*, which is the smallest canid species in North America. It is endemic to the San Joaquin Valley and a few adjacent valleys in the central region of California (Cypher et al. 2013). The SJKF is primarily nocturnal and typically occurs in annual grassland or mixed shrub/grassland habitats throughout low, rolling hills and in valleys. They need loose sandy soils in order to dig their burrows and a prey population of black-tailed jackrabbits, rodents, desert cottontails, insects, some birds, reptiles and vegetation (CDFW 2014; CNDDB 2017). The most suitable habitat for SJKF has low precipitation, sparse vegetation coverage with high densities of kangaroo rats (*Dipodomys* spp.). For the SJKF to succeed in an area it needs large expanses of non-fragmented suitable habitat. This type of habitat is decreasing rapidly by conversion into agricultural land or degraded by urban development (Cypher et al. 2013). Female SJKF began preparing natal dens in September and October and then breeding occurs from December through February. Pups are born from January to March and family groups typically split up the following October (Meaney et al. 2006).

SJKF in Contra Costa County were thought to have been extirpated by a vigorous ground squirrel control program in the 1970's and 1980's (USFWS 2020). The closest reported occurrence of the SJKF is located approximately 0.4 miles west of the Study Area (CNDDB #63) in 1989 within grassland habitat. The most recent reports of SJKF in the county are from 1996 (CNDDB #32, 33) along Vasco Road about four miles north of the Study Area. A survey reported by Clark et al. (2003) found no evidence of recent kit fox occupancy in Contra Costa and Alameda counties using a combination of ground, aerial, and scent dog surveys. Surveys conducted in 2003 for the adjacent Buena Vista Wind Energy Project documented numerous kit fox potential dens (those with suitable dimensions), but no observations or sign of kit fox was detected (Lamphier-Gregory 2004). Current status of the SJKF in Contra Costa County is presumed to be either extirpated or at very low population levels (B. Cypher, personal communication, August 24, 2021). Habitat in the vicinity of the Study Area remains suitable. One mammal den was examined in the Study Area during June 2021 surveys that met size criteria for kit fox, and thus qualifies as a SJKF potential den by USFWS definition (USFWS 2011), although no sign of SJKF was present (Figure 4). The San Joaquin kit fox has low potential to occur in the Study Area.

TABLE 5. SPECIAL STATUS ANIMAL LIST

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
1. <i>Accipiter cooperii</i>	Cooper's Hawk	-/ G5/S4 WL	Oak woodland, riparian, open fields. Nests in dense trees, esp. coast live oak.	Low (nesting). Planted trees surrounding the residential trailer in the Study Area could provide low-quality nesting habitat, though Cooper's hawks are not commonly known to nest in the area. Nearest nesting occurrence is over 8 mi southwest of the Study Area in 2009 (CNDDDB #124). Moderate (foraging). Suitable open field habitat is present for hunting and the few trees near the residential trailer could provide perching substrate.
2. <i>Agelaius tricolor</i>	Tricolored Blackbird	-/CT G2G3/S1S2 SSC	Requires open water, protected nesting substrate, & foraging area with insect prey near nesting colony.	No Potential (nesting). Suitable nesting habitat is not present in the Study Area due to the lack of wetland vegetation for nest substrates. Vegetation within the ponds is low-growing or non-existent and does not provide preferred (cattail, bulrush) protection for nesting. Closest known nesting colony record is 1.9 miles northeast (CNDDDB #593). Low (foraging). Abundant occurrences of this species are documented in the area and the site could be utilized for forage or as a satellite water source between nesting sites.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
3. <i>Ambystoma californiense-Pop 1</i>	California Tiger Salamander-Central California DPS	FT/CT G2G3/S2S3 WL	Need underground refuges, ground squirrel burrows & vernal pools or other seasonal water for breeding.	High. A potential breeding pond is present in the Study Area. Known breeding ponds are within dispersal distance. CTS may occupy upland habitat in burrows within the Study Area.
4. <i>Ammodramus savannarum</i>	Grasshopper Sparrow	-/ G5/S3 SSC	Nests in grassland habitats on mountain slopes, foothills, and valleys. May nest colonially.	Low (nesting). Suitable nesting habitat is present in grassland and rock outcrops on the site. Closest recorded occurrence is 6.0 miles southwest of the Study Area (CNDDB #21), however nearer occurrences have been documented within 1.7 miles of the site in 2012 (eBird 2021). Moderate (foraging). Suitable grassland foraging habitat with protective rock outcrops are present in the Study Area.
5. <i>Aquila chrysaetos</i>	Golden Eagle	-/ G5/S3 FP	Nests in large, prominent trees in valley and foothill woodland. Requires adjacent food source.	No Potential (nesting). Potentially suitable foraging habitat available onsite and in the vicinity; however, site does not support large prominent trees for nesting. Closest documented nest occurrence is 2.3 miles west (CNDDB #71). High (foraging). Golden eagles are frequently documented in the area (eBird 2021) and suitable foraging habitat is present in the Study Area.
6. <i>Athene cunicularia</i>	Burrowing Owl	-/ G4/S3 SSC	Burrows in squirrel holes in open habitats with low vegetation.	Present. This species was observed onsite in the annual grassland habitat. An active burrow was detected and mapped.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
7. <i>Branchinecta longiantenna</i>	Longhorn Fairy Shrimp	FE/- G1/S1S2 SA	Small clear water depressions in sandstone, and clear to turbid clay/grass bottomed pools in shallow swales.	Moderate. Suitable clay depressions within wetland habitat are present in the Study Area and CNDDDB records indicate species presence in the area (CNDDDB #12).
8. <i>Branchinecta lynchi</i>	Vernal Pool Fairy Shrimp	FT/- G3/S3 SA	Clear water sandstone depression pools, grassed swale, earth slump, or basalt flow depression pools.	Moderate. Suitable clay depressions within wetland habitat are present in the Study Area and closest known occurrence is 0.5 miles north (CNDDDB #219) in 2017, with several occurrences in the area.
9. <i>Branchinecta mesoallensis</i>	Midvalley Fairy Shrimp	-/- G2/S2S3 SA	Vernal pools in the Central Valley.	Moderate. The wetland pond area at the NE corner of the Study Area is marginally suitable and regularly trampled by cattle; however, CNDDDB records indicate species occurrence in 2017, 0.7-mile northeast of the Study Area (CNDDDB #35), with several other occurrences in the immediate area.
10. <i>Buteo regalis</i>	Ferruginous Hawk	-/- G4/S3S4 WL	Winters in open grassland or savannah habitats.	No Potential (nesting). The Study Area is outside the known breeding range for this species. Moderate (foraging). Potentially suitable foraging habitat available onsite and in the vicinity. Closest documented occurrence is 2.5 miles east of the Study Area (CNDDDB #27).

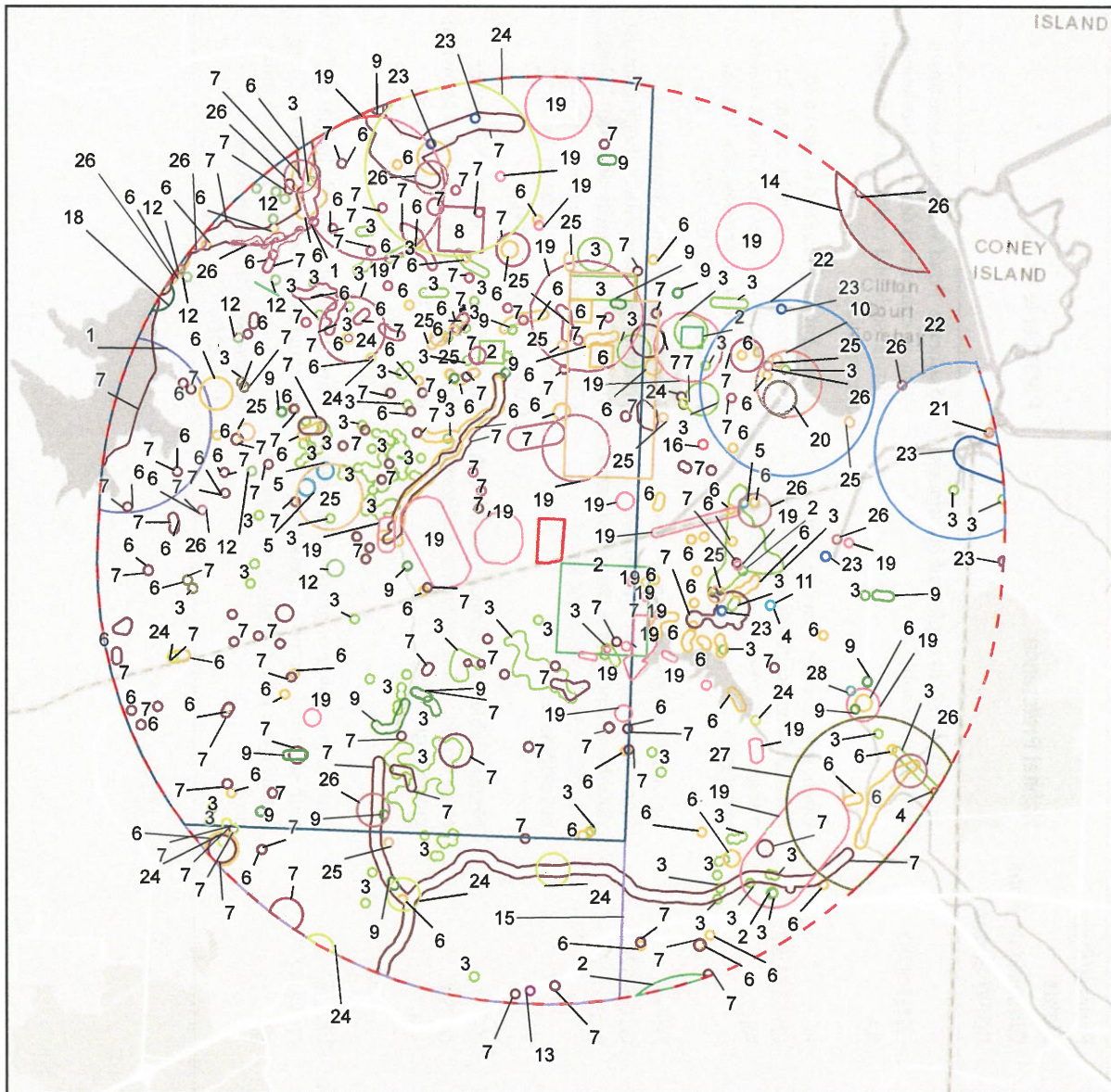
Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
11 <i>Buteo swainsoni</i>	Swainson's Hawk	-/CT G5/S3 SA	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, agricultural fields.	Low (nesting). Species is known to nest in lone and farmyard trees and this species could nest in the ornamental trees located around the unoccupied residence. High (foraging). Species observed flying and pair observed copulating in the nearby vicinity, east of the Study Area. Suitable foraging habitat available onsite. Closest documented occurrence is 2 miles southeast (CNDDB #2380).
12 <i>Circus hudsonius</i>	Northern Harrier	-/ G5/S3 SSC	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Low (nesting). Wetland and grassland habitat onsite is marginally suitable breeding/nesting habitat. Moderate (foraging). Suitable open grassland with an abundant prey base is present in the Study Area.
13 <i>Elanus leucurus</i>	White-Tailed Kite	-/ G5/S3S4 FP	Nests in dense tree canopy near open foraging areas.	No Potential (nesting). Suitable nesting habitat with a dense tree canopy is not present in the Study Area. Moderate (foraging). Suitable open grassland foraging habitat is present in the Study Area.
14 <i>Eremophila alpestris actia</i>	California Horned Lark	-/ G5T4Q/S4 WL	Nests on the ground in open habitats. More common in the interior.	Moderate (nesting & foraging). The Study Area has suitable open grassland habitat for nesting and foraging horned larks and there are numerous occurrences in the vicinity.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
15 <i>Falco mexicanus</i>	Prairie Falcon	-/ G5/S4 WL	Inhabits dry, open terrain. Nests on cliffs near open areas for hunting.	No Potential (nesting). Suitable nesting cliff habitat is not present in the Study Area. Moderate (foraging). Open grassland habitat with an abundant prey base is present in the Study Area with several nearby occurrences in the area.
16 <i>Falco peregrinus anatum</i>	American Peregrine Falcon	FD/CD G4T4/S3S4 FP	Nests on cliffs, banks, dunes, mounds, and human-made structures, especially near water.	No Potential (nesting). Suitable nesting habitat is not present in the Study Area. Moderate (foraging). Abundant prey base of small birds in the Study Area and presence of water systems surrounding the site could provide suitable foraging habitat.
17 <i>Hygrotus curvipes</i>	Curved-Foot Hygrotus Diving Beetle	-/ G1/S1 SA	Aquatic; known only from Alameda & Contra Costa counties.	Low. Few known occurrences are in the area, however limited information does not negate potential for this species to occur on the site. Marginally suitable wetland habitat is present, and species is known to occur in the County.
18 <i>Lanius ludovicianus</i>	Loggerhead Shrike	-/ G4/S4 SSC	Open areas with appropriate perches, near shrubby vegetation for nesting.	Low (nesting) Suitable shrub habitat is not present in the Study Area and ornamental trees provide limited nesting habitat. High (foraging). This species was observed just offsite in-flight above the access road to the northeast. Suitable foraging habitat available onsite. Closest documented occurrence is 4.9 miles south (CNDDB #113).

