Botanical Resources Survey Report

Zeta Solar and Battery Energy Storage System Project

July 7, 2023

Prepared for:

Longroad Development Company, LLC
125 High Street
High Street Tower, Suite 1705
Boston, Massachusetts 02210

Prepared by:

Stantec Consulting Services Inc.
300 Montgomery Street, Suite 1200
San Francisco, California 94104

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Abbreviations

CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
I-5	U.S. Interstate 5
Longroad	Longroad Development Company, LLC
Los Banos	City of Los Banos
MCV	Manual of California Vegetation, Online Edition
Project	Zeta Solar and Battery Energy Storage System Project
PV	photovoltaic
report	Botanical Resources Survey Report
study area	study area
Stantec	Stantec Consulting Services Inc.
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

This Botanical Resources Survey Report (report) has been prepared to document the results of the botanical surveys and vegetation mapping within the study area for the Zeta Solar and Battery Energy Storage System Project (Project). Longroad Development Company, LLC (Longroad) proposes to develop the Project approximately 9 miles south of the City of Los Banos (Los Banos) in Merced County, California (Project site) (Figure 1).

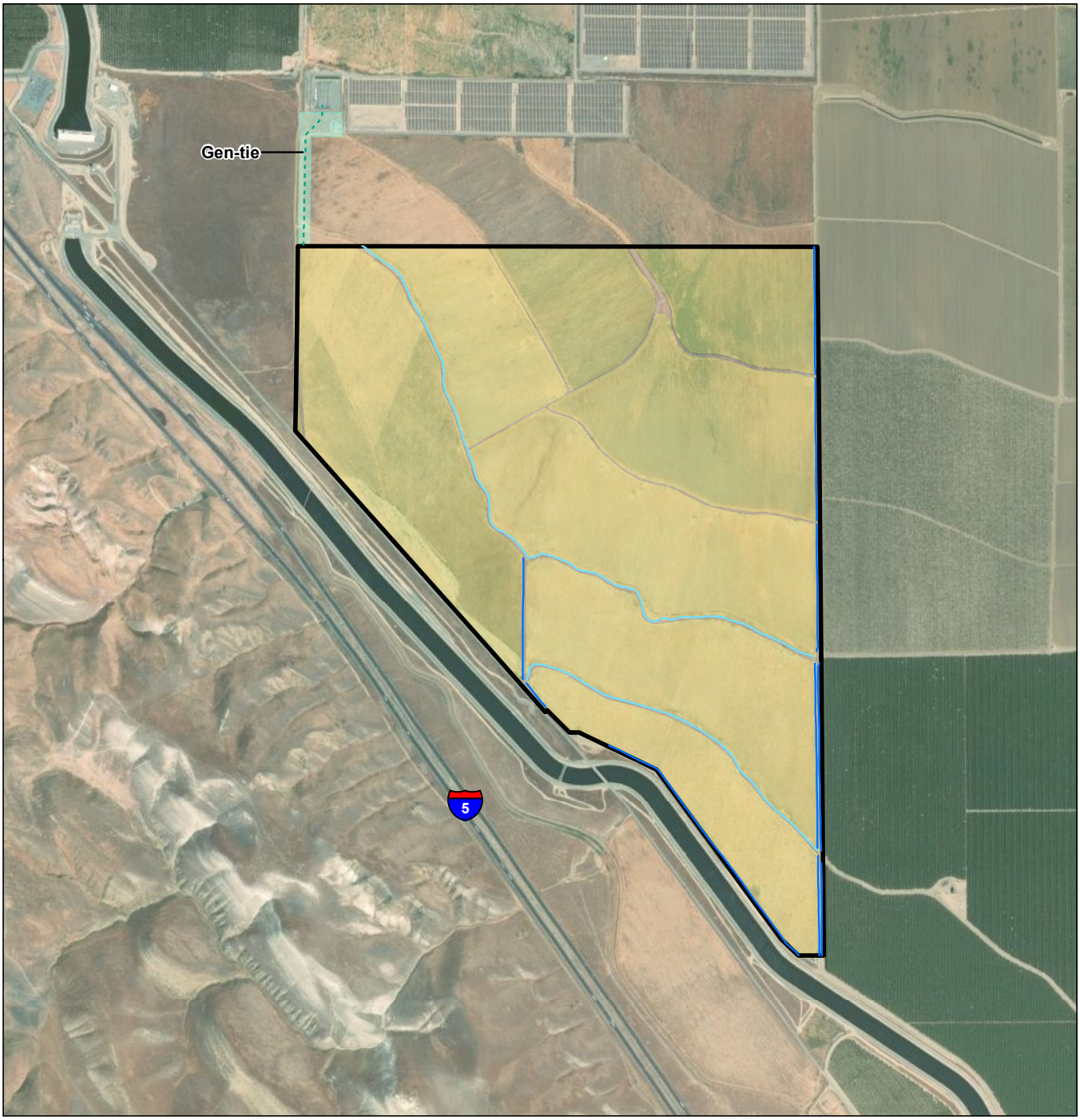
Stantec Consulting Services Inc. (Stantec) conducted a floristic survey and mapped vegetation in all parts of the study area, which is defined as the 650-acre photovoltaic (PV) solar energy and battery energy storage system facility area plus an additional 1,700-foot-long generation-tie (gen-tie) line corridor terminating at the Mercy Springs substation.

