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TN #:	268172-1
Document Title:	Appendix Y Biological Resources Technical Study_VDPC_Part 1 of 3
Description:	Includes a Biological Resources Technical Study which analyzes the potential impacts of the Project and evaluates short and long term impacts of the Project to biological resources. Y.A Regulatory Framework; Y.B Species Compendia; Y.C Representative Site Photographs; Y.D Burrowing Owl Survey Report; Y.E Dry Season Large Branchiopod Protocol Sampling Results (2024); Y.F Wet Season Large Branchiopod Protocol Sampling Results; Y.G Large Branchiopod Habitat Assessment Report; Y.H Dry Season Large Branchiopod Protocol Sampling Results (2025); Y.I Crotch's Bumble Bee Survey Report; Y.J Aquatic Resources Delineation Report; Y.K Special-Status Species Evaluation Table; Y.L California Natural Diversity Database (CNDDB) Figure (scale1:6,000) (Confidential - submitted separately); Y.M United States Fish and Wildlife Service Meeting Minutes
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Appendix Y, Part 1

Biological Resources Technical Study

Vaca Dixon Power Center Project

Biological Resources Technical Study

prepared for

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RINCON CONSULTANTS

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Executive Summary

This document provides the findings of a Biological Resources Technical Study (BRTS) prepared by Rincon Consultants, Inc. (Rincon) for the proposed Vaca Dixon Power Center Project (Project). This proposed Project consists of the development of a battery energy storage system (BESS) with associated infrastructure in the City of Vacaville in Solano County, California and associated transmission intertie (gen-tie) lines in unincorporated Solano County. This BRTS documents the biological resources that occur or have the potential to occur, based on results of field visits and a desktop review, and provides an assessment of impacts to those resources as a result of proposed Project activities. This BRTS also includes recommended avoidance and minimization measures to further ensure the protection of sensitive resources occurring in the Project area. The combined Project area and 250-foot survey buffer was the focus of this BRTS and herein referred to as the Biological Study Area (BSA). This BRTS is prepared with the intent of serving as the basis for suitable analysis of the potential impacts to biological resources pursuant to the California Environmental Quality Act (CEQA) environmental review process.

Currently, the southern BSA (south of I-80) consists primarily of an active plum orchard, surrounded by ruderal and barren areas, developed areas, a fresh emergent wetland, and non-native annual grassland. The northern BSA (north of I-80) consists of non-native annual grasslands, landscaped and developed areas, patches of perennial rye grass fields (*Lolium perenne* [*Festuca perennis*] Herbaceous Semi-Natural Alliance), and open water. No sensitive natural communities, significant wildlife movement corridors, or federally-designated critical habitat occurs within the southern or northern portions of the overall BSA.

Based on the existing site conditions and evaluation of desktop resources, Rincon determined that the BSA may contain marginal suitable habitat to support two special-status plant species, Baker's navarretia *(Navarretia leucocephala* ssp. *bakeri*) and bearded popcornflower (*Plagiobothrys hystriculus*). These species were not detected during field surveys. Both special-status plant species were determined to have a low potential to occur within the BSA due to anthropogenic disturbance and a lack of native vegetation in the BSA. One special-status plant species is known to occur within one mile of the BSA, Baker's navarretia. Due to the routine mowing that occurs in the site for fuel reduction around the adjacent PG&E Vaca-Dixon Substation, along I-80, within the existing transmission lines, and agricultural areas, no impacts to special-status plant species are expected.

Rincon determined that the BSA may provide suitable habitat for eight special-status wildlife species, including Crotch's bumble bee (*Bombus crotchii*), vernal pool fairy shrimp (*Branchinecta lynchi*), monarch butterfly (*Danaus plexippus*), tricolored blackbird (*Agelaius tricolor*), Swainson's hawk (*Buteo swainsoni*), burrowing owl (*Athene cunicularа*), northern harrier (*Circus hudsonius*), and white-tailed kite (*Elanus leucurus*). Protocol-level surveys were completed for Crotch's bumble bee, vernal pool fairy shrimp, and burrowing owl. No Crotch's bumble bee, vernal pool fairy shrimp, or burrowing owl have been detected within the BSA during these surveys. However, there remains a low potential for occurrence of Crotch's bumble bee and burrowing owl in the northern BSA which was not included in the protocol survey area due to site restrictions. Large branchiopods were not detected during wet-season dip-net sampling in pools occurring in the northern BSA. Soil samples were collected as part of dry-season large branchiopod sampling in the northern and southern BSA. Survey results were inconclusive for soils collected in the northern BSA due to the inability to identify cysts to species level; however, unidentified cysts were detected. No cysts were identified in soil samples collected from the southern BSA. Therefore, it was determined that there remains a high potential for the

species to occur within the seasonal wetland habitats in the northern BSA. Special-status species that may occur on-site could experience direct, and/or indirect impacts as a result of Project construction, operation, and/or decommissioning. These impacts would be reduced with the incorporation of recommended avoidance and minimization measures discussed herein.

A variety of common bird species may also nest within the BSA. Nesting birds are provided protection by the California Fish and Game Code (CFGC) and/or Federal Migratory Bird Treaty Act (MBTA). Nesting birds that may occur on-site could experience direct, and/or indirect impacts as a result of Project construction, operation, and/or decommissioning. These impacts would be reduced with the incorporation of recommended avoidance and minimization measures discussed herein.

Several aquatic resources were documented within the BSA, including nine seasonal wetlands, one swale feature, three agricultural ditches, and one man-made pond. These aquatic features may be subject to United States Army Corps of Engineering (USACE), Central Valley Regional Water Quality Control Board (RWQCB), and/or California Department of Fish and Wildlife (CDFW) jurisdictions. Impacts to jurisdictional aquatic resources, as a result of the Project, would be reduced with the incorporation of recommended avoidance and minimization measures, discussed herein.

1 Introduction

Rincon Consultants, Inc. (Rincon) prepared this Biological Resources Technical Study (BRTS) to document existing conditions and assess potential impacts to sensitive biological resources within the Biological Study Area (BSA), defined as the Project area and a 250-foot survey buffer. This report also provides recommendations to avoid and/or reduce impacts to biological resources. This BRTS is prepared with the intent of serving as the basis for suitable analysis of the potential impacts to biological resources pursuant to the California Environmental Quality Act (CEQA) environmental review process.

1.1 Project Location

The proposed Vaca Dixon Power Center Project (Project) is made up of two major components: the battery energy storage system (BESS) facilities and transmission intertie (gen-tie) lines. The BESS facilities are proposed to be installed on an approximately 10-acre site in the City of Vacaville in Solano County, California. The proposed BESS facilities would be located on Assessor's Parcel Number (APN) 0133-060-060. The Project's gen-tie lines cross Interstate 80 (I-80) to the north to connect the BESS facilities to the existing Pacific Gas & Electric (PG&E) Vaca-Dixon Substation located on a PG&E-owned parcel (APN 0133-060-070) in unincorporated Solano County. The Project site is defined as the BESS and gen-tie Project components. Please refer to Figure 1 for the Project location in a regional setting and Figure 2 for an illustration of the BSA and proposed Project components.

Land uses surrounding the Project area include agricultural land surrounding the BESS facilities; existing PG&E facilities associated with the PG&E Vaca-Dixon Substation to the north beyond I-80; and undeveloped land and backyards of residential areas to the west and southwest.

1.2 Project Description

Vaca Dixon BESS LLC and Arges BESS LLC (Applicants), propose to construct, operate, and eventually repower or decommission the Project. The Project would operate 7 days a week, 365 days a year, with an up to 35-year anticipated lifespan. The primary Project facility components at the approximately 10-acre combined BESS portion of the Project area include:

- Vaca Dixon BESS (57 megawatts [MW], 1-hour duration, 57 MW hour [MWh]), including electrical switchyard
- Arges BESS (100 MW, 4-hour duration, 400 MWh), including electrical substation

Both BESS components would interconnect to the existing PG&E Vaca-Dixon Substation at 115 kilovolts (kV). The Vaca Dixon BESS is proposed to connect to the existing 13.8/115 kV generation step up (GSU) transformer at the existing CalPeak Power - Vaca Dixon Peaker Plant (VDPP) on the PG&E parcel via a new overhead 13.8 kV line from the proposed BESS switchyard to the low side of the VDPP GSU transformer to the north. The existing GSU transformer in the VDPP switchyard is connected to the PG&E substation by an existing 115 kV line. The Arges BESS would interconnect to the PG&E substation via a new overhead 115 kV gen-tie to be constructed from the Arges BESS switchyard at the BESS Project area south of I-80 to the PG&E substation to the north.

The proposed gen-tie components for the Vaca Dixon 57 MWh and Arges BESS 400 MWh BESS facilities would be co-located on shared transmission structures carrying both 13.8 kV and 115 kV conductors for approximately 1,500 feet of the gen-tie lengths, from the vicinity of the BESS switchyards across I-80 and up to the northwest corner of the VDPP facility site. As shown in (Figure 2), from that point, the 13.8 kV gen-tie component for the Vaca Dixon 57 BESS would continue approximately 150 feet to the east for connection to the low side of the 13.8/115 kV GSU transformer at the VDPP. The Arges BESS 400 MWh 115 kV gen-tie route continues approximately 725 feet north and east to the connection point at the PG&E Vaca-Dixon Substation. The final gen-tie crossing of I-80 crossing would require an encroachment permit from the California Department of Transportation (Caltrans).

Each phase of the Project would have an operational life of 35 years. The Phase 1 Vaca Dixon 57 MWh BESS component is assumed to be operational from 2028 to 2062, and the Phase 2 Arges 400 MWh BESS component would be operational from 2029 to 2063. Following decommissioning, the Project area would be restored and reclaimed to the maximum extent practicable to pre-construction conditions consistent with site lease agreements.

Main access to the BESS portion of the Project area would be provided from Kilkenny Road. The gen-tie routes on the PG&E parcel to the north would be accessed primarily from the existing VDPP access road located along the southwestern portion of the PG&E parcel/gen-tie portion of the Project area. The existing VDPP access road connects to Quinn Road on the southern end. Internal asphalt access roads approximately 20 feet wide would be constructed to provide vehicular access within the BESS facilities south of I-80.

The Project does not require the use of fossil fuel generators during operation; therefore, nitrogen deposition rates were not evaluated or further discussed in this BRTS.

This BRTS assesses the biological resources within the approximate 55-acre BSA, inclusive of the Project area, plus a 250-foot buffer. Within this BRTS, the BSA is differentiated between the northern BSA and southern BSA. The northern BSA includes the Project area (gen-tie corridors) and survey buffer occurring north of I-80; and the southern BSA includes the Project area (BESS sites) and survey buffer occurring south of I-80. Please refer to Figure 3 for an illustration of the BSA.

1.3 Regulatory Summary

Regulated or sensitive resources studied and analyzed herein include special-status plant and wildlife species, nesting birds and raptors, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement, regionally protected resources, and locally protected resources, such as protected trees. Regulatory authority over biological resources is shared by federal, state, and local authorities.

1.3.1 Assembly Bill 205

The California Energy Commission (CEC) has been authorized under Government Code amendments enacted through Assembly Bill (AB) 205 (Chapter 61, 2022) to establish a new certification program for eligible non-fossil-fueled power plants and related facilities to optionally seek certification from the CEC, using emergency rulemaking authority provided by AB 205. Pursuant to the Notice of Approval of Emergency Regulatory Action for Opt-in Regulations Section 1877, Opt-In applications are required to include all the information specified by California Code of Regulations Title 20 Division 2 Section 1704(a) Appendix B that is relevant to the Project. More detailed regulatory information on the AB 205 Opt-in Certification Process can be found in Appendix A.

Figure 1 Regional Location

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Fig X Regional Location Landscape

Figure 2 Project Area and Project Components

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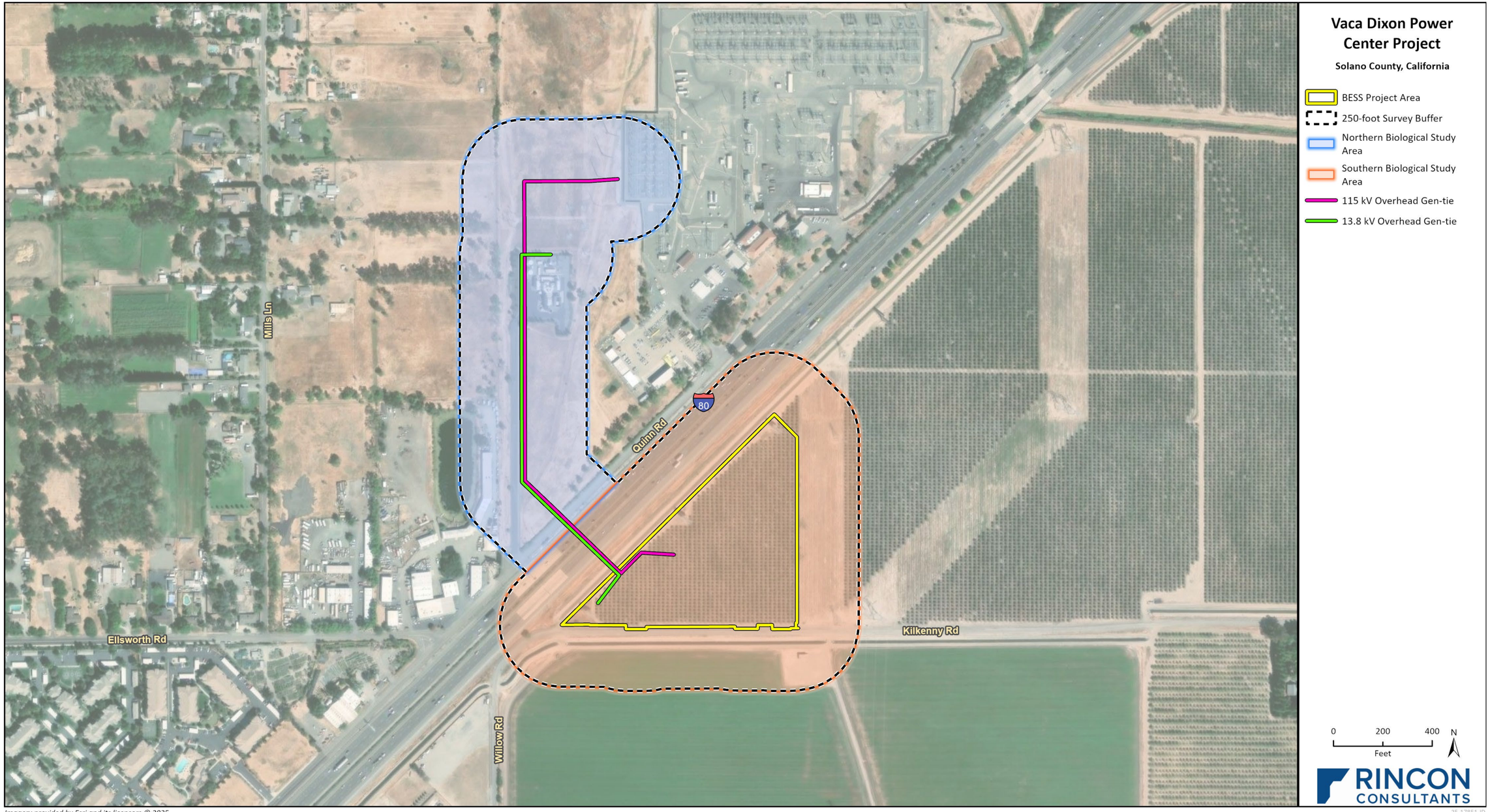
Fig X Project Site and Components_Label_Landscape

Figure 3 Biological Study Area



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25-17851 JD
Fig X Project Site - BSA

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1.3.2 Definition of Sensitive Biological Resources

For the purposes of this report, sensitive biological resources, including special-status species, are those that meet the criteria defined by CEC in Appendix B, requirement 13(A) inclusive of:

- Species listed under the California Endangered Species Act (CESA) or federal Endangered Species Act (ESA)
- Species receiving consideration during environmental review under the *California Environmental Quality Act* (CEQA) *Guidelines* (14 California Code of Regulations Section 15380)
- Species identified as state Fully Protected
- Species covered by the Migratory Bird Treaty Act
- Species and habitats identified by local, state, and federal agencies as needing protection, including, but not limited to, those identified by the CDFW
- Locally significant species that are rare or uncommon in a local context, such as county or region or if so, designated in local or regional plans, policies, or ordinances
- Plant species listed as rare under the California Native Plant Protection Act
- Established native resident or migratory wildlife corridors or wildlife nursery sites

1.3.3 Environmental Statutes

For the purposes of this report, the evaluation of potential impacts to biological resources was guided by the following statutes, as applicable (Appendix A):

- California Environmental Quality Act
- ESA
- CESA
- Federal Clean Water Act
- California Fish and Game Code
- Migratory Bird Treaty Act
- The Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act

1.3.4 Guidelines for Determining CEQA Significance

The following threshold criteria, as defined by the CEQA Environmental Checklist (Appendix G of the *CEQA Guidelines*), were used to evaluate potential impacts to biological resources. Based on these criteria, the Project would have a significant impact on biological resources if it would:

a) *Have 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 Wildlife or U.S. Fish and Wildlife Service.*

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.*

c) 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.

d) 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.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

2 Methodology

Pursuant to CEC guidance, biological resources within the BSA (Figure 3) and a 10-mile radius around the BSA were evaluated. The methodologies for evaluating biological resources within this BRTS included a literature and database review and field surveys, further discussed below.

2.1 Literature and Database Review

Rincon conducted an extensive literature and database review to characterize the nature and extent of biological resources and assist in determining potential for special-status species to occur within the BSA.

Database queries were completed to obtain comprehensive information regarding state and federally listed and candidate species, and other special-status species, considered to have potential to occur within 10 miles of the BSA. Queries included the *Allendale*, *California* United States Geological Survey (USGS) 7.5-minute quadrangle and surrounding eight quadrangles (*Elmira, Fairfield North, Mt. Vaca, Dozier, Monticello Dam, Merritt, Winters,* and *Dixon, California*). The following databases were reviewed:

- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA NRCS 2019)
- CDFW California Natural Diversity Database (CNDDB; CDFW 2025c)
- CDFW Biogeographic Information and Observation System (CDFW 2025d)
- United States Fish and Wildlife Service (USFWS) Critical Habitat Mapper (USFWS 2025a)
- USFWS National Wetlands Inventory (NWI) (USFWS 2025b)
- USFWS Information for Planning and Consultation (iPac) USFWS 2025c)
- USGS National Hydrography Dataset (NHD) (USGS 2025)
- California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants of California (CNPS 2025a)
- eBird: An online database of bird distribution and abundance (eBird 2025)
- iNaturalist: An online database of plant and animal species occurrences (iNaturalist 2025)
- Jepson eFlora: An online database of native and naturalized vascular plants of California (Jepson eFlora 2025)

The literature review also included an evaluation of current and historical aerial imagery of the BSA (Google Earth 2024), regional and site-specific topographic maps, and climatic data.

The vegetation community characterizations for this analysis were based on the classification systems presented in *A Manual of California Vegetation, Second Edition* (MCV2; Sawyer et al. 2009) and *A Manual of California Vegetation Online* (CNPS 2025b). Plant species nomenclature and taxonomy follow the treatments within the second edition of *The Jepson Manual* (Baldwin et al. 2012).

The potential for wildlife movement corridors was evaluated based on the *California Essential Habitat Connectivity Project* commissioned by the California Department of Transportation and CDFW (Spencer et al. 2010), and by evaluating the presence of other site-specific natural corridors typically used by wildlife.

2.2 Field Surveys

Field surveys conducted to support this BRTS included reconnaissance surveys, a rare plant survey, a Swainson's hawk presence evaluation, burrowing owl (*Athene cunicularia*) surveys, large branchiopod surveys, Crotch's bumble bee (*Bombus crotchii*) surveys, and aquatic resources delineation surveys. A summary of field survey dates, personnel, and survey area locations are provided in Table 1 below. Field surveys incorporated varying survey areas within the BSA due to access restrictions and changes in the Project footprint and location. These survey areas are illustrated on Figure 4.

Table 1 Summary of Field Survey Efforts

Survey Type	Date	Survey Area	Personnel	Qualifications
Swainson's Hawk Presence Evaluation	04/21/23	Northern BSA and 0.25-mile buffer	K. Asmus	MS, Biologist, 23 years of experience
			C. Rice	BS, Biologist, 7 years of experience
Field Reconnaissance Survey	04/24/23 04/25/23 05/14/24 05/17/24	Northern BSA	K. Asmus	MS, Biologist, 23 years of experience
			C. Rice	BS, Biologist, 7 years of experience
			A. Ennis	MS, Biologist, 15 years of experience
			G. Myers	BS, Biologist, 5 years of experience
Field Reconnaissance Survey	04/14/25	Southern BSA	N. Carpenter	BS, Biologist, 4 years of experience
			G. Myers	BS, Biologist, 5 years of experience
Aquatic Resources Delineation	04/24/23 05/14/24 05/17/24 07/24/24	Northern BSA	K. Asmus	MS, Biologist, 23 years of experience
			C. Rice	BS, Biologist, 7 years of experience
			A. Ennis	MS, Biologist, 15 years of experience
			G. Myers	BS, Biologist, 5 years of experience
			B. Elenzweig	BS, Botanist, 4 years of experience
Aquatic Resources Delineation	07/14/25	Southern BSA	O. Routt	BS, Biologist, 10+ years of experience
			G. Myers	BS, Biologist, 5 years of experience
Burrowing Owl Habitat Assessment and Breeding Season Protocol Surveys	04/14/25 05/07/25 06/02/25 07/14/25	Southern BSA	N. Carpenter	BS, Biologist, 4 years of experience
			G. Myers	BS, Biologist, 5 years of experience
			O. Routt	BS, Biologist, 10+ years of experience
Burrowing Owl Habitat Assessment	04/21/23	Northern BSA	K. Asmus	MS, Biologist, 23 years of experience
			C. Rice	BS, Biologist, 7 years of experience
Habitat Assessment and Wet-season Listed Large Branchiopod Sampling	12/12/23 01/03/24 01/12/24 01/26/24 02/09/24 02/23/24 03/08/24 03/22/24 04/05/24	Northern BSA	B. Helm	PhD, Biologist, Ecologist, Botanist, 25+ years of experience, USFWS recovery permit #TE-795930-12
			K. Colima Aguirre	BS, Biologist, working under USFWS recovery permit #TE-795930-12
			Z. Einweck	BS, Biologist, working under USFWS recovery permit # TE-795930-10.2

Survey Type	Date	Survey Area	Personnel	Qualifications
Dry-season Listed Large Branchiopod Sampling	08/30/23	Northern BSA	B. Helm	PhD, Biologist, Ecologist, Botanist, 25+ years of experience, USFWS recovery permit # RP-Vaca Dixon Site-2023-0824
			K. Colima Aguirre	BS, Biologist, working under USFWS recovery permit # TE-795930-12
Habitat Assessment for Listed Large Branchiopods	07/12/25	Southern BSA	B. Helm	PhD, Biologist, Ecologist, Botanist, 25+ years of experience, USFWS recovery permit # RP-Vaca Dixon Site-2023-0824
Dry-season Listed Large Branchiopod Sampling	09/24/25	Southern BSA	B. Helm	PhD, Biologist, Ecologist, Botanist, 25+ years of experience, USFWS recovery permit # RP-Vaca Dixon Site-2023-0824
Crotch's Bumble Bee Protocol Surveys	07/15/25 07/30/25 08/14/25	Southern BSA	S. Moore	BS, Biologist, 2 years of experience, CDFW Bumble Bee MOU/SCP S-242390003-24239-001
			E. Shoemaker	BS, 1 year of experience, CDFW Bumble Bee MOU/SCP No. S-242420002-24249-001
			I. Kreger	MPhil, Biologist, 7 years of experience

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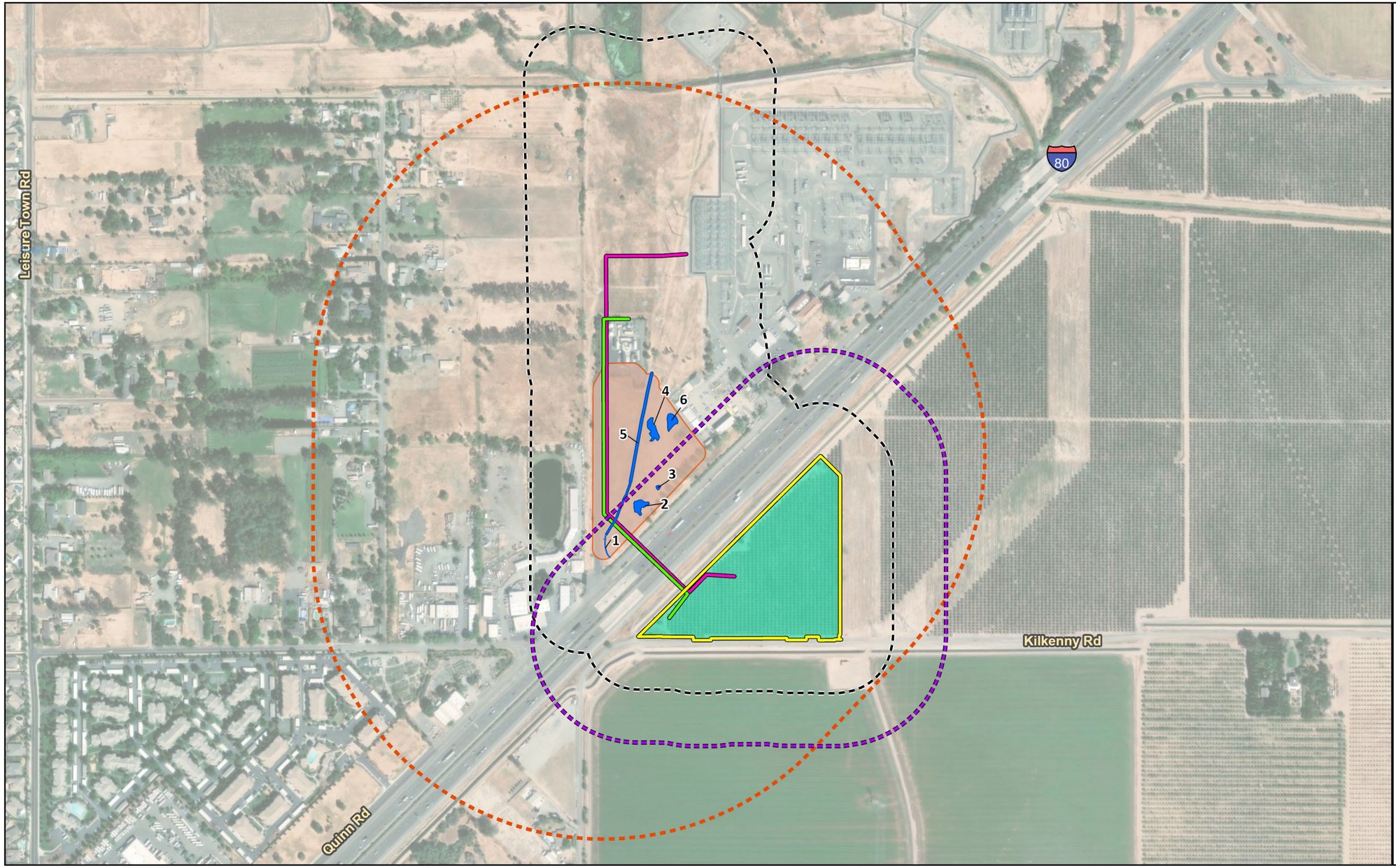
Figure 4 Field Survey Areas



Vaca Dixon Power Center Project

Solano County, California

- 115 kV Overhead Gen-tie
- 13.8 kV Overhead Gen-tie
- BESS Project Area
- Field Reconnaissance Survey Area/Aquatic Resources Delineation Survey Area
- 500-foot Burrowing Owl Survey Area
- 0.25-mile Swainson's Hawk Survey Area
- Burrowing Owl Habitat Assessment Area/ Rare Plant Survey Area/ Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Protocol Survey Area
- Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Wet-Season Survey (Sampled Wetlands)
- Burrowing Owl Habitat Assessment Area/ LargeBranchiopod Habitat Assessment Area/Crotch's Bumble Bee Protocol Survey Area

0 250 500 N
Feet

Scale: 1:6,000

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25_17851 Bio
Fig X Field Survey Areas

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2.2.1 Field Reconnaissance Surveys

Rincon biologists conducted field reconnaissance surveys (field surveys) throughout the northern BSA on April 21-25, 2023, May 14-17, 2024, and July 24, 2024, and in the southern BSA on April 14, 2025 (Table 1, Figure 4). The field surveys focused on documenting existing conditions, including plant and wildlife species, field-verifying land cover types and vegetation communities, and evaluating the area for the potential to support special-status plant and wildlife species, sensitive plant communities, wildlife corridors and nursery sites, locally protected resources, and potential jurisdictional waters. Results of the field surveys were used to identify suitable habitat that may warrant focused protocol surveys or habitat assessments for a particular species or other more involved analyses, and to develop a research approach for evaluating existing biological resources in the BSA.