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
19 <i>Lindriella occidentalis</i>	California Lindriella	-/- G2G3/S2S3 SA	Seasonal pools in unplowed grasslands with alluvial soils.	Moderate. Pond Wetland downstream from an ephemeral drainage has suitable alluvial soils and conditions to support this species.
20 <i>Masticophis flagellum ruddocki</i>	San Joaquin Coachwhip	-/- G5T2T3/S2? SSC	Open, dry, treeless areas, including grasslands and saltbush scrub; takes refuge in burrows and under shaded vegetation.	Low. Annual grassland habitat and ephemeral drainage features may be suitable for this species. Closest record is from 1980, approximately 5 miles northwest (CNDDDB #17).
21 <i>Rana draytonii</i>	California Red-Legged Frog	FT/- G2G3/S2S3 SSC	Lowlands and foothills in or near sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks for larval development.	Low. Pond Wetland onsite is low potential breeding habitat. Southernmost drainage is low quality dispersal habitat. Closest recorded occurrence is from 2005, ~1 mile southeast of the Study Area (CNDDDB #264).
22 <i>Taxidea taxus</i>	American Badger	-/- G5/S3 SSC	Needs friable soils in open ground with abundant food source such as California ground squirrels.	High. Potentially suitable habitat for dens onsite. Species is actively known in the area. Closest record is located adjacent to the Study Area (CNDDDB #65).
23 <i>Vulpes macrotis mutica</i>	San Joaquin Kit Fox	FE/CT G4T2/S2 SA	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose textured sandy soil and prey base.	Low. Potentially suitable habitat and potential den observed within the Study Area. Closest record is located 6 miles southwest of the Study Area (CNDDDB #23).

See section 1.6 for status and rank definitions.

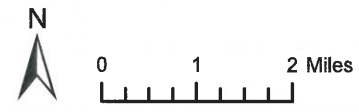
Figure 6. California Natural Diversity Database Animal Records



Label	Common Name	Label	Common Name
1	Alameda Whipsnake	16	Midvalley Fairy Shrimp
2	American Badger	17	Prairie Falcon
3	Burrowing Owl	18	San Joaquin Coachwhip
4	California Horned Lark	19	San Joaquin Kitfox
5	California Linderella	20	San Joaquin Pocket Mouse
6	California Red-Legged Frog	21	Song Sparrow
7	California Tiger Salamander	22	Steelhead
8	Coast Horned Lizard	23	Swainson's Hawk
9	Curved-Foot Hygrotus Diving Beetle	24	Tricolored Blackbird
10	Eulachon	25	Vernal Pool Fairy Shrimp
11	Ferruginous Hawk	26	Western Pond Turtle
12	Golden Eagle	27	Western Ridged Turtle
13	Loggerhead Shrike	28	White-Tailed Kite
14	Longfin Smelt	29	American Badger
15	Longhorn Fairy Shrimp		

Legend

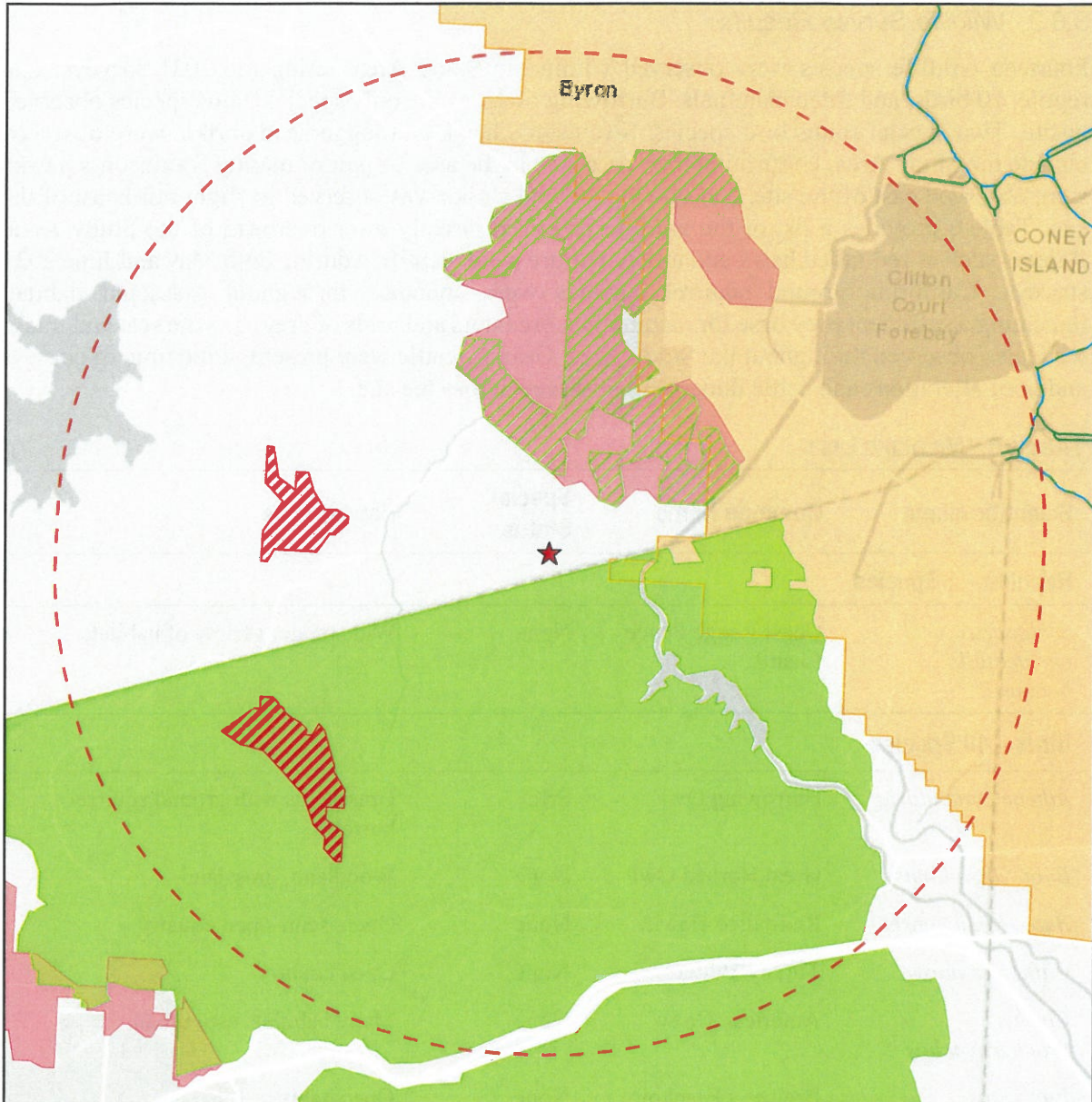
Study Area (84.6 acres) 5-Mile Buffer



PV Byron EG-1
Map Center: 121.64156°W 37.79709°N
Contra Costa County, California

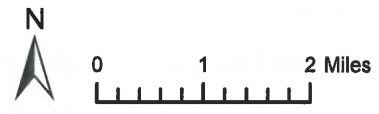
CNDDDB GIS Data Last Updated: June 2021

Figure 7. United States Fish and Wildlife Service Critical Habitat



Legend

- ★ Project Location
- 5-Mile Buffer
- NMFS Critical Habitat**
 - Steelhead
 - Green Sturgeon
- USFWS Critical Habitat**
 - Alameda whipsnake
 - California red-legged frog
 - Contra Costa goldfields
 - Delta smelt
 - Longhorn fairy shrimp
 - Vernal pool fairy shrimp



PV Byron EG-1
 Map Center: 121.64355°W 37.79869°N
 Contra Costa County, California

USFWS Critical Habitat Data Last Updated: April, 2021

3.6.2 Wildlife Survey Results

Fourteen wildlife species were observed within the Study Area during the 2021 surveys: one reptile, 10 birds, and three mammals. Burrowing owl was the only special status species observed onsite. Two special status bird species, Swainson's hawk and loggerhead shrike, were observed outside the Study Area, confirming their presence in the area. A pair of mating Swainson's hawks were observed east of the site, and one loggerhead shrike was observed in flight northeast of the site. Table 6 provides a list of the wildlife observed directly in or overhead of the Study Area. Raptors such as red-tailed hawk and turkey vulture were identified during both May and June 2021 surveys. California ground squirrel burrows were abundant throughout grassland habitat, indicating a sufficient prey base for mammalian predators and birds of prey. Coyote scat and tracks were also observed throughout the Study Area. Grazing cattle were present at the time of surveys and hoof alterations and cattle dung were observed across the site.