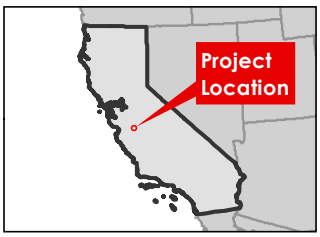
This report is intended to inform Project design and support environmental compliance documentation and potential permit applications. For this evaluation, special status plant species meet one or more of the following criteria:

- Listed as threatened or endangered under the California Endangered Species Act or the federal Endangered Species Act;
- Proposed for federal listing as threatened or endangered;
- State or federal candidate species;
- Designated as rare by the California Department of Fish and Wildlife (CDFW); or
- Meet the criteria for listing, even if not currently included on any list as described in State California Environmental Quality Act Guidelines Section 15380[b], [c], and [d]); plants that may meet this definition include:
    - Plants ranked as “rare, threatened, or endangered in California” (California Rare Plant Rank [CRPR] 1B and 2B)
    - Plants that may warrant consideration on the basis of local significance or recent biological information (State California Environmental Quality Act Guidelines Section 15380[d]), that may include CRPR 3 (plants about which more information is needed to determine their status) and CRPR 4 (plants of limited distribution)

California Department of Fish and Wildlife designates some natural communities as “sensitive”, which includes natural communities that are rare in the state or throughout its entire range. “Sensitive natural communities,” as defined by CDFW, are vegetation alliances and/or associations with a state rarity ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable). Communities with a state ranking of S4 (apparently secure) or S5 (secure) are not considered sensitive. Sensitive natural communities are not defined by the presence of special status plant species; they typically contain several native species that together form an assemblage that is considered rare. CDFW has not yet provided state rarity rankings for all associations. Sensitive natural communities, including associations not yet ranked but considered sensitive, are included in the current CDFW Sensitive Natural Communities List (CDFW 2023).

V:\1857\Active\185705411\03_data\gis_cad\gis\mxd\bot\map\Fig_1_VegetationCommunities.mxd Revised: 2024-07-09 By: pglendening





Project Site (650 acres)

Gen-tie

Gen-tie Corridor

Concrete Ditch

Earthen Ditch

Vegetation Types

Developed

Ripgut Brome and Wild Oats Annual Grassland

0 1,000 2,000 Feet

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

N

Stantec

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

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

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

Figure No.
1

Title
Vegetation Communities

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

2.0 Environmental Setting

2.1 Project Location

The Project and its associated study area are located in the San Joaquin Valley in southwestern Merced County, within the U.S. Geological Survey (USGS) Charleston School 7.5-minute topographic quadrangle (Figure 1). Poleline Road abuts the southwestern Project site boundary and U.S. Interstate 5 (I-5) runs parallel to this southwestern boundary approximately 0.2 miles to the west. The California Aqueduct runs between Poleline Road and I-5. A road known as 1st Lift Canal abuts the western boundary of the Project site and the eastern boundary abuts an unnamed dirt/gravel road. An existing solar PV facility, the Vega Solar Project, is located to the east and northeast of the substation.

2.2 Project Setting

The project is located within the San Joaquin Valley Subregion, within the Great Central Valley Region of the California Floristic Province (Jepson Flora Project 2023). The San Joaquin Valley Subregion stretches from the northern border of Contra Costa and San Joaquin counties south to where oak-pine woodlands or mixed hardwood forests begin. The western edge of this Subregion reaches to the coast ranges, and the eastern edge to the Sierra Nevada. Much of the San Joaquin Valley is agricultural, but some grasslands, vernal pools, riparian woodlands, and alkali sinks are still present. In the landscape surrounding the study area, the lands to the east of I-5 are primarily active agricultural lands, while the areas west of I-5 are undeveloped, rolling hills of grassland that are the eastern foothills of the Coast Ranges.

Within the study area, overall topography is extremely low-gradient, with elevations ranging from approximately 200 to 320 feet above mean sea level. Soil textures within the study area include those typically found in the San Joaquin Valley: clay, silty clay, and clay loam. (NRCS 2023). The contains three soil map units designated by the U.S. Department of Agriculture, Natural Resources Conservation Service; none of the soil map units meet the criteria for hydric soil (NRCS 2023).

The regional climate is typical of the Central Valley and is characterized by a Mediterranean climate with cool, wet winters and hot, dry summers. Precipitation in the region primarily occurs as rain between November and March. The study area climate typically exhibits a nine-month growing season from February 23 through November 24 (Western Regional Climate Center 2023).

2.3 Methodology

Botanical surveys were conducted in accordance with California Native Plant Society (CNPS) (2001), CDFW (2018), and United States Fish and Wildlife Service (USFWS) (1996, 2002) protocols. This report also includes a desktop review and field component as described in the sections below.