The field surveys were conducted on foot where accessible, and inaccessible areas were visually surveyed with binoculars. Particular attention was given to areas with lower levels of disturbance and a higher likelihood of supporting special-status species. Wildlife was detected via the observation of calls, tracks, scat, nests, or other signs of presence, and direct observation. Natural and semi-natural vegetation communities were identified and mapped. Classification of vegetation communities was based using MCV2 (Sawyer et al. 2009), which establishes systematic classifications and definitions of vegetation communities. Updates to the MCV2 provided in the online database (CNPS 2025b) were taken into consideration. Each vegetation mapping unit was analyzed for characteristics to define the applicable vegetation community, such as dominant or co-dominant plant species and community membership rules. Additionally, land covers were characterized in areas that appeared to be altered by anthropogenic activities (e.g., developed/disturbed). A compendium of plants and wildlife observed during surveys is included in Appendix B of this report. Representative site photographs taken during the surveys are included in Appendix C.

2.2.2 Rare Plant Survey

A rare plant survey was completed within the southern portion of the northern BSA on April 24, 2023, in accordance with USFWS's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (2000a), and CDFW's *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (2018). This survey was conducted by qualified Rincon botanists walking transects in the southern portion of the northern BSA (Figure 4). This survey was initiated after the initial database review indicated that special-status plant species were previously documented near the BSA. The timing for this survey was intentionally completed during peak blooming season when special-status plant species with potential to occur were expected to be blooming and more easily identifiable, in accordance with USFWS and CDFW survey guidelines.

A formal rare plant survey was not conducted on the southern BSA; however, a Rincon biologist qualified to conduct a rare plant survey assisted with the field reconnaissance survey that took place on April 14, 2025. The biologist paid special attention to the plants occurring within the southern BSA throughout the duration of the survey. If observed on site during the survey, the Rincon biologist would record the location and species of rare plant(s) observed.

2.2.3 Swainson's Hawk Presence Evaluation

A one-time, focused survey for Swainson's hawk was conducted on April 21, 2023. This survey was completed due to the presence of potentially suitable foraging habitat within the BSA and due to nearby documented occurrences of Swainson's hawk, identified in the desktop review, including records of a previously used nest site located approximately 0.25 mile west of the BSA. This survey was conducted using the general guidance presented in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). The survey was performed throughout the northern BSA and a 0.25-mile survey buffer, which encompassed the southern BSA, during the breeding season (generally March through April) to obtain a baseline presence evaluation for this species and document potential nest sites (Figure 4). The survey included both a pedestrian and windshield survey performed by qualified Rincon biologists familiar with the species, using high powered binoculars. Due to the high number of occurrences of this species near the BSA, a previously used nest within 0.25 mile, and suitable foraging habitat within the northern BSA, this species is assumed to be present. As such, full protocol surveys were determined to be unnecessary and were therefore not initiated.

2.2.4 Burrowing Owl Habitat Assessments and Surveys

Habitat assessments and protocol surveys for burrowing owls were conducted by Rincon biologists familiar with this species in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (2012). A habitat assessment was completed within the northern BSA. Additional protocol-level burrowing owl surveys were not completed in the northern BSA due to lack of suitable habitat and site access restrictions.

A habitat assessment and breeding-season protocol-level burrowing owl surveys were completed for the southern BSA on April 14, May 7, June 2, and July 14, 2025. The timing and survey methodology for the breeding season surveys were completed per the guidance outlined in CDFW's 2012 Staff Report. Following completion of the breeding season protocol surveys for the southern BSA, a report was prepared to further document the methodologies and results of the surveys, and is provided as Appendix D.

2.2.5 Large Branchiopod Protocol Surveys

Results of the literature and database review identified designated critical habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp as occurring approximately 5.2 miles south of the BSA, and multiple potentially suitable seasonal hydrological features were documented within the BSA during field surveys. Additionally, the CNDDB query yielded a small number of recorded observations of vernal pool fairy shrimp near the BSA, including some within one mile of the BSA. Dry season sampling surveys for large branchiopods were completed within the northern BSA on August 30, 2023, and wet season sampling surveys were initiated on December 12, 2023, and completed on April 5, 2024. A habitat assessment of the southern BSA was completed on July 12, 2025, and dry season sampling was completed on September 24, 2025. Suitable habitat for vernal pool fairy shrimp was observed in the southern BSA, therefore dry-season sampling was initiated. Results of the sampling efforts and results of the habitat assessments are provided as Appendices E through H.

The sampling surveys were intended to determine presence/absence of these species using the guidance of the USFWS's *Survey Guidelines for the Listed Large Branchiopods* (2015). Surveys were completed by Brent Helm, PhD of Helm Consulting, a USFWS permitted biologist with a valid Section 10(a)(1)(A) recovery permit for these species.

2.2.6 Crotch's Bumble Bee Protocol Surveys

Crotch's bumble bee surveys were completed within the southern BSA on July 15, July 30, and August 14, 2025, by Rincon biologists (surveyors) qualified to conduct surveys for candidate bumble bee species. The surveyors conducted foraging and nesting surveys (described below) in accordance with *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW Survey Considerations), issued June 6, 2023 (CDFW 2023), and in compliance with the Memorandum of Understanding (MOU) for Crotch's bumble bee and western bumble bee issued to Principal Investigator Stella Moore (SCP S-242390003-24239-001) and Principal Investigator Elizabeth Shoemaker (SCP S- 242420002-24249-001) in February 2025, authorizing incidental take of the California Endangered Species Act Candidate Crotch's bumble bees during survey activities. The required notifications to conduct the MOU capture surveys were submitted to CDFW via email on June 30, 2025. A copy of the Crotch's bumble bee report is provided as Appendix I.

Due to site access restrictions, Crotch's bumble bee protocol surveys were only conducted in the southern BSA (Figure 4) and not along the gen-tie corridors north of I-80.

Foraging Surveys

Foraging surveys consisted of meandering transect surveys, with the transect and surveyor spacing varying depending on the quality of the foraging habitat in any given area, with transects closer together in areas with a higher density of floral resources and farther apart in areas with sparse floral resources. If bumble bees were captured or observed during the surveys, they would be identified to species and caste.

Nesting Surveys

Nesting surveys were conducted to assess the presence of suitable nesting resources, including rodent holes/tunnels, or cavities within rock piles, brush piles, bunch grasses, leaf piles, pine needle duff, and vegetation mulch, and such potential nesting substrates were documented with representative photographs. Potential nesting sites were surveyed for active Crotch's bumble bee colonies by looking for concentrated bumble bee activity, and if a site was suspected to be occupied, it was observed to identify signs of bumble bees entering or exiting the entrance. If an active Crotch's bumble bee colony were to be observed, the location, vegetation cover type, slope, aspect, and distance to colony foraging location would be documented and photographed.

2.2.7 Aquatic Resources Delineation Surveys

Aquatic resources delineation (ARD) surveys were conducted in selected locations within the BSA due to access restrictions (Figure 4). Current federal and state methods and guidelines were used as guidance for identifying potential jurisdictional areas. Potential wetland features were evaluated for presence of wetland parameters, specifically including positive indicators for hydrophytic vegetation, hydric soils, and wetland hydrology, according to routine delineation procedure (USACE 1987, 2020).

Extents of potential jurisdictional features, sample points, and photo locations were mapped using a Juniper Systems® Geode Global Positioning System (GPS) unit with submeter accuracy with the use of aerial imagery. Wetland sample points were taken at representative locations to determine the presence/absence of positive indicators for each of three wetland parameters (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology), where applicable. Soil test pits (wetland sample points or SP) confirmed the soil conditions and hydrology at the sample point. Soils data were collected and identified using a shovel and Munsell® Color (2009) soil color chart. Representative

photographs of the ARD surveys can be found in the ARD Report (Rincon 2025) for this Project, provided as Appendix J.

The biologists identified and mapped streams or other drainages that might exhibit positive indicators for an ordinary high water mark (OHWM) and which might constitute waters of the U.S. and/or state, as well as having a defined channel, bed and banks and any adjacent riparian habitat that could qualify as streambeds under Section 1602 of the California Fish and Game Code.

3 Existing Conditions

This section summarizes the existing conditions of the BSA based on the literature and database review and field survey efforts. Discussions regarding the general physical characteristics of the BSA, including topography and geography, hydrology, vegetation and land cover types, general wildlife, and biologically important site features are presented below.

3.1 Topography and Geography

The BSA includes areas in both unincorporated Solano County and within the City of Vacaville. The areas surrounding the BSA are mostly comprised of open space and agricultural land, but also include commercial, industrial, and residential areas (Solano County 2008). The BSA is comprised of a mostly flat landscape, with minor elevation changes throughout. Elevations range from approximately 79 to 84 feet above mean sea level. The Vaca Mountains lie to the west of the BSA, with the City center of Vacaville due south. The northern BSA has been previously disturbed during development of the existing infrastructure but has largely been left undisturbed for over 20 years, with the exception of routine mowing. The vegetation throughout the northern BSA is periodically mowed for fuel reduction/fire clearance around the surrounding energy infrastructure. The southern BSA is active agriculture that is routinely maintained. Land uses within the vicinity of the BSA include energy infrastructure, open space, agricultural, and rural residential. In addition, Interstate 80 (I-80) is a major transportation corridor that splits between the southern and northern BSA areas.

According to the National Oceanic Atmospheric Administration's (NOAA) National Weather Service (NWS), average annual temperatures in the Vacaville area between 1991 and 2024 ranged from 60.1- to 65.7-degrees Fahrenheit, typically varying between 39 (in December and January) and 92 degrees Fahrenheit (in July and August), with temperatures rarely reaching below 30 degrees Fahrenheit or above 101 degrees Fahrenheit (NOAA NWS 2025, Cedar Lake Ventures, Inc. 2025). Vacaville receives an average rainfall of approximately 24 inches, with the most rain occurring between December and January (NOAA NWS 2025).

3.2 Hydrology

The BSA is located entirely in the Ulatis Creek Watershed (Hydrologic Unit Code [HUC]-10 1802016305). The northern BSA occurs in the Gibson Canyon Creek-Sweany Creek Subwatershed (HUC-12 180201630502) and the southern BSA occurs within the Upper Ulatis Creek Subwatershed (HUC-12 180201630503). Gibson Canyon Creek occurs to the north of the BSA and flows from north to south until it meets with Sweany Creek and eventually to the Sacramento River. Illustrations of the watersheds and mapped hydrological units of the region and BSA are included in Figure 5a and Figure 5b.

According to the USGS's NHD (2005) and USFWS's NWI, three hydrological features are mapped within the BSA. Two features occur within the southern BSA and can be described as well-developed agricultural ditches occurring to the north and south of the plum orchard. The NWI describes these features as man-made perennial riverine features. The southern ditch is identified herein as Agricultural Ditch 1 and the northern ditch is identified herein as Agricultural Ditch 2. Water within Agricultural Ditch 1 drains from west to east where flows eventually meet with Gibson Canyon Creek, to the east of the BSA. The third feature occurs in the northern BSA and is a man-made pond described

by the NWI as permanently flooded with some riparian vegetation. This pond is potentially used for agricultural or stormwater purposes.

Drainage ditches and culverts that were not documented in the NWI or NHD were mapped during the 2024 and 2025 delineation surveys. The mapping presented in the NHD and NWI provides useful context but is not a completely accurate depiction of current conditions or extent of aquatic features in the BSA.

3.3 Soils

According to the USDA NRCS Web Soil Survey data for Solano County, California (USDA NRCS 2019), three soil map units occur within the BSA. Parent rock material for this site can be described as older quaternary alluvium and marine deposits, dating back to the Pleistocene era (USGS 2005). Figure 6 depicts the location of the soil series throughout the BSA. The BSA contains Clear Lake clay, 0 to 2 percent slopes, MLRA 17, San Ysidro sandy loam, 0 to 2 percent slopes, and San Ysidro sandy loam, thick surfaces, 0 to 2 percent slopes (Figure 6). Of the three soil map units, the Clear Lake clay, 0 to 2 percent slopes, MRLA 17 soil is considered hydric.

3.3.1 Soil Descriptions

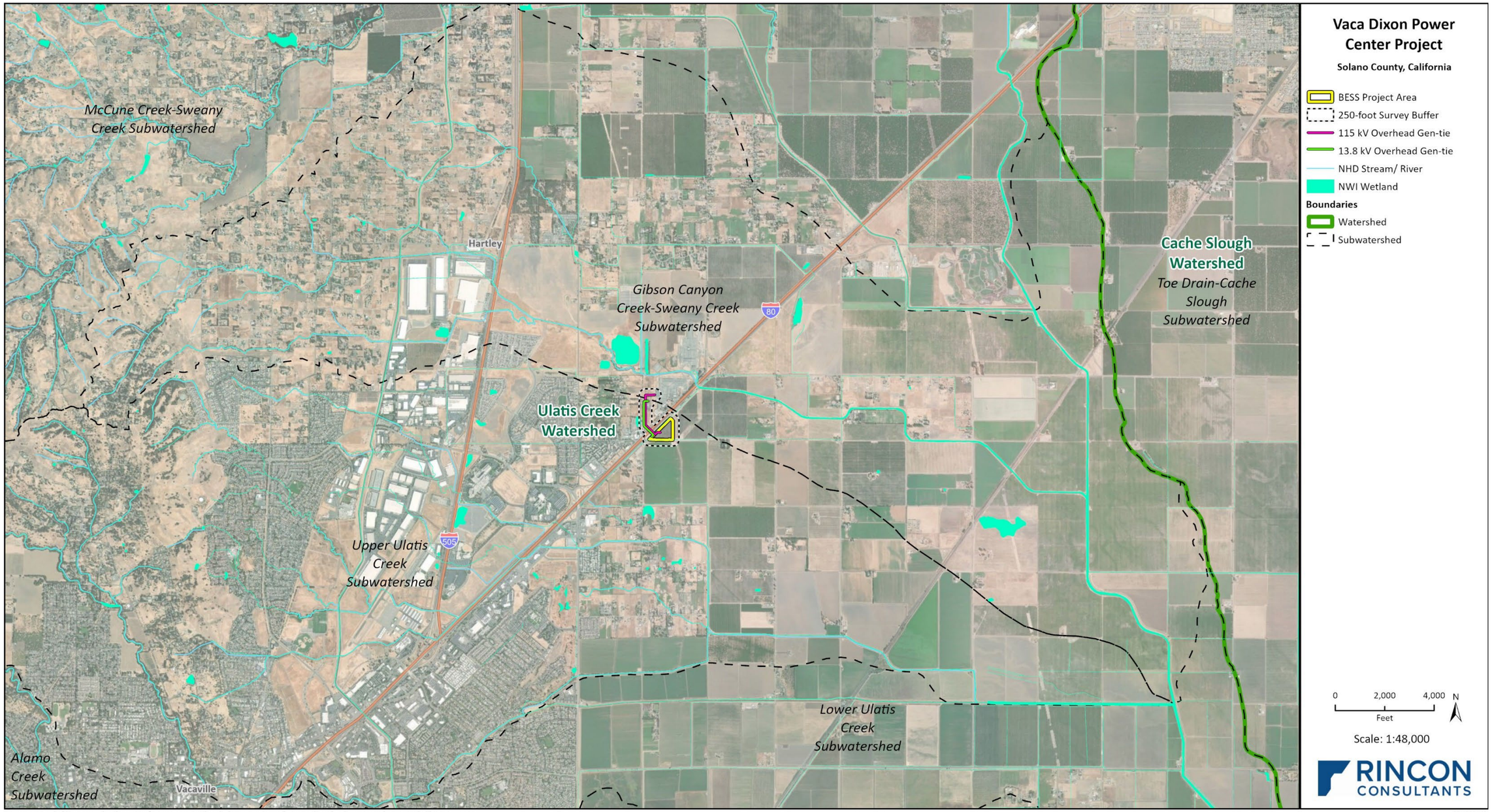
Clear Lake Series

The Clear Lake series is a soil series composed of very deep, poorly drained soils on flood basin floors and valleys. This soil type is derived from basin alluvium derived from igneous, metamorphic and sedimentary rock. The mean annual precipitation is approximately 20 inches. This soil series has negligible to high runoff with slow to very slow permeability and is considered hydric.

San Ysidro Series

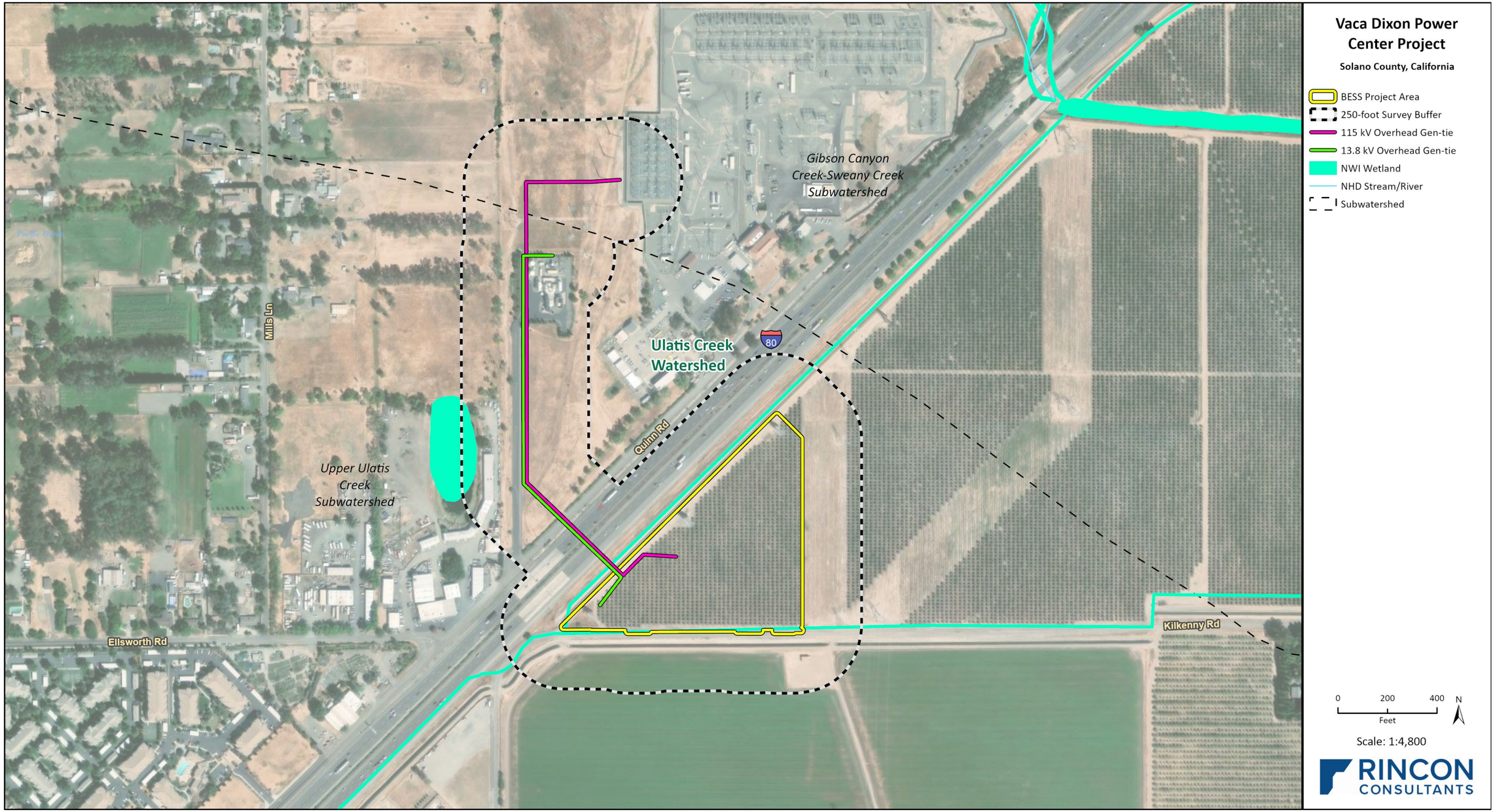
The San Ysidro series consists of very deep, moderately well drained soils on terraces. This soil type is derived from alluvium derived from sedimentary rocks. The mean annual precipitation is approximately 20 inches. This soil series has slow to medium runoff with very slow permeability and is not considered hydric.

Figure 5a Aquatic Resources near the Biological Study Area (Figure 1 of 2)



Imagery provided by ESRI and its licensors © 2025. National Hydrology Dataset and National Wetland Inventory data provided by USGS, 2025.

Figure 5b Aquatic Resources of the Biological Study Area (Figure 2 of 2)



Imagery provided by ESRI and its licensors © 2025. National Hydrology Dataset and National Wetland Inventory data provided by USGS, 2025.

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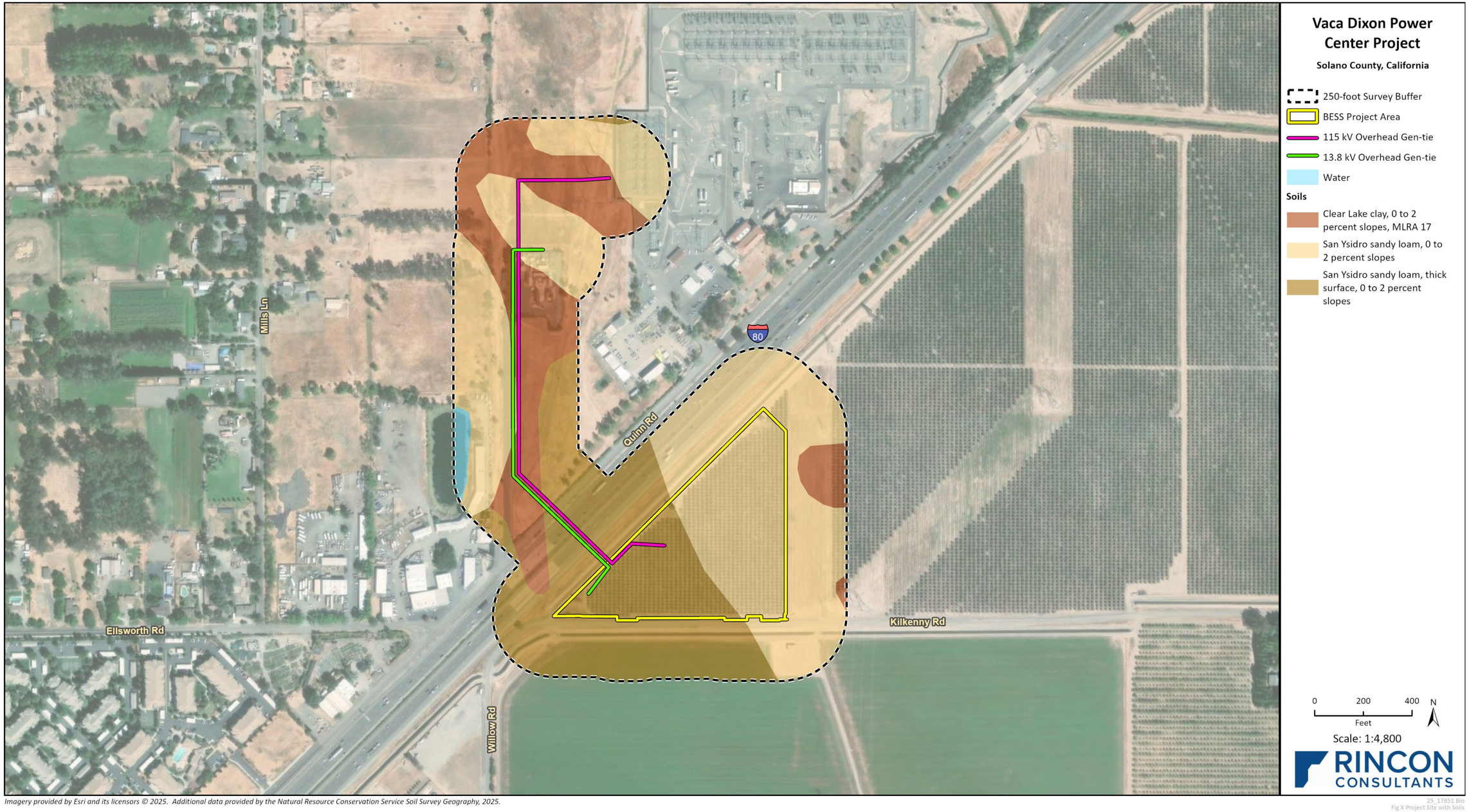
Fig X-X Hydrology - Project Site

Figure 6 Soils within the Biological Study Area



Imagery provided by Esri and its licensors © 2025. Additional data provided by the Natural Resource Conservation Service Soil Survey Geography, 2025.