TABLE 6. WILDLIFE LIST

Scientific Name	Common Name	Special Status	Habitat Type
Reptiles – 1 Species			
<i>Sceloporus occidentalis bocourtii</i>	Coast Range Fence Lizard	None	Wide range; variety of habitats
Birds – 10 Species			
<i>Athene cunicularia</i>	Burrowing Owl	SSC	Grasslands with ground squirrel burrows
<i>Bubo virginianus</i>	Great Horned Owl	None	Woodland, grassland
<i>Buteo jamaicensis</i>	Red-tailed Hawk	None	Open, semi-open country
<i>Cathartes aura</i>	Turkey Vulture	None	Open country
<i>Corvus brachyrhynchos</i>	American Crow	None	Many habitats, esp. urban
<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	None	Open habitats
<i>Icterus bullockii</i>	Bullock's Oriole	None	Oak, riparian woodlands
<i>Sturnella neglecta</i>	Western Meadowlark	None	Open habitats, grasslands
<i>Tyrannus verticalis</i>	Western Kingbird	None	Grasslands, savannah
<i>Zenaida macroura</i>	Mourning Dove	None	Open and semi-open habitats
Mammals – 3 Species			
<i>Bos taurus</i>	Cattle	None	Rangelands

Scientific Name	Common Name	Special Status	Habitat Type
<i>Canis latrans</i>	Coyote	None	Open woodlands, brushy areas, wide ranging
<i>Otospermophilus beecheyi</i>	California Ground Squirrel	None	Grasslands

See Section 1.6 for status and rank definitions.

3.6.3 Habitat Connectivity and Wildlife Movement

Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance (Beier and Loe 1992). Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors for wildlife travel. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas; and facilitate the exchange of genetic traits between populations (Beier and Loe 1992). The Study Area is largely surrounded by open grassland used as rangeland and/or wind energy production, with intermittent development and agriculture occurring to the north and east. The California Aqueduct water system to the east and north may draw wildlife through the area to access water. Wetland habitat on the site may provide satellite drinking water sources, refugia, as well as breeding habitat for some species. Barbed wire cattle fencing currently surrounds the site as part of the wind farm development and rangeland activities. Wire fencing is typically designed with an appropriate amount of spacing to allow for wildlife passage either under (small to medium-sized wildlife) or over (larger wildlife, i.e., mule deer; Hanophy 2009). It is expected that wildlife utilize the site for forage and/or refugia; however, the Study Area itself is not a defined corridor that would inhibit wildlife movement, if developed.

4 PRELIMINARY ENVIRONMENTAL IMPACT ANALYSIS

The proposed project is a 6.5-megawatt (MW) solar generation facility with an 8-megawatt hour (MWh) battery storage system occupying approximately 34 acres of the Study Area when complete. Construction activities would permanently impact 34 acres of California annual grassland habitat, with minimal additional temporary impacts (to be determined with final site plans). The Project is still in early planning phases and therefore this impact analysis is preliminary and will be updated upon completion of more detailed plan sets. This preliminary impact analysis is based on a Site Plan by Natron Solar Engineering and Design, included below in Appendix A.

The proposed Project has potential to impact common and special status species and habitats (Table 7). The solar development area is situated in annual grassland habitat with a north-northeast aspect. Construction of the solar tracker system will not require mass grading and the Project footprint is planned to have a grassland understory for the life of the operation phase. The Applicant proposes to avoid all direct impacts to ephemeral drainages and wetlands in and near the solar development area and will design the solar tracker system to adhere to a minimum 75-foot setback from the drainages.

TABLE 7. PRELIMINARY IMPACT AND MITIGATION SUMMARY

Biological Resource	Impact Description	Level of Significance	Recommended Mitigation Measures
California Annual Grassland	34 acres converted to solar development	Less than Significant	None Required
Developed	No impacts proposed	No Impact	None Required
Wetland	No impacts proposed	No Impact	Avoidance BIO - 1
Special Status Plants	None present; No impacts proposed	No Impact	None Required
Curved-Foot Hygrotus Diving Beetle	No impacts to aquatic habitats proposed	No Impact	Aquatic Resources Avoidance, Worker Training BIO - 1, BIO - 2
Listed Fairy Shrimp	No impacts to aquatic habitats proposed	No Impact	Aquatic Resources Avoidance, Worker Training BIO - 1, BIO - 2

Biological Resource	Impact Description	Level of Significance	Recommended Mitigation Measures
California Tiger Salamander	No impact to aquatic breeding habitat. Temporary impact to upland habitat during construction. Potential for direct mortality during construction and operation phases.	Less than Significant with Mitigation Incorporated	To be Developed in Consultation with USFWS and CDFW
California Red-Legged Frog	No impacts to aquatic habitat. Low potential for direct mortality during construction and operation phases during wet season overland movements.	Less than Significant with Mitigation Incorporated	To be Developed in Consultation with USFWS and CDFW
San Joaquin Coachwhip	Potential for direct mortality	Less than Significant with Mitigation Incorporated	Worker Training, Clearance Surveys BIO - 2, BIO - 3
Nesting Birds	Construction during nesting season could cause direct mortality or nest abandonment	Less than Significant with Mitigation Incorporated	Worker Training, Preconstruction Surveys BIO - 2, BIO - 4
Special Status Birds (foraging)	Potential loss or degradation of foraging habitat	Less than Significant	None Required See BIO - 4 for nesting birds
Burrowing Owl	Loss of wintering and breeding habitat. Potential for direct mortality in damaged burrows or nest abandonment	Less than Significant with Mitigation Incorporated	Worker Training, Preconstruction Surveys, Monitoring BIO - 2, BIO - 4, BIO - 5
American Badger	Loss of potential foraging habitat. Potential for direct mortality or natal den abandonment	Less than Significant with Mitigation Incorporated	Worker Training, Preconstruction Surveys BIO - 2, BIO - 6

Biological Resource	Impact Description	Level of Significance	Recommended Mitigation Measures
San Joaquin Kit Fox	Loss of potential foraging habitat. Potential for direct mortality or natal den abandonment	Less than Significant with Mitigation Incorporated	To be Developed in Consultation with USFWS and CDFW
Wildlife Corridors	No Impact	No Impact	None Required

4.1 Habitats

The proposed Project would impact California annual grassland and would avoid and protect wetland habitat (Table 8). No impacts to developed habitat are anticipated. Approximately 34 acres of California annual grassland would be impacted by solar array development and affiliated infrastructure (Table 8; Figure 8). Impacts to California annual grassland habitat is not considered significant except where these habitat impacts affect other sensitive biological resources such as sensitive plants, animals, or nesting birds (see following Sections 4.2 and 4.3).

TABLE 8. HABITAT IMPACTS

Habitat Type	Existing (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)
California Annual Grassland	81.1	34.0	TBD
Developed	3.0	0	0
Wetland	0.5	0	0
TOTAL	84.6	34.0	TBD

4.1.1 Potential Jurisdictional Wetlands and Waters

Approximately 0.51 acres of federal and state wetlands occurring in the Study Area would be avoided by the Project (refer to Figure 8). In addition, approximately 0.62 acres of waters of the U.S. and 1.34 acres of waters of the state within the Study Area would also be avoided by the Project (Figure 8). The following mitigation measures are provided to ensure that water quality and special status species with potential to occur in aquatic habitat (see Sections 4.3.1 and 4.3.2 below) are protected from Project activities occurring in upland habitat.

BIO - 1 75-foot Drainage Setbacks. To protect water quality and sensitive species habitats, a minimum 75-foot setback shall be established from the top of bank of jurisdictional wetlands and waters of the U.S. and state within the solar development area. Setbacks shall be shown on all Project plans.

Figure 8. Biological Resource Impacts



Legend

Study Area (84.6 acres)

Project Area

● American Badger Den (potential)

● Burrowing Owl Den (active)

Habitats

California Annual Grassland (approximately 34 acres)

Wetlands and Waters (Avoided)

Federal and State Wetlands (0.1 acres)

Federal and State Wetlands (Potential CTS Breeding Habitat) (0.4 acres)

— Waters of the U.S. (0.62 acre; 2,612 LF)

Waters of the State (1.3 acres; 2,612 LF)

Wetlands and Waters Setback (75 feet)



0 250 500 Feet

PV Byron EG-1

Map Center: 121.64358°W 37.79863°N
Contra Costa County, California

Imagery Sources: USDA NAIP, 05/25/2020
Althouse and Meade, Inc., 05/13/2021



ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
February 24, 2022 12:08 PM by SAF

4.2 Botanical Resources

Special status plants were not detected during appropriately timed botanical surveys conducted in May and June 2021 and are not expected to be present. No mitigation is required for botanical resources.

4.3 Wildlife Resources

Several special status wildlife species have potential to occur in the Study Area, including federal and state listed species. The following mitigation measure shall be implemented prior to commencement of construction activities to ensure all personnel are aware of potential biological resources and what to do in the event a special status species is encountered during work.

BIO - 2 Worker Environmental Awareness Program (WEAP). An approved biological monitor will provide a WEAP training to all personnel associated with the project within 30 days prior to initiation of site disturbance and/or construction, to avoid or reduce impacts to biological resources. At a minimum, the training shall include information on protection of aquatic resources, nesting birds, and special status species with potential to occur on the site. A fact sheet shall also be developed prior to the training program, and distributed at the training program to all contractors, employers, and other personnel involved with the construction of the project.

4.3.1 Invertebrates

4.3.1.1 Curved-Foot Hygrotus Diving Beetle

Aquatic resources would be avoided by the Project and required setbacks would be implemented (see BIO - 1). Additionally, array fields in the upstream watershed would not require grading, and therefore would not adversely affect water quality for aquatic species during construction. No mitigation is required for curved-foot hygrotus diving beetle.

4.3.1.2 Listed Fairy Shrimp

Aquatic resources would be avoided by the Project and required setbacks would be implemented (see BIO - 1). Additionally, array fields in the upstream watershed would not require grading, and therefore would not adversely affect water quality for aquatic species during construction. No mitigation is required for special status fairy shrimp.

4.3.2 Amphibians and Reptiles

The Pond Wetland, Seep Wetland, seasonal drainages, and upland grassland located in the Study Area are considered potential habitat for California tiger salamander and California red-legged frog. Impacts to San Joaquin coachwhip could occur from vehicle or equipment strikes during construction. Potential impacts to these species are discussed below and mitigation measures are included where appropriate for each species.