2.3.1 DESKTOP REVIEW

Prior to the field work, several resources were used to identify and classify potential vegetation communities within the study area to create a preliminary vegetation map for use during the field surveys. These resources included the Manual of California Vegetation (MCV) Online Edition (CNPS 2023), and Google Earth aerial imagery dating back to 1989.

A list of special status plant species that could occur in the study area was developed using the following databases and lists:

- California Natural Diversity Database (CNDDB) (CDFW 2023a);
- CNPS Inventory of Rare and Endangered Plants (CNPS 2023b);
- U.S. Fish and Wildlife (USFWS) database of federally protected species (USFWS 2023);
- California Department of Fish and Wildlife's (CDFW's) Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2023b); and
- CDFW's State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2023c).

The California Natural Diversity Database (CNDDB) was queried for reported occurrences of special status plants. The query includes quadrangles within the study area and those immediately adjacent: Charleston School, Delta Ranch, Dos Palos, Hammonds Ranch, Laguna Seca Ranch. Los Banos, Ortigalita Peak, Ortigalita Peak NW, and Volta, California.

The CNPS online Inventory of Rare and Endangered Plants of California was also queried for all California Rare Plant Rank 1, 2, 3, and 4 species occurring in the same nine quadrangles included in the CNDDB query. Trust Resources Reports generated from the USFWS Information, Planning, and Conservation System database were also reviewed. A total of 32 species were returned from the database queries listed above; based on the review of existing information, species habitat requirements, and habitat characteristics present in the study area, 25 of the 32 special status plant were determined to have potential to occur in the study area (Appendix A).

2.3.2 FIELD SURVEYS

The botanical resource field assessment was conducted over two survey periods in order to correlate with the blooming periods of the 32 species identified in the Desktop Review (Appendix A). The first round of surveys for the botanical resource field assessment were conducted April 24-26, 2023; the second round of surveys was conducted June 15-16, 2023. Both rounds were conducted by Stantec senior botanist, Sheryl Creer over the course of 50 person-hours. Sheryl has over 12 years of experience in California as a botanist and holds a Masters of Science in Biology and a Bachelors of Science in Botany, both from San Francisco State University.

The study area was surveyed on foot in meandering transects per CNPS (CNPS 2001) and CDFW guidelines (CDFW 2018). Each species encountered was identified to the taxonomic level necessary to determine whether the plant was listed as a special status species. Plant taxonomy follows the Jepson Flora Project (Jepson Flora Project 2023). Timing of the field surveys coincided with the blooming period(s) for potentially occurring special status plants in the study area, as outlined in Appendix A. Collectively, the April and June field visits covered the period when all 32 of the potential special status plants would be identifiable in the region and meet the CNPS and CDFW requirements of a complete floristic survey for the entire study area.

Stantec's botanist mapped vegetation communities and land cover types within the study area on September 21-22, 2021. Vegetation was classified using the Manual of California Vegetation, online edition (California Native Plant Society 2023a). Vegetation was mapped by walking transects through the study area and assessing vegetative cover within stands. The botanist visited the full extent (or representative stand) of all vegetation communities mapped during the preliminary desktop exercise. Vegetation communities were classified to the level necessary (i.e., alliance or association) to determine sensitivity, and plant species composition, stand structure, regional occurrence, and other notable characteristics were documented, where applicable. After completing the surveys, the botanist refined the preliminary desktop vegetation community map with field observations. Each vegetation community was checked for sensitivity against the California Natural Community List (CDFW 2023). All vegetation communities were mapped during the field aquatic resource delineation in September 2021, and were re-confirmed during botanical surveys in 2023.

To the extent practicable, nearby reference populations of special status plant species were visited to ensure that the Stantec botanist had an accurate search image for a species and to determine whether the species was identifiable at the time of the survey. Reference site visits were made for plant occurrences near the study area that were documented by the CNDDB (CDFW 2023a) and Calflora (Calflora 2023), and the results are included below in Section 3.1. Species identification was confirmed using the Jepson eFlora (Jepson Flora Project 2023). Reference sites were visited on April 24 and June 15, 2023.

2.3.3 REFERENCE SITES

Four special status plant species were detected at known reference sites. Dates and findings are detailed below and representative photographs are included in Appendix B.

Table 1. Reference Site Visits

Species	Status	Location Source and Occurrence Number	Date of Visit	Species Located?	General Location	Notes
Boraginaceae (Borage Family)						
Amsinckia furcata forked fiddleneck	California Rare Plant Rank (CRPR) 4.2	Calflora ID: io60423	4/24/2023	Yes	Located approximately 20 air miles southwest of the study area (SA) off of Panoche Road on BLM lands south of the Panoche Hills,	Thousands of individuals; 80% past bloom, 20% late bloom.
Chenopodiaceae (Goosefoot Family)						
Atriplex coronata var. *vallicola* Lost Hills crownscale	CRPR 1B.2	Calflora ID: mu30733	4/24/2023	Yes	Located approximately 21 air miles southwest of the SA off of off of Panoche Road at the Silver Creek crossing on BLM lands south of the Panoche Hills	Many individual plants; all in bloom.
Polemoniaceae (Phlox Family)						
Eriastrum hooveri Hoover's eriastrum	CRPR 4.2	Calflora ID: wb2161-100	6/15/2023	Yes	Located approximately 21 air miles southwest of the SA off of off of Panoche Road at the Silver Creek crossing on BLM lands south of the Panoche Hills	Hundreds of individual plants; just past bloom but still identifiable.
Polygonaceae (Buckwheat Family)						
Eriogonum vestitum Idria buckwheat	CRPR 4.3	Calflora ID: po14796	6/15/2023	Yes	Located approximately 20 air miles southwest of the SA off of Panoche Road at Tumey Hills Box Canyon on BLM lands.	Many individual plants; all in bloom.