25_17851 Bio
Fig X Project Site with Soils

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3.4 Vegetation Communities and Land Cover Types

Vegetation communities and land cover types identified in the BSA include non-native annual grassland, developed, orchard, agricultural fields, barren/ruderal, landscaped, open water, perennial rye grass fields, and fresh emergent wetland (Table 2). Vegetation communities and land cover types are described below, and locations and extents for vegetation communities and land cover types within the BSA are shown on Figure 7a through Figure 7c. Plant species observed during the field surveys are listed in Appendix B.

Vegetation communities and land cover types within one mile of the BSA include urban residential, rural residential, business park, commercial highway, public open space, and a large amount of agriculture. The habitat types occurring and expected to occur within 1,000 feet of the Project area do not differ greatly from those listed below (including, but not limited to aquatic, wetland, and grassland habitats), as the Project area is located within a large portion of public/quasi-public land that is regularly maintained.

Table 2 Vegetation Communities and Land Cover Types within the BSA

Vegetation Community/Land Cover Type	Approximate Acreage[1]	CDFW Sensitive Community[2]?
Non-native Annual Grassland	17	No
Developed	17	No
Orchard	12	No
Agricultural Fields	4	No
Barren/Ruderal	3	No
Landscaped	2	No
Open Water	1	No
Perennial Rye Grass Fields	1	No
Fresh Emergent Wetland	.02	No

[1] Acreages are rounded to the nearest whole number, where applicable.

[2] California Department of Fish and Wildlife (CDFW) California Sensitive Natural Communities (CDFW 2025a)

Non-native Annual Grassland

Non-native annual grassland covers approximately 17 acres of the BSA. This vegetation community most closely resembles the wild oats and annual brome grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance) described in MCV2 (Sawyer et al. 2009). Wild oats and annual brome grassland are generally found in open areas in valleys and foothills throughout coastal and interior California. They typically occur on soils consisting of fine-textured loams or clays that are somewhat poorly drained. Non-native annual grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, dominate this vegetation type. Scattered native grass and wildflower species, representing remnants of the original vegetation may also be common (Sawyer et al. 2009).

In the BSA, characteristic non-native annual grass species observed include wild oats (*Avena fatua*), Italian ryegrass (*Festuca perennis* or *Lolium perenne*), and soft chess (*Bromus hordeaceus*). Native herbaceous species observed include autumn willowherb (*Epilobium brachycarpum*), California plantain (*Plantago erecta*), and sprangletop (*Leptochloa* sp). Non-native herbs present include yellow

star thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), rose clover (*Trifolium hirtum*), and narrow-leaved vetch (*Vicia sativa* ssp. *nigra*). Agricultural Ditches 2 and 3 are included within this community, as they contained a variety of non-native annual grasses mentioned above (i.e., beard grass, sprangletop, and wild oats).

Developed

The developed land cover type encompasses approximately 17 acres of the BSA. This land cover type is not naturally occurring and is not described in either the Holland (1986) or Sawyer et al. (2009) classification systems. Despite being sparsely vegetated, the Urban classification in the CWHR (CDFW 2025b) classification system would still most closely resemble this land cover type. This land cover type consists of areas that have been modified and are built up such that most or all vegetation has been removed and/or minimal ornamental trees and shrubs are present. Within the BSA, this land cover type consists of paved roads, I-80, Solano County Irrigation District dirt roads, structures, and other infrastructure associated with the Vaca Dixon Substation.

Orchard

The BSA contains approximately 12 acres of active orchard, including the proposed BESS site. The orchard, located north of Kilkenny Road, is dominated by plum trees (*Prunus* sp.) with non-native annual grasses (e.g., *Bromus* spp., *Hordeum* spp., *Festuca* spp., *Festuca myuros*, *Poa annua,* etc.) interspersed between rows. The orchard is organized in neat rows, with exposed soil and understory throughout, and minimal overhead canopy coverage, as plum trees lack a substantial canopy.

The orchard is regularly mowed and maintained by workers walking and driving utility terrain vehicles. This human presence may make it harder for wildlife to hide from predators and escape human disturbance despite the understory making it easier for wildlife to travel freely throughout.

Agricultural Fields

The BSA contains approximately 4 acres of agricultural fields. The agricultural fields are located south of Kilkenny Road and are rotational crops (currently grasses) that are routinely mowed. Similar to the orchard land cover type, these fields are regularly maintained by workers and include a level of human disturbance that may dissuade wildlife from using the area.

Barren/Ruderal

The barren/ruderal land cover consists of areas that are unpaved and/or devoid or mostly devoid of vegetation and are routinely disturbed by human intervention. Barren/ruderal land within BSA can be found between the orchards north of Kilkenny Road in the southern BSA, totaling approximately 3 acres. This area includes transmission towers and lines, minimal California ground squirrel (*Otospermophilus beecheyi*) burrows underneath the transmission towers, but this area does not appear to be used for agricultural activities (e.g., routine orchard upkeep), though the lack of vegetation growing in the area strongly suggests the presence of pesticides and/or herbicides. These areas are not classified in the MCV2 classification system (Sawyer et al. 2009) or the Holland (1986) classification system.

Figure 7a Overview of Vegetation and Land Cover Types within the Biological Study Area (Figure 1 of 3)

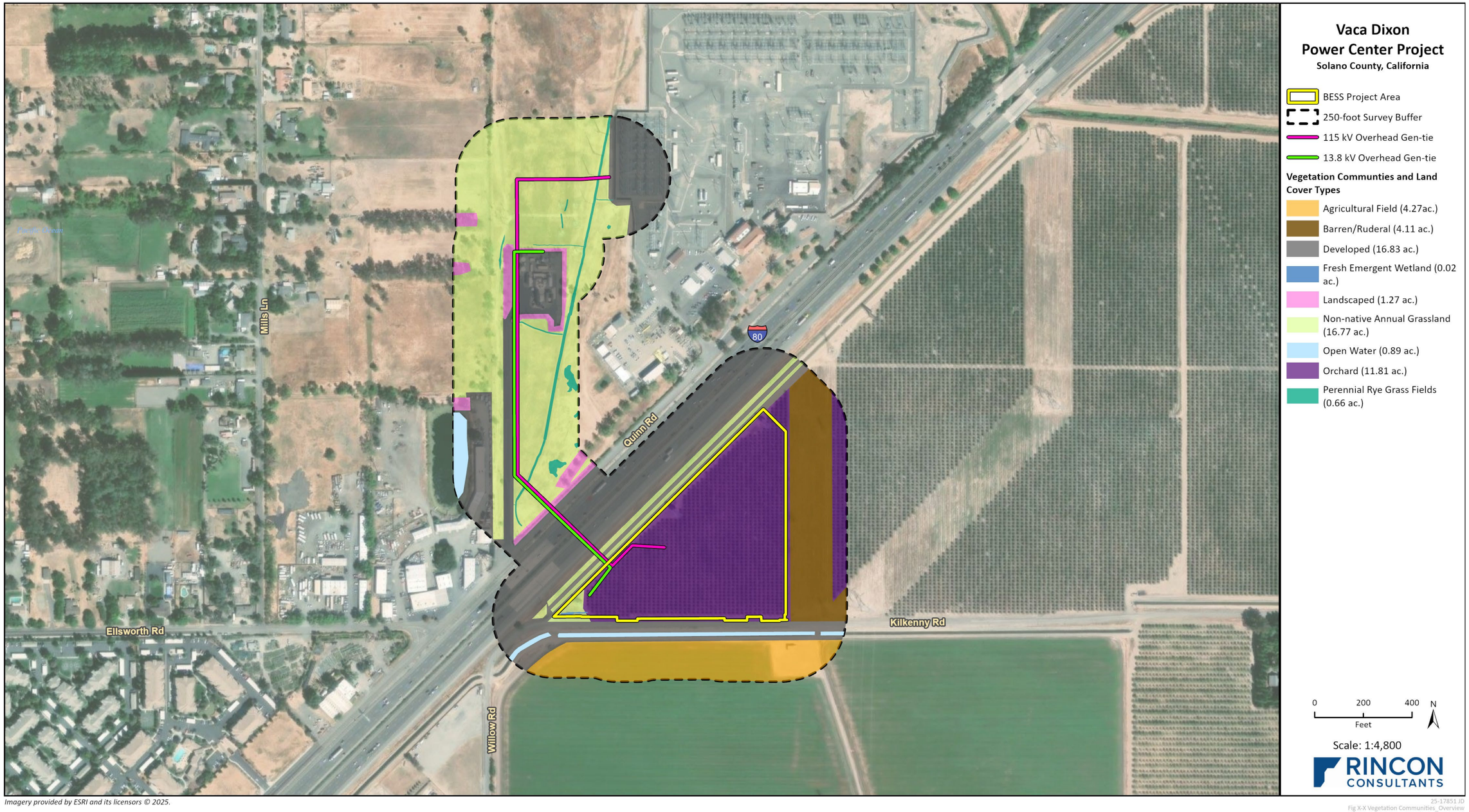

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Fig X-X Vegetation Communities_Overview

Figure 7b Vegetation and Land Cover Types within the Biological Study Area (Figure 2 of 3)

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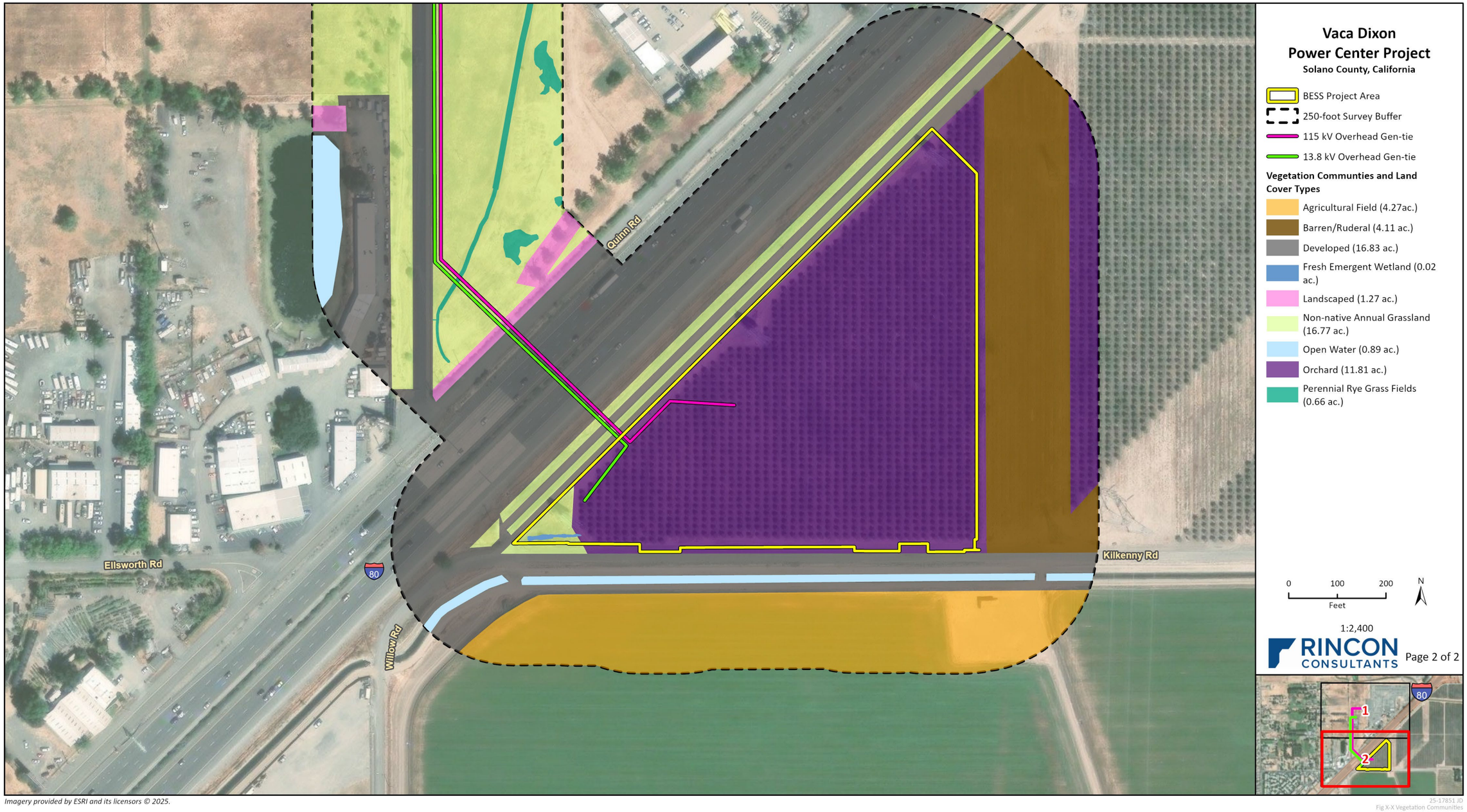
Figure 7c Vegetation and Land Cover Types within the Biological Study Area (Figure 3 of 3)



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Landscaped

Landscaped areas cover approximately 1 acre of the BSA. This land cover type is not naturally occurring and is not described in the MCV2 (Sawyer et al. 2009) classification system but is considered "Urban" in the California Wildlife Habitat Relationships (CDFW 2024s) classification system. This land cover type consists of areas that have been modified and are built up such that most or all vegetation has been removed and/or non-native ornamental trees and shrubs are present. Within the BSA, this land cover type consists of landscaped areas associated with the CalPeak Power Vaca Dixon Peaker Plant in the northwestern portion of the BSA and the PG&E Vaca-Dixon Substation to the east of the BSA. Species observed include valley oak (*Quercus lobata*), and rosemary (*Rosmarinus officinalis*), with scattered ruderal herbs and grasses.

Open Water

Open water occurring within the BSA includes a man-made pond and Agricultural Ditch 1 (totaling approximately 1 acres). The pond is located in the northern BSA, within the 250-foot survey buffer. Agricultural Ditch 1 is in the southern BSA, within the 250-foot survey buffer. Agricultural Ditch 1 holds water year-round and flows are controlled by agricultural runoff. It is anticipated that the pond holds water year-round, based on aerial imagery, and possibly contains hydrophytic vegetation. Both Agricultural Ditch 1 and the pond are surrounded by developed areas.

Perennial Rye Grass Field

The BSA contains approximately 1 acre of perennial rye grass fields (*Lolium perenne* [*Festuca perennis*] Herbaceous Semi-Natural Alliance) described by Sawyer et al. (2009). This vegetation community occurs in association with depressional aquatic features (Seasonal Wetlands 1 through 8 and Swale) throughout the northern portion of the BSA. The compilation of plant species occurring between each feature varies; however, perennial ryegrass (*Lolium perenne* [*Festuca perennis*]) appears as a dominant species throughout the majority of the aquatic features in the northern BSA and therefore this vegetation community is characterized as such. Species observed in this community included native perennial ryegrass, autumn willowherb, Mediterranean barley (*Hordeum marinum*), purslane speedwell (*Veronica peregrina* ssp. *xalapensis*), and dwarf sack clover (*Trifolium depauperatum* var. *truncatum*).

Fresh Emergent Wetland

The BSA contains approximately 0.02 acre of fresh emergent wetland, consisting of Seasonal Wetland 9, found in the southwestern corner of the southern BSA. Though there is variation between the eastern and western portions of Seasonal Wetland 9, as cattails (*Typha* sp.) are a dominant species in the eastern portion whereas flat sedge (*Cyperus* sp.) are a dominant species in the western portion; this vegetation community most closely resembles the *Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance described by Sawyer et al. (2009) as these species are co-dominant in the herbaceous layer. Furthermore, this community may include emergent trees present at low cover, which are reflected in this feature as a single willow tree (*Salix* sp.). A standpipe is present at the western end of the wetland. Seasonal Wetland 9 contained water during the final burrowing owl protocol survey (July 14, 2025).

3.5 General Wildlife

Wildlife detected during the field surveys was consistent with expectations for the existing site setting. Bird diversity was low overall and included common resident species and expected migrant species during spring and fall migratory seasons. Limited wildlife detections are likely a result of I-80, Highway-505, and Kilkenny Road occurring within the BSA, features which act as significant wildlife movement barriers and increasing the amount of human disturbance, noise, and light in the vicinity.

Raptor species, including Swainson's hawk and red-tailed hawk (*Buteo jamaicensis*) were observed soaring above the BSA or in the nearby vicinity of the BSA. California ground squirrels were observed in the southern BSA during field surveys. Some small mammal burrows were observed in the southern BSA along the transmission towers; however, no sign of recent activity (i.e., fresh dirt, scat) was observed at any of the burrows. Common bird species observed included northern mockingbird (*Mimus polyglottos*), California scrub jay (*Aphelocoma californica*), Canada goose (*Branta canadensis*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), red-winged blackbird (*Agelaius phoeniceus*), mourning dove (*Zenaida macroura*), yellow-billed magpie (*Pica nuttalli*), western kingbird (*Tyrannus verticalis*), and European starling (*Sturnus vulgaris*). Reptiles and mollusks observed included western fence lizard (*Sceloporus occidentalis*) and shoulderband snail (*Helminthoglypta* sp.). A full list of wildlife detected during the surveys is included in Appendix B.

3.6 Biologically Important Site Features

Wildlife present and likely to be present throughout the BSA may use various natural and manmade elements within the BSA for movement, protection, foraging, nesting and/or roosting. These features include but are not limited to landscaped trees and shrubs, non-native annual grassland, small mammal burrows, perennial rye grass fields, open water such as the man-made pond and other aquatic features within the BSA, and developed areas such as temporary and permanent access roads and pathways, transmission towers and associated lines, buildings within and surrounding the BSA prior to, during, and after construction, including the BESS, substations, VDPP, and associated structures. These site features are anticipated to attract wildlife species based on their utility, relative to the species' needs. For example, a raptor may use a transmission tower as a foundation for their nest, whereas a passerine may use the transmission line for a clear view of their foraging area.

4 Sensitive Biological Resources

This section discusses special-status species and sensitive biological resources observed in the BSA and evaluates the potential for the Project area to support additional sensitive biological resources. Assessments for the potential occurrence of special-status species are based upon known ranges, habitat preferences for the species, species occurrence records from the CNDDB and other sources such as iNaturalist and eBird, species occurrence records from other sites near the BSA, previous reports for the Project area, and the results of surveys completed for this Project. The potential for each special-status species to occur in the BSA was evaluated according to the following criteria:

- **Not Expected.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), and species would have been identifiable on the site if present (e.g., oak trees).
- **Low Potential.** Few of the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- **Moderate Potential**. Some of the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential**. All the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- **Present**. The species has been observed on the site or has been recorded (e.g., CNDDB, other reports) on the site recently (within the last 5 years).

4.1 Special-Status Species

The list of special-status plant and wildlife species known to occur within 10 miles of the BSA resulting from the literature and database review and field surveys can be found in Appendix K. Species documented in one or more CNDDB records within 10 miles of the BSA are shown in Figure 8. Special-status species and small mammal burrows observed during surveys overlaid with CNDDB data are shown in Appendix L. No nests were observed during any of the field surveys. A shapefile of all biological resources overlaid with the CNDDB data will be provided in the AB 205 Opt-in Application package.

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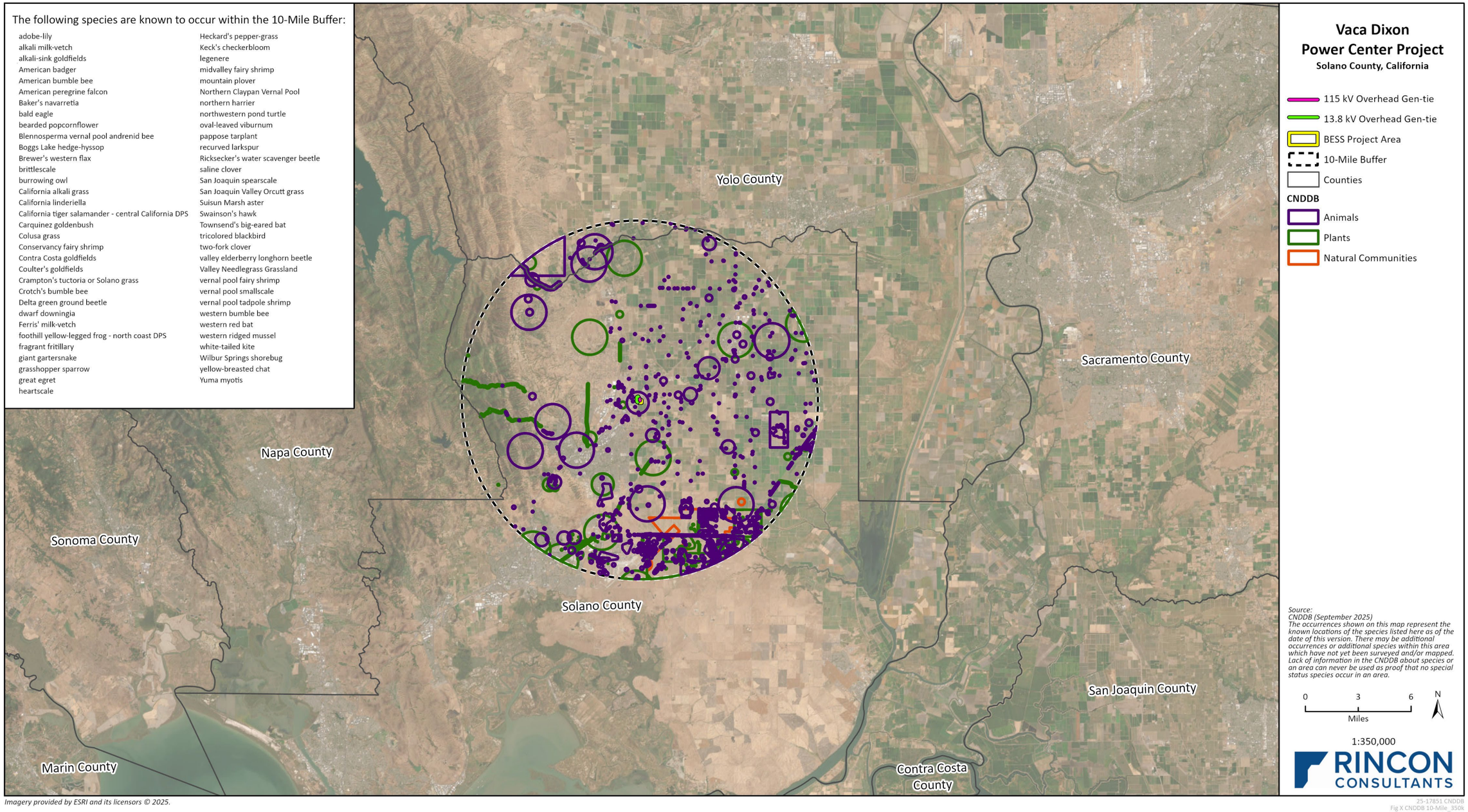
Figure 8 Sensitive Biological Resources Documented within a 10-Mile Radius of the Biological Survey Area



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4.1.1 Special-Status Plant Species

The evaluation of special-status plant species with potential to occur within the BSA included 41 species known to occur in the region (Appendix K). Thirty-nine of those species are not expected to occur based on having only historical documentation, specific habitat requirements not found within the BSA (e.g., mountains, forest, woodland, vernal pools), and/or because the BSA does not fall within the geographical or elevation range for the species. Two special-status plant species were determined to have a low potential to occur within the BSA, summarized in Table 3 and further discussed below.

Table 3 Special-Status Plant Species with the Potential to Occur within the BSA

Common Name	Scientific Name	Status[1] (ESA/CESA/Other)	Potential to Occur
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	–/–/1B.1	Low Potential
bearded popcornflower	*Plagiobothrys hystriculus*	–/–/1B.1	Low Potential

[1]Status

ESA = Federal Endangered Species Act

CESA = California Endangered Species Act

Other

CRPR (CNPS California Rare Plant Rank)

1B = Rare, Threatened, or Endangered in California and elsewhere

CRPR Threat Code Extension

.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)

Bearded Popcornflower (*Plagyiobothrys hystriculus*), California Rare Plant Rank 1B.1

Bearded popcornflower is an annual herb that can be found in grasslands, vernal pools, and wetlands within the southwestern portions of the Sacramento Valley at elevations between 0 and 900 feet above mean sea level. This species has a very short blooming period, between the months of March and April (CNPS 2025s, Jepson 2025).

Bearded popcornflower has been previously documented approximately 1.5 miles northwest of the BSA (CDFW 2025c). Three iNaturalist observations have been recorded within 10 miles of the BSA (2025). This species was not observed during the 2023 rare plant survey and is therefore absent from the southern portion of the northern BSA. Since the surveyed habitat in the south is representative of that occurring throughout the entire northern BSA, the negative results from the 2023 rare plant survey indicate that this species is absent from the entire northern BSA. Additionally, the northern BSA is routinely mowed for fire protection, and the majority of the southern BSA is active agriculture which is routinely maintained; repeatedly introducing a high level of disturbance that would dissuade this species from growing within the BSA. However, due to the proximity of previous documented occurrences of the species in similar habitat conditions as the BSA, there remains a low potential for occurrence of bearded popcornflower in the BSA.

Baker's Navarretia (*Navarretia leucocephala* ssp. *bakeri*); California Rare Plant Rank 1B.1

Baker's navarretia is an annual herb that occurs in wetlands, cismontane woodlands, lower montane coniferous forests, meadows and seeps, vernal pools, valleys, and grassland habitats at elevations between 15 and 2100 feet (Jepson 2025).

Baker's navarretia has been previously documented approximately 0.75-mile southwest of the Project area in 2010 and approximately one mile northwest of the Project area in 2011 (CDFW 2025c). A closer and more recent occurrence was recorded on iNaturalist along Quinn Road, just south of the Vaca-Dixon substation on (2018; iNaturalist 2025). However, this observation has not been confirmed by another iNaturalist member, meaning this observation is not considered "Research Grade." Habitat within the northern BSA largely consists of non-native annual grassland, with several seasonal aquatic features and suitable clay loam soils that this species prefers. Despite suitable habitat present in the northern BSA, the site is routinely mowed for fire protection, repeatedly introducing a high level of disturbance that would dissuade this species from growing within the northern BSA. Additionally, this species was not observed during the 2023 rare plant survey and is therefore considered absent from the northern BSA. Habitat in the southern BSA is not ideal for this species, as it is made up of mostly developed areas such as I-80 and Kilkenny Road and agricultural areas that experience regular human disturbance, are likely treated with pesticides and/or herbicides, and are routinely irrigated. Though the sandy loam soil in the southern BSA is preferrable, the high levels of disturbance in this area from agricultural practices reduce the likelihood of this species' presence. However, due to the proximity of the previous documented occurrences of the species, there remains a low potential for occurrence in the BSA.