4.3.2.1 California Tiger Salamander

California tiger salamander is known to occupy and breed in seasonal ponds in the vicinity of the Study Area. As the Study Area is within the dispersal distance of known breeding ponds, and a

seasonal stock pond occurs on the site, the onsite upland habitat and Project footprint could also be potentially occupied. Therefore, the Project has potential to impact CTS.

The Project is not within the service area of the East Contra Costa County HCP/NCCP and therefore the Applicant will consult with USFWS and CDFW regarding potential for take of CTS. It is expected that the Applicant will obtain a take statement from both agencies and implement compensatory mitigation and construction protection and minimization measures developed during the agency consultations.

4.3.2.2 California Red-Legged Frog

Potential habitat for CRLF is present in the Study Area, with low quality breeding habitat in the Pond Wetland and potential dispersal habitat in the drainages. Overland movements outside of aquatic habitat is also possible. The Project would not impact aquatic resources and has a low potential to impact CRLF during construction and operation phases if CRLF make rare overland movements through the Project area.

The Project is not within the service area of the East Contra Costa County HCP/NCCP and therefore the Applicant will consult with USFWS regarding potential for take of CRLF. If USFWS determines that the Project could affect CRLF, the Applicant will obtain a take statement and implement compensatory mitigation and/or construction protection and minimization measures developed during the agency consultation.

4.3.2.3 San Joaquin Coachwhip

San Joaquin coachwhip could be present in grassland habitat and could be impacted by construction activities. The following mitigation measure is recommended to reduce the potential for impacts to San Joaquin coachwhip.

BIO - 3 Clearance Surveys. The Project Biologist shall conduct a morning clearance survey of the Project work area each day that ground disturbing activities are proposed. San Joaquin coachwhip captured during surveys or during construction monitoring shall be relocated to the nearest suitable habitat outside of the Project area.

4.3.3 Birds

4.3.3.1 Nesting Birds

Impacts to or take of nesting birds could occur if Project activities that affect vegetation or structures are conducted during nesting season (typically February 15 through August 31). To reduce potential impacts of the proposed Project on nesting birds, the following mitigation measure is recommended.

BIO - 4 Preconstruction Nesting Bird Survey. If ground or vegetation disturbing activities commence between February 15 and August 31, preconstruction nesting bird surveys shall be conducted within one week (7 days) of starting work. Surveys shall cover the entire work area plus a 300-foot buffer. If surveys do not locate nesting birds, construction activities may commence. If an active bird nest (a nest with eggs or young) is located, a protective buffer shall be established by a qualified biologist.

For nests of common bird species, the buffer shall consist of a 50-foot radius area around the nest until the chicks have fledged and are no longer dependent on the nest. Active raptor nests shall be protected by a 300-foot buffer. The qualified biologist may increase or decrease the buffer on a case-by-case basis in consultation with the County, if the species, location, topography, or work scope support the determination. A preconstruction survey report shall be submitted to the County immediately upon completion of the survey, and prior to start of work. The report shall detail appropriate fencing or flagging of buffer zones if applicable. A map of the project site and nest locations shall be included with the report.

4.3.3.2 Special Status Birds (foraging)

Eleven special status birds have some potential to nest and/or forage in the Study Area, including Cooper's hawk, tricolored blackbird, grasshopper sparrow, burrowing owl, ferruginous hawk, Swainson's hawk, northern harrier, California horned lark, prairie falcon, American peregrine falcon, and loggerhead shrike (refer to Table 5 for nesting and foraging potential). Measure BIO - 4 is prescribed to reduce potential impacts to nesting birds, including common and special status birds and raptors. Impacts to foraging birds during Project activities is negligible. Specific measures for burrowing owl are provided in Section 4.3.3.3 below.

4.3.3.3 Burrowing Owl

In order to reduce the potential for impacts to burrowing owls, the applicant shall implement the following measure prior to ground disturbance activities.

BIO - 5 Burrowing Owl Surveys and Monitoring. A qualified wildlife biologist shall survey for burrowing owl within the Project work area and a 500-foot radius around the work area, within 30 days prior to starting Project activities. Surveys shall be conducted at appropriate times to maximize detection. If active burrowing owl burrows are observed, these burrows shall be designated as Environmentally Sensitive Areas, protected, and monitored by a qualified biologist during Project-related activities. A minimum 500-foot avoidance buffer shall be established and maintained around each owl burrow during the nesting season (February 1 through August 31). If active burrowing owl burrows are observed outside of the nesting season, minimum 150-foot no-disturbance buffer shall be established around each burrow. Results of the burrowing owl surveys shall be submitted to CDFW at least one (1) week prior to the start of Project activities.

4.3.4 Mammals

4.3.4.1 American Badger

American badger could occur in the Project areas and potential badger dens were detected during May and June 2021 surveys. Project activities could result in take of American badger adults or young, or disturbance of natal dens and abandonment by adult badgers. To reduce this potential impact to a less than significant level the following measure is recommended.

BIO - 6 Preconstruction Survey. A preconstruction survey shall be conducted within thirty days of beginning work on the site to identify if badgers are using the site. The results of the survey shall be sent to the project manager and Contra Costa County. If the preconstruction survey finds potential badger dens, they shall be inspected to determine whether they are occupied. The survey shall cover the entire property and shall examine both old and new dens. If potential badger dens are too long to completely inspect from the entrance, a fiber optic scope shall be used to examine the den to the end. Inactive dens may be excavated by hand with a shovel to prevent re-use of dens during construction. If badgers are found in dens on the property between February and July, nursing young may be present. To avoid disturbance and the possibility of direct take of adults and nursing young, and to prevent badgers from becoming trapped in burrows during construction activity, no grading shall occur within 100 feet of active badger dens between February and July. Between July 1st and February 1st all potential badger dens shall be inspected to determine if badgers are present. During the winter badgers do not truly hibernate but are inactive and asleep in their dens for several days at a time. Because they can be torpid during the winter, they are vulnerable to disturbances that may collapse their dens before they rouse and emerge. Therefore, surveys shall be conducted for badger dens throughout the year. If badger dens are found on the property during the preconstruction survey, the CDFW wildlife biologist for the area shall be contacted to review current allowable management practices.

4.3.4.2 San Joaquin Kit Fox

The SJKF population in Contra Costa County is either extirpated or persisting at very low levels. There is low potential for kit fox to be present in the Project area.

The Project is not within the service area of the East Contra Costa County HCP/NCCP and therefore the Applicant will consult with USFWS and CDFW regarding potential for take of SJKF. If the agencies determine that the Project could affect SJKF, the Applicant will obtain a take statement and implement compensatory mitigation and/or construction protection and minimization measures developed during the agency consultations.

4.3.5 *Habitat Connectivity and Wildlife Movement*

Project development could potentially result in injury or mortality of individual special status wildlife species listed in Table 7. However, the low-impact design of individual solar panel trackers would not impede or block wildlife from utilizing this site for movement; therefore, no mitigation measures are recommended aside from those prescribed above for individual special status species during construction.

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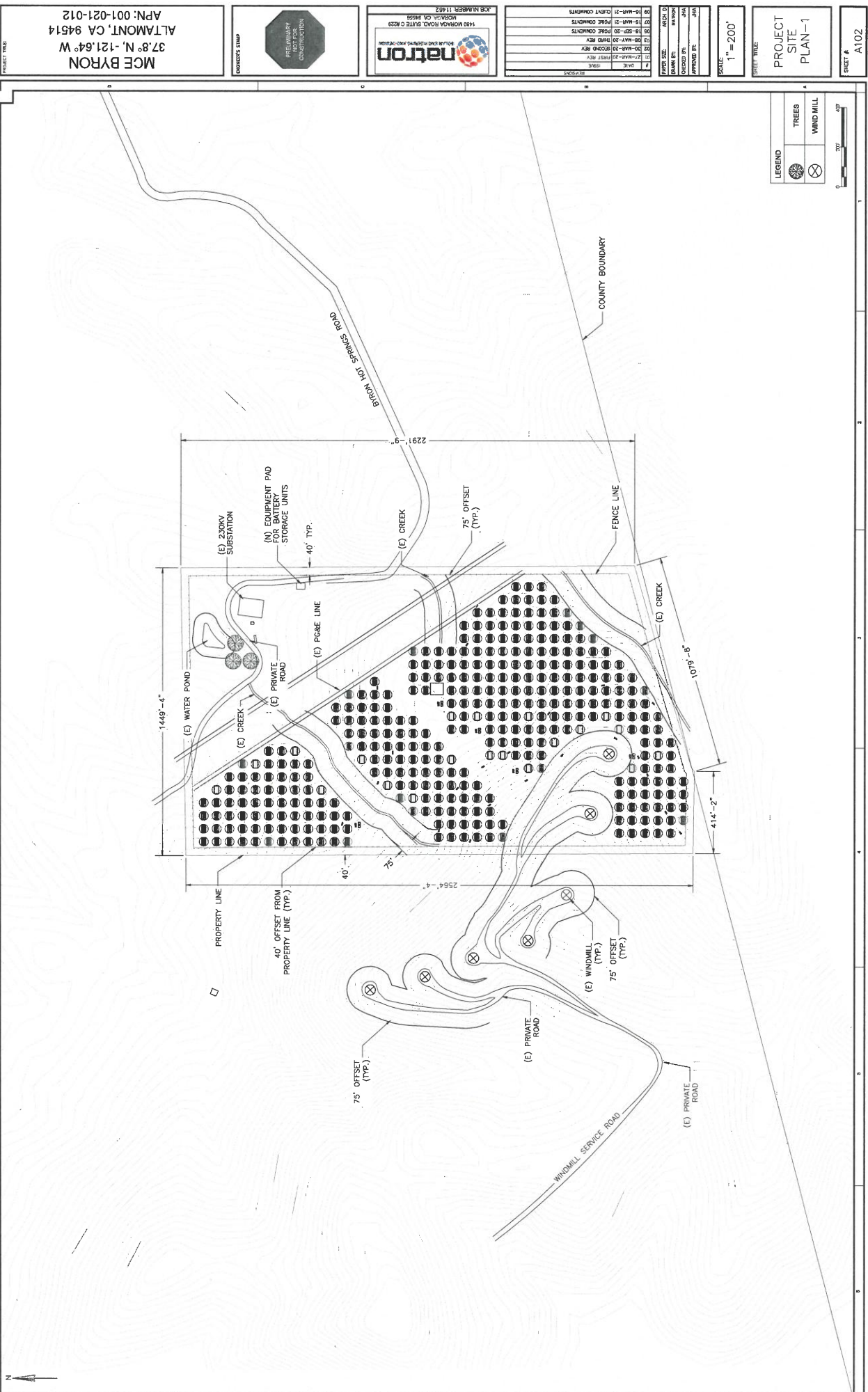
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6 APPENDICES