3.0 Results

3.1 Reference Sites

3.2 Special-Status Plants

No special status plant species were detected within the study area during the April and June surveys; a complete plant list of all species observed is included in Appendix C. Overall, the study area consists mostly of non-native and invasive species; of the 54 plant species observed on-site, only 11 are native to the region. The native species were observed sporadically and in low numbers across the study area and are a remnant of the vegetation present prior to agricultural conversion. Eight of the non-native species within the study area are listed as invasive by the California Invasive Plant Council (Cal-IPC), three are ranked "high."[1] Specific populations of noxious weeds were not mapped, as the study area has widespread infestations of the observed noxious weeds. The study area consisted of agricultural fields occasionally grazed by sheep and goats for weed management purposes; this type of disturbance results in increases in noxious weed infestation and density.

3.3 Vegetation Communities and Land Cover

As described above, the study area consists of fallow agricultural fields that are now dominated by non-native and invasive species. No native or sensitive natural communities are present within the study area. Vegetation communities mapped within the study area are summarized in Table 2, described below, and shown in Figure 1. There were no changes made to the vegetation classified and mapped in 2021.

1 The California Invasive Plan Council (Cal-IPC) uses the following rankings to classify noxious weeds:
High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate – These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.
Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.
Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.

Table 2. Manual of California Vegetation Communities within the Study Area

Association	Status	Acres
Herbaceous		
Bromus diandrus – *Avena* spp. Herbaceous Semi-Natural Association Ripgut Brome and Wild Oats Annual Grassland	Non-native	631.30
Other		
Developed	N/A	18.70
	Total	**650.00**

3.3.1 HERBACEOUS

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

This non-native association occurs within all areas of the study area, except for those that are developed (e.g., roads, channelized ditches). From 2012 to 2018, dryland plants were planted on the Project site as a weed-control measure, but these plants were not irrigated. The land laid fallow for 3 years between 2018 and 2020. Grazing sheep and goats have been used on the Project site periodically since 2021 as a weed-control measure. The Project site is undeveloped and consists largely of patches of common wheat (not grown for harvest), along with other non-native grass species that are dominant with greater than 30% relative cover. Dominant grass species observed include *Avena* spp. (wild oats), *Bromus diandrus* (ripgut brome), and *Hordeum murinum* (foxtail barley). Forbs were also present and include senesced *Amsinckia* spp. (fiddleneck) as well as non-native species such as *Lepidium latifolium* (perennial pepperweed), *Salsola tragus* (Russian thistle), and *Lactuca serriola* (prickly lettuce). Scattered individual shrubs of *Tamarix ramosissima* (tamarisk) and scattered patches of Russian thistle were also observed.

3.3.2 OTHER

Developed

Developed areas in the study area include unvegetated areas, such as unpaved roads, paved roads, channelized ditches, and sections of riprap.

4.0 Conclusion

No special status plant species or native or sensitive natural communities were detected within the study area during the 2023 floristic surveys. One non-native vegetation community (and developed areas) was mapped; and noxious weeds are present and ubiquitous throughout the study area. Overall, the study area is highly disturbed as it historically was used in cultivation and currently the fallow fields are subject to ongoing weed management and associated disturbances in the form of sheep and goat grazing.

5.0 References

Calflora: Information on California plants for education, research and conservation. [web application]. 2023. Berkeley, California: The Calflora Database [a non-profit organization]. Available: https://www.calflora.org/. Accessed: March 2023.

California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Sacramento, California.

——. 2023. California Sensitive Natural Communities List. Last Updated June 1, 2023. Accessed June 2023.

——. 2023a. California natural diversity database - RareFind 5 for commercial subscribers. Available: https://nrm.dfg.ca.gov/cnddb. Accessed February 2023.

——. 2023b. Special Vascular Plants, Bryophytes, and Lichens List. Accessed March 2023.

——. 2023c. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Accessed March 2023.

California Native Plant Society. 2001. CNPS Botanical Survey Guidelines. California Native Plant Society, Sacramento, California.

——. 2023a. A Manual of California Vegetation, Online Edition. Available: http://vegetation.cnps.org. Accessed March 2023.

California Native Plant Society Rare Plant Program. 2023b. Inventory of Rare and Endangered Plants of California (online edition). Available: http://www.rareplants.cnps.org. Accessed January 2023).

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

Natural Resources Conservation Service (NRCS). 2023. United State Department of Agriculture. STATSGO 2 Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/. Accessed June 2023.