4.1.2 Special-Status Wildlife Species

Rincon evaluated 39 species known to occur in the region (Appendix K), including one species that did not appear in the literature and database search but was mentioned during discussions with the CEC, the California red-legged frog (*Rana draytonii*). Of those 39 species, 31 species are not expected to occur in the BSA based on the absence of shrubs, and deciduous woodlands; absence of vernal pools with hydroperiods of 12 weeks or more; and/or because the BSA does not fall within the geographical or elevation range for the species. Alternatively, the California red-legged frog is not expected to occur in the BSA based on zero recorded occurrences within 10 miles of the BSA (CDFW 2025c) and lack of suitable habitat within the BSA and therefore will not be discussed further. Four species were determined to have a low potential to occur within the BSA, one has a high potential to occur, two have a moderate potential to occur, and one, Swainson's hawk, is determined to be present in the BSA (Table 4). All wildlife species with potential to occur in the BSA could additionally occur within 1,000 feet and one mile of the Project area and are discussed below. In addition, a discussion on California tiger salamander (*Ambystoma californiense*) is also provided below, following communications with the USFWS and occurrences of the species recorded within 10-miles of the BSA; however, the species is not expected to occur within the BSA.

Table 4 Special-Status Wildlife Species with the Potential to Occur within the BSA

Common Name	Scientific Name	Status[1] (ESA/CESA/Other)	Potential to Occur
Invertebrates			
Crotch's bumble bee	*Bombus crotchii*	–/–/SCE	Low Potential (northern BSA) Not Expected (southern BSA)
vernal pool fairy shrimp	*Branchinecta lynchi*	FT/–/–	High Potential (northern BSA) Not Expected (southern BSA)
monarch butterfly	*Danaus plexippus*	FPT/–/–	Low Potential
Birds			
tricolored blackbird	*Agelaius tricolor*	–/ST/SSC	Low Potential (foraging) Not Expected (nesting)
burrowing owl	*Athene cunicularia*	–/SCE/SSC	Low Potential (nesting, foraging)
Swainson's hawk	*Buteo swainsoni*	–/ST/–	Present (foraging) Low Potential (nesting)
northern harrier	*Circus hudsonius*	–/–/SSC	Moderate Potential (Foraging) Not Expected (nesting)
white-tailed kite	*Elanus leucurus*	–/–/FP	Moderate Potential (foraging) Not Expected (nesting)

[1] Status

Federal Endangered Species Act Status (ESA)

FE = Federally Endangered

FT = Federally Threatened

FPT = Federal Proposed Threatened

California Endangered Species Act (CESA)

ST = State Threatened

SCE = State Candidate Endangered

Other

FP = CDFW Fully Protected

SSC = CDFW Species of Special Concern

California Tiger Salamander – Central California DPS (*Ambystoma californiense* pop 1.); FT, ST, CDFW WL

The California tiger salamander – Central California DPS (pop. 1) is a federally threatened, state threatened, and CDFW Watch List species that is endemic to the San Joaquin-Sacramento River valley, coastal valleys and neighboring foothills of Central California. California tiger salamanders require access to both aquatic and upland habitat throughout their life cycle. They use standing bodies of fresh water, like ponds, vernal pools and other ephemeral or permanent water bodies for breeding (USFWS 2025c). Suitable breeding pools must hold water for a minimum of 12 weeks to support the salamander larvae development. Permanent aquatic sites can be used for breeding, but use of such sites is only common in the absence of predatory fish. The salamanders also need access to upland habitat that contains small animal burrows or underground hideaways, including those constructed by California ground squirrel and valley pocket gopher (*Thommomys bottae*) (USFWS 2025c). The California tiger salamander uses these underground burrows for shelter and protection from predators and desiccation during nonbreeding periods and hot summer and fall months.

Adult California tiger salamanders engage in mass migrations during a few rainy nights per year, typically from November through April, although migrating adults can be observed as early as October and as late as May (Hansen and Tremper 1993, Petranka 1998). During these rain events, adults leave their underground burrows and return to breeding ponds to mate and will then return to their underground burrows. Adult California tiger salamanders may migrate up to one mile from their estivation sites to the breeding ponds (Austin and Shaffer 1992, USFWS 2000a and 200b), which may be vernal pools, stock ponds, or other seasonal water bodies. California tiger salamanders require a large amount of barrier-free landscape for successful migration (Shaffer et al. 1993, Loredo et al. 1996). Roads and highways are permanent physical obstacles that can block the animals from moving to new breeding habitats or prevent them from returning to their breeding ponds or estivation sites. The historical range of the Central Valley DPS extends throughout the vicinity of the Project area; however, the range of the Central Valley DPS has been reduced and the species has been restricted to specific isolated breeding nodes, two of which occur near the BSA: the Jepson Prairie (to the south of I-80) and Dunagan Hills (to the north or I-80). The Jepson Prairie area extends from the southeastern extent of the Solano County line north-northwest to I-80. There is a gap in which no California tiger salamanders occur to the north of I-80 until State Highway 128, approximately nine miles to the north at the southern extent of the Dunagan Hills population node.

During protocol-level wet season sampling for federally listed large branchiopods in the northern BSA, completed by Helm Consulting in 2023/2024, the hydroperiod for seasonal wetland features within the northern BSA were documented (Helm Biological Consulting 2024a, 2024b). During Helm's first site visit in December of 2023, after a storm event that delivered 1.31 inches of rain, the seasonal wetlands remained dry. After a series of rain events in January and February 2024, the seasonal wetlands were inundated but were dry after six weeks, except for the swale extending north to south in the northern BSA. Helm Consulting (2024a, 2024b) did not document the presence of California tiger salamander during their survey efforts, which included dip-net sampling. However, of the six basins that were sampled, the swale is the only wetland area that may support this species.

A large branchiopod habitat assessment was conducted by Helm Consulting in the southern BSA in 2025, where depressions south of the BESS Project area were identified as suitable habitat (Helm Biological Consulting 2025). Though these depressions have not been sampled for large branchiopods during the wet season and therefore the hydroperiod has not been determined, these depressions hold water during the rainy months. Aside from large branchiopods, when inundated with water, these depressions may be suitable for California tiger salamander to breed in. Agricultural Ditch 1 may also be used by this species for breeding; however, the flow of water may be too fast to successfully inhabit larvae. Considering that the southern BSA is mostly an active plum orchard with increased human disturbance and the site is located north and east of highly trafficked roadways, these factors would deter this species from entering or moving through the southern BSA to small mammal burrows that would have otherwise been usable for this species.

Due to the presence of significant movement barriers surrounding the Project area, including I-80 occurring between the northern and southern BSAs, Highway 128 to the north of the Project area, and Kilkenny Road north of the agricultural ditch in the southern BSA, the absence of California tiger salamander being observed during the protocol-level large branchiopod surveys completed by Helm Consulting in 2023/2024; and active row-crop agriculture, development, and a network of heavily populated roadways, California tiger salamanders are not expected to occur in the BSA and will not be discussed further in this report.

Crotch's Bumble Bee (*Bombus crotchii*); SCE

The Crotch's bumble bee (*Bombus crotchii*) is a candidate species for state listing under CESA. Formal determination of the listing is expected to occur in 2025 and could result in the species being recorded as a state listed endangered species under CESA. This species occurs from coastal California to the Sierra-Cascade crest and south into Mexico. Crotch's bumble bee is known to inhabit open grassland, shrublands, chaparral, desert margins, including Joshua tree and creosote scrub, and semi-urban settings. This species is a generalist that is known to forage on a variety of floral resources including *Antirrhinum* spp., *Phacelia* spp., *Clarkia* spp., *Dendromecon* spp., *Eschscholzia* spp., *Eriogonum* spp., *Vicia* spp., *Carduus* spp., and *Amsinckia* spp. The species' queen flight season is defined as February-March, their worker active period is defined as April-August, and their gyne flight season is defined as September-October (Williams et al. 2014). Nests are located in cavities, most commonly underground in abandoned rodent nests, but may also be found above ground in cavities formed by tufts of grass, brush piles, leaf litter, vegetation mulch, old bird nests, rock piles, or cavities in dead trees. New queens overwinter a few centimeters underneath bare soil, leaf litter, or vegetation mulch.

No Crotch's bumble bees, or any species of bumble bee, were observed during any of the surveys conducted within the BSA. Furthermore, the Crotch's bumble bee protocol surveys completed in August 2025 yielded negative results. Flowering plants within non-native grassland habitat in which Crotch's bumble bee may forage, occur within the BSA, including genera such as *Centaurea solstitialis*, *Amsinckia* spp., *Carduus* spp., and *Vicia* spp. In addition, the BSA supports a low density of small mammal burrows, grass tufts, and other vegetative detritus which may provide potential nesting or overwintering sites for this species. There are two known occurrences within 10 miles, approximately 6.6 miles south of the BSA (CDFW 2025c). Additionally, the California Bumble Bee Atlas database documents three observations approximately 9 miles south of the BSA, with the most recent occurrence in 2023 (Xerces Society 2025). Since the species has been identified as a candidate species for State listing, more information has become available about widespread occurrences that may have not been documented in previous years, resulting in potentially more occurrences than previously documented within the CNDDB and Xerces Society. Though the results of the Crotch's bumble bee protocol surveys on the southern BSA were negative, due to the potential foraging, nesting, and overwintering habitat present within the BSA and the multiple recorded occurrences within 10 miles of the BSA, this species was determined to have a low potential to occur on the northern BSA and is not expected to occur within the southern BSA.

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*); FT

Vernal pool fairy shrimp is a federally threatened species that occurs within vernal pool and seasonal wetland habitats in grasslands and some coastal scrub habitat types. This species is short-lived and reproduction occurs quickly, as vernal pool fairy shrimp can, under optimal conditions, complete their life cycle in as few as 18 days. During the dry season, vernal pool fairy shrimp embryos are contained in a protective impenetrable shell called a cyst. Cysts may remain viable in the soil for 15 years and often much longer. Following winter/spring rains and the inundation of vernal pools, embryos hatch from the protective cysts and enter the water column and begin their life cycle (USFWS 2025d).

A total of six aquatic features, referred to as "basins" in Helm's report (Appendices E and F), were sampled within the northern BSA in 2024 (Figure 4). During the initial survey each of the six aquatic features/basins were determined to provide suitable habitat for large branchiopods. Due to presence of suitable habitat, dip net sampling was conducted, and soil samples were taken and later processed in a laboratory via a brine solution (Helm Biological Consulting 2024a, 2024b). Soil sampling was conducted in accordance with the USFWS' *Survey Guidelines for the Listed Large Branchiopods* (2015)

protocol methodology, which states that "soil samples shall be collected mainly from the lowest topographical areas within the feature sampled." Results of the wet-season survey resulted in the absence of large branchiopods. The dry-season survey was inconclusive due to the inability to identify cysts to species level, although cysts from the *Branchinecta* genus were detected. These results were subsequently discussed with USFWS. Wet and dry season sampling reports can be found in Appendices E and F.

During the 2025 habitat assessment conducted by Helm, five depressions or "road ruts", were determined to have potential to support large branchiopods though these road ruts may not exhibit the appropriate hydroperiod needed for this species (Helm Biological Consulting 2025). Additional depressions throughout the orchard were identified by Helm during the habitat assessment, however, these depressions are regularly inundated with irrigation water for the plum trees and are not considered suitable habitat for large branchiopods. Similarly, the agricultural ditches on-site are seasonally flooded with irrigation water and are also not considered suitable habitat for large branchiopods. Unlike the results of the dry season sampling effort that took place in the northern BSA, the results of dry season sampling in the southern BSA yielded negative results. The results of the 2025 habitat assessment and dry season sampling effort suggest that large branchiopods are absent from the southern BSA. The results of the 2025 large branchiopod surveys can be found in Appendices G and H.

Vernal pool fairy shrimp has a high potential to occur within the swales and seasonal wetlands of the northern BSA and are not expected to occur within the southern BSA. The BSA falls within a 1993 generalized (0.6-mile accuracy) CNDDB occurrence polygon (CDFW 2025c), which include several documented occurrences of vernal pool fairy shrimp. Wet season sampling, completed by Helm Consulting in 2023/2024 within the northern BSA, resulted in negative findings for the species (Helm Consulting 2024b). However, dry season sampling detected a low density of *Branchinecta* sp. cysts in two of the seasonal wetlands in the northern BSA, but identification to species-level was not possible as no *Branchinecta* cysts were viable after multiple attempts at lab-culturing (Helm Consulting 2024a). Protocol-level dry-season surveys for the southern BSA resulted in negative findings. Based on presence of *Branchinecta* sp. cysts in the dry-sampling results for the northern BSA, and further discussions with the USFWS regarding these results (Appendix M), it was determined that the species is expected to be present in the northern BSA under optimal conditions; therefore, the species was determined to have a high potential for occurrence in the northern BSA. Because vernal pool fairy shrimp were not detected during the dry season sampling effort in the southern BSA, the results suggest the road ruts may not provide low quality habitat for this species. As such, this species is not expected to occur in the southern BSA. However, wet-season sampling of the southern BSA will be completed during the winter/rainy months in 2025/2026 to further confirm absence of large branchiopods, including vernal pool fairy shrimp.

Monarch Butterfly (*Danaus plexippus*); FPT

Monarch butterflies are proposed for listing as threatened under the federal ESA. Monarchs require milkweed plants to begin their life cycle in the spring months, laying eggs on milkweed and hatching within two to five days. Once hatched, the eggs form into larvae (i.e., caterpillars) and then pupate into a chrysalis after approximately two weeks. After another two weeks, an adult monarch will emerge. This species can exist in a variety of habitats, so long as milkweed is present at the time of breeding and laying eggs (USFWS 2025e). Due to California's moderate winter climate, monarchs in western North America typically spend the winter months along the Pacific coast of California, and in more inland areas such as Solano, Alameda, Contra Costa, and Santa Clara counties, as opposed to

migrating to Mexico like the monarchs in eastern North America. During the winter months, this species primarily roosts in Monterey cypresses, Monterey pines, and eucalyptus trees (USDA 2024).

Suitable milkweed plants for breeding were present in a very small area in the northern BSA (approximately 875 square feet), just north of the existing VDPP within the center branch of the existing swale. No other occurrences of milkweed and no overwintering roosting habitat were observed within the northern or southern BSA. Though no CNDDB occurrences of overwintering monarchs were documented within 10 miles of the BSA, the grassland habitat on northern BSA site provides foraging habitat that this species may use temporarily during migration from breeding sites to overwintering sites, as the BSA is within the geographic range for overwintering and breeding monarchs (CDFW 2025c). Since the species has only recently been identified as a proposed species for federal listing, more information has become available about widespread occurrences that may have not been documented in previous years, resulting in potentially more occurrences than previously documented within the CNDDB. Due to the lack of overwintering habitat present within the BSA, and lack of documented occurrences of overwintering monarchs within 10 miles of the BSA, the species is not expected to occur in clusters during the overwintering period or using the BSA for breeding. However, due to the minimal foraging habitat within the site, there remains a low potential for occurrence temporarily during migration from breeding sites to overwintering sites.

Tricolored Blackbird (*Agelaius tricolor*); ST, SSC

Tricolored blackbirds are listed as state threatened and are a species of special concern that requires open, accessible water; a protected nesting substrate, including either flooded, thorny, or spiny vegetation for nesting; and a suitable foraging space providing adequate insect prey within a few kilometers of the nesting colony. Colonies also use Himalayan blackberry (*Rubus armeniacus*) and thistles and grain fields near dairies (Shuford and Gilardi 2008). Preferred foraging habitats include crops such as rice, alfalfa, irrigated pastures, and ripening or cut grain fields, annual grasslands, cattle feedlots, and dairies, wet and dry vernal pools and other seasonal wetlands, riparian scrub habitats, and open marsh borders (Shuford and Gilardi 2008).

No tricolored blackbirds were observed during the field surveys. However, nine CNDDB occurrences have been recorded within 10 miles of the BSA, with the closest observation located approximately 5.5 miles southeast (CDFW 2025c). Though open water exists within the BSA (i.e., Agricultural Ditch 1 and Pond), suitable nesting substrate is absent, as Agricultural Ditch 1 is concrete lined and lacks vegetation and the pond lacks flooded, thorny or spiny vegetation. Suitable foraging habitat within and around the BSA include the non-native annual grassland habitat, perennial rye grass fields, seasonal wetlands, and agricultural areas. Due to the presence of suitable foraging habitat but lack of nesting substrate, this species has a low potential to forage within the BSA and is not expected to nest within the BSA.

Western Burrowing Owl (*Athene cunicularia*); CESA Candidate

As of March 2025, the western burrowing owl (burrowing owl) is a CESA candidate species. Burrowing owl prefers desert, grassland, and shrubland habitat with the presence of fossorial mammals, whose burrows are used for nesting and roosting (Klute et al. 2003). The burrowing owl is a yearlong resident of open grasslands, especially prairie, plains, and savanna, and sometimes other open areas such as vacant lots near human habitation or airports. This species spends much of its time on the ground or on low perches such as fence posts, and nests in abandoned burrows such as those dug by ground squirrels, desert kit foxes, and badgers (Zeiner et al. 1990). During migration and winter, burrowing

owls are more widespread in lowland areas of the state and reach offshore islands (Shuford and Gilardi. 2008).

No burrowing owls were observed during the field surveys, habitat assessments, or during the breeding season protocol surveys that took place within various areas in the BSA (Figure 4). While there have been several known occurrences of burrowing owls within a 10-mile radius of the BSA, the site has minimal favorable foraging conditions for this species. There are a few small mammal burrows present throughout the non-native grassland in the northern BSA and in the barren/ruderal areas of the southern BSA; however, no burrowing owl or sign of burrowing owl activity (i.e., whitewash, pellets, feathers) were observed at any of the burrows during the surveys. Additionally, the BSA is highly disturbed as a result of the mowing and other anthropogenic activities in the BSA, reducing the potential for occurrence. The northern BSA does contain marginally suitable habitat for burrowing owls after mowing events when the grass is much shorter (i.e., 2 to 3 inches tall). Due to the documented occurrences near the BSA and suitable habitat within the BSA, there remains a low potential the species may occur within the BSA for foraging and nesting.

Swainson's Hawk (*Buteo swainsoni*); ST

The Swainson's hawk is listed as a state threatened species. The historical breeding range of the Swainson's hawk in California included the Great Basin, Sacramento and San Joaquin Basins, the coast from Marin County to San Diego County, the Antelope Valley in Los Angeles and Kern counties, and scattered sites in the Mojave and Colorado Deserts (England et al. 1997). The species continues to breed across its entire historical range but in significantly lower numbers. In the Central Valley, much of the native habitat has been converted to agricultural and urban uses, thereby limiting nesting and foraging opportunities for Swainson's hawks. This species is often found nesting in trees associated with scattered rural residences, particularly in relation to grasslands or dry-land grain fields. Throughout its range the species nest almost exclusively in trees, typically on the edges of woodlands adjacent to grass or shrubland habitat (England et al. 1997). Prey species include squirrels, mice, voles, rabbits, and insects. Nests are typically constructed in solitary trees or small groves of trees near streams (Cornell Lab of Ornithology 2024).

Multiple Swainson's hawks have been observed flying overhead both the northern and southern BSAs during the 2024 and 2025 field surveys, including pairs and individuals. The dominance of non-native grassland, small mammal burrows confirming presence of prey species, and records of flyovers suggest that this species forages throughout the northern BSA. In addition, Swainson's hawks have been observed flying over the agricultural areas of the southern BSA, suggesting that this species also forages near the southern BSA. Though the plum orchard itself does not provide suitable foraging habitat, the barren/ruderal areas to the east of the orchard may be used for foraging by this species. There is one known Swainson's hawk nest site approximately 0.25 mile west of the northern BSA (CDFW 2025c) and the presence of Swainson's hawk pairs observed during the field surveys indicates that this species may be nesting near the BSA. Furthermore, although not commonly used as a nest substrate, the transmission towers in and near the BSA do provide suitable nesting habitat for this species. Results of the initial Swainson's hawk presence survey in 2023 yielded negative results, with no nesting individuals, pairs, or active nests observed. However, since potential nesting structures (e.g., transmission towers) exist on site and documented occurrences flying over the site, there remains a low potential for this species to nest in and around the BSA, with a high potential for foraging in the northern BSA and in the barren/ruderal areas of the southern BSA.

Northern Harrier (*Circus hudsonius*); SSC

Northern harrier is a species of special concern that generally inhabits meadows, grasslands, open rangelands, desert sinks, and wetlands. This species nests on the ground in shrubby vegetation, usually at the marsh edge (Brown and Amadon 1968). This species may also nest in emergent wetlands, grasslands, grain fields, sagebrush flats, or along rivers or lakes, and feeds mostly on small mammals, birds, frogs, small reptiles, crustaceans, insects, and rarely on fish. Northern harriers are highly territorial and will attack other birds of prey during the breeding season (Zeiner et al. 1988).

This species was not observed during the field surveys. However, two CNDDB occurrences were recorded within 10 miles of the BSA with the closest 4.8 miles south (CDFW 2025c), and several recent occurrences have been documented in the nearby vicinity in eBird (eBird 2025). Though no salt and freshwater marsh habitat is present within the BSA, which are optimal foraging habitat for northern harriers, grassland habitat and seasonal wetlands that small mammals occupy do occur within the northern BSA, including aquatic habitats within the 250-foot survey buffer, in which the species may use for foraging. Conversely, the southern BSA primarily consists of an orchard, which is not preferred foraging or nesting habitat, as the plum trees do not allow for good visibility to prey species and there is no shrubby vegetation available for nesting. Due to the absence of shrubby vegetation within the BSA, regular disturbance due to mowing, and no documented occurrences within the site, this species is not expected to nest on site, yet there remains a moderate potential for the species to forage throughout the site.

White-tailed Kite (*Elanus leucurus*); FP

White-tailed kite is a federally protected species that occurs in coastal and valley lowlands, often in agricultural areas. Substantial groves of dense, broad-leafed deciduous trees are used for nesting and roosting, with nests placed usually 20 to 100 feet above ground near open foraging area. This species preys mostly on voles and other small, diurnal mammals, occasionally on birds, insects, reptiles, and amphibians. This species forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands (Zeiner et al. 1988).

White-tailed kites have been previously documented in CNDDB approximately 0.85 mile south of the BSA in 2001, and four more CNDDB occurrences have been recorded within 10 miles of the BSA (CDFW 2025c). Additionally, eBird provides several recent documented occurrences within 10 miles of the BSA (eBird 2025). Though this species was not observed during the field surveys, the northern BSA contains suitable open grassland and prey for white-tailed kite and is regularly mowed, which allows for greater visibility of prey. The grassland habitat, including adjacent grassland habitats within the 250-foot survey buffer, may be used by the species for foraging. However, the southern BSA lacks open grassland areas suitable for foraging, as the majority of the site is agriculture and does not allow for good visibility to prey species that may be present. Though there are some suitable nesting trees present within 0.5 mile of the BSA, suitable nesting habitat is absent from the BSA. Due to the proximity of previous documented occurrences in the area, and presence of suitable foraging habitat throughout the BSA, this species has a moderate potential to forage in the northern BSA but is not expected to nest within the BSA.

4.2 Sensitive Natural Communities and Critical Habitat

Plant communities are considered sensitive biological resources if they have limited distributions, have high wildlife value, include sensitive species, or are particularly susceptible to disturbance. The CDFW ranks natural and sensitive communities using NatureServe's Heritage Methodology, the same

system used to assign Global (G), and State (S) rarity ranks for plant and wildlife species in the CNDDB (CDFW 2022c).

The BSA is not within or proximate to any defined USFWS critical habitat, and there are no CDFW listed Sensitive Natural Communities within the BSA (USFWS 2025a, CDFW 2025a).

4.3 Jurisdictional Waters and Wetlands

Aquatic resources delineated within the BSA were reviewed and evaluated for a preliminary assessment of limits of jurisdictional areas during ARD surveys (Appendix J). Results of the ARD surveys concluded that the BSA contains fourteen jurisdictional features, including nine seasonal wetlands (Seasonal Wetland 1 through 9), one swale (Swale), three agricultural ditches (Agricultural Ditch 1 through 3), and one man-made pond (Pond). Aquatic features delineated during the field surveys, and the proposed Project's limits of disturbance are shown in Figure 9a through Figure 9c. A summary of jurisdictional waters identified within the BSA is provided in Table 5. A map set of all delineated features with their respective agency acreage/linear feet, representative photographs of the various types of features, and all ARD datasheets are included in the Project's Aquatic Resources Delineation report, found in Appendix J.

One man-made ditch identified in the BSA was determined to be non-jurisdictional, as it lacked vegetation, changing substrate, or hydrology indicators, making bed and bank and OHWM indicators difficult to identify and properly map. Although culverts are present at the northern end of the ditch, the ditch did not provide a relatively permanent source of water, or a continuous surface water connection to a traditionally navigable water. Drainage features lacking identifiable jurisdictional indicators were identified as non-jurisdictional and are not discussed further in this report.

Table 5 Summary of Potential Jurisdictional Aquatic Resources in the BSA

	USACE Jurisdiction		RWQCB Jurisdiction		CDFW Jurisdiction
Aquatic Feature (acres)	Non-Wetland Waters of the U.S.[1] (acres/lin. ft.)	Wetland Waters of the U.S. (acres/lin. ft.)	Non-wetland Waters of the State[1] (acres/lin. ft.)	Wetland Waters of the State (acres/lin. ft.)	Streambed[2] (acres/lin. ft.)
Northern BSA					
Seasonal Wetland 1	–/–	–/–	–/–	0.06/80	–/–
Seasonal Wetland 2	–/–	–/–	–/–	0.01/20	–/–
Seasonal Wetland 3	–/–	–/–	–/–	0.01/26	–/–
Seasonal Wetland 4	–/–	–/–	–/–	0.08/112	–/–
Seasonal Wetland 5	–/–	–/–	–/–	0.01/17	–/–
Seasonal Wetland 6	–/–	–/–	–/–	0.01/53	–/–
Seasonal Wetland 7	–/–	–/–	–/–	0.01/62	–/–
Seasonal Wetland 8	–/–	–/–	–/–	0.02/150	–/–
Swale	–/–		–/–	0.47/2,252	0.47/2,252
Pond	–/–		0.40/372	–/–	–/–
Southern BSA				–/–	–/–
Agricultural Ditch 1	0.50/1,347	–/–	0.50/1,347	–/–	0.50/1,347
Agricultural Ditch 2	0.45/1,452	–/–	0.45/1,452	–/–	0.45/1,452
Agricultural Ditch 3	–/–	–/–	0.50/1,441	–/–	0.50/1,441

Aquatic Feature (acres)	USACE Jurisdiction		RWQCB Jurisdiction		CDFW Jurisdiction
	Non-Wetland Waters of the U.S.[1] (acres/lin. ft.)	Wetland Waters of the U.S. (acres/lin. ft.)	Non-wetland Waters of the State[1] (acres/lin. ft.)	Wetland Waters of the State (acres/lin. ft.)	Streambed[2] (acres/lin. ft.)
Seasonal Wetland 9				0.02/111	0.02/111
Total	**0.95/2,800**	**–**	**1.85/4,613**	**0.68/2,883**	**1.94/6,605**

[1] Calculated from Ordinary High Water Mark (OHWM)

[2] Calculated from top of bank or outer extent of associated wetland feature

Jurisdictional Features Within the Limits of Disturbance

All jurisdictional features within the BSA occur outside of the limits of the disturbance of the BESS facilities or associated gen-tie.