- **Appendix A. Site Plan**
- **Appendix B. Special Status Plants Reported from the Region**
- **Appendix C. Special Status Animals Reported from the Region**
- **Appendix D. CNDDDB Submission Form**

APPENDIX A. SITE PLAN



APPENDIX B. SPECIAL STATUS PLANTS REPORTED FROM THE REGION

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
1. <i>Acanthomintha lanceolata</i>	Santa Clara Thorn-Mint	-/ G4/S4 4.2	Mar-Jun	Woodland, chaparral, talus, rocky slopes, outcrops, occasionally serpentine	No Potential. Appropriate habitat and soils are not present in the Study Area. Nearest occurrence is over 12 miles southeast (CCH DAV148634; UCD77300) in 1998.
2. <i>Amsinckia grandiflora</i>	Large-Flowered Fiddleneck	FE/CE G1/S1 1B.1	Mar-May	Grassy slopes	Low. The disturbed quality of grassland habitat in the Study Area is marginally suitable and nearest occurrences are either extirpated or historic.
3. <i>Amsinckia lunaris</i>	Bent-Flowered Fiddleneck	-/ G3/S3 1B.2	Mar-Jun	Gravelly slopes, grassland, openings in woodland, often serpentine	No Potential. Suitable serpentine soils are not present and there are no occurrences within 10 miles of the Study Area.
4. <i>Androsace elongata</i> subsp. <i>acuta</i>	California Androsace	-/ G5?T3T4/S3S4 4.2	Mar-Jun	Dry grassy slopes	Low. Dry, grassy slopes are present in the Study Area, however disturbed quality of grassland habitat is not preferred. Nearest occurrence is 2.1 miles southwest of the Study Area (CCH DAV189751; UCD84947) in 2010.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
5. <i>Anomobryum julaceum</i>	Slender Silver Moss	-/ G5?/S2 4.2		Damp rock and soil on outcrops, usually on roadcuts	No Potential. Rock outcrops on site are dry from high winds and heat exposure. Nearest occurrence is over 11 miles northwest of the Study Area (CNDDB #7) in 2000.
6. <i>Arctostaphylos auriculata</i>	Mt. Diablo Manzanita	-/ G2/S2 1B.3	Jan-Mar	Sandstone, upland chaparral near coast	No Potential. Suitable habitat is not present in the Study Area and species (perennial shrub) was not observed during surveys.
7. <i>Arctostaphylos manzanita</i> subsp. <i>laevigata</i>	Contra Costa Manzanita	-/ G5T2/S2 1B.2	Jan-Apr	Chaparral, rocky outcrops	No Potential. Suitable habitat is not present in the Study Area and species (perennial shrub) was not observed during surveys.
8. <i>Astragalus tener</i> var. <i>tener</i>	Alkali Milk-Vetch	-/ G2T1/S1 1B.2	Mar-Jun	Alkaline flats, vernal moist meadows	No Potential. Suitable alkaline or meadow habitat is not present in the Study Area.
9. <i>Atriplex cordulata</i> var. <i>cordulata</i>	Heartscale	-/ G3T2/S2 1B.2	Apr-Oct	Saline or alkaline soils	No Potential. Suitable habitat is not present in the Study Area.
10. <i>Atriplex coronata</i> var. <i>coronata</i>	Crownscale	-/ G4T3/S3 4.2	Mar-Oct	Fine, alkaline soils	No Potential. Suitable habitat is not present in the Study Area.
11. <i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills Crownscale	-/ G4T2/S2 1B.2	Apr-Sep	Dried ponds, alkaline soils	No Potential. Suitable habitat is not present in the Study Area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
12. <i>Atriplex depressa</i>	Brittlescale	-/ G2/S2 1B.2	Apr-Oct	Alkaline or clay soils	High. Suitable clay soils are present, and the nearest occurrence is 0.8 miles north of the Study Area (CNDDB #43) in 2000, with numerous occurrences in the vicinity.
13. <i>Atriplex minuscula</i>	Lesser Saltscale	-/ G2/S2 1B.1	May-Oct	Sandy, alkaline soils	No Potential. Suitable habitat is not present in the Study Area.
14. <i>Balsamorhiza macrolepis</i>	Big-Scale Balsamroot	-/ G2/S2 1B.2	Mar-Jun	Open grassy or rocky slopes, valleys	Low. Suitable grassy slope habitat is present in the Study Area, though nearest occurrence is over 10 miles to the southeast (CNDDB #13) in 1993.
15. <i>Blepharizonia plumosa</i>	Big Tarplant	-/ G1G2/S1S2 1B.1	Jul-Oct	Dry slopes in grassland	Moderate. Appropriate grassland habitat with clay loam soils is present in the Study Area.
16. <i>Calandrinia breweri</i>	Brewer's Calandrinia	-/ G4/S4 4.2	Mar-Jun	Chaparral, coastal scrub. Disturbed sites, burns. Sandy to loamy soil. <1200 m.	No Potential. Suitable habitat and soils are not present in the Study Area.
17. <i>Calochortus pulchellus</i>	Mt. Diablo Fairy-Lantern	-/ G2/S2 1B.2	Apr-Jun	Wooded slopes, rarely chaparral, generally northern aspect	No Potential. Suitable habitat is not present in the Study Area.
18. <i>Campanula exigua</i>	Chaparral Harebell	-/ G2/S2 1B.2	May-Jun	Talus slopes, generally serpentine soil	No Potential. Suitable serpentine soils and/or talus slopes are not present in the Study Area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
19. <i>Caulanthus lemmonii</i>	Lemmon's Jewelflower	-/ G3/S3 1B.2	Feb-May	Grassland, chaparral, scrub	No Potential. The disturbed quality of grassland habitat in the Study Area is not suitable for this species. Nearest occurrences are historic and over 11 miles southeast of the Study Area (CNDDB #35 and #34).
20. <i>Centromadia parryi</i> subsp. <i>congdonii</i>	Congdon's Tarplant	-/ G3T1T2/S1S2 1B.1	May-Nov	Grassland, disturbed sites. Terraces, swales, floodplains, Alkaline, heavy clay soil <300 m.	Moderate. Wetland habitat occurs within grassland habitat and suitable clay soils are present in the Study Area.
21. <i>Chloropyron molle</i> subsp. <i>hispidum</i>	Hispid Bird's-Beak	-/ G2T1/S1 1B.1	Jun-Sep	Saline marshes and flats	No Potential. Marsh habitat with saline conditions is not present in the Study Area.
22. <i>Chloropyron palmatum</i>	Palmate-Bracted Bird's-Beak	FE/CE G1/S1 1B.1	May-Oct	Alkaline flats	No Potential. Suitable alkaline habitat is not present in the Study Area.
23. <i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's Water- Hemlock	-/ G5T4T5/S2? 2B.1	Jul-Sep	Coastal wetlands	No Potential. Coastal habitat is not present in the Study Area.
24. <i>Convolvulus simulans</i>	Small-Flowered Morning-Glory	-/ G4/S4 4.2	Mar-Jul	Clay substrates, occasionally serpentine, annual grassland, coastal-sage scrub, chaparral	Low. Open grassland habitat with clay soils is present, though disturbed quality of grassland reduces potential to occur. Nearest occurrence is 2.9 miles northwest of the Study Area (CCH # JEPS100237) in 1990.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
25. <i>Cryptantha hooveri</i>	Hoover's Cryptantha	-/ GH/SH 1A	Apr-May	Dry, coarse sand, flats and hills	No Potential. Suitable sandy soil is not present in the Study Area.
26. <i>Deinandra baccigalupii</i>	Livermore Tarplant	-/ G1/S1 1B.1	Jun-Oct	Alkaline meadows, edges of alkali barrens or sinks	No Potential. Alkaline habitat is not present in the Study Area.
27. <i>Delphinium californicum</i> subsp. <i>interius</i>	Hospital Canyon Larkspur	-/ G3T3/S3 1B.2	Apr-Jun	Generally slopes in open woodland, eastern side of coast ranges	No Potential. Appropriate woodland habitat is not present in the Study Area.
28. <i>Delphinium recurvatum</i>	Recurved Larkspur	-/ G2?/S2? 1B.2	Mar-Jun	Poorly drained, fine, alkaline soils in grassland, Atriplex scrub.	No Potential. Alkaline soils are not present in the Study Area.
29. <i>Eriogonum truncatum</i>	Mt. Diablo Buckwheat	-/ G1/S1 1B.1	Apr-Sep	Sand	No Potential. Suitable sandy soils are not present in the Study Area.
30. <i>Eryngium jepsonii</i>	Jepson's Coyote Thistle	-/ G2?/S2? 1B.2	Apr-Aug	Moist clay soil	No Potential. Though clay soils are present, his species is not known to occur in the region and nearest occurrence is over 16 miles northwest of the Study Area (CNDDDB #4) in 1998. Species was not detected during surveys.
31. <i>Eryngium racemosum</i>	Delta Button-Celery	-/ G1/S1 1B.1	Jun-Oct	Seasonally flooded clay depressions in floodplains	Low. Clay soils are present and nearest occurrence is 7.5 miles northwest of the Study Area (CNDDDB #33).