U.S. Fish and Wildlife Service (USFWS). 1996. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. Available: https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/Listed_plant_survey_guidelines.pdf. Accessed January 2023.

——. 2002. General Rare Plant Survey Guidelines. Available: https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/rare_plant_protocol.pdf. Accessed January 2023.

——. 2023. Environmental Conservation Online System, Information for Planning and Consultation Available: https://ecos.fws.gov/ipac/. Accessed January 2023.

Western Regional Climate Center. 2023. Los Banos Weather Station period of record climate summary, period of record: 1906 to 2022. Available: http://agacis.rcc-acis.org/?fips=06047. Accessed June 2023.

APPENDIX A

Special Status Plant Species with Potential to Occur in the Study Area

Table A1. Special Status Plan Species with Potential to Occur in the Study Area and Survey Results

Scientific Name Common Name	Status1 (Federal State CRPR)	Lifeform	General Habitat Requirements	Potential to Occur within the Study Area	Survey Results
Alismataceae (Water Plantain Family)					
Sagittaria sanfordii Sanford's arrowhead	— — 1B.2	perennial rhizomatous herb (emergent)	Marshes and swamps. Blooms: May-Oct (Nov) Elevation: 0 to 2135 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Alliaceae (Onion Family)					
Allium howellii var. howellii Howell's onion	— — 4.3	perennial bulbiferous herb	Valley and foothill grassland. Sometimes on clay or serpentinite soils. Blooms: Mar-Apr Elevation: 165 to 7220 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Apiaceae (Carrot Family)					
Eryngium spinosepalum spiny-sepaled button-celery	— — 1B.2	annual/perennial herb	Valley and foothill grassland, vernal pools. Blooms: Apr-Jun Elevation: 260 to 3200 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Asteraceae (Sunflower Family)					
Centromadia parryi ssp. *rudis* Parry's rough tarplant	— — 4.2	annual herb	Alkaline soils in seeps, vernally mesic valley and foothill grassland, vernal pools. Sometimes found on roadsides, Blooms: May-Oct Elevation: 0 to 330 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Hesperevax caulescens hogwallow starfish	— — 4.2	annual herb	Valley and foothill grassland, vernal pools; sometimes in alkaline soils. Blooms: Mar-Jun Elevation: 0 to 1655 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.

Scientific Name Common Name	Status1 (Federal State CRPR)	Lifeform	General Habitat Requirements	Potential to Occur within the Study Area	Survey Results
Lasthenia chrysantha alkali-sink goldfields	— — 1B.1	annual herb	Alkaline vernal pools. Blooms: Feb-Apr Elevation: 0 to 655 feet	**No potential.** There are no occurrences of this species within 5 miles of the study area, and there is no suitable habitat within the study area.	Not detected.
Lasthenia ferrisiae Ferris' goldfields	— — 4.2	annual herb	Vernal pools. Blooms: Feb-May Elevation: 65 to 2295 feet	**No potential.** There is one occurrence of this species within 5 miles of the study area, but there is no suitable habitat within the study area.	Not detected.
Layia munzii Munz's tidy-tips	— — 1B.2	annual herb	Chenopod scrub, valley and foothill grassland. Blooms: Mar-Apr Elevation: 490 to 2295 feet	**Moderate potential.** There is one occurrence of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields. However, this species was not detected during floristic surveys and is not present within the study area.	Not detected.
Madia radiata showy golden madia	— — 1B.1	Annual herb	Cismontane woodland; valley and foothill grassland. Blooms: Mar-May Elevation:80 to 3985 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Senecio aphanactis chaparral ragwort	— — 2B.2	annual herb	Chaparral, Cismontane woodland, coastal scrub. Blooms: Jan-Apr(May) Elevation: 50 to 2625 feet	**No potential.** There are no occurrences of this species within 5 miles of the study area, and there is no suitable habitat within the study area.	Not detected.
Trichocoronis wrightii var. wrightii Wright's trichocoronis	— — 2B.1	annual herb	Marshes and swamps, meadows and seeps, riparian forest, vernal pools. Blooms: May-Sep Elevation: 15 to 1425 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Boraginaceae (Borage Family)					
Amsinckia furcata forked fiddleneck	— — 4.2	annual herb	Cismontane woodland, valley and foothill grassland. Blooms: Feb-May Elevation: 165 to 3280 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.

Scientific Name Common Name	Status1 (Federal State CRPR)	Lifeform	General Habitat Requirements	Potential to Occur within the Study Area	Survey Results
Cryptantha rattanii Rattan's cryptantha	— — 4.3	annual herb	Cismontane woodland, riparian woodland, valley and foothill grassland. Blooms: Apr-Jul Elevation: 805 to 3000 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Brassicaceae (Mustard Family)					
Caulanthus lemmonii Lemmon's jewelflower	— — 1B.2	annual herb	Pinyon and juniper woodland, valley and foothill grassland. Blooms: Feb-May Elevation: 260 to 5185 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Lepidium jaredii ssp. *album* Panoche pepper-grass	— — 1B.2	annual herb	Valley and foothill grassland. Blooms: Feb-Jun Elevation: 605 to 2445 feet	**Moderate potential.** There is one occurrence of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields. However, this species was not detected during floristic surveys and is not present within the study area.	Not detected.
Streptanthus insignis ssp. lyonii Arburua Ranch jewelflower	— — 1B.2	annual herb	Coastal scrub. Blooms: Mar-May Elevation: 755 to 2805 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Chenopodiaceae (Goosefoot Family)					
Atriplex cordulata var. cordulata heartscale	— — 1B.2	annual herb	Chenopod scrub, meadows and seeps, valley and foothill grassland; sometimes in alkaline soil. Blooms: Apr-Oct Elevation: 0 to 1835 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.