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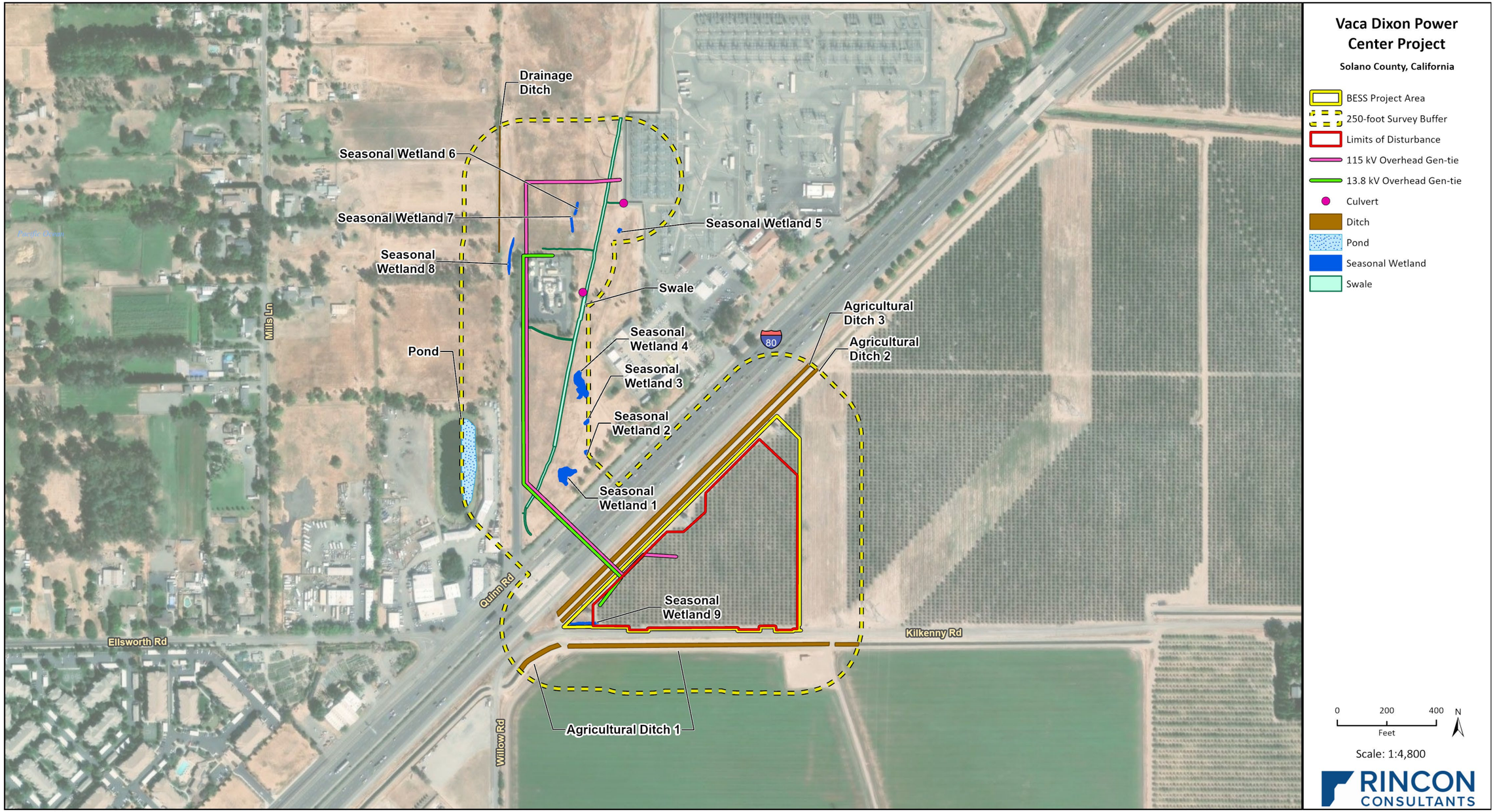
Figure 9a Delineated Aquatic Features with Project Area and Limits of Disturbance (Figure 1 of 3)



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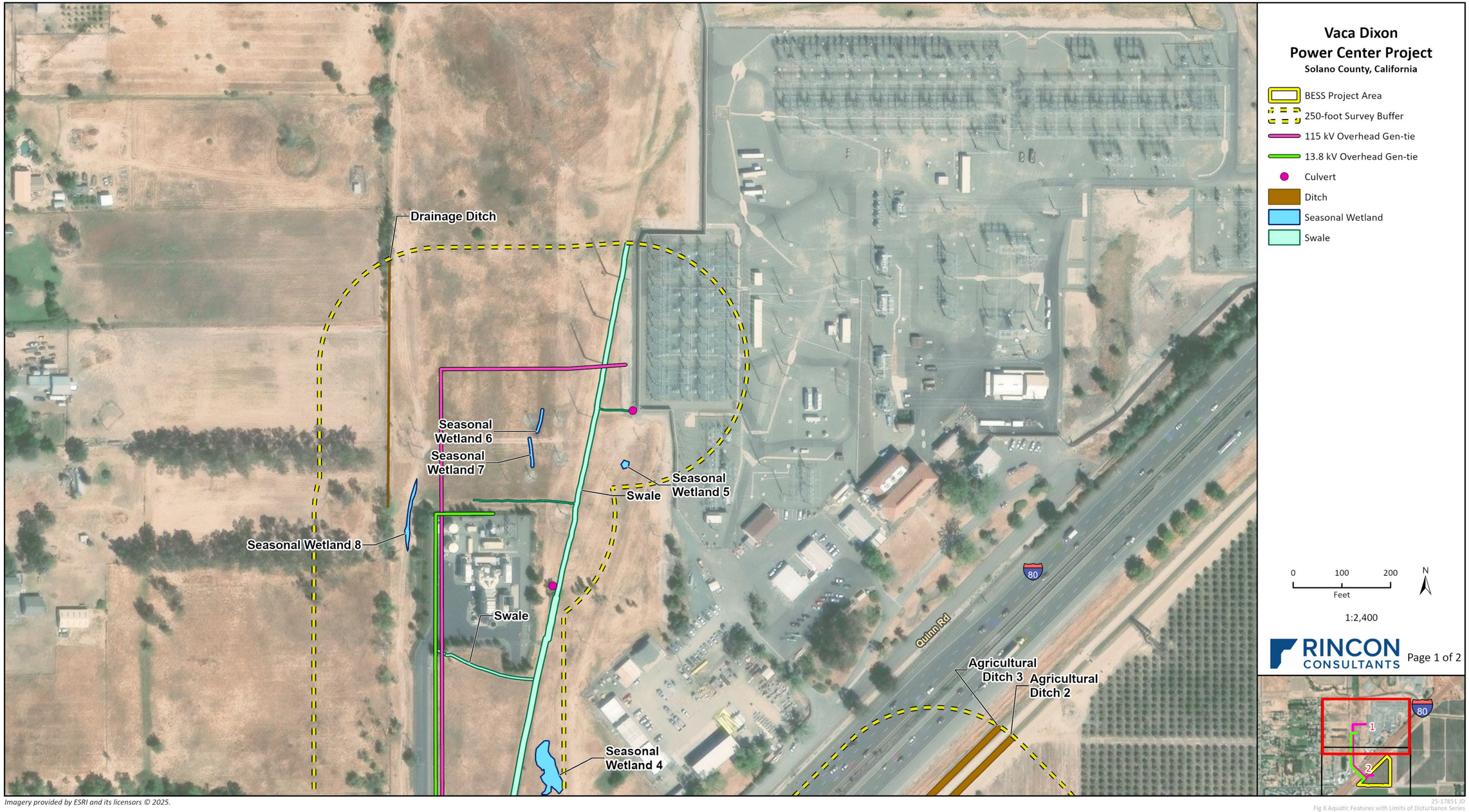
25-17851 JD
Fig X Aquatic Features with Limits of Disturbance Overview

Figure 9b Delineated Aquatic Features with Project Area and Limits of Disturbance (Figure 2 of 3)



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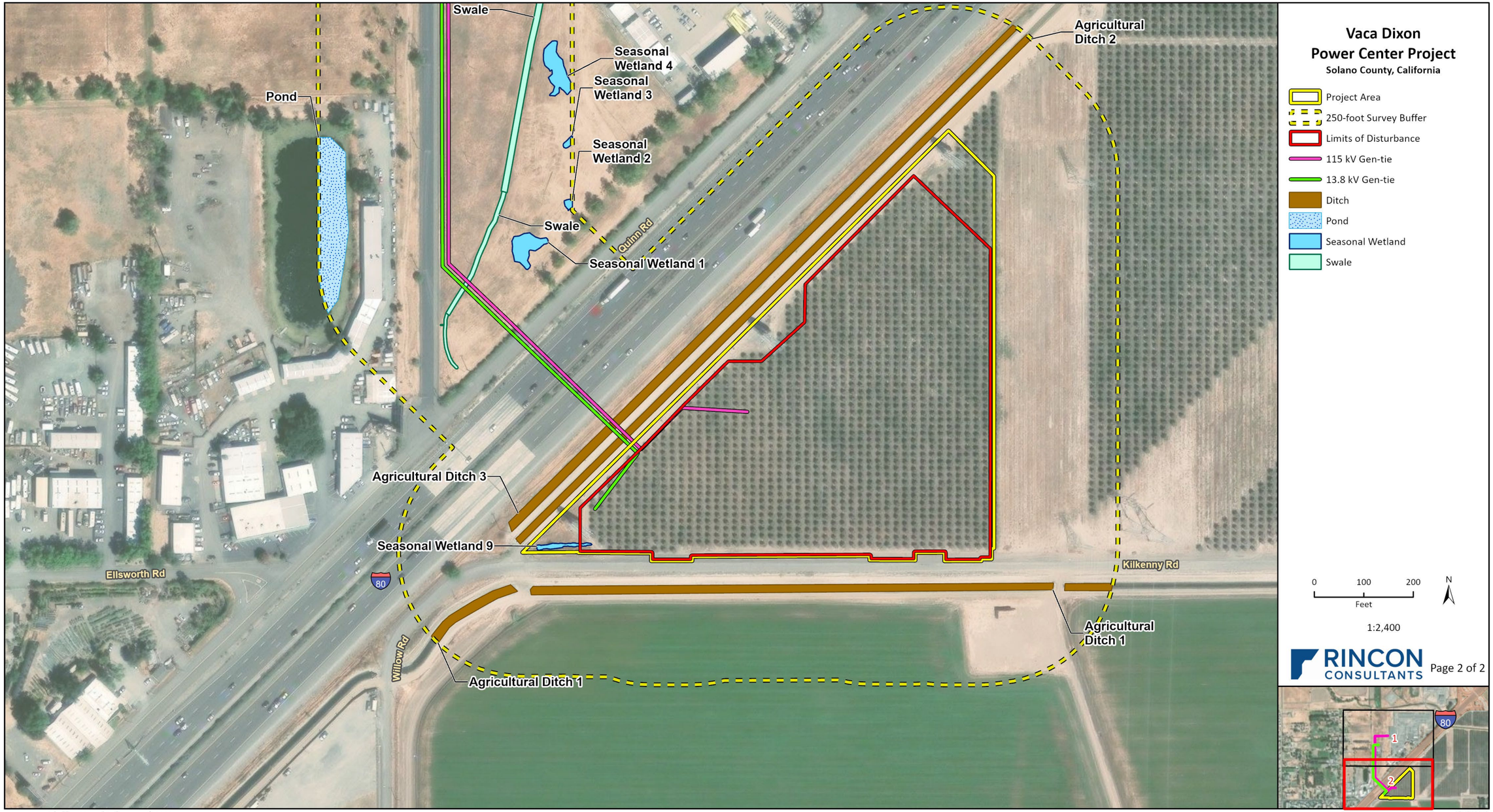
25-17851 JD
Fig X Aquatic Features with Limits of Disturbance Series

Figure 9c Delineated Aquatic Features with Project Area and Limits of Disturbance (Figure 3 of 3)



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25-17851 JD
Fig X Aquatic Features with Limits of Disturbance Series

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4.4 Wildlife Movement

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

Habitats within a linkage are not necessarily the same as those being linked. Rather, the linkage needs only contain sufficient cover and forage to allow temporary inhabitation by ground-dwelling species during periods of movement among areas of suitable habitat. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending on the species, a linkage may require specific minimum physical characteristics (such as rock outcroppings, vernal pools, specific vegetation cover, etc.) to function as an effective wildlife corridor and allow those species to traverse the linkage. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a relatively short period of time.

The CDFW Biogeographic Information and Observation System website (CDFW 2025d), the *California Essential Habitat Connectivity Project: A Strategy for Conserving Connected California* (Spencer et al. 2010), and aerial and topographic imagery were reviewed to obtain information on wildlife movement near the BSA. Regionally, the BSA is not located within a defined Essential Connectivity Area, as mapped in Spencer et al. (2010). The BSA is not located within a mapped habitat linkage or corridor. The area surrounding the BSA is highly disturbed and developed with active agriculture on the southern portion and infrastructure associated with the existing VDPP and PG&E Vaca-Dixon Substation on the northern portion. Additionally, I-80 intersecting the BSA, and Highway 505 located to the west, can be considered significant movement barriers, restricting wildlife movements from the south, east, and west of the BSA. Therefore, the BSA is not considered an important regional wildlife movement area.

4.5 Resources Protected by Local Policies and Ordinances

The proposed BESS facility site is within the City of Vacaville, and the gen-tie alignment is in unincorporated Solano County. Thus, the CEC will need to consider both City and County policies related to biological resources when making a decision on the Project.

Chapter 4 of the City of Vacaville General Plan (Conservation and Open Space Element) includes goals, policies, and actions to ensure the comprehensive and long-range preservation and management of open space lands in and around the City for the protection of natural resources as a scenic resource. Two goals of this General Plan Element include: Goal COS-1: Protect and enhance habitat for sensitive species and natural communities; and GOAL COS-2: Preserve and restore Vacaville's creeks. Biological resources discussed in the policies and actions for these goals have been addressed in the sections above.

Chapter 4 of the Solano County General Plan (Resources) focuses on protecting natural resources within unincorporated Solano County. This chapter outlines distinct goals, policies and regulations used by the county in decision making to protect natural resources, focusing on conserving, preserving, and enhancing biological resources to ensure a high quality of life for current and future county residents. Biological resources discussed in the Solano County General Plan have been addressed in the sections above.

A table of Laws, Ordinances, Regulations, and Standards (LORS; LORS Table) will be provided in Section 5.12.5 of the Opt-in Application and will provide more information on the relevant resources protected by federal, state, and local policies and ordinances.

4.6 Habitat Conservation Plans

The proposed BESS facility site, within the southern BSA, is located within the City of Vacaville. The Solano County Water Agency is developing a multispecies Habitat Conservation Plan (Solano HCP) to further protect threatened and endangered species and their habitat, and the City of Vacaville is a member agency for the Solano HCP, as discussed in the Conservation and Open Space Element (Chapter 4) of the City's General Plan. The policies outlined in the Element include compliance with the Solano HCP until the HCP has been formally adopted. Unincorporated Solano County does not participate in the Solano HCP; therefore, compliance with the Solano HCP would not be applicable to the gen-tie portion of the Project (northern BSA), once approved.

5 Impact Analysis

5.1 Impact Evaluation

Impacts are defined as project-related activities that destroy, damage, alter, or otherwise affect biological resources. This may include injury or mortality to plant or wildlife species, effects on an animal's behavior (such as through harassment or frightening off an animal by construction noise), as well as the loss, modification, or disturbance of natural resources or habitats. Impacts are defined as direct and/or indirect and either permanent or temporary. This section includes a brief overview of the types of impacts analyzed and discussed in Section 5.2, *Special-Status Species Impact Evaluations*.

Direct impacts involve a direct physical change in the environment which is caused by and immediately related to the project. Direct impacts for this Project may include injury, death, and/or disturbance of special-status wildlife species, if present in the work areas or vicinity. Direct impacts from direct physical changes to the environment may also include dust, noise, and traffic from construction machinery, or the destruction of vegetation communities necessary for special-status species breeding, feeding, or sheltering. Direct impacts to plants can include crushing of plants, bulbs, or seeds where present in the impact areas, as well as removal of vegetation communities during land use development activities.

Indirect impacts involve an indirect physical change in the environment which is not immediately related to the project but is caused indirectly by the Project. A potential indirect physical change is considered only if it is reasonably certain to occur, rather than remote or speculative. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect impact. Specific examples for this Project may include activities that result in compacted soils or areas cleared of vegetation that, in the future, following completion of the Project, prevents wildlife from digging burrows, or facilitates site colonization by invasive species (particularly weedy plant species that outcompete native plant species) that over time negatively affect the local ecology. Other examples may include dust that drifts outside Project disturbance areas and covers native plants, thereby decreasing their photosynthetic capacity.

Temporary impacts to biological resources are those that are short-term or reversible over time, with or without implementation of recommended avoidance/minimization measures. Examples include the generation of fugitive dust and noise during Project implementation, trimming or crushing vegetation that will regrow following Project completion, and removed vegetation that will be actively restored. These temporary impacts are anticipated to last during Project implementation and shortly thereafter; however, the biological resources are anticipated to return to baseline after Project completion.

Permanent impacts that result in the long-term or irreversible loss of biological resources are considered permanent. For example, construction of a new electrical substation, which would result in a large, developed, and fenced property where native vegetation may have existed before, would have a permanent impact.

5.2 Special-Status Species

Implementation of Project construction (including site preparation), operation (including maintenance), and decommissioning have the potential to result in direct and/or indirect impacts to sensitive biological resources. The following sections provide an analysis of potential impacts to biological resources within the Project area using the threshold criteria specified in the CEQA Environmental Checklist (Appendix G of the *CEQA Guidelines*).

The Project would have a significant impact on biological special-status species if it would:

a) *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 Wildlife or U.S. Fish and Wildlife Service.*

This section describes impacts on special status-species that are likely to occur in the Project area and may be affected by the Project. Species with no or low potential to occur are not expected to be affected by the Project and are not discussed further.

5.2.1 Special-Status Plant Species

Minimal suitable habitat for special-status plant species exists within the Project area and only two species have a low potential to occur. The Project area has been significantly disturbed by routine mowing, human presence, development, and active agriculture likely maintained with pesticides and/or herbicides, all of which decreases the likelihood of special-status plant species inhabiting the area. No special-status plants were observed on site during the rare plant survey or during the numerous other surveys completed within the Project area. Therefore, no impacts to special-status plant species are expected to occur.

5.2.2 Special-Status Wildlife Species

Crotch's Bumble Bee

There is a low potential for Crotch's bumble bee to occur within the non-native annual grasslands in the northern BSA. Protocol surveys for the species completed in the southern BSA resulted in negative findings and are not expected to occur.

Direct Impacts

Potential direct impacts to Crotch's bumble bee during construction, operation, or decommissioning could include injury or death as a result of individuals being struck by vehicles or equipment, crushed or buried by project vehicles, equipment, or displaced soil, accidental destruction of active nests by construction vehicles or equipment, or disturbance of individuals by construction-related noise and vibration. Temporary direct impacts would result from the loss of foraging habitat within laydown areas during gen-tie construction activities that will ultimately be available after Project construction is complete. Since the limits of disturbance for this Project are constrained south of I-80 where protocol surveys determined absence of the species, and gen-tie lines will be installed overhead within the Project area north of I-80, direct impacts to Crotch's bumble bee are expected to be temporary and less than significant with the incorporation of avoidance and minimization measures.

Indirect Impacts

Potential indirect impacts to Crotch's bumble bee during construction, operation, or decommissioning could include the degradation of foraging habitat or refugia through grading and other ground disturbing Project activities. Loss of burrow habitat could also occur, where the soil will be compacted for laydown areas infrastructure for gen-tie lines. Since the limits of disturbance for this Project are constrained south of I-80 where protocol surveys determined absence of the species, and gen-tie lines will be installed overhead within the Project area north of I-80, indirect impacts to Crotch's bumble bee are expected to be temporary and less than significant with the incorporation of avoidance and minimization measures.

Recommended Measures

Direct and indirect impacts to Crotch's bumble bee would be reduced through implementation of measures BIO-1 (Construction Worker Environmental Awareness Training and Education Program), BIO-2 (Construction Best Management Practices), and BIO-3 (Pre-construction Biological Surveys and Biological Monitoring), which include a worker environmental orientation, incorporation of best management practices, and pre-construction biological surveys and biological monitoring.

Vernal Pool Fairy Shrimp

Due to the inconclusive results of the dry-season soil sampling that documented cysts of an unidentifiable large branchiopod species, and through discussions with the USFWS, potentially suitable aquatic habitats occurring in the northern BSA, within the seasonal wetland habitat, are assumed to occupy vernal pool fairy shrimp. In addition, in communications with the USFWS, these pools, and any potential suitable habitat within 250-feet, are to be assumed to occupy vernal pool fairy shrimp. Based on the habitat assessment for large branchiopods, completed by Helm (2025), potential habitat, although poor quality, was identified in road ruts in the southern BSA. Subsequent dry-season soil samples were collected from the road ruts and based on the results of laboratory analysis, no cysts for large branchiopods were detected.

Direct Impacts

Potential direct impacts to vernal pool fairy shrimp during construction, operation, or decommissioning activities could include injury or death of individuals, and habitat loss from leveling out or filling in suitable habitat, or suitable habitat within 250-feet. Impacts to these suitable pool habitats would require obtaining an Incidental Take Permit pursuant to Section 10(a)(1)(B) of the federal ESA, and Compensatory Mitigation. The Project, however, has been designed to avoid potentially suitable habitat documented in the northern BSA. No other pools have been documented in the northern Project disturbance area, within 250-feet of the documented suitable vernal pool habitat; therefore, no direct impacts are expected in the northern BSA. Since this species was determined to be absent from the southern portion of the Project area as a result of dry-season sampling, direct impacts to this species in the southern BSA are not expected as a result of this Project. Wet-season surveys are scheduled for the winter/rainy season in the southern BSA to further determine absence; however, if the results detect special-status large branchiopods, including vernal pool fairy shrimp, an Incidental Take Permit may be required.

Indirect Impacts

Indirect impacts to vernal pool fairy shrimp may result from potential stormwater runoff from Project activities entering potential suitable habitat during construction, operation, and decommissioning.

These impacts may include degraded water quality and other essential water conditions that are optimal for the species' survival. Indirect impacts to vernal pool fairy shrimp may be reduced to less than significant within the incorporation of recommended avoidance and minimization measures.

Recommended Measures

Indirect impacts to vernal pool fairy shrimp as a result of the Project would be reduced to less than significant through the implementation of measures BIO-1 (Construction Worker Environmental Awareness Training and Education Program), BIO-2 (Construction Best Management Practices), and BIO-3 (Pre-construction Biological Surveys and Biological Monitoring).

Swainson's Hawk

There is potential for Swainson's hawk to forage throughout the non-native grasslands within the Project area, and nest on the utility transmission towers within the Project area.

Direct Impacts

Potential direct impacts to Swainson's hawk include disturbance or human activity during construction, maintenance, or decommissioning that results in nest abandonment or failure. Temporary direct impacts may result from the loss of foraging habitat from increased human disturbance in the northern Project area during construction activities that will ultimately be available after Project construction is complete. Permanent loss of foraging habitat is not anticipated as the presence of the gen-tie lines will still allow this species to use the area for foraging and the supporting structures will still allow for perching. Based on the Project footprint, minimal foraging habitat would be unavailable during Project site preparation, construction, and operation, as the plum orchard is not considered suitable foraging habitat and the barren/ruderal areas will still be available during all stages of construction. These temporary direct impacts to foraging habitat would be less than significant under CEQA due to the ample foraging habitat found within and near the Project area, and the small acreage of the Project area and anticipated Project impacts. In addition, avoidance and minimization measures have been recommended to further reduce impacts to less than significant.

Indirect Impacts

The introduction of fugitive dust, erosion, sedimentation, and potential runoff of hazardous materials during construction, maintenance, or decommissioning could indirectly impact Swainson's hawk by degrading habitat. However, due to the small size of the Project area, availability of suitable foraging and nesting habitat in the areas surrounding the Project area, indirect impacts to Swainson's hawk habitat would be less than significant under CEQA. In addition, avoidance and minimization measures have been recommended to further reduce impacts.

Recommended Measures

Direct and indirect impacts to Swainson's hawk are less than significant under CEQA., Impacts would be further reduced through the implementation of measures BIO-1 (Construction Worker Environmental Awareness Training and Education Program), BIO-2 (Construction Best Management Practices), BIO-3 (Pre-construction Biological Surveys and Biological Monitoring), BIO-4 (Pre-construction Nesting Bird Survey and Avoidance Buffers), and BIO-5 (Measures for Swainson's Hawk). Measures BIO-1 and BIO-2 would allow construction workers to identify Swainson's hawk if present and would reduce the level of human activity on-site, decreasing the possibility of accidental injury or deaths as a result of Project activities. Measures BIO-3, BIO-4, and BIO-5 provide pre-construction

surveys, biological monitoring, and a focused Swainson's hawk presence evaluation, which would assist in the identification of Swainson's hawk, and nests, within 0.25 mile of the Project area, and provide nest buffers, as needed.

White-tailed Kite and Northern Harrier

White-tailed kites and northern harriers both have a moderate potential to forage in the northern portion of the Project area due to the suitable grassland habitat but are not expected to nest in the Project area due to the absence of sufficient nesting habitat and routine disturbance.

Direct Impacts

Temporary direct impacts to white-tailed kites and northern harriers could result from the increase of human disturbance in the northern BSA during construction activities that would ultimately be available after Project construction was complete. However, these direct impacts were determined to be less than significant under CEQA due to the ample foraging habitat found within the remainder of the Project area and near the Project area, and the small acreage of the Project area and anticipated Project impacts. In addition, avoidance and minimization measures have been recommended to further reduce impacts.

Indirect Impacts

Project activities could potentially degrade the quality of foraging habitat for white-tailed kites and northern harriers. Due to the small area of the Project with viable foraging habitat in surrounding areas, such as along Gibson Canyon Creek or within the agricultural areas, indirect impacts were determined to be less than significant. In addition, avoidance and minimization measures have been recommended to further reduce impacts.