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
32. <i>Eryngium spinosepalum</i>	Spiny-Sepaled Button-Celery	-/ G2/S2 1B.2	Apr-Jun	Vernal pools, swales, roadside ditches	Moderate. Wetland and swale habitat is present, and this species is known to occur in wetland habitat within 1.5 miles of the Study Area (CNDDB #93).
33. <i>Eschscholzia rhombipetala</i>	Diamond-Petaled California Poppy	-/ G1/S1 1B.1	Mar-Apr	Fallow fields, open places	Low. Suitable grassland habitat with clay soils is present in the Study Area; however, nearest occurrences are historic (from 1888), with one recent occurrence approximately 2.3 miles southwest of the site (CNDDB #12) in 2015.
34. <i>Extriplex joaquinana</i>	San Joaquin Spearscale	-/ G2/S2 1B.2	Apr-Oct	Alkaline soils	Low. Alkaline conditions are not present in the Study Area, but nearest occurrence is 0.6 miles from the site (CNDDB #19) and grassland habitat with clay soils could support this species.
35. <i>Fritillaria agrestis</i>	Stinkbells	-/ G3/S3 4.2	Mar-Jun	Clay, often vertic, occasionally serpentine	Low. Grassland habitat with clay soils is present in the Study Area and numerous occurrences are in the vicinity.
36. <i>Galium andrewsii</i> subsp. <i>gatense</i>	Phlox-Leaf Serpentine Bedstraw	-/ G5T3/S3 4.2	Apr-Jul	Dry, rocky places in serpentine soil, chaparral or open oak/pine woodland	No Potential. Suitable habitat with serpentine soils is not present in the Study Area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
37. <i>Helianthella castaneu</i>	Diablo Helianthella	-/ G2/S2 1B.2	Mar-Jun	Open, grassy sites	Low. Appropriate grassland habitat is present in the Study Area.
38. <i>Hesperervax caulescens</i>	Hogwallow Starfish	-/ G3/S3 4.2	Mar-Jun	Declining. Drying shrink-swell clay of vernal pools, flats, steep slopes (sometimes serpentine)	Low. Wetland habitat with clay soils is present though nearest occurrence is historic. More recent occurrence is 6.7 miles southeast (CCH DAV212141; UCD160257) in 2014.
39. <i>Hesperolinon breweri</i>	Brewer's Western Flax	-/ G2/S2 1B.2	May-Jul	Chaparral or grassland, occasionally on serpentine	No Potential. Suitable serpentine or alkaline soils are not present in the Study Area.
40. <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	Woolly Rose-Mallow	-/ G5T3/S3 1B.2	Jun-Sep	Freshwater wetlands, wet banks, marshes	Low. Limited wetland habitat is present in the study Area and nearest occurrence is 3.2 miles northeast (CNDDB #152) in 2009.
41. <i>Lasthenia conjugens</i>	Contra Costa Goldfields	FE/- G1/S1 1B.1	Mar-Jun	Vernal pools, wet meadows	No Potential. Alkaline wetland habitat is not present in the Study Area and species was not detected.
42. <i>Lasthenia ferrisiae</i>	Ferris' Goldfields	-/ G3/S3 4.2	Feb-May	Vernal pools or wet saline flats	No Potential. Vernal pool habitat with high salinity is not present in the Study Area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
43. <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta Tule Pea	-/ G5T2/S2 1B.2	May-Sep	Coastal, estuarine marshes	No Potential. Suitable coastal habitat is not present in the Study Area.
44. <i>Lilaeopsis masonii</i>	Mason's Lilaeopsis	-CR G2/S2 1B.1	Apr-Nov	Intertidal marshes, streambanks	No Potential. Suitable intertidal habitat is not present in the Study Area.
45. <i>Limosella australis</i>	Delta Mudwort	-/ G4G5/S2 2B.1	May-Aug	Muddy or sandy intertidal flats, brackish water	No Potential. Suitable intertidal habitat is not present in the Study Area.
46. <i>Madia radiata</i>	Showy Golden Madia	-/ G3/S3 1B.1	Mar-May	Grassy or open slopes, vertic clay, rarely serpentine	No Potential. Suitable soils are not present in the Study Area. Open grassland habitat is present, however open grassy areas in woodland habitat is preferred by this species.
47. <i>Malacothamnus hallii</i>	Hall's Bush-Mallow	-/ G2/S2 1B.2	Apr-Oct	Open chaparral	No Potential. Suitable habitat is not present in the Study Area.
48. <i>Navarretia heterandra</i>	Tehama Navarretia	-/ G4/S4 4.3	Apr-Jun	Heavy soil, vernal pools, wet or drying flats	Low. Heavy clay soils and limited wetland habitat are present, though nearest occurrence is over 13 miles northwest of the Study Area (CCH JEPS116947) in 2008.
49. <i>Navarretia nigelliformis</i> subsp. <i>nigelliformis</i>	Adobe Navarretia	-/ G4T3/S3 4.2	Apr-Jun	Vernal pools, clay depressions	Low. Suitable clay soils in wetland habitat are present -in the Study Area, though no known occurrences have been documented in the area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
50. <i>Navarretia nigelliformis</i> subsp. <i>radians</i>	Shining Navarretia	-/ G4T2/S2 1B.2	Mar-Jul	Grassland and cismontane woodland. Often on clay and alkaline sites, sometimes vernal pools. 65-1,000 m.	Moderate. Suitable grassland habitat with clay soils is present and nearest occurrence is 2.3 miles southeast of the Study Area.
51. <i>Navarretia prostrata</i>	Prostrate Vernal Pool Navarretia	-/ G2/S2 1B.1	Apr-Jul	Alkaline floodplains, vernal pools	No Potential. Suitable habitat is not present in the Study Area.
52. <i>Oenothera deltoides</i> subsp. <i>howellii</i>	Antioch Dunes Evening-Primrose	FE/CE G5T1/S1 1B.1	Mar-Sep	Sandy bluffs, dunes	No Potential. Suitable bluff habitat is not present in the Study Area.
53. <i>Plagiobothrys glaber</i>	Hairless Popcornflower	-/ GH/SH 1A	Mar-May	Presumed extinct. Wet, saline, +/- alkaline soils in valleys, coastal marshes	No Potential. Suitable saline habitat is not present in the Study Area.
54. <i>Puccinellia simplex</i>	California Alkali Grass	-/ G3/S2 1B.2	Mar-May	Saline flats, mineral springs	No Potential. Suitable saline habitat is not present in the Study Area.
55. <i>Scutellaria galericulata</i>	Marsh Skullcap	-/ G5/S2 2B.2	Jun-Sep	Wet sites, meadows, streambanks, conifer forest	No Potential. Suitable habitat is not present in the Study Area.
56. <i>Senecio aphanactis</i>	Chaparral Ragwort	-/ G3/S2 2B.2	Jan-May	Alkaline flats, dry open rocky areas	No Potential. Suitable alkaline soils are not present in the Study Area and nearest occurrences are historic.
57. <i>Spergularia macrotheca</i> var. <i>longistyla</i>	Long-Styled Sand-Spurrey	-/ G5T2/S2 1B.2	Feb-Jun	Alkaline marshes, mud flats, meadows, hot springs	No Potential. Suitable alkaline soils are not present in the Study Area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CA Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur
58. <i>Symphytotrichum lentum</i>	Suisun Marsh Aster	-/ G2/S2 1B.2	Apr-Nov	Marshes	No Potential. Suitable marsh habitat is not present in the Study Area.
59. <i>Trifolium hydrophilum</i>	Saline Clover	-/ G2/S2 1B.2	Apr-Jun	Salt marshes, open areas in alkaline soils	No Potential. Suitable marsh habitat with alkaline soils is not present in the Study Area.
60. <i>Tropidocarpum capparideum</i>	Caper-Fruited Tropidocarpum	-/ G1/S1 1B.1	Mar-Apr	Alkaline soils, low hills, valleys	No Potential. Suitable alkaline soils are not present in the Study Area.
61. <i>Viburnum ellipticum</i>	Oval-Leaved Viburnum	-/ G4G5/S3? 2B.3	May-Jun	Chaparral, yellow-pine forest, generally n-facing slopes	No Potential. Suitable habitat is not present in the Study Area.

State/Rank Abbreviations:

FE: Federally Endangered
 FT: Federally Threatened
 PE: Proposed Federally Endangered
 PT: Proposed Federally Threatened
 CE: California Endangered
 CR: California Rare
 CT: California Threatened
 CCE: Candidate for California Endangered
 CCT: Candidate for California Threatened

California Rare Plant Ranks:

CRPR 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
 CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
 CRPR 2A: Plants presumed extirpated in California, but common elsewhere
 CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
 CRPR 4: Plants of limited distribution - a 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)
 0.3 - Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Global/State Ranks:

G1/S1 – Critically Imperiled
 G2/S2 – Imperiled
 G3/S3 – Vulnerable G4/S4 – Apparently Secure
 G5/S5 – Secure

Q – Element is very rare but there are taxonomic questions associated with it.
 Range rank – (e.g., S2S3 means rank is somewhere between S2 and S3)
 ? – (e.g., S2? Means rank is more certain than S2S3 but less certain that S2)