Scientific Name Common Name	Status1 (Federal State CRPR)	Lifeform	General Habitat Requirements	Potential to Occur within the Study Area	Survey Results
Atriplex coronata var. coronata crownscale	— — 4.2	annual herb	Chenopod scrub, valley and foothill grassland, vernal pools; sometimes clay and often alkaline soil. Blooms: Mar-Oct Elevation: 5 to 1935 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Atriplex coronata var. vallicola Lost Hills crownscale	— — 1B.2	annual herb	Alkaline soil in chenopod scrub, valley and foothill grassland, vernal pools. Blooms: Apr-Sep Elevation: 165 to 2085 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Atriplex minuscula lesser saltscale	— — 1B.1	annual herb	Alkaline, sandy soils in chenopod scrub, playas, valley and foothill grassland. Blooms: May-Oct Elevation: 50 to 655 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Eriophorum gracile slender cottongrass	— — 4.3	perennial rhizomatous herb (emergent)	Acidic soil in bogs and fens, meadows and seeps, upper montane coniferous forest. Blooms: May-Sep Elevation: 4200 to 9515 feet	**No potential.** There are no occurrences of this species within 5 miles of the study area, and there is no suitable habitat within the study area.	Not detected.
Lamiaceae (Mint Family)					
Acanthomintha lanceolata Santa Clara thorn-mint	— — 4.2	annual herb	Rocky chaparral, cismontane woodland, coastal scrub. Blooms: Mar-Jun Elevation: 260 to 3935 feet	**No potential.** There are no occurrences of this species within 5 miles of the study area, and there is no suitable habitat within the study area.	Not detected.
Onagraceae (Evening-Primrose Family)					
Clarkia breweri Brewer's clarkia	— — 4.2	annual herb	Chaparral, cismontane woodland, coastal scrub; often in serpentinite. Blooms: Apr-Jun Elevation: 705 to 3660 feet	**No potential.** There are no occurrences of this species within 5 miles of the study area, and there is no suitable habitat within the study area.	Not detected.
Orobanchaceae (Broomrape Family)					

Scientific Name Common Name	Status1 (Federal State CRPR)	Lifeform	General Habitat Requirements	Potential to Occur within the Study Area	Survey Results
Chloropyron molle ssp. *hispidum* hispid salty bird's-beak	— — 1B.1	annual herb (hemiparasitic)	Alkaline meadows and seeps, playas, valley and foothill grassland. Blooms: Jun-Sep Elevation: 5 to 510 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Poaceae (Grass Family)					
Puccinellia simplex California alkali grass	— — 1B.2	annual herb	Chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools. Blooms: Mar-May Elevation: 5 to 3050 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Polemoniaceae (Phlox Family)					
Eriastrum hooveri Hoover's eriastrum	FD — 4.2	annual herb	Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland; sometimes in gravelly soil. Blooms: Mar-Jul Elevation: 165 to 3000 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Leptosiphon ambiguus serpentine leptosiphon	— — 4.2	annual herb	Cismontane woodland, coastal scrub, valley and foothill grassland; usually in serpentine soil. Blooms: Mar-Jun Elevation: 395 to 3710 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Navarretia prostrata prostrate vernal pool navarretia	— — 1B.2	annual herb	Coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools. Blooms: Apr-Jul Elevation: 10 to 3970 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Polygonaceae (Buckwheat Family)					

Scientific Name Common Name	Status1 (Federal State CRPR)	Lifeform	General Habitat Requirements	Potential to Occur within the Study Area	Survey Results
Eriogonum nudum var. *indictum* protruding buckwheat	— — 4.2	perennial herb	Clay or serpentinite soil in chaparral, chenopod scrub, cismontane woodland. Blooms: (Apr) May-Oct (Dec) Elevation: 490 to 4800 feet	**No potential.** There are no occurrences of this species within 5 miles of the study area, and there is no suitable habitat within the study area.	Not detected.
Eriogonum vestitum Idria buckwheat	— — 4.3	annual herb	Valley and foothill grassland. Blooms: Apr-Aug Elevation: 770 to 2955 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Primulaceae (Primrose Family)					
Androsace elongata ssp. *acuta* California androsace	— — 4.2	annual herb	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley and foothill grassland. Blooms: Mar-Jun Elevation: 490 to 4280 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.
Ranunculaceae (Buttercup Family)					
Delphinium recurvatum recurved larkspur	— — 1B.2	perennial herb	Alkaline soil in chenopod scrub, cismontane woodland, valley and foothill grassland. Blooms: Mar-Jun Elevation: 10 to 2590 feet	**Low potential.** There are no occurrences of this species within 5 miles of the study area, and marginal habitat is present in the study area in the non-native grassland in the fallow agricultural fields.	Not detected.