Recommended Measures

Direct and indirect impacts to white-tailed kites and northern harriers are less than significant under CEQA. Impacts would be further reduced through implementation of measure BIO-1 (Construction Worker Environmental Awareness Training and Education Program), BIO-2 (Construction Best Management Practices), BIO-3 (Pre-construction Biological Surveys and Biological Monitoring), and BIO-4 (Pre-construction Nesting Bird Survey and Avoidance Buffers) shall be implemented. Measure BIO-1 would provide construction workers with the ability to identify this species if observed on-site and directs workers to a qualified designated biologist where needed. Measure BIO-2 reduces construction and construction-related activities to limited areas, allowing the remaining foraging habitat within the Project Area to be undisturbed. Measures BIO-4 includes pre-construction surveys and biological monitoring, allowing biological monitors to stop work activities. Measure BIO-4, a nesting bird survey, would confirm the absence of nesting individuals within the Project area.

Birds Protected by the California Fish and Game Code and Migratory Bird Treaty Act

Common bird species were observed throughout the Project area, including many species that occur as residents and breed in the Central Valley. Native birds protected by the CFGC and the MBTA could potentially nest in all areas within the Project area. Construction activity has the potential to directly impact nesting birds through the destruction of nests during vegetation clearing and reduced nesting success due to disturbance from Project activities; or indirectly through impacts to nesting habitat or degradation of foraging habitat from invasive plants, fugitive dust, erosion, and runoff. Impacts to

nesting birds protected under the CFGC and MBTA would be reduced or avoided the implementation of avoidance and minimization measures.

Recommended Measures

Impacts would be reduced to less than significant through implementation of measure BIO-1 (Construction Worker Environmental Awareness Training and Education Program) and BIO-3 (Pre-construction Biological Surveys and Biological Monitoring), which includes providing education to construction workers that may encounter nesting birds and pre-construction nesting bird surveys and includes establishment of nest buffers, if nests are found. Indirect impacts would be reduced to less than significant by implementation of measure BIO-2, which requires implementation of best management practices, such as limiting the spread of weeds and retaining native foraging habitat for birds.

5.3 Sensitive Natural Communities and Critical Habitat

The Project would have a significant effect on biological resources if it would:

b) Have a substantial adverse impact 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 Wildlife or U.S. Fish and Wildlife Service.

No CDFW listed Sensitive Natural Communities or Critical Habitat exist within the Project area (CDFW 2025a, USFWS 2025a). The swale and seasonal wetlands in the northern Project area exist within the perennial rye grass fields (*Lolium perenne* [*Festuca perennis*] Herbaceous Semi-Natural Alliance) categorization, which is not a CDFW sensitive natural community. Additionally, the agricultural ditches in the southern Project area would not be impacted by Project activities. Therefore, no impacts are expected to occur as a result of the Project.

5.4 Jurisdictional Waters and Wetlands

The Project would have a significant effect on biological resources if it would:

c) 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.

No aquatic resources exist within the limits of disturbance for this Project.

Direct Impacts

Direct impacts to the aquatic resources within the Project area could include site grading and excavation, soil compaction, and the presence and activity of equipment on site, removing and/or reducing and degrading the aquatic resources. The Project, however, has been designed to avoid aquatic resources in both the northern and southern BSA. No other aquatic resources are documented within the BSA, therefore, no direct impacts to aquatic resources are expected as a result of this Project.

Indirect Impacts

Indirect impacts could include the potential runoff from Project activities that result in degradation of aquatic resources. With the implementation of avoidance and minimization measures, these impacts would be reduced to less than significant.

Recommended Measures

Impacts to aquatic resources would be further reduced to less than significant through implementation of measures BIO-2 and BIO-6, which includes best management practices to avoid and/or minimize impacts, and/or require compensatory mitigation for any permanent loss of habitat as result of Project activities.

5.5 Wildlife Movement

The Project would have a significant impact on biological resources if it would:

d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.

The Project area is not within a mapped regional wildlife linkage or corridor and is bordered by agriculture, residential areas, infrastructure, and vacant but disturbed areas, and is relatively fragmented overall. Local wildlife likely use the natural habitats in the Vaca Mountains to the west of the Project area for movement; however, none of the Project component locations overlap these areas and construction and operation of the Project would not create a significant barrier for wildlife movement therein. The Project area does not occur within a corridor that links between or among larger habitat areas on a regional basis and is not within any areas mapped as Essential Connectivity Areas by the California Essential Habitat Connectivity Project. Additionally, the Project area is positioned between Interstate 80 and Highway 505 on the south, southeast, and west sides, creating significant movements barrier for wildlife movement. Therefore, Project construction, operation, and decommissioning activities are expected to have no impact on wildlife movement.

5.6 Resources Protected by Local Policies and Ordinances

The Project would have a significant impact on biological resources if it would:

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance

The BESS facilities component of this Project is located within the City of Vacaville and consistent with the City of Vacaville General Plan. The goals and policies addressing environmental elements of the General Plan that potentially apply to the proposed Project include policies to manage open space lands, protect native non-agriculture trees, minimize disturbance of natural habitats and vegetation, incorporate native vegetation in landscape plans and prohibit the use of non-native, invasive plant species, and compliance with the draft Solano Habitat Conservation Plan (HCP).

The BESS portion of this Project does not occur within the three broad natural communities types identified in the City's General Plan, does not include removal of existing native non-agriculture or mature trees, is not located within a high-priority habitat area or significant wildlife corridor, avoids

wetland areas, and would minimize disturbance of natural habitats and vegetation. Furthermore, required riparian setbacks are not applicable to this Project as riparian areas are absent from the southern BSA where the BESS portion of this Project is located. No special status species have been documented within the Project site; therefore, the Project is not in conflict with the draft Solano HCP.

The gen-tie corridors associated with the Project are located in unincorporated Solano County, outside city limits, and therefore subject to compliance with Chapter 4 of the Solano County General Plan. The County General Plan requires projects to protect and enhance the County's biological resources, focusing on high-priority habitat areas, wildlife movement areas, oak woodlands, and habitat restoration, as applicable. The gen-tie portion of this Project is not located within a high-priority habitat area, significant wildlife corridor, contains no oak trees or oak woodlands, and does not include any current or ongoing habitat restoration efforts. Therefore, the proposed Project does not conflict with Chapter 4 of the Solano County General Plan.

More detailed information on local policies and ordinances are provided in the LORS Table in Section 5.12.5 of the Opt-In Application and can be found in Appendix A of this report.

5.7 Habitat Conservation Plans

The Project would have a significant impact on biological resources if it would:

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan.

The proposed Project is located within the area covered by the Solano County Water Agency draft Solano HCP. Though the Solano HCP has yet to be approved or adopted, the City of Vacaville is a member agency for the HCP and the City's General Plan Policy COS-P1.12 states that one must comply with all the avoidance, minimization, and mitigation measures listed in the draft Solano HCP. The proposed Project, and the avoidance and minimization measures incorporated herein, comply with draft Solano HCP measures. In addition, unincorporated Solano County chose not to participate in the HCP and therefore, the northern Project components, consisting of the gen-tie routes, would have no impact on the draft Solano HCP.

The Project, therefore, does not conflict with the draft Solano HCP, or any other adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state HCPs.

6 Recommended Avoidance and Minimization Measures

The following measures have been recommended to avoid and/or reduce Project impacts to biological resources.

BIO-1 Construction Worker Environmental Awareness Training and Education Program

Prior to any activity on-site and for the duration of construction activities, all personnel shall attend a training as part of a Worker Environmental Awareness Program (WEAP) developed and presented by the qualified biologist or authorized designee. New personnel shall receive the WEAP training on the first day of work and prior to commencing work on the site.

1. The program shall include information on the life history of the Crotch's bumble bee, northern harrier, white-tailed kite, vernal pool fairy shrimp, burrowing owl, Swainson's hawk, and nesting birds as well as other wildlife and plant species that may be encountered during Project activities.
2. The program shall discuss the legal protection status of each species, the definition of "take" under the federal Endangered Species Act and California Endangered Species Act, measures for reducing impacts to biological resources, reporting requirements, contact information, and penalties for violation of the federal Endangered Species Act or California Endangered Species Act.
3. The program shall include contact information for the project biologist and on-site environmental compliance manager.
4. The program shall provide information on how and where to bring injured animals for treatment in the case any animals are injured within the Project Area.
5. An acknowledgement form signed by each worker indicating that WEAP training has been completed shall be kept on record.

BIO-2 Construction Best Management Practices

The following best management practices shall be implemented during Project activities:

- Designation of a 15 mile per hour speed limit in all construction areas.
- All vehicles and equipment shall be parked on pavement, existing roads, and previously disturbed areas, and clearing of vegetation for vehicle access should be avoided to the greatest extent feasible.
- The number of access routes, number and size of staging areas, and the total area of the activity shall be limited to the minimum necessary to achieve the goal of the project.
- Designation of equipment washout and fueling areas to be located within the limits of grading at a minimum of 100 feet from any sensitive resources as identified by a qualified biologist. Washout areas shall be designed to fully contain polluted water and materials for subsequent removal from the site.
- Drip pans should be placed under all stationary vehicles and mechanical equipment that have leaking or discharging lubricants or other fluid.

- All trash shall be placed in sealed containers and should be removed from the Project Area a minimum of once per week.
- Construction materials and spoils shall be protected from stormwater runoff using temporary perimeter sediment barriers such as silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
- No pets are permitted on the Project Area during construction.

BIO-3 Pre-construction Biological Surveys and Biological Monitoring

Prior to initial ground disturbing Project activities, including vegetation removal, a qualified biologist shall conduct a pre-construction survey to document site conditions, identify any wildlife that may be in harm's way, confirm the Project disturbance limits, and to provide recommendations to avoid unnecessary impacts to sensitive biological resources. If wildlife, including special status species, are found within the immediate Project disturbance area and the individual(s) are likely to be killed or injured by construction activities, work shall be stopped and the qualified biologist shall be contacted immediately. The biologist shall be allowed sufficient time to capture and relocate the animal(s) from the Project site before construction activities begin, or contact the local U.S. Fish and Wildlife Service (USFWS) and/or California Department of Fish and Wildlife (CDFW) office to determine next steps for any special status species encountered. At no time will a federally or state-listed species be handled without prior approval by the appropriate regulatory agency (USFWS/CDFW). In the event the species is not identified as a listed special status species, the qualified biologist shall relocate the individuals the shortest distance possible to a location that contains suitable habitat not likely to be affected by Project activities. The biologist shall maintain sufficiently detailed records of any individual observed, captured, relocated, etc., including size, coloration, any distinguishing features and photographs (preferably digital) to assist in determining whether relocated animals are returning to the Project.

BIO-4 Pre-construction Nesting Bird Survey and Avoidance Buffers

A general pre-construction nesting bird survey shall be conducted by a qualified biologist within seven days prior to the initiation of construction activities if construction is expected to commence during the nesting bird season (February 1 to August 31). If construction is stopped for more than seven days during the nesting season, a pre-construction survey should be conducted prior to the restart of construction activities. Surveys shall include the disturbance area plus a 100-foot buffer for passerine species and a 300-foot buffer for raptors.

If active nests are located, an appropriate avoidance buffer shall be established within which no work activity would be allowed which would impact these nests. The avoidance buffer would be established by the qualified biologist on a case-by-case basis based on the species and site conditions. Larger buffers may be required depending upon the status of the nest and the construction activities occurring near the nest. The buffer area(s) shall be closed to all construction personnel and equipment until juveniles have fledged and/or the nest is inactive. A qualified biologist shall confirm that breeding/nesting is complete, and the nest is no longer active prior to removal of the buffer. If work within a buffer area cannot be avoided, then a qualified biologist shall be present to monitor all project activities that occur within the buffer. The biological monitor should evaluate the nesting avian species for signs of disturbance and should have the ability to stop work.

BIO-5 Measures for Swainson's Hawk

One pre-construction survey shall be conducted to search for Swainson's hawk nests within 0.25 mile of the proposed Project, generally following guidance in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000).

In the event an active Swainson's hawk nest(s) is found within 0.25 mile and Project activities will occur during the Swainson's hawks nesting season (February 15 through September 15), a qualified biologist shall be present daily during any activities within the Project area, including access routes, that are within 0.25 mile of the active nest(s) to monitor the behavior of the potentially affected Swainson's hawks. The qualified biologist shall have the authority to order the cessation of all project activities if the bird(s) exhibits distress and/or abnormal nesting behavior (swooping/stooping, excessive vocalization [distress calls], agitation, failure to remain on nest, failure to deliver prey items for an extended time period, failure to maintain nest, etc.), which may cause reproductive failure (nest abandonment and loss of eggs and/or young).

BIO-6 Measures for Jurisdictional Waters and Wetlands

The Project shall be designed to avoid potentially jurisdictional aquatic features where feasible. If impacts to potentially jurisdictional waters/wetlands of the State and are unavoidable, then the Project proponent shall consult with USACE, RWQCB, and CDFW (via the AB 205 Opt-in pathway) to obtain the following permits, if required: CWA Section 404 from USACE for impacts to waters of the U.S.; Waste Discharge Requirement from the Central Valley RWQCB for impacts to waters of the State; and a CDFW Notification of Lake or Streambed Alteration. The Project proponent shall abide by all permit conditions, and compensatory mitigation for all permanent impacts to waters/wetlands of the State shall be completed at the ratio required by the applicable permits, no less than 1:1. Compensatory mitigation may be in the form of an in-lieu fee payment or purchase of mitigation bank credits.

7 Limitations, Assumptions, and Use Reliance

This BRTS has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but may not have been performed during a particular blooming period, nesting period, or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive unless protocol surveys were completed. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. In particular, mobile wildlife species could occupy the site on a transient basis or reestablish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, jurisdictional areas, review of CNDDB RareFind6, and specified historical and literature sources. Standard data sources relied upon during the completion of this report, such as the CNDDB, may vary with regard to accuracy and completeness. In particular, the CNDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

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Appendix A

Regulatory Framework

Regulatory Framework

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the Project Area include the following:

- California Energy Commission (CEC)
- Central Valley Regional Water Quality Control Board (RWQCB; waters of the State)
- California Department Fish and Wildlife (CDFW; riparian areas, streambeds, and lakes; state-listed species; nesting birds, marine resources) United States Fish and Water Service (USFWS; federally protected fish and wildlife)
- United States Army Corps of Engineering (USACE; wetlands and other waters of the U.S.)
- City of Vacaville
- Solano County

California Energy Commission

The CEC has been authorized under Assembly Bill (AB) 205 (Chapter 61, 2022) to establish a new certification program for eligible non-fossil-fueled power plants and related facilities to optionally seek certification from the CEC, using emergency rulemaking authority provided by AB 205. Per the Notice of Approval of Emergency Regulatory Action for Opt-in Regulations Section 1877, Opt-In applications are required to include all the information specified by California Code of Regulations (CCR) Title 20 Division 2 Section 1704(a) Attachment B that is relevant to the Project. As per Attachment B (g) (2) of Title 20 CCR Division 2, this assessment must include:

(A) A regional overview and discussion of terrestrial and aquatic biological resources, with particular attention to sensitive biological resources within ten (10) miles of the project. Include a map at a scale of 1:100,000 (or other suitable scale) showing sensitive biological resource location(s) in relation to the project area and related facilities and any boundaries of a local Habitat Conservation Plan or similar open space land use plan or designation. Sensitive biological resources include the following:

  (i) species listed under state or federal Endangered Species Acts;

  (ii) resources defined in sections 1201(d) and (u) of Title 20 of the California Code of Regulations;

  (iii) species identified as state Fully Protected;

  (iv) species covered by Migratory Bird Treaty Act (MBTA);

  (v) species and habitats identified by local, state, and federal agencies as needing protection, including but not limited to those identified by the California Natural Diversity Database, or where applicable, in Local Coastal Programs or in relevant decisions of the California Coastal Commission; and

  (vi) fish and wildlife species that have commercial and/or recreational value.

(B) Include a list of the species actually observed and those with a potential to occur within 1 mile of the project area and 1,000 feet from the outer edge of linear facility corridors.

Maps or aerial photographs shall include the following:

(i) Detailed maps at a scale of 1:6,000 or color aerial photographs taken at a recommended scale of 1 inch equals 500 feet (1:6,000) with a 30 percent overlap that show the proposed project area and related facilities, biological resources including, but not limited to, those found during project-related field surveys and in records from the California Natural Diversity Database, and the associated areas where biological surveys were conducted. Label the biological resources and survey areas as well as the project facilities.

(ii) A depiction of the extent of the thermal plume at the surface of the water if cooling water is proposed to be discharged to a water source. Provide the location for the intake and discharge structures on an aerial photograph(s) or detailed maps. Water sources include, but are not limited to, waterways, lakes, impoundments, oceans, bays, rivers, and estuaries. 564.

(iii) An aerial photo or wetlands delineation maps at a scale of (1:2,400) showing any potential jurisdictional and non-jurisdictional wetlands delineated out to 250 feet from the edge of disturbance if wetlands occur within 250 feet of the project area and/or related facilities that would be included with the US Army Corps of Engineers Section 404 Permit application. For projects proposed to be located within the coastal zone, also provide aerial photographs or maps as described above that identify wetlands as defined by the Coastal Act.

(C) A discussion of the biological resources at the proposed project area and related facilities. Related facilities include, but are not limited to, laydown and parking areas, gas and water supply pipelines, transmission lines, and roads. The discussion shall address the distribution of vegetation community types, denning or nesting sites, population concentrations, migration corridors, breeding habitats, and other appropriate biological resources, including the following:

(i) A list of all the species actually observed.

(ii) A list of sensitive species and habitats with a potential to occur (as defined in (A) above).

(iii) If cooling water is taken directly from or discharged to a surface water feature source, include a description of the intake structure, screens, water volume, intake velocity hydraulic zone field of influence, and the thermal plume dispersion area as depicted in response to B(ii) above. Describe the thermal plume size and dispersion under high and low tides, and in response to local currents and seasonal changes. Provide a discussion of the aquatic habitats, biological resources, and critical life stages found in these affected waters. For repower projects that anticipate no change in cooling water flow, this information shall be provided in the form of the most recent federal Clean Water Act 316(a) and (b) studies of entrainment and impingement impacts that has been completed within the last five (5) years. For new projects or repower projects proposing to use once-through cooling and anticipating an increase in cooling water flow, provide a complete impingement and entrainment analysis per guidance in (D)(ii), below.

(D) A description and results of all field studies and seasonal surveys used to provide biological baseline information about the project area and associated facilities. Include copies of the California Natural Diversity Database records and field survey forms completed by the applicant's biologist(s). Identify the date(s) the surveys were completed, methods used to complete the surveys, and the name(s) and qualifications of the biologists conducting the surveys. Include:

(i) Current biological resources surveys conducted using appropriate field survey protocols during the appropriate season(s). State and federal agencies with jurisdiction shall be consulted for field survey protocol guidance prior to surveys if a protocol exists.

(ii) If cooling water is proposed to be taken directly from or discharged to a surface water feature source, seasonal aquatic resource studies and surveys shall be conducted. Aquatic resource survey data shall include, but is not limited to, fish trawls, ichthyoplankton and benthic sampling, and related temperature and water quality samples. For new projects or repower projects anticipating a change in cooling water flows, sampling protocols shall be provided to the Energy Commission staff for review and concurrence prior to the start of sampling. For repower projects not anticipating a change in cooling water flows, this information shall be provided in the form of the most recent federal Clean Water Act 316(b) impingement and entrainment impact study completed within five (5) years of the AFC filing date.

(iii) If the project or any related facilities could impact a jurisdictional or non-jurisdictional wetland, provide completed Army Corps of Engineers wetland delineation forms and/or determination of wetland status pursuant to Coastal Act requirements, name(s) and qualifications of biologist(s) completing the delineation, the results of the delineation and a table showing wetland acreage amounts to be impacted.

(E) Impacts discussion of the following:

(i) all impacts (direct, indirect, and cumulative) to biological resources from project area preparation, construction activities, plant operation, maintenance, and decommissioning. Discussion shall also address sensitive species habitat impacts from cooling tower drift and air emissions.

(ii) facilities that propose to take water directly from, and/or discharge water to surface water features, daytime and nighttime impacts from the intake and discharge of water during operation, water velocity at the intake screen, the intake field of influence, impingement, entrainment, and thermal discharge. Provide a discussion of the extent of the thermal plume, effluent chemicals, oxygen saturation, intake pump operations, and the volume and rate of cooling water flow at the intake and discharge location.

(iii) Methods to control biofouling and chemical concentrations, and temperatures that are currently being discharged or will be discharged to receiving waters.

(F) following: A discussion of all feasible mitigation measures, including, but not limited to the

(i) resources. All measures proposed to avoid and/or reduce adverse impacts to biological

(ii) All off-site habitat mitigation and habitat improvement or compensation, and an identification of contacts for compensation habitat and management.

(iii) Design features to better disperse or eliminate a thermal discharge.

(iv) All measures proposed to avoid or minimize adverse impacts of cooling water intake. This shall include a Best Technology Available (BTA) discussion. If BTA is not being proposed, the rationale for not selecting BTA must be provided. (v) Educational programs to enhance employee awareness during construction and operation to protect biological resources.

(G) A discussion of compliance and monitoring programs to ensure the effectiveness of impact avoidance and mitigation measures incorporated into the project.

(H) Submit copies of any preliminary correspondence between the project applicant and state and federal resource agencies regarding whether federal or state permits from other agencies such as the USFWS, the NMFS, the USACE, the California Department of Fish and Game, and the RWQCB will be required for the proposed project.

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and nine RWQCBs have jurisdiction over "waters of the State," which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code Section 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant requests a pre-application meeting with the RWQCB, waits no less than 30 days, and then submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a "reasonable period of time" for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. Under current regulations, once initiated, the reasonable period of time cannot be stopped or paused. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected.
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason.
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the state from degradation.

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface

water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). The SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* establish a process for permitting for dredging and fill activities *(Procedures)*. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the State except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

(i) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both

(ii) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate

(iii) the area's vegetation is dominated by hydrophytes or the area lacks vegetation

The SWRCB's *Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State* (2020), states that waters of the United States and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

United States Fish and Wildlife Service

The USFWS implements several laws protecting the nation's fish and wildlife resources, including the Endangered Species Act (ESA; 16 United States Code [USC] Sections 153 et seq.), the MBTA (16 USC Sections 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668).

Endangered Species Act

The USFWS and NMFS share responsibility for implementing the ESA. Generally, the USFWS implements the ESA for terrestrial and freshwater species, while the NMFS implements the ESA for marine and anadromous species. Projects that would result in "take" of any threatened or endangered wildlife species, or a threatened or endangered plant species if occurring on federal land, are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of the ESA, depending on the involvement by the federal government in funding, authorizing, or carrying out the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. "Take" under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of the ESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

Migratory Bird Treaty Act

The MBTA of 1918 implements four international conservation treaties that the United States entered into with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976. It is intended to ensure the sustainability of populations of all protected migratory bird species. The law has been amended with the signing of each treaty, as well as when any of the treaties were amended, such as with Mexico in 1976 and Canada in 1995. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS.

The list of migratory bird species protected by the law, in regulations at 50 CFR Part 10.13, is primarily based on bird families and species included in the four international treaties. A migratory bird species is included on the list if it meets one or more of the following criteria:

1. It occurs in the United States or United States territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments.
2. Revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the United States or United States territories as the result of natural biological or ecological processes.
3. New evidence exists for its natural occurrence in the United States or United States territories resulting from natural distributional changes and the species occurs in a protected family.

In 2004, the Migratory Bird Treaty Reform Act limited the scope of the MBTA by stating the MBTA applies only to migratory bird species that are native to the United States or United States territories, and that a native migratory bird species is one that is present as a result of natural biological or ecological processes. The MBTRA requires the USFWS to publish a list of all nonnative, human-introduced bird species to which the MBTA does not apply, and an updated list was published in 2020.

The 2020 update identifies species belonging to biological families referred to in treaties the MBTA implements but are not protected because their presence in the United States or United States territories is solely the result of intentional or unintentional human-assisted introductions.

California Department of Fish and Wildlife

The CDFW derives its authority from the Fish and Game Code of California and administers several State laws protecting fish and wildlife resources and the habitats upon which they depend.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state-listed threatened or endangered. Take under CESA is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (Fish and Game Code Section 86). This definition does not prohibit indirect harm by way of habitat modification, except where such harm is the proximate cause of death of a listed species. Where incidental take would occur during construction or other lawful activities, CESA allows the CDFW to issue an Incidental Take Permit upon finding, among other requirements, that impacts to the species have been minimized and fully mitigated. Unlike the federal ESA, CESA's protections extend to candidate species during the period (typically 1 year) while the California Fish and Game Commission decides whether the species warrants CESA listing.

Native Plant Protection Act

The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare, and regulates the take of listed plant species. Effective in 2015, CDFW promulgated regulations (14 CCR 786.9) under the authority of the NPPA, establishing that the CESA's permitting procedures would be applied to plants listed under the NPPA as "Rare."

Fully Protected Species Laws

The CDFW enforces Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code, which prohibits take of species designated as Fully Protected. Under Senate Bill 147, effective July 1, 2023, the CDFW is allowed to issue an Incidental Take Permit for Fully Protected species under CESA through December 31, 2033, or take can be authorized by a Natural Community Conservation Plan which is in place that authorizes take of the Fully Protected species.

Avian Protection Laws

California Fish and Game Code sections 3503, 3503.5, and 3513 describe unlawful take, possession, or destruction of native birds, nests, and eggs. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs. Section 3513 makes it a state-level offense to take any bird in violation of the federal MBTA.

Protection of Lakes and Streambeds

California Fish and Game Code section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the CDFW of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW, and a final SAA is executed.

The CDFW has not defined the term "stream" for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- **The plain language of Section 1602 of the California Fish and Game Code** establishes the following general concepts:
  - References "river," "stream," and "lake"
  - References "natural flow"
  - References "bed," "bank," and "channel"
- **Applicable court decisions**, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602's use of "stream" to be as defined in common law. The Court indicated that a "stream" is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM
- **CDFW regulations** defining "stream" for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life

- Can be dry for a period of time
- Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation

- **Guidance documents**, including *A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically.
  - A stream is defined by the course in which water currently flows, or has flowed during the historical hydrologic course regime (approximately the last 200 years).
  - Width of a stream course can reasonably be identified by physical or biological indicators.
  - A stream may have one or more channels (single thread vs. compound form).
  - Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse.
  - Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife.
  - Biologic components of a stream may include aquatic and riparian vegetation, all aquatic wildlife, including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system.
  - The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk.

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on-site-specific considerations and the applicability of the indicators to the streambed at hand.

United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites."

Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including the territorial seas." "Waters of the United States" are broadly defined at 33 CFR Part 328.3 to include navigable waters, perennial and intermittent streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows. In recent years, the USACE and U.S. Environmental Protection Agency (USEPA) have undertaken several efforts to modernize their regulations defining "waters of the United States" (e.g., the 2015 Clean Water Rule and 2020 Navigable Waters Protection Rule), but

these efforts have been frustrated by legal challenges which have invalidated the updated regulations. Thus, the agencies' longstanding definition of "waters of the United States," which dates from 1986, remains in effect albeit with supplemental guidance interpreting applicable court decisions as described below.

Waters of the U.S.

In summary, USACE and USEPA regulations define "waters of the United States" as follows:

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:
    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in items 1-6 above.

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 CWA, the final authority regarding CWA jurisdiction remains with the USEPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.

The lateral limits of USACE jurisdiction in non-tidal waters is defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of vegetation, or the presence of debris (33 CFR 328.3(e)). As such, waters are recognized in the field by the presence of a defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of USACE jurisdiction extend beyond the OHWM to the outer edge of the wetlands (33 CFR 328.4 (c)). The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible (33 CFR 328.4; see also 51 FR 41217).

Wetlands

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater 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" (33 CFR 328.3). The USACE's delineation procedures identify wetlands in the field based on indicators of three wetland parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE published the National Wetland Plant List (USACE 2018), which separates vascular plants into the following four basic categories based on plant species frequency of occurrence in wetlands:

- **Obligate Wetland (OBL).** Almost always occur in wetlands
- **Facultative Wetland (FACW).** Usually occur in wetlands, but occasionally found in non-wetlands
- **Facultative (FAC).** Occur in wetlands or non-wetlands
- **Facultative Upland (FACU).** Usually occur in non-wetlands, but may occur in wetlands
- **Obligate Upland (UPL).** Almost never occur in wetlands

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not appearing on the United States Fish and Wildlife Service's list is assumed to be an upland species, almost never occurring in wetlands. In addition, an area needs to contain at least 5% vegetative cover to be considered as a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying (indicates reducing conditions by a blue-grey color), or accumulation of organic material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

Limitations on Jurisdiction based on Sackett v. USEPA Supreme Court Decision

On May 25, 2023, the Supreme Court issued its decision on the petition from the Sacketts, a family in Idaho that was subject to a compliance order from the USEPA for backfilling their lot near Priest Lake, which the USEPA claimed contained federally regulated wetlands. The wetlands in question were adjacent to a ditch that fed a creek that ultimately drained into Priest Lake, a navigable water body. The USEPA asserted that the Sacketts had violated the law by filling the wetlands on their property without a permit. The Court's decision addressed controversy over whether, and under what conditions, the CWA reaches navigable waters' tributaries or adjacent wetlands. The Supreme Court's decision in *Sackett* provides definitive guidance to the agencies in determining the limits of their Clean Water Act authority. Major tenets of the decision have been incorporated into the agencies' current regulations through the September 2023 Conforming Rule.

The Court decided:

- "Adjacent wetlands" are WOTUS only if there is a continuous surface connection between the wetland and a navigable or relatively permanent water body, such that it is difficult to determine the boundary between the wetland and the water body. The opinion notes that "temporary interruptions to surface connection may sometimes occur because of phenomena like low tides or dry spells." The agencies addressed this element by defining the term "adjacent" to mean "having a continuous surface connection" in the Conforming Rule.
- The Significant Nexus Standard, introduced by the Court in prior decisions, is not mentioned in the Clean Water Act and should not be used. The Court determined that the standard applies ecological factors whose use in determining jurisdiction is not supported by the statute. The Conforming Rule removed significant nexus considerations from the definition.
- Although jurisdiction over tributaries was not addressed by the Court, the decision stated that "…the [Clean Water Act's] use of "waters" encompasses only those relatively permanent, standing or continuously flowing bodies of water forming geographical features that are described in ordinary parlance as streams, oceans, rivers, and lakes." The Conforming Rule makes clear that only relatively permanent tributaries qualify as "waters of the United States."

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

City of Vacaville General Plan

The City of Vacaville's General Plan focuses on the preservation and management of open space lands, and the conservation of natural resources within and around the City of Vacaville. Below are policies provided in Chapter 4 of the General Plan, which outline the strategies that are used to conserve the County's biological resources related to the Project:

Goal COS-1 Protect and enhance habitat for sensitive species and natural communities.

- **Policy COS-P1.2**: Manage natural open space lands, where feasible, in a manner consistent with wildlife protection.
- **Policy COS-P1.5**: Continue to protect mature trees and existing native non-agricultural trees.
- **Policy COS-P1.6:** Require that new development minimize the disturbance of natural habitats and vegetation. Require revegetation of disturbed natural habitat areas with native or non-invasive naturalized species.
- **Policy COS-P1.7:** Encourage new development to incorporate native vegetation into landscape plans.
- **Policy COS-P1.8:** Prohibit the use of invasive, non-native species, as identified by the State or County Department of Agriculture or other authoritative sources, in landscaping on public property or in common areas in private developments.
- **Policy COS-P1.10:** Where avoidance of wetlands is not practicable or does not contribute to long-term conservation of the resources, require new development to provide for off-site mitigation that results in no net loss of wetland acreage and functional value within the watersheds draining to the Delta or Suisun Marsh.
- **Policy COS-P1.12:** Until the Solano Habitat Conservation Plan (HCP) is adopted, comply with all of the Avoidance, Minimization, and Mitigation Measures listed in the Draft Solano HCP (see Appendix A for a list of the Avoidance and Minimization Measures that are applicable to Vacaville). In addition, require that development projects provide copies of required permits, or verifiable statements that permits are not required, from the California Department of Fish and Wildlife (2081 Individual Take Permit) and U.S. Fish and Wildlife Service (Section 7 Take Authorization) prior to receiving grading permits or other approvals that would permit land disturbing activities and conversion of habitats or impacts to protected species. In cases where environmental review indicates that such permits may not be required, the Community Development Director may establish time limits of not less than 45 days from the submission of an adequate request for concurrence response from an agency. If the agency has not responded, or requested a time extension of no more than 90 days to complete their assessment, within the established time frame, applicable grading permits or other authorizations may be provided, subject to other City requirements and review. However, the City's issuance of grading permits or other authorizations does not absolve the applicant's obligations to comply with all other State and federal laws and regulations.

Goal COS-2 Preserve and restore Vacaville's creeks.

- **Policy COS-P2.2:** Protect existing stream channels and riparian vegetation by requiring buffering or landscaped setbacks and storm runoff interception.

- **Policy COS-P2.3:** Require creekway and riparian area protection during construction, such as providing adequate setbacks from the creek bank and riparian areas, and creekway and riparian area restoration after construction.

Solano County General Plan

The Solano County General Plan was adopted in 2008 and acts as a guide for conservation and land development within the unincorporated areas of Solano County through 2030. Below are policies provided in Chapter 4 of the General Plan, which outline the strategies that are used to conserve the County's biological resources related to the Project:

- **RS.P-1:** Protect and enhance the county's natural habitats and diverse plant and animal communities, particularly occurrences of special-status species, wetlands, sensitive natural communities, and habitat connections. Actions to enhance or restore habitat areas should not cause adverse impacts to airports, including Travis Air Force Base.
- **RS.P-2:** Manage the habitat found in natural areas and ensure its ecological health and ability to sustain diverse flora and fauna.
- **RS.P-3:** Focus conservation and protection efforts on high-priority habitat areas.
- **RS.P-4:** Together with property owners and federal and state agencies, identify feasible and economically viable methods of protecting and enhancing natural habitats and biological resources.
- **RS.P-5:** Protect and enhance wildlife movement corridors to ensure the health and long-term survival of local animal and plant populations. Preserve contiguous habitat areas to increase habitat value and to lower land management costs.
- **RS.P-6:** Protect oak woodlands and heritage trees and encourage the planting of native tree species in new developments and along road rights-of-way.

Appendix B

Species Compendia

Plant Species Observed within the Biological Study Area

Scientific Name	Common Name	Status	Native or Introduced
Trees			
Platanus racemosa	western sycamore	None	Native
Prunus sp.	plum	None	Introduced
Quercus lobata	valley oak	None	Native
Salix nigra	black willow	None	Native
Sequoia sempervirens	coast redwood	None	Native
Shrubs			
Rosmarinus officinalis	rosemary	None	Introduced
Herbs			
Achyrachaena mollis	blow wives	None	Native
Agapanthus sp.	unknown agapantha	None	Introduced
Amsinckia intermedia	common fiddleneck	None	Native
Brodiaea elegans ssp. *elegans*	harvest brodiaea	None	Native
Bromus hordaceous	soft chess	None	Introduced; Cal-IPC Limited
Callitriche marginata	California water starwort	None	Native
Carduus pycnocephalus	Italian thistle	None	Introduced; Cal-IPC Moderate
Centaurea solstitialis	yellow star thistle	None	Introduced; Cal-IPC High
Centromatia fitchii	spikeweed	None	Native
Chenopodium album	lamb's quarters	None	Introduced
Convolvulus arvensis	field bindweed	None	Introduced; CDFA, Weeds of CA
Cyperus sp.	flatsedge	None	Introduced
Downingia ornatissima var. *ornatissima*	horned downingia	None	Native
Epilobium brachycarpum	autumn willowherb	None	Native
Erodium botrys	broad-leaf filaree	None	Introduced
Erodium cicutarium	red-stem filaree	None	Introduced; Cal-IPC Limited
Eryngium castrense	Great Valley coyote thistle	None	Native
Gallium aparine	goosegrass	None	Native
Geranium dissectum	cranesbill	None	Introduced; Cal-IPC Limited
Gnaphalium palustre	western marsh cudweed	None	Native
Hordeum marinum	Mediterranean barley	None	Introduced; Cal-IPC Moderate
Hypochaeris glabra	smooth cat's-ear	None	Introduced; Cal-IPC Limited
Lactuca seriola	prickly lettuce	None	Introduced
Lupinus bicolor	miniature lupine	None	Native
Myosurus minimus	Mousetail	None	Native
Plantago communis	English plantain	None	Introduced; Cal-IPC Limited
Psylocarpus brevissimus	woolly heads	None	Native
Poa annua	annual meadowgrass	None	Introduced
Polygonum aviculare	prostrate knotweed	None	Introduced
Raphanis sativa	wild radish	None	Introduced; Cal-IPC Limited

Scientific Name	Common Name	Status	Native or Introduced
Rumex pulcher	fiddle dock	None	Introduced
Tragopogon porrifolius	salsify	None	Introduced
Trifolium depauperatum var. *truncatum*	dwarf sack clover	None	Native
Trifolium hirtum	rose clover	None	Introduced; Cal-IPC Limited
Triteleia hyacinthina	white brodiaea	None	Native
Typha spp.	cattails	None	Native
Veronica peregrina ssp. *xalapensis*	purslane speedwell	None	Native
Vicia sativa ssp. *nigra*	narrow-leaved vetch	None	Introduced; Weeds of CA
Festuca myuros	rat-tail fescue	None	Native
Graminoids			
Alopecurus saccatus	foxtail	None	Native
Avena fatua	wild oats	None	Introduced; Cal-IPC Moderate
Bromus diandrus	ripgut brome	None	Introduced; Cal-IPC Moderate
Bromus hordeaceus	soft chess	None	Introduced; Cal-IPC Limited
Cynodon dactylon	Bermuda grass	None	Introduced; Cal-IPC Moderate
Digitaria sp.	crabgrass	None	Native
Eleocharis macrostachya	common/pale spike-rush	None	Native
Festuca perennis	Italian ryegrass	None	Introduced; Cal-IPC Moderate
Festuca myuros	rattail sixweeks grass	None	Introduced; Cal-IPC Moderate
Lythrum hyssopifolia	hyssop loosestrife	None	Introduced; Cal-IPC Moderate
Lolium perenne	perennial ryegrass	None	Introduced; Cal-IPC Moderate
Hordeum brachyantherum	meadow barley	None	Native
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	None	Introduced; Cal-IPC Moderate
Juncus balticus ssp. *Ater*	Baltic rush	None	Native
Juncus bufonius	toad rush	None	Native

Cal-IPC = California Invasive Plant Council

Wildlife Species Observed within the Biological Study Area

Scientific Name	Common Name	Status[1]	Native or Introduced
Birds			
Agelaius phoeniceus	red-winged blackbird	None; MBTA/CFGC	Native
Aphelocoma californica	California scrub jay	None; MBTA/CFGC; CDFW:WL	Native
Branta canadensis	Canada goose	None; MBTA/CFGC	Native
Buteo jamaicensis	red-tailed hawk	None; MTBA/CFGC	Native
Buteo swainsoni	Swainson's hawk	ST; MBTA/CFGC	Native
Calypte anna	Anna's hummingbird	None; MBTA/CFGC	Native
Cathartes aura	turkey vulture	None; MBTA/CFGC	Native
Charadrius vociferus	killdeer	None; MBTA/CFGC	Native
Corvus brachyrhynchos	American crow	None; MBTA/CFGC	Native
Corvus corax	common raven	None; MBTA/CFGC	Native
Haemorhous mexicanus	house finch	None; MBTA/CFGC	Native
Hirundo rustica	barn swallow	None; MBTA/CFGC	Native
Melospiza melodia	song sparrow	None; MBTA/CFGC	Native
Mimus polyglottos	northern mockingbird	None; MBTA/CFGC	Native
Passer domesticus	house sparrow	None	Introduced
Pica nuttalli	yellow-billed magpie	None; MBTA/CFGC; USFWS:BCC	Native
Sayornis nigricans	black phoebe	None; MBTA/CFGC	Native
Streptopelia decaocto	Eurasian collared dove	None	Introduced
Sturnus vulgaris	European starling	None	Introduced
Tyrannus verticalis	western kingbird	None; MBTA/CFGC	Native
Zenaida macroura	mourning dove	None; MBTA/CFGC	Native
Reptiles			
Sceloporus occidentalis	western fence lizard	None	Native
Invertebrates			
Helminthoglypta sp.	unknown shoulderband snail	None	Native

[1] Notes:
ST = State Threatened
MBTA = Migratory Bird Treaty Act
BCC = Birds of Conservation Concern
CDFW = California Department of Fish and Wildlife
WL = Watch List
CFGC = California Fish and Game Code Section 3503

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Appendix C

Representative Site Photographs

Note to Reader

- Photographs #1 – # 9 are on the northern BSA (PG&E parcel)
- Photographs #10 – #16 are on the southern BSA (BESS parcel)

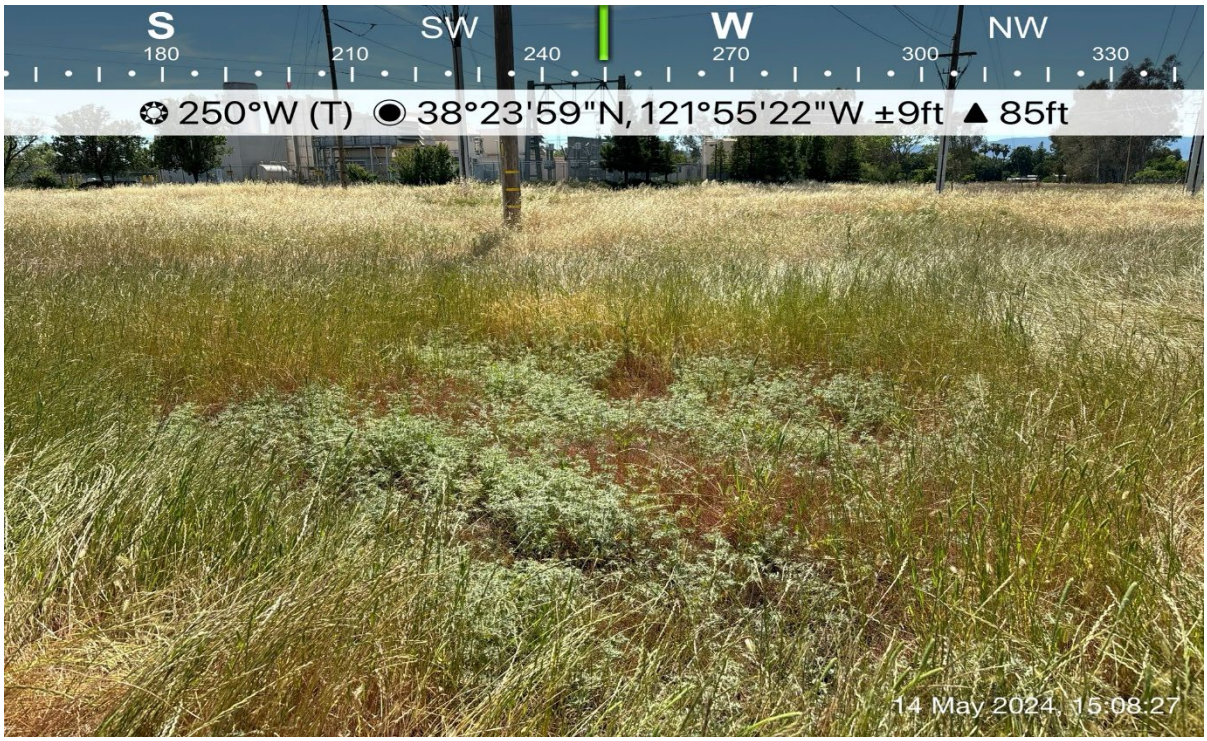
Photograph 1. View of the Swale from the northern portion of the Biological Study Area, facing southwest. April 25, 2023.

Photograph 2. View of the Swale and non-native grassland within the Biological Study Area, facing northeast. PG&E Vaca-Dixon Substation shown on righthand side of photo. May 14, 2024.

Photograph 3. View facing north of a portion of Seasonal Wetlands 1 and 2 (center and eastern portions of the photo). April 24, 2023.

Photograph 4. View of Seasonal Wetland 3 after the grass had been mowed, facing west. July 24, 2024.

Photograph 5. View of Seasonal Wetland 4, facing north. April 24, 2023.



Photograph 6. View of Seasonal Wetland 5's hydrophytic vegetation, facing southwest. May 14, 2024.

Photograph 7. View of the blow wives (*Achyrachaena mollis*) in Seasonal Wetland 6, facing east. May 14, 2024.

Photograph 8. View of Seasonal Wetland 8 prior to the grass being mowed, facing north. May 14, 2024.

Photograph 9. View of culvert in the Swale on the northern BSA, facing south. July 24, 2024.

Photograph 10. View of Seasonal Wetland 9 on the southern BSA, facing west. July 14, 2025.

Photograph 11. View of SP20, taken from Seasonal Wetland 9. July 14, 2025.

Photograph 12. View of Agricultural Ditch 1, south of the BSA, facing west. July 14, 2025.

Photograph 13. View of Agricultural Ditch 2, northeast of the southern portion of the BSA, facing northeast. July 14, 2025.

Photograph 14. View of Agricultural Ditch 3, northeast of the southern portion of the BSA and east of I.80, facing northeast. July 14, 2025.

Photograph 15. View between the rows of plum (*Prunus* sp.) within the orchard areas in the southern BSA.. July 14, 2025.

Photograph 16. View of the barren/ruderal areas in the eastern portion of the southern BSA, facing south. July 14, 2025.

Appendix D

Burrowing Owl Survey Report

Rincon Consultants, Inc.
601 University Avenue, Suite 221
Sacramento, California 95825
916-706-1374

September 26, 2025
Project No: 25-17851

Robert Ray
Patch Services, LLC
333 Sunset Avenue, Suite 210
Suisun City, California 94585
Via email: rray@patchservices.com

Subject: Burrowing Owl Habitat Assessment and Protocol Survey Results for the Vaca Dixon Power Center Battery Energy Storage System Project in Solano County, California

Dear Mr. Ray:

Rincon Consultants, Inc. (Rincon) is pleased to provide this report documenting the findings of a western burrowing owl (*Athene cunicularia*) habitat assessment and protocol-level breeding season surveys conducted for the Vaca Dixon Power Center Project (Project), specifically within the southern portion of the Project area where the battery energy storage system (BESS) is proposed (BESS Project area), within a 10-acre parcel (Accessor's Parcel Number 0133-060-060) located in the City of Vacaville, California. Please refer to Attachment 1: Figure 1 and Figure 2 for illustrations of the Project location.

Western Burrowing Owl Natural History

The western burrowing owl (burrowing owl) is a California Endangered Species Act (CESA) candidate species. Burrowing owls prefer desert, grassland, and shrubland habitat with the presence of fossorial mammals, whose burrows are used for nesting and roosting (Klute et al. 2003). The burrowing owl is a yearlong resident of open grasslands, especially prairie, plains, and savanna, and sometimes other open areas such as vacant lots near human habitation or airports. This species spends much of its time on the ground or on low perches such as fence posts, and nests in abandoned burrows such as those dug by ground squirrels, desert kit foxes, and badgers (Zeiner et al. 1990). During migration and winter, burrowing owls are more widespread in lowland areas of the state and reach offshore islands (Shuford and Gilardi. 2008).

The burrowing owl is crepuscular (active primarily during dusk and dawn) and perches during daylight hours at the entrance to its burrow or on low posts. Nesting typically occurs from March through August. Burrowing owls form a pair-bond for more than one (1) year and exhibit high site fidelity, reusing the same burrow year after year. The female remains inside the burrow during most of the egg laying and incubation periods and is fed by the male through the brooding period. Burrowing owls are opportunistic feeders, consuming a diet that includes arthropods, small mammals, birds, and occasionally amphibians and reptiles (Shuford and Gardali 2008). Typical burrowing owl sign includes, but is not limited to, feathers, white-wash, and pellets.

The burrowing owl was once abundant and widely distributed in coastal southern California, but it has declined in counties such as Los Angeles, Orange, San Diego, Riverside, and San Bernardino. Urbanization has greatly reduced the amount of suitable habitat for this species. Other contributions to the decline of burrowing owls include habitat destruction, insecticide poisoning, rodenticide for squirrels and prairie dogs, and collisions with automobiles (Shuford and Gardali 2008).

Methodology

Prior to conducting field surveys, Rincon conducted a literature and database review. This review included a review of eBird (http://ebird.org; eBird 2025), and a query of the California Natural Diversity Database (CNDDB; CDFW 2025a) and Biographic Information and Observation System (BIOS; CDFW 2025b). The review encompassed the following 7.5-minute U.S. Geological Surveys quadrangles: *Allendale*, *Elmira, Dozier, Dixon, Merritt, Winters, Monticello Dam, Mt. Vaca, and Fairfield North,* California, and/or a 10-mile radius around the Project area.

Due to site access restrictions on the northern portion of the Project area, field surveys were initiated exclusively within the BESS Project area. Rincon biologists, skilled in burrowing owl life history with experience identifying burrowing owls and their sign, conducted a total of four field surveys within the BESS Project area and a 150-meter (~500-foot) survey buffer (herein referred to as the survey area; Attachment 1: Figure 3) during the typical breeding season for burrowing owls. Please refer to Table 1, below, for a summary of the surveys conducted is included in Table 1 below. The surveys were conducted according to guidelines outlined in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). Field surveys were performed by systematically searching for potential foraging and nesting habitat within the survey area. The survey area was assessed on foot by the biologists walking transects spaced approximately 15 meters apart, appropriately adjusted to allow for 100 percent visual coverage of the ground surface. Areas within the survey area that were inaccessible (i.e., Interstate-80 [I-80], Kilkenny Road, canals, and private property) were investigated with binoculars to the greatest extent possible. During each survey, potentially suitable burrows, that may be used by burrowing owl, were documented using a handheld Global Positioning System unit capable of recording positions at sub-meter accuracy. Other signs of burrowing owl were also noted as applicable, such as whitewash around burrows, owl pellets, eggshell fragments, prey remains, owl feathers, or owl observations; however, sign was not observed during the surveys. Representative site photographs captured during the survey effort are provided as Attachment 2.

Table 1 Survey Dates and Site Conditions

Date	Time (24-hour)	Surveyor(s)	Air Temp (°F)	Wind Speed (mph)	Weather Notes
April 14, 2025	0710 – 0930	Nicole Carpenter Grace Myers	53-60	10-12	0% cloud cover
May 7, 2025	0700 – 0845	Grace Myers	59-61	5-10	0% cloud cover
June 2, 2025	0630 – 0815	Grace Myers	58-60	5-7	0% cloud cover
July 14, 2025	0710 – 0900	Owen Routt Grace Myers	63-79	0-1	0% cloud cover

Summary of Findings

Database Search and Literature Review

There are 79 documented occurrences of burrowing owl in the nine-quad CNDDB search area (CDFW 2025a). Of those 79 occurrences, the closest occurrence was recorded approximately 1.25 miles southwest of the Project area in 2004, with fourteen additional observations recorded within 5-miles of the Project area (CDFW 2025a). According to eBird, there are many documented observations of burrowing owl within 5-miles of the Project area, with the closest observation made 1.25 miles northeast of the Project area in 2024 (eBird 2025).

Survey Area

The survey area consists primarily of an existing orchard, a row crop of plum trees that is regularly maintained (e.g., mowing, disking, herbicides) and bound by agricultural dirt roads. I-80 occurs within the northern extent of the survey area, and a Pacific Gas and Electric (PG&E) transmission line easement to the east, characterized as barren/ruderal habitat mostly devoid of vegetation with presence of non-native grasses that are routinely mowed and/or disked. Rotational agricultural lands occur within the southern portion of the 500-foot survey buffer that are routinely disked and rotated seasonally. The survey area also consists of ditches/canals associated with agricultural activities. Please refer to Attachment 1: Figure 4 for an illustration of the vegetation and other land cover documented within the survey area.

The survey area is relatively flat, with elevations between approximately 79 to 84 feet above mean sea level. Based on the most recent U.S. Department of Agriculture, Natural Resources Conservation Service (USDA, NRCS) soil survey for Solano County, California (USDA, NRCS 2019), the survey area contains Clear Lake clay, 0 to 2 percent slopes, MLRA 17, San Ysidro sandy loam, San Ysidro sandy loam, 0 to 2 percent slopes, and San Ysidro sandy loam, thick surfaces, 0 to 2 percent slopes.

Protocol Surveys

During the field surveys, no burrowing owls, or sign of burrowing owls, were observed. Potentially suitable burrows, created by California ground squirrel (*Otospermophilus beecheyi*), were observed, specifically within the eastern portion of the survey area (Attachment 1: Figure 4). Overall avian activity was low during the surveys, however, common species expected to occur within agricultural or urbanized areas were observed. Bird species observed included red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsonii*), killdeer (*Charadrius vociferus*), American crow (*Corvus brachyrhynchos*), house finch (*Haemorhous mexicanus*), American goldfinch (*Spinus tristis*), Eurasian collared dove (*Streptopelia decaocto*), European starling (*Sturnus vulgaris*), and mourning dove (*Zenaida macroura*).