APPENDIX C. SPECIAL STATUS ANIMALS REPORTED FROM THE REGION

Scientific Name	Common Name	Federal/State Status	Global/State Rank	Habitat Preference	Potential to Occur
1. <i>Accipiter cooperii</i>	Cooper's Hawk	-/ G5/S4 WL		Oak woodland, riparian, open fields. Nests in dense trees, esp. coast live oak.	Low (nesting). Planted trees surrounding the residential trailer in the Study Area could provide low-quality nesting habitat, though Cooper's hawks are not commonly known to nest in the area. Nearest nesting occurrence is over 8 mi southwest of the Study Area in 2009 (CNDDDB #124). Moderate (foraging). Suitable open field habitat is present for hunting and the few trees near the residential trailer could provide perching substrate.
2. <i>Agelaius tricolor</i>	Tricolored Blackbird	-/CT G2G3/S1S2 SSC		Requires open water, protected nesting substrate, & foraging area with insect prey near nesting colony.	No Potential (nesting). Suitable nesting habitat is not present in the Study Area due to the lack of wetland vegetation for nest substrates. Vegetation within the ponds is low-growing or non-existent and does not provide preferred (cattail, bulrush) protection for nesting. Closest known nesting colony record is 1.9 miles northeast (CNDDDB #593). Low (foraging). Abundant occurrences of this species are documented in the area and the site could be utilized for forage or as a satellite water source between nesting sites.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
3. <i>Ambystoma californiense-Pop 1</i>	California Tiger Salamander-Central California DPS	FT/CT G2G3/S2S3 WL	Need underground refuges, ground squirrel burrows & vernal pools or other seasonal water for breeding.	High. A potential breeding pond is within the Study Area. Known breeding ponds are within dispersal distance. CTS may occupy upland habitat in burrows within the Study Area.
4. <i>Ammodramus savannarum</i>	Grasshopper Sparrow	-/ G5/S3 SSC	Nests in grassland habitats on mountain slopes, foothills, and valleys. May nest colonially.	Low (nesting). Suitable nesting habitat is present in grassland and rock outcrops on the site. Closest recorded occurrence is 6.0 miles southwest of the Study Area (CNDDB #21), however nearer occurrences have been documented within 1.7 miles of the site on eBird in 2012 (eBird 2021). Moderate (foraging). Suitable grassland foraging habitat with protective rock-outcrops are present in the Study Area.
5. <i>Andrena blennospermatis</i>	Blennosperma Vernal Pool Andrenid Bee	-/ G2/S2 SA	Bees nest in the uplands around vernal pools.	No Potential. <i>Blennosperma</i> sp. nectar sources not observed onsite. No bee nests observed during field surveys. CNDDB occurrence record over 15 miles northwest (CNDDB #2)
6. <i>Anniella pulchra</i>	Northern California Legless Lizard	-/ G3/S3 SSC	Sandy or loose loamy soils under coastal scrub or oak trees. Soil moisture essential.	No Potential. Onsite substrate is clay and too hard for this species to burrow, and habitat and substrate not appropriate.
7. <i>Antrozous pallidus</i>	Pallid Bat	-/ G5/S3 SSC	Rock crevices, caves, tree hollows, mines, old buildings, and bridges.	No Potential. Appropriate roosts for bats are not present onsite. No existing structures, tree hollows onsite. The rock outcrops onsite are low to the ground and are not suitable roosting habitat.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
8. <i>Aquila chrysaetos</i>	Golden Eagle	-/ G5/S3 FP	Nests in large, prominent trees in valley and foothill woodland. Requires adjacent food source.	No Potential (nesting). Potentially suitable foraging habitat available onsite and in the vicinity; however, site does not support large prominent trees for nesting. Closest documented nest occurrence is 2.3 miles west (CNDDB #71). High (foraging). Golden eagles are frequently documented in the area (eBird 2021) and suitable foraging habitat is present in the Study Area.
9. <i>Ardea herodias</i>	Great Blue Heron	-/ G5/S4 SA	Rookeries located in tall trees near foraging areas.	No Potential. Site does not support large prominent trees for rookeries. Closest documented rookery is over 10 miles northeast (CNDDB #64).
10. <i>Arizona elegans occidentalis</i>	California Glossy Snake	-/ G5T2/S2 SSC	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	No Potential. Onsite substrate is clay and too hard for this species to burrow. Substrate not appropriate. Closest record is 6.9 miles southeast (CNDDB #6).
11. <i>Asio flammeus</i>	Short-Eared Owl	-/ G5/S3 SSC	Fresh and salt swamps, lowlands. Nests on dry ground in tules/tall grasses.	No Potential. No suitable nesting habitat within the Study Area because onsite ponds are dry throughout most of the year. Vegetation onsite is low-growing due to grazed grass conditions and does not provide tall vegetation protection for nesting.
12. <i>Athene cunicularia</i>	Burrowing Owl	-/ G4/S3 SSC	Burrows in squirrel holes in open habitats with low vegetation.	Present. This species was observed onsite in the annual grassland habitat. An active burrow was detected and mapped.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
13. <i>Bombus crotchii</i>	Crotch Bumble Bee	-/CCE G3G4/S1S2 SA	Open grassland and scrub habitats. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.	No Potential. Most suitable nectar sources are not present. No bumblebee nests observed onsite. Nearest occurrences are over 15 miles away in 1926 and 1932 (CNDDDB #14 and #17).
14. <i>Bombus occidentalis</i>	Western Bumble Bee	-/CCE G2G3/S1 SA	Wide variety of natural, agricultural, urban, and rural habitats. Flower-rich meadows of forests and subalpine zones.	No Potential. Most suitable nectar sources are not present. No bumblebee nests observed onsite. Nearest occurrence approximately 7 miles southwest in 1956 (CNDDDB #231).
15. <i>Branchinecta longiantenna</i>	Longhorn Fairy Shrimp	FE/- G1/S1S2 SA	Small clear water depressions in sandstone, and clear to turbid clay/grass bottomed pools in shallow swales	Moderate. Suitable clay depressions within low-quality wetland habitat are present in the Study Area and CNDDDB records indicate species presence in the area (CNDDDB #12).
16. <i>Branchinecta lynchi</i>	Vernal Pool Fairy Shrimp	FT/- G3/S3 SA	Clear water sandstone depression pools, grassed swale, earth slump, or basalt flow depression pools.	Moderate. Suitable clay depressions within low-quality wetland habitat are present in the Study Area and closest known occurrence is 0.5 miles north (CNDDDB #219) in 2017, with several occurrences in the area.
17. <i>Branchinecta mesoovallensis</i>	Midvalley Fairy Shrimp	-/ G2/S2S3 SA	Vernal pools in the Central Valley.	Moderate. The wetland pond area at the NE corner of the Study Area is marginally suitable and regularly trampled by cattle; however, CNDDDB records indicate species occurrence in 2017, 0.7-mile northeast of the Study Area (CNDDDB #35), with several other occurrences in the immediate area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
18. <i>Buteo regalis</i>	Ferruginous Hawk	-/- G4/S3S4 WL	Winters in open grassland or savannah habitats.	No Potential (nesting). The Study Area is outside the known breeding range for this species. Moderate (foraging). Potentially suitable foraging habitat available onsite and in the vicinity. Closest documented occurrence is 2.5 miles east of the Study Area (CNDDB #27).
19. <i>Buteo swainsoni</i>	Swainson's Hawk	-/CT G5/S3 SA	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, agricultural fields.	Low (nesting). Species is known to nest in lone and farmyard trees and this species could nest in the ornamental trees located around the unoccupied residence. High (foraging). Species observed flying and pair observed copulating in the nearby vicinity, east of the Study Area. Suitable foraging habitat available onsite. Closest documented occurrence is 2 miles southeast (CNDDB #2380).
20. <i>Circus hudsonius</i>	Northern Harrier	-/- G5/S3 SSC	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Low (nesting). Wetland and grassland habitat onsite is marginally suitable breeding/nesting habitat. Moderate (foraging). Suitable open grassland with an abundant prey base is present in the Study Area.
21. <i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	-/- G3G4/S2 SSC	Roosts in caves, abandoned buildings, tunnels. Roosting sites limiting. Sensitive to human disturbance.	No Potential. Appropriate roosting habitat is not present onsite. Nearest known records are historic and occur over 10 miles southeast (CNDDB #421).

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
22. <i>Desmocerus californicus dimorphus</i>	Valley Elderberry Longhorn Beetle	FT/- G3T2/S2 SA	Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	No Potential. <i>Sambucus</i> sp. is not present within the Study Area.
23. <i>Elanus leucurus</i>	White-Tailed Kite	-/ G5/S3S4 FP	Nests in dense tree canopy near open foraging areas	No Potential (nesting). Suitable nesting habitat with a dense tree canopy is not present in the Study Area. Moderate (foraging). Suitable open grassland foraging habitat is present in the Study Area.
24. <i>Emys marmorata</i>	Western Pond Turtle	-/ G3G4/S3 SSC	Permanent or semi-permanent streams, ponds, lakes.	No Potential. Perennial streams and water feature(s) not present onsite.
25. <i>Eremophila alpestris actia</i>	California Horned Lark	-/ G5T4Q/S4 WL	Nests on the ground in open habitats. More common in the interior.	Moderate (nesting & foraging). The Study Area has suitable open grassland habitat for nesting and foraging horned larks and there are numerous occurrences in the vicinity.
26. <i>Falco mexicanus</i>	Prairie Falcon	-/ G5/S4 WL	Inhabits dry, open terrain. Nests on cliffs near open areas for hunting.	No Potential (nesting). Suitable nesting cliff habitat is not present in the Study Area. Moderate (foraging). Open grassland habitat with an abundant prey base is present in the Study Area with several nearby occurrences in the area.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
27. <i>Falco peregrinus anatum</i>	American Peregrine Falcon	FD/CD G4T4/S3S4 FP	Nests on cliffs, banks, dunes, mounds, and human-made structures, especially near water.	No Potential (nesting). Suitable nesting habitat is not present in the Study Area. Moderate (foraging). Abundant prey base of small birds in the Study Area and presence of water systems surrounding the site could provide suitable foraging habitat.
28. <i>Gonidea angulata</i>	Western Ridged Mussel	-/ G3/S1S2 SA	Primarily creeks & rivers & less often lakes. Originally in most of state, now extirpated from Central & Southern Calif.	No Potential. Ephemeral wetlands/ponds onsite are not suitable, and Study Area is grazed by cattle.
29. <i>Helminthoglypta nickliniana bridgesi</i>	Bridges' Coast Range Shoulderband	-/ G3T1/S1S2 SA	Tends to colonize under tall grasses and weeds.	No Potential. The Study Area is not suitable habitat due to grazed grass conditions.
30. <i>Hygrotus curvipes</i>	Curved-Foot Hygrotus Diving Beetle	-/ G1/S1 SA	Aquatic; known only from Alameda & Contra Costa counties.	Low. Few known occurrences are in the area, however limited information does not negate potential for this species to occur on the site. Marginally suitable wetland habitat is present, and species is known to occur in the County.
31. <i>Hypomesus transpacificus</i>	Delta Smelt	FT/CE G1/S1 SA	Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.	No Potential. Ephemeral wetlands/ponds onsite are not suitable, and Study Area is grazed by cattle.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
32. <i>Lanius ludovicianus</i>	Loggerhead Shrike	-/ G4/S4 SSC	Open areas with appropriate perches, near shrubby vegetation for nesting.	Low (nesting) Suitable shrub habitat is not present in the Study Area and ornamental trees provide limited nesting habitat. High (foraging). This species was observed just offsite in-flight above the access road to the northeast. Suitable foraging habitat available onsite. Closest documented occurrence is 4.9 miles south (CNDDDB #113).
33. <i>Lasiurus blossevillii</i>	Western Red Bat	-/ G5/S3 SSC	Roosts primarily in trees, from sea level up through mixed conifer forests.	No Potential. Appropriate roosting habitat is not present onsite. Nearest known records are historic and occur over 10 miles south (CNDDDB #15).
34. <i>Lasiurus cinereus</i>	Hoary Bat	-/ G5/S4 SA	Forages in open habitats or habitat mosaics with trees. Roosts in dense foliage of medium to large trees. Feeds on moths. Requires water.	No Potential. Appropriate roosting habitat is not present onsite. Nearest known records are historic and occur over 10 miles south (CNDDDB #15).
35. <i>Laterallus jamaicensis coturniculus</i>	California Black Rail	-CT G3G4T1/S1 FP	Occurs in tidal salt marsh heavily grown to pickleweed, also in freshwater and brackish marshes near the coast.	No Potential. Habitat onsite is not suitable as the Study Area is not tidally influenced.
36. <i>Lepidurus packardii</i>	Vernal Pool Tadpole Shrimp	FE/- G4/S3S4 SA	Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	No Potential. The Pond Wetland has marginal suitability; however, nearest occurrence is over 13 mi northeast of the project and is only occurrence in the 9-quadrant search.
37. <i>Linderiella occidentalis</i>	California Linderiella	-/ G2G3/S2S3 SA	Seasonal pools in unplowed grasslands with alluvial soils.	Moderate. Pond Wetland downstream from an ephemeral drainage has suitable alluvial soils and conditions to support this species.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
38. <i>Lytta molesta</i>	Molestan Blister Beetle	-/- G2/S2 SA	Inhabits the Central Valley, from Contra Costa to Kern and Tulare Counties.	No Potential. The wetland pond area has marginal suitability; however, absence of host bees and regular agricultural grazing would hinder a complete lifecycle.
39. <i>Masticophis flagellum ruddocki</i>	San Joaquin Coachwhip	-/- G5T2T3/S2? SSC	Open, dry, treeless areas, including grasslands and saltbush scrub; takes refuge in burrows and under shaded vegetation	Low. Annual grassland habitat and ephemeral drainage features may be suitable for this species. Closest record is from 1980, approximately 5 miles northwest (CNDDB #17).
40. <i>Masticophis lateralis euryxanthus</i>	Alameda Whipsnake	FT/CT G4T2/S2 SA	Mostly south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows, where shrubs form a vegetative mosaic with oak trees and grasses.	No Potential. Study Area is predominantly herbaceous with a lack of rodent activity, shrubs, and canopy. Habitat not suitable for this species.
41. <i>Melospiza melodia</i>	Song Sparrow ("Modesto" Population)	-/- G5/S3? SSC	Emergent freshwater marshes dominated by tules and cattails, riparian willow thickets, valley oak riparian forests.	No Potential. Study Area habitats are not suitable for this species. Onsite wetlands are not dominated by shrub or canopy layers that provide species protection.
42. <i>Neotoma fuscipes annectens</i>	San Francisco Dusky-Footed Woodrat	-/- G5T2T3/S2S3 SSC	Constructs nests of shredded grass, leaves & other material. May be limited by availability of nest-building materials.	No Potential. Only one CNDDB location cited in search area (CNDDB #8), 6.5 miles west. Recorded habitat in grass understory surrounded by oak woodland. Study Area habitat unsuitable due to low quality and lack of oak tree cover.
43. <i>Oncorhynchus mykiss irideus Pop. 11</i>	Steelhead - Central Valley Dps	FT/- G5T2Q/S2 SA	Populations in the Sacramento and San Joaquin rivers and their tributaries.	No Potential. Ephemeral drainage features onsite are not suitable because Study Area does not support perennial hydrology.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
44. <i>Perdita scitula antiochensis</i>	Antioch Andrenid Bee	-/ G1T1/S1 SA	Visits flowers of Eriogonum, Gutierrezia californica, Heterotheca grandiflora, Lessingia glandulifera.	No Potential. Nectar sources are not available onsite. One historic CNDDB record (CNDDB #2) located over 10 miles north of Study Area.
45. <i>Perognathus inornatus</i>	San Joaquin Pocket Mouse	-/ G2G3/S2S3 SA	Associated with fine-textured, sandy, friable soils.	No Potential. Onsite substrate is clay and too hard for this species to burrow; substrate is not suitable onsite.
46. <i>Phrynosoma blainvillii</i>	Coast Horned Lizard	-/ G3G4/S3S4 SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	No Potential. Onsite substrate habitat not suitable for species preferred protection and cover.
47. <i>Rana boylei</i>	Foothill Yellow-Legged Frog	-/CCT G3/S3 SSC	Partly shaded, shallow streams and riffles with rocky substrate. Min. 15 weeks for larval development.	No Potential. Aquatic habitats in the Study Area are not suitable for foothill yellow-legged frog.
48. <i>Rana draytonii</i>	California Red-Legged Frog	FT/- G2G3/S2S3 SSC	Lowlands and foothills in or near sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks for larval development.	Low. Pond Wetland onsite is low potential breeding habitat. Southernmost drainage is low quality dispersal habitat. Closest recorded occurrence is from 2005, ~1 mile southeast of the Study Area (CNDDB #264).
49. <i>Spea hammondi</i>	Western Spadefoot	-/ G3/S3 SSC	Grassland and woodland habitats with vernal pools for breeding. Most of year spent underground.	No Potential. Habitat onsite is degraded and not suitable for this species. In addition, all records in the search area are over 8 miles south.
50. <i>Spirinchus thaleichthys</i>	Longfin Smelt	FC/CT G5/S1 SA	Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	No Potential. Ephemeral wetlands/ponds onsite are not suitable, and Study Area is degraded from existing cattle grazing activities.