[1]Status Codes:
Federal Delisted (FD)
CRPR (California Rare Plant Rank) Codes and Extensions:
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 more common elsewhere.
2B Plants rare, threatened, or endangered in California, but more common elsewhere.
3 Review list: Plants about which more information is needed
4 Watch List: Plants of limited distribution
xx.3 Not very endangered in California
xx.2 Fairly endangered in California
xx.1 Seriously endangered in California.

APPENDIX B

Representative Photographs

Photo 1. *Amsinckia furcata* (forked fiddleneck) on 4/24/2023 at a reference site in the Tumey Hills (Calflora ID: io60423).

Photo 2. *Atriplex coronata* var. *vallicola* (Lost Hills crownscale) on 4/24/2023 at a reference site in the Tumey (Calflora ID: mu30733).

Photo 3. *Eriastrum hooveri* (Hoover's eriastrum) on 6/15/2023 at a reference site in Tumey Hills Box Canyon (Calflora ID: wb2161-100).

Photo 4. *Eriogonum vestitum* (Idria buckwheat) on 6/15/2023 at a reference site in Tumey Hills Box Canyon (Calflora ID: po14796).

Photo 5. Typical vegetation within the study area: non-native and invasive grasses and forbs.

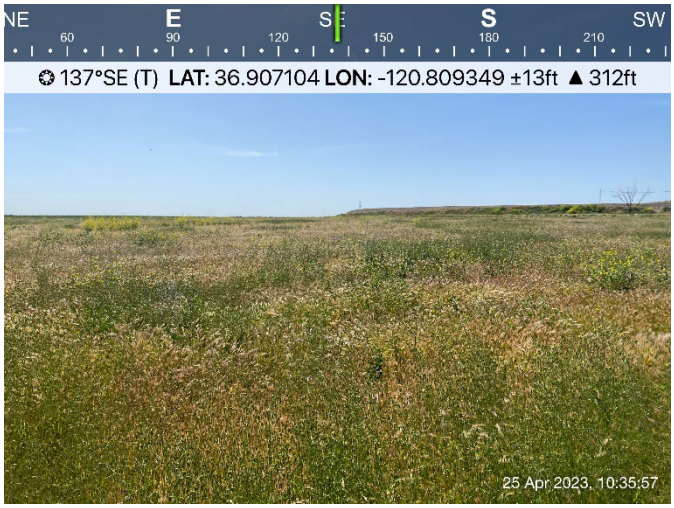


Photo 6. Typical vegetation within the study area: non-native and invasive grasses and forbs.

Photo 7. A small patch of *Helianthus anuus* (hairy leaved sunflower), a native forb within the study area.

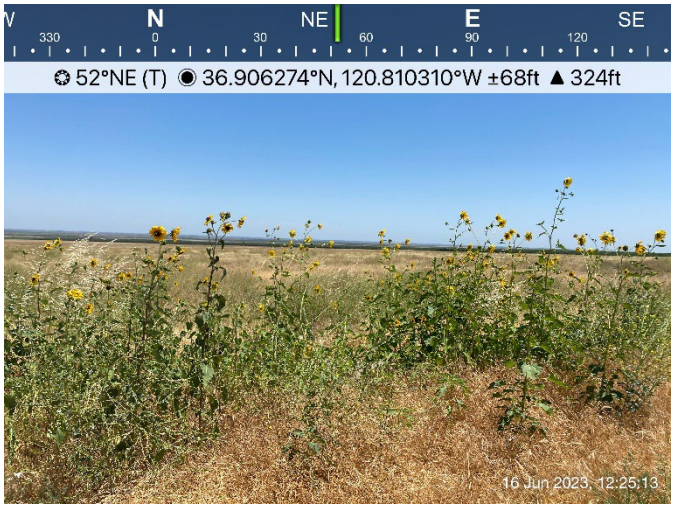


Photo 8. Typical vegetation within the study area: non-native and invasive grasses and forbs.

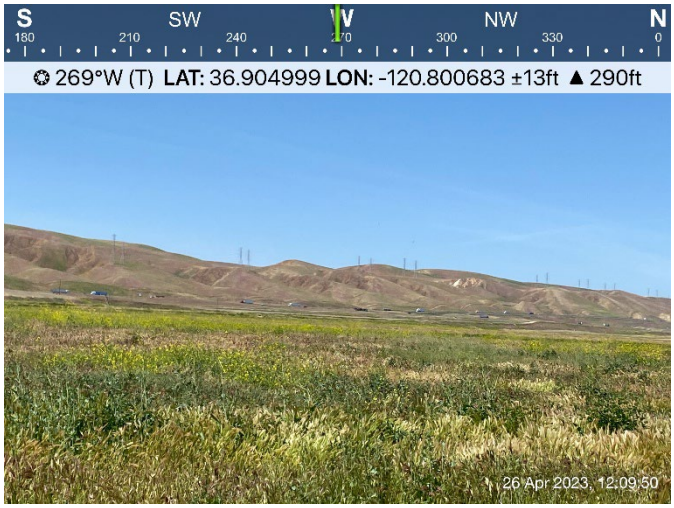


Photo 9. *Amaranthus albus* (tumbleweed), an invasive species growing out of an abandoned channelized ditch.