Discussion

Burrowing owls have been documented within 1.25 miles of the Project area (CDFW 2025; eBird 2025). The survey area does offer short vegetation, small berms associated with the agricultural ditches/canals; however, the plum trees within the orchard restrict an open line of sight, in which burrowing owls prefer while foraging for food. Additionally, the I-80 corridor along the northern extent of the survey area is a significant movement barrier and hazard for burrowing owls. California ground squirrel burrows and burrow complexes were observed within the survey area that may provide suitable burrowing habitat for burrowing owls; however, no burrowing owls or sign of burrowing owls were observed during the focused breeding season survey effort. Based on the information retained from the literature/database review and protocol survey effort, the overall habitat suitability for burrowing owl within the survey area can be considered low and no burrowing owls currently occupy the survey area during the breeding season.

Thank you for the opportunity to work with you on this Project. Please contact us if you have any questions or concerns regarding the information presented herein.

Sincerely,
Rincon Consultants, Inc.

Grace Myers
Biologist

Thea Benson
Senior Biologist

Attachments

Attachment 1 Figures

Attachment 2 Representative Site Photographs

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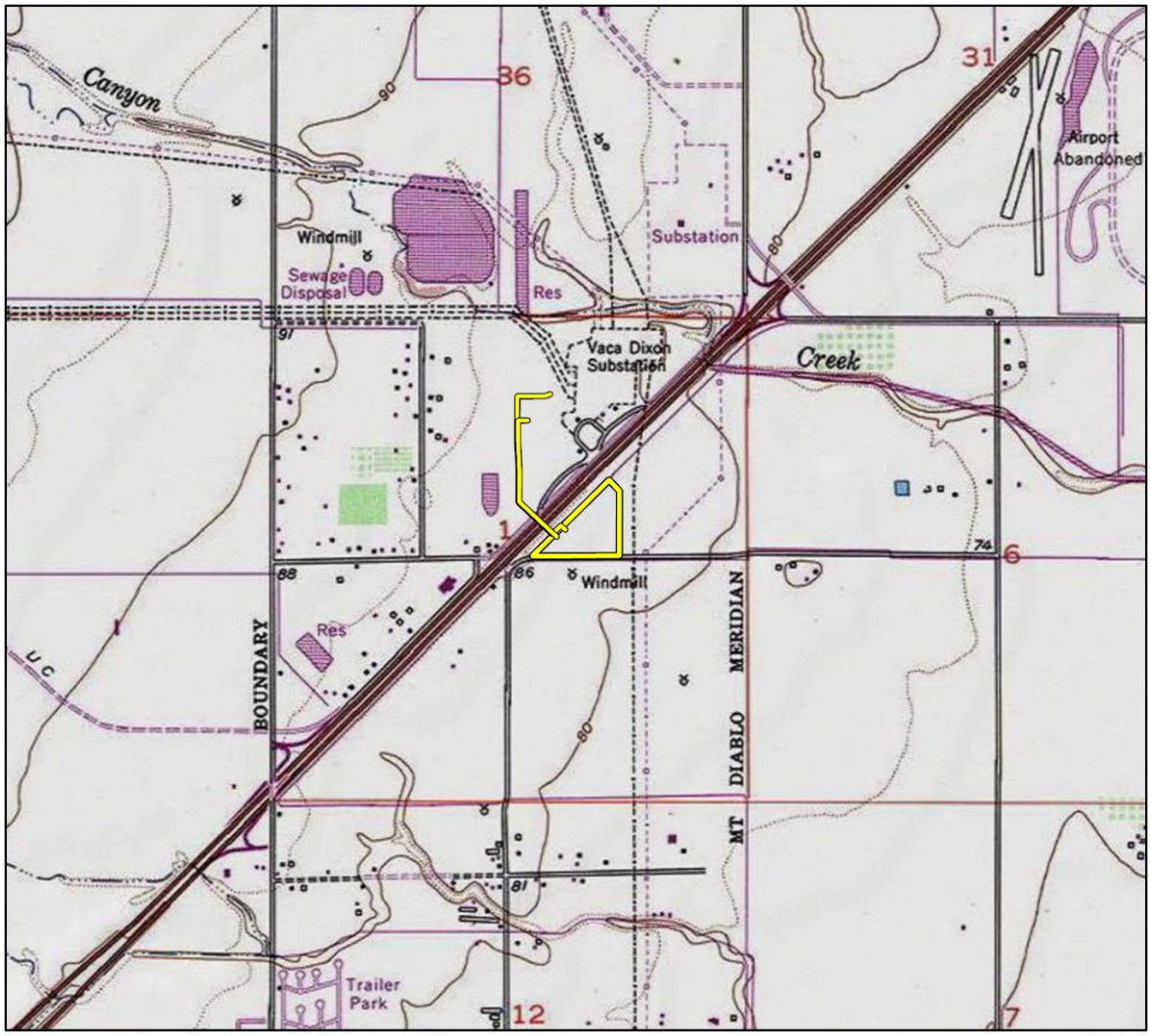
Attachment 1

Figures

Figure 1 Project Location



Basemap provided by National Geographic Society, Esri and their licensors © 2025. Allendale Quadrangle. T06N R01W S01. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

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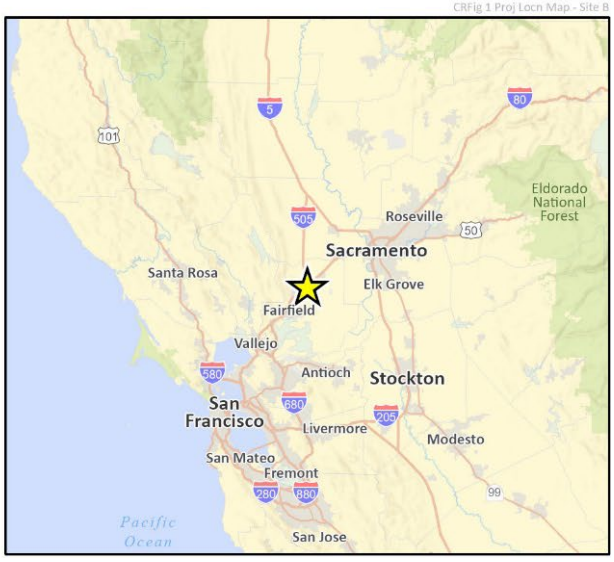
CRFig 1 Proj Locn Map - Site B



Project Area

0 1,000 2,000 Feet

N

Figure 2 Project Components Within BESS Project Area and 500-foot Survey Buffer

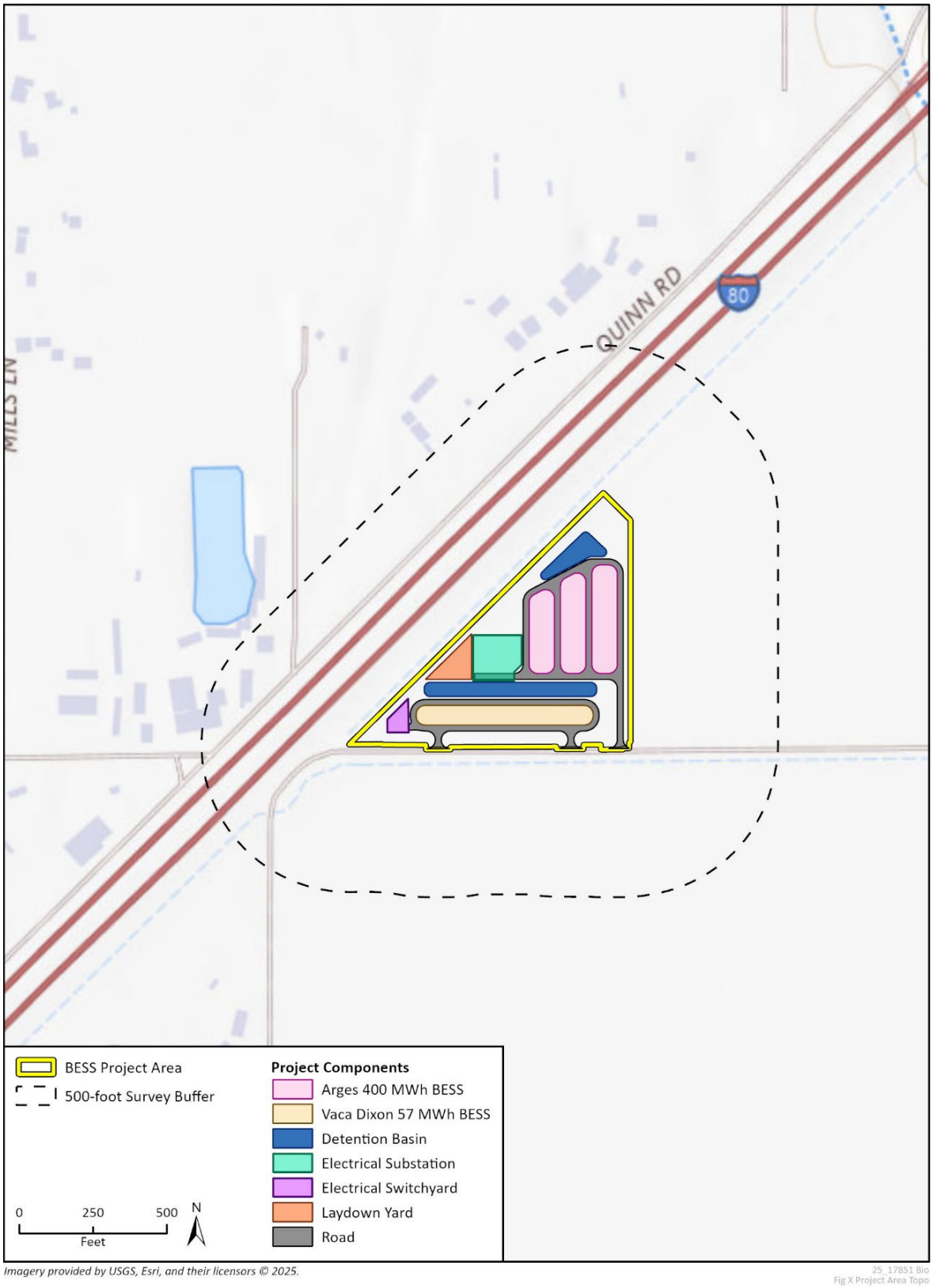


Figure 3 BESS Project Area and 500-foot Survey Buffer (Survey Area)

Imagery provided by Esri and its licensors © 2025.

25_17851 Bio
Fig X Project Area

Figure 4 Vegetation Communities/Land Cover Types and Suitable Burrows Within Survey Area

Attachment 2

Representative Site Photographs

Photograph 1. View of the orchard land cover type within the survey area, facing north. April 14, 2025.

Photograph 2. View of the mowed field in the southern extent of the survey area, facing south. April 14, 2025.

Photograph 3. View of the canal and agricultural areas within the southern extent of the survey area, facing west. April 14, 2025.

Photograph 4. View of the ditch that runs north-south along the northern extent of the survey area, facing northeast. April 14, 2025.

Photograph 5. View of suitable burrows observed along northeastern boundary of the survey area, facing northwest. April 14, 2025.

Photograph 6. View of burrows underneath transmission tower in the eastern extent of the survey area, facing north. April 14, 2025.

Photograph 7. View of burrows documented underneath transmission tower in the eastern extent of survey area, facing northwest. April 14, 2025.

Appendix E

Dry Season Large Branchiopod Protocol Sampling Results (2024)

REVISED PROTOCOL-LEVEL DRY-SEASON SAMPLING FOR FEDERALLY-LISTED LARGE BRANCHIOPODS AT THE VACA DIXON BATTERY ENERGY STORAGE SYSTEM PROJECT, SOLANO COUNTY, CALIFORNIA (USFWS # RP-VACA DIXON SITE-2023-0824)

Prepared for:

Rincon Consultants, Inc.
Environmental Scientists | Planners | Engineers

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September 2023
(Revised June 2024)

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REVISED PROTOCOL-LEVEL DRY-SEASON SAMPLING FOR FEDERALLY-LISTED LARGE BRANCHIOPODS AT THE VACA DIXON BATTERY ENERGY STORAGE SYSTEM PROJECT, SOLANO COUNTY, CALIFORNIA (USFWS # RP-VACA DIXON-2023-0824)

INTRODUCTION

Helm Biological Consulting (HBC), a division of Tansley Team, Inc., was contracted by Rincon Consultants, Inc. to conduct protocol-level dry-season sampling for large branchiopods (fairy shrimp, tadpole shrimp, and clam shrimp) that are listed as threatened or endangered under the federal Endangered Species Act (ESA) (e.g., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardi*]) at the Vaca-Dixon Battery Energy Storage System Project (hereafter Project).

The Project consists of 4.6 acres and is located on the north side of Interstate 80, east of Leisure Town Road, and south of Midway Road, Solano County, California (Figure 1). Additionally, the Project is located within the southwest ¼ of the northeast ¼ of Section 1, Township 6 North, Range 1 West, and Mount Diablo Base and Meridian of the Allendale 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map; approximate center coordinates in decimal degrees (North American Datum [NAD83]) are: 38.397721, -121.923819 (Figure 2).

The remainder of this report discusses the methods and results of the 2023 and 2024 dry-season sampling for the presence of federally-listed large branchiopods at the Project.

"I certify that the information in this survey report fully and accurately represents my work."

Brent P. Helm
(TE-795930-12)

Signature 

Date 06-14-2024

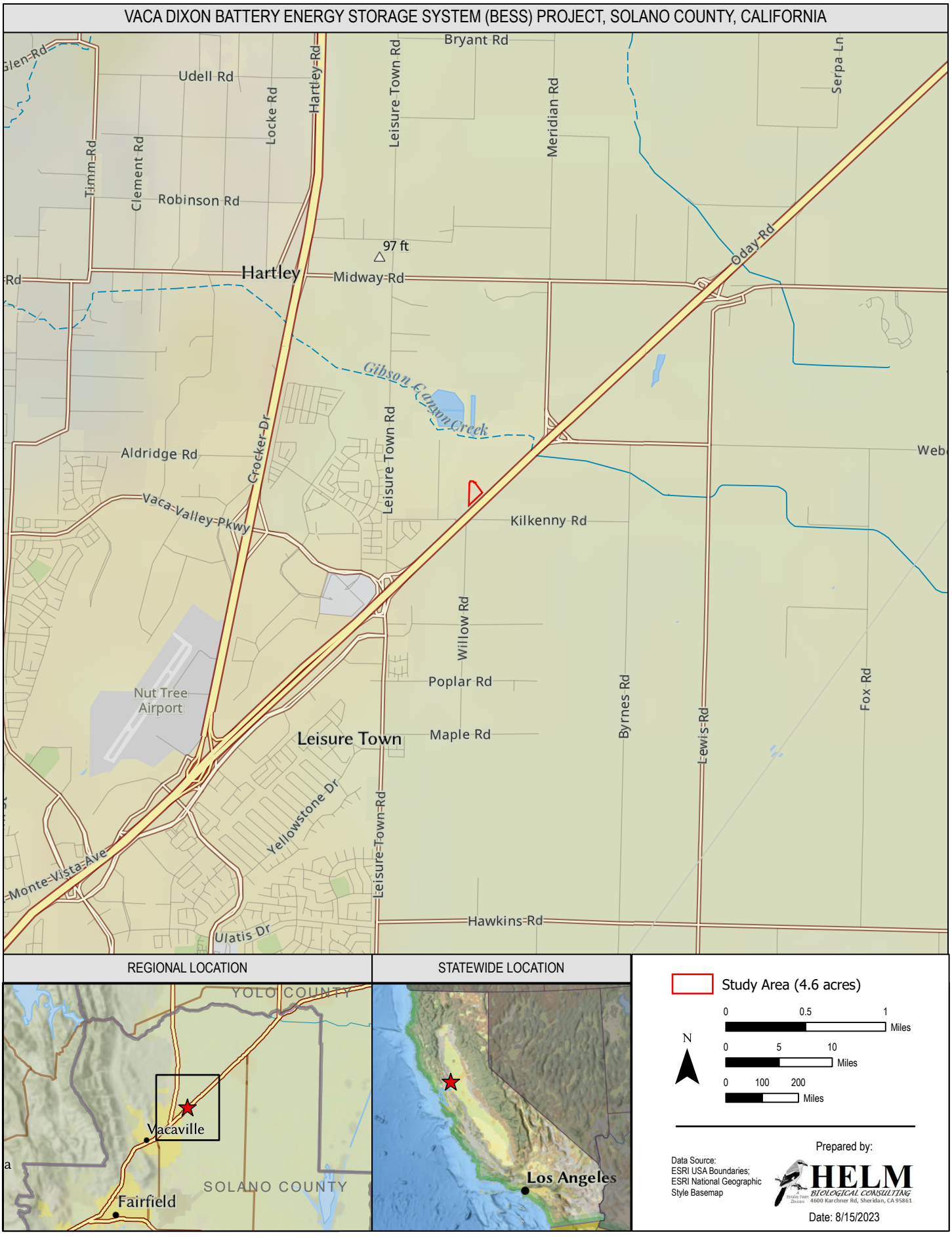

Figure 1. Project Vicinity

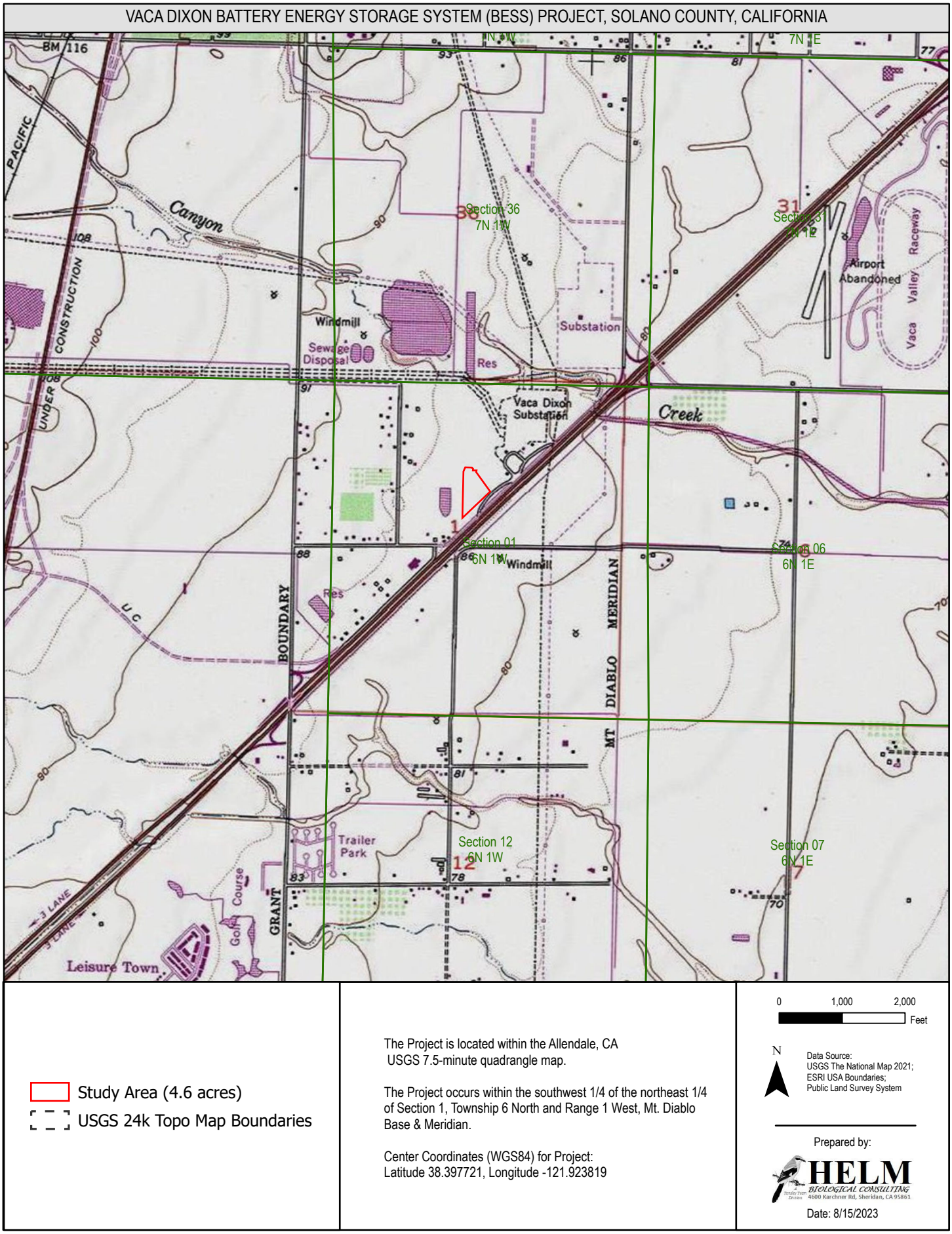

Figure 2. Project Location

METHODS

Dr. Brent Helm of HBC conducted dry-season sampling on August 30, 2023 with the assistance of Ms. Kathleen Colima Aguirre (HBC) as authorized by the U.S. Fish and Wildlife Service (USFWS) (Appendix A) under recovery permit TE-795930-12 of Section 10(a)(1)(A) of the federal Endangered Species Act, 16 U.S.C. 1531 *et seq*., and its implementing regulations. An additional depression ponding at a sufficient duration and depth to support large branchiopods was observed during the wet-season sampling (HBC 2024) and sampled using dry season techniques on May 18, 2024. Dry-season sampling methods followed USFWS's (2017) *Survey Guidelines for the Listed Large Branchiopods* for dry-season sampling as described below.

SOIL COLLECTION

Dry-season sampling was conducted in all basins (habitats) within the Project with the potential to support federally-listed large branchiopods. A map of these habitats, including wetlands (Figure 3), was utilized to target appropriate habitats for sampling.

Habitat characteristics of large branchiopods are based on the life history of Central Valley endemics (Eriksen and Belk 1999; Helm 1998, 1999; Helm and Vollmar 2002, Helm and Noyes 2016). The presence of water marks, algae mats, drift lines, hydrophytic vegetation ("water-loving plants"), slope, contributing watershed, maximum potential ponding depth, and aquatic arthropods (i.e., crustaceans and insects) exoskeletons were helpful indicators for evidence of ponding depth and duration. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages), semi-to-permanently inundated areas that support population of predators (e.g., bullfrogs, fish, and crayfish), and habitats that receive water during the dry season (i.e., artificial water sources) were not generally considered suitable habitat for federally-listed large branchiopods.

Soil samples were collected mainly from the lowest topographic areas within each sampled basin. Soil samples were placed in liter size plastic sealable bags and marked with the Project name, basin, and date. Representative photographs were taken of the basins sampled (Appendix B). The soil was then transported to HBC for processing and analysis as described below.

SOIL PROCESSING AND ANALYSIS

In HBC's laboratory, a brine solution was prepared by mixing table salt (NaCl) with lukewarm tap water in a large container. The collected soil material was placed in the brine solution. The soil material was then gently worked by hand to breakdown any persistent soil structure. The organic material rising to the top of the brine solution was skimmed off and placed in a 600-micron diameter pore-size sieve stacked atop a 75-micron diameter pore-size sieve. The soil material was processed through the top sieve by flushing it with lukewarm tap water while gently rubbing it

with a soft-bristle brush. The soil retained from the 75-micron diameter pore size sieve was then removed and thinly (≈1.0 mm) spread into plastic petri dishes.

The contents of each petri dish were examined under a 10 to 252-power zoom binocular microscope. A minimum of 0.5-hour was spent searching the contents of each petri dish for large branchiopod cysts (embryonic eggs). Dr. Helm's large branchiopod cyst reference collection and scanning electron micrographs of cysts (Belk 1989, Brendock *et al*. 2008, Gilchrist 1978, Hill and Shepard 1998, Mura 1991, and Rabet 2010) were used to identify and compare any cysts observed within the soil samples. This processing method (described above) favors the detection of cysts belonging to the genera *Branchinecta*, *Lepidurus*, and *Streptocephalus* since these three genera have species that are federally listed. However, this method is less precise in detecting the presence of *Linderiella* cysts since they are fragile and often lose their spines in the process, rendering their external cyst morphology similar to other invertebrates (e.g., copepods and hydracarina) eggs/cysts. Evidence of other aquatic macroinvertebrates encountered were also noted on the laboratory data sheet.

Figure 3. Basins Sampled

CYST CULTURING

Petri dishes containing soils with *Branchinecta* cysts were placed into individual six-quart plastic containers. The soils were saturated with 50° F well water (non-chlorinated) and allowed to dry. This saturation and drying process was repeated three times. The soils were then inundated completely with 50° F well water. The containers holding the inundated soils were inserted into an environmental chamber. The environmental chamber controls were set to mimic the winter light, humidity, and temperature fluctuations of the Project's vicinity. The contents of the containers were monitored daily for fairy shrimp hatchlings (instars).

If no hatchlings were observed after ten (10) days, the containers were removed from the environmental chamber and the soils were allowed to completely dry before reinitiating the hatching process described above. A total of three hatching attempts were performed on each soil sample.

Fairy shrimp hatchlings were feed ground fish food and reared in the environmental chamber until they were mature enough to be identified using dichotomous keys and diagrams from "Fairy Shrimps of California's Puddles, Pools, and Playas" (Eriksen and Belk 1999); along with comparisons to Dr. Helm's large branchiopod reference collection.

RESULTS

SOIL COLLECTION

Soils were collected from seven basins onsite that could potentially support federally-listed large branchiopods (Figure 3).

SOIL ANALYSIS

Cysts belonging to the genus *Branchinecta* were observed in soils collected from basin 1 and basin 3 (Table 1). Representative photographs of sampled basins are provided in Appendix B.

CYST CULTURING

After three hatching attempts, zero fairy shrimp were hatched and raised to maturity.

Table 1. Results of Soil Examinations for Rincon- Vaca Dixon- Solano County, California.

Basin No.	Insect Exo-Skeletons	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Large Branchiopod Cysts *Branchinecta* sp.	Hydracarina Live	Nematoda	Collembola
1	X	X	X	Low			X
1A	X			None			X
2	X			None			X
3	X			Low	X	X	X
4	X			None			X
5	X	X		None			
6	X	X	X	None			X

X = Present

*Abundance categories are derived from USFWS's Survey Guidelines for the Listed Large Branchiopods - Section VI(d) (none = no cysts found in sample; low abundance = estimate of 1-10 cysts/100 ml soil; medium abundance = estimate of 11-50 cysts/100 ml soil; high abundance = estimate of more than 50 cysts/100 ml soil)

CONCLUSION

Cysts belonging to the genus *Branchinecta* were observed in soils collected from Basins 1 and Basin 3 in low abundance (<10 Cysts). None of the cysts observed were successfully hatched and raised to maturity. Due to the cysts inability to hatch, the survey was unable to conclusively determine presence or absence of the federally-threatened vernal pool fairy shrimp.

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