Scientific Name	Common Name	Federal/State Status Global/State Rank CDFW Status	Habitat Preference	Potential to Occur
51. <i>Taxidea taxus</i>	American Badger	-/ G5/S3 SSC	Needs friable soils in open ground with abundant food source such as California ground squirrels.	High. Potentially suitable habitat for dens onsite. Species is actively known in the area. Closest record is located adjacent to the Study Area (CNDDB #65).
52. <i>Thaleichthys pacificus</i>	Eulachon	FT/- G5/S3 SA	Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris.	No Potential. Ephemeral wetlands/ponds onsite are not suitable; and degraded in quality; substrate and water velocities not suitable.
53. <i>Vulpes macrotis mutica</i>	San Joaquin Kit Fox	FE/CT G4T2/S2 SA	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose textured sandy soil and prey base.	Low. Potentially suitable habitat and potential den observed within the Study Area. Closest record is located 6 miles southwest of the Study Area (CNDDB #23).

Federal and State Status Abbreviations:

FE: Federally Endangered
FT: Federally Threatened
PE: Proposed Federally Endangered
PT: Proposed Federally Threatened
CE: California Endangered
CT: California Threatened
CCE: Candidate for California Endangered
CCT: Candidate for California Threatened

Global/State Ranks:

G1/S1 – Critically Imperiled
G2/S2 – Imperiled
G3/S3 – Vulnerable
G4/S4 – Apparently Secure
G5/S5 – Secure
Q – Element is very rare but there are taxonomic questions associated with it.
Range rank – (e.g., S2S3 means rank is somewhere between S2 and S3)
? – (e.g., S2? Means rank is more certain than S2S3 but less certain that S2)

CDFW Rank:

WL: Watch List
SSC: Species of Special Concern
FP: Fully Protected
SA: Special Animal

APPENDIX D. CNDDDB SUBMISSION FORM

CNDDDB Online Field Survey Form Report



California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/



Source code AND21F0009
Quad code 3712176
Occ. no. _____
EO index no. _____
Map index no. _____

This data has been reported to the CNDDDB, but may not have been evaluated by the CNDDDB staff

Scientific name: *Athene cunicularia*

Common name: *burrowing owl*

Date of field work (mm-dd-yyyy): *05-12-2021*

Comment about field work date(s):

OBSERVER INFORMATION

Observer: *Kristen L. Andersen*

Affiliation: *Althouse and Meade, Inc.*

Address: *2929 Cottage Lane , Paso Robles, CA 93446*

Email: *kristena@althouseandmeade.com*

Phone: *(510) 847-3838*

Other observers: *None*

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: *Highly experienced with this species and have worked monitoring burrowing owls for many years.*

Identification explanation: *Visual: Individuals flushed from sight and perched on nearby rock; vocalizations. Sign: Fresh whitewash surrounding burrow.*

Identification confidence: *Very confident*

Species found: *Yes* If not found, why not?

Level of survey effort: *Protocol-level botanical and wildlife surveys*

Total number of individuals: *2*

Collection? *No*

Collection number:

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? *Seen*

Number detected in each age class:

2

adults

juveniles

larvae

egg mass

unknown

Age class comment: *Potentially mating pair. No juveniles detected.*

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☒ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☐ Other

Site use description: Potential nesting site, but not confirmed. In rock outcrop with several suitable burrows, southwest of two wind turbines by approximately 300 feet. On southwest facing slope. Abundant whitewash on apron.

What was the observed behavior? 2 individuals flushed from the den. One perched on nearby rock within 50 feet of me, the other flew off to nearby fence about 100 feet south. Vocalizations from both individuals.

Describe any evidence of reproduction: Not observed

SITE INFORMATION

Habitat description: Rock outcrop within annual grassland habitat with some perennial bunchgrass (*Stipa pulchra*). Site is heavily grazed by cattle.

Slope: 20-30

Land owner/manager: Private

Aspect: southwest

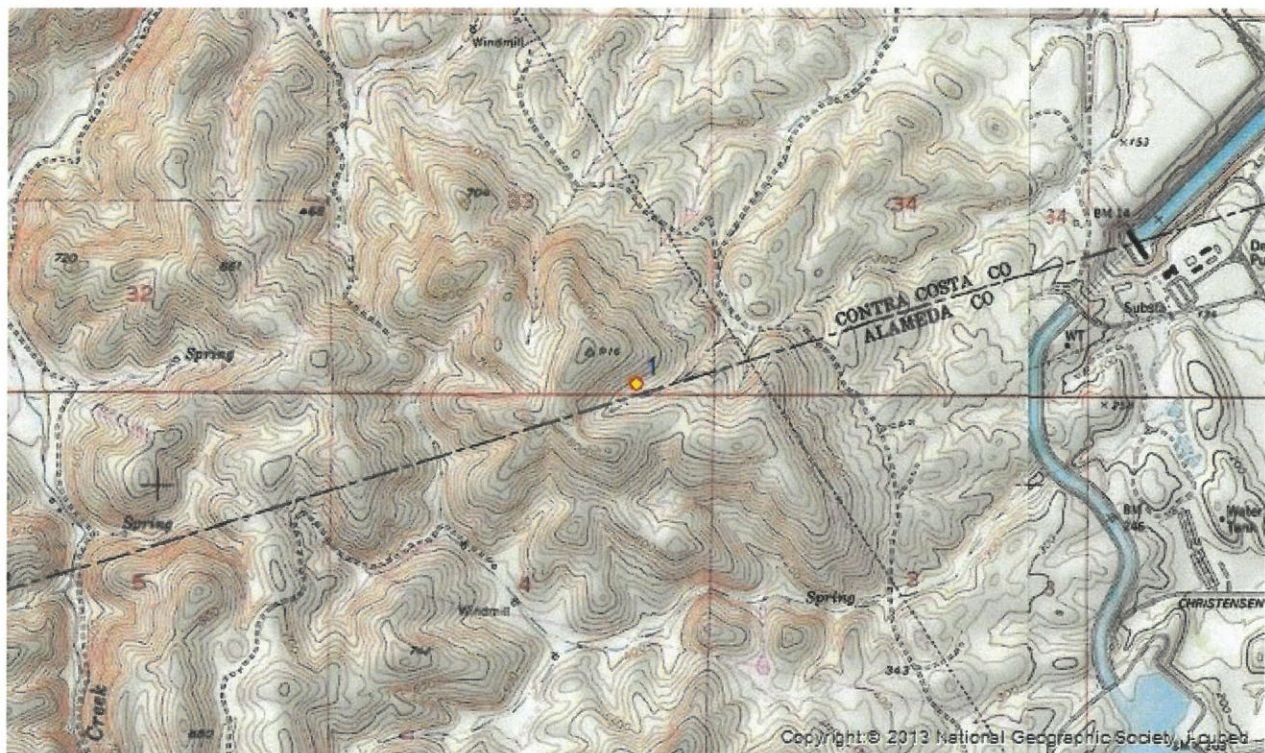
Site condition + population viability: Excellent

Immediate & surrounding land use: Grazing and wind energy

Visible disturbances: Wind turbines

Threats: Future solar project

General comments: Only burrow observed throughout the 77-acre site

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Byron Hot Springs	683	37.79533	-121.64474	619320	4183972	10
1	Public Land Survey	Feature Comment						
	M T01S R03E 33	Active BUOW den; 2 individuals flushed						

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS

Mapping notes:

Location/directions comments: In rock outcrop, southwest of two wind turbines by approximately 300 feet. On southwest facing slope.

Attachment(s): 32059_20210512125026415.jpg