APPENDIX C

Plant Species Observed Within the Study Area

Table C1. Plant Species Observed Within the Study Area

Scientific Name	Common Name	Habit	Status
Amaranthaceae (Amaranth Family)			
Amaranthus albus	tumbleweed	annual herb	non-native
Apocynaceae (Milkweed Family)			
Asclepias fascicularis	milkweed	perennial herb	native
Asteraceae (Sunflower Family)			
Carduus tenuiflorus	slender flowered thistle	annual herb	invasive (Cal-IPC L)
Centaurea solstitialis	yellow starthistle	annual herb	invasive (Cal-IPC H)
Erigeron bonariensis	flax-leaved horseweed	annual herb	non-native
Erigeron sumatrensis	tropical horseweed	annual herb	non-native
Grindelia camporum	gumweed	perennial herb	native
Helianthus annuus	hairy leaved sunflower	annual herb	native
Helminthotheca echioides	bristly ox-tongue	annual, perennial herb	invasive (Cal-IPC L)
Lactuca serriola	prickly lettuce	annual herb	non-native
Senecio vulgaris	common groundsel	annual herb	non-native
Silybum marianum	milk thistle	annual, perennial herb	invasive (Cal-IPC L)
Sonchus asper	spiny sowthistle	annual Herb	non-native
Boraginaceae (borage family)			
Amsinckia intermedia	common fiddleneck	annual herb	native
Amsinckia retrorsa	rigid fiddleneck	annual herb	native
Amsinckia tessellata	devil's lettuce	annual herb	native
Brassicaceae (Cruciferae) (Mustard Family)			
Brassica nigra	black mustard	annual herb	non-native (invasive)
Capsella bursa-pastoris	shepherd's purse	annual herb	non-native
Hirschfeldia incana	mustard	perennial herb	invasive (Cal-IPC M)
Lepidium latifolium	perennial pepperweed	perennial herb	invasive (Cal-IPC H)
Lepidium nitidum	shining pepper grass	annual herb	native
Sisymbrium irio	London rocket	annual herb	invasive (Cal-IPC M)

Scientific Name	Common Name	Habit	Status
Chenopodiaceae (Goosefoot Family)			
Chenopodium album	lambs quarters	annual herb	non-native
Chenopodium murale	nettle leaf goosefoot	annual herb	non-native
Salsola tragus	Russian thistle	annual herb	invasive (Cal-IPC L)
Convolvulaceae (Morning-Glory Family)			
Convolvulus Arvensis	field bindweed	perennial herb, vine	non-native
Euphorbiaceae (Spurge Family)			
Croton setiger	turkey-mullein	annual herb	native
Euphorbia maculata	spotted spurge	annual herb	non-native
Fabaceae (Legume Family)			
Medicago sativa	alfalfa	perennial herb	non-native
Melilotus indicus	annual yellow sweetclover	annual herb	non-native
Geraniaceae (Geranium Family)			
Erodium moschatum	whitestem filaree	annual herb	non-native
Malvaceae (Mallow Family)			
Eremalche parryi ssp. *parryi*	Parry's mallow	annual herb	native
Malva neglecta	dwarf mallow	annual, perennial herb	non-native
Malva parviflora	cheeseweed	annual herb	non-native
Poaceae (Gramineae) (Grass Family)			
Avena barbata	slim oat	annual grass	invasive (Cal-IPC M)
Avena fatua	wildoats	annual grass	invasive (Cal-IPC M)
Bromus diandrus	ripgut brome	annual grass	invasive (Cal-IPC M)
Bromus hordeaceus	soft chess	annual grass	invasive (Cal-IPC L)
Bromus madritensis	foxtail chess, foxtail brome	annual grass	non-native
Echinochloa crus-galli	barnyard grass	annual grass	non-native
Elymus ponticus	tall wheat grass	perennial grass	non-native
Hordeum marinum	seaside barley	annual grass	non-native
Hordeum marinum ssp. *gussoneanum*	barley	annual grass	non-native
Hordeum murinum ssp. *leporinum*	farmer's foxtail	annual grass	non-native

Scientific Name	Common Name	Habit	Status
Hordeum vulgare	common barley	annual grass	non-native
Phalaris aquatica	harding grass	perennial grass	invasive (Cal-IPC M)
Triticum aestivum	common wheat	annual grass	non-native
Solanaceae (Nightshade Family)			
Solanum elaeagnifolium	horse nettle	perennial herb	non-native
Tamaricaceae (Tamarisk Family)			
Tamarix ramosissima	tamarisk	-	non-native (invasive)
Urticaceae (Nettle Family)			
Urtica urens	annual stinging nettle	annual herb	non-native
Zygophyllaceae (Caltrop Family)			
Tribulus terrestris	puncture vine	annual herb	invasive (Cal-IPC L)