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APPENDIX 4.4-A: BIOLOGICAL RESOURCES REPORT

BIOLOGICAL RESOURCES REPORT FOR THE CORBY BATTERY ENERGY STORAGE SYSTEM PROJECT

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Acronyms and Abbreviations

Applicant	Corby Energy Storage, LLC
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CNPS	California Native Plant Society
CWA	Clean Water Act
ESA	Endangered Species Act
gen-tie line	generation tie line
kV	kilovolt
MBTA	Migratory Bird Treaty Act
PG&E	Pacific Gas & Electric
Project	Corby Battery Energy Storage System Project
USFWS	U.S. Fish and Wildlife Service
USGS	U.S Geological Survey

Executive Summary

Corby Energy Storage, LLC, proposes to construct, own, and operate the Corby Battery Energy Storage System Project (Project) on approximately 40.3 acres of privately owned land in Solano County, California. The Project includes the construction of a battery energy storage system, associated Project substation, inverters, and other ancillary facilities. Ancillary facilities encompass another approximately 29.2 acres for a total project disturbance area of approximately 69.5 acres. To comply with regulatory requirements, ICF conducted a Biological Resource Assessment for the Project to collect and review information on biological resources, including special-status species and their habitats, with potential to occur within the vicinity of the Project Area. The Project is planned to be permitted through the California Energy Commission under an "opt-in" process and information presented within this Biological Resource Assessment is consistent with standards described in California Code of Regulations Title 20, Division 2, Chapter 5 Appendix B§13 *Information Requirements for an Application for Certification (AFC) or Small Power Plant Exemption (SPPE;* CCR 2023).

A desktop literature review and biological resource surveys were conducted at the Project to evaluate the occurrence, quality, and extent of biological resources in the Project Area and surrounding vicinity. The majority of land cover in the Project Area consists of habitat converted to agricultural uses including orchard and dryland agriculture; a portion of the Project spans the Interstate 80 corridor and connects to an existing substation, reducing the likelihood of occurrence of most special-status plant and wildlife species. Although the existing highly anthropogenically modified landscape precludes occurrence of most species and blocks wildlife movement and connectivity, three special-status bird species were observed using the Project Area or vicinity during surveys including burrowing owl (CDFW Species of Special Concern), Swainson's hawk (California Threatened), and white-tailed kite (CDFW Fully Protected). Based on observations of these species during surveys and presence of suitable nesting and foraging habitat. These species would likely occupy portions of the Project Area, depending on the time of year (e.g., breeding, nonbreeding periods). Orchards, non-native forest, and electrical poles provide suitable nesting and foraging habitat for other nonspecial-status bird species.

Aquatic resources (wetlands and waters of the U.S.) were delineated within and 250 feet surrounding the Project Area. Four types of aquatic resources were mapped including basin, ditch, intermittent riverine, and palustrine emergent seasonal wetland. A preliminary jurisdictional analysis determined the intermittent riverine feature, consisting of a reach of Gibson-Canyon Creek may be considered jurisdictional under Section 404 of the Clean Water Act per Code of Federal Regulations 328.3.b.3 and Section 1600 et. seq. of the Fish and Game Code because of its connectivity to a tidal slough. Waters of the State include the seasonal wetlands, ditches, and basins per Porter-Cologne Act and under the jurisdiction of the Central Valley Regional Water Quality Control Board/State Water Board. A full report of the wetland/waters delineation is appended to this report.

Chapter 1
Introduction

Corby Energy Storage, LLC (Applicant), proposes to construct, own, and operate the Corby Battery Energy Storage System Project (Project) on an approximately 40.3 acre privately owned parcel The Project will include a 300-megawatt (MW) battery energy storage system (BESS), associated Project substation, inverters, and other ancillary facilities, such as fencing, roads, a retention basin, and a supervisory control and data acquisition (SCADA) system. in Solano County, California. On behalf of the Applicant, ICF conducted a Biological Resource Assessment for the Project to collect and review information on biological resources, including special-status species and their habitats, with potential to occur within the vicinity of the Project Area. Information presented within this Biological Resource Assessment is consistent with standards described in California Code of Regulations (CCR) Title 20, Division 2, Chapter 5 Appendix B§13 *Information Requirements for an Application for Certification (AFC) or Small Power Plant Exemption (SPPE;* CCR 2023).

1.1 Project Location and Study Area

The approximately 69.5-acre Project Area is located in the middle of Solano County, along Interstate 80 (I-80) between the towns of Vacaville and Dixon, California. (Figure 1). The Project Area is within the Allendale 7.5-minute U.S. Geological Survey (USGS) quadrangle in Township 6 north, Range 1 east, Section 6; (38.39246° latitude, -121.90747° longitude is the approximate center of the Project Area).

The desktop Study Area consisted of a 10-mile radius (314 mile^2) surrounding the Project Area which overlapped thirteen 7.5-minute (1:24,000) USGS quadrangles located in three California counties (Table 1). The 10-mile desktop Study Area represented the largest area where biological resources were evaluated and varied among resource types (e.g., wildlife, habitats, wetlands). Chapter 2*, Methods*, describes the resource specific distances from the Project Area that were used in the assessment.

Table 1. USGS 7.5-minute quadrangles within the 10-mile Survey Area surrounding the Corby Energy Battery Storage System, Solano County, California.

Quad Name	USGS Quad Code	Associated County(ies)
Birds Landing	3812127	Solano
Denverton	3812128	Solano
Liberty Island	3812136	Solano, Yolo
Dozier	3812137	Solano
Elmira	3812138	Solano
Saxon	3812146	Solano, Yolo
Dixon	3812147	Solano
Allendale*	3812148	Solano
Merritt	3812157	Solano, Yolo
Winters	3812158	Solano, Yolo
Fairfield North	3812231	Solano, Napa
Mt. Vaca	3812241	Solano, Napa, Yolo
Monticello Dam	3812251	Solano, Napa, Yolo

* Project location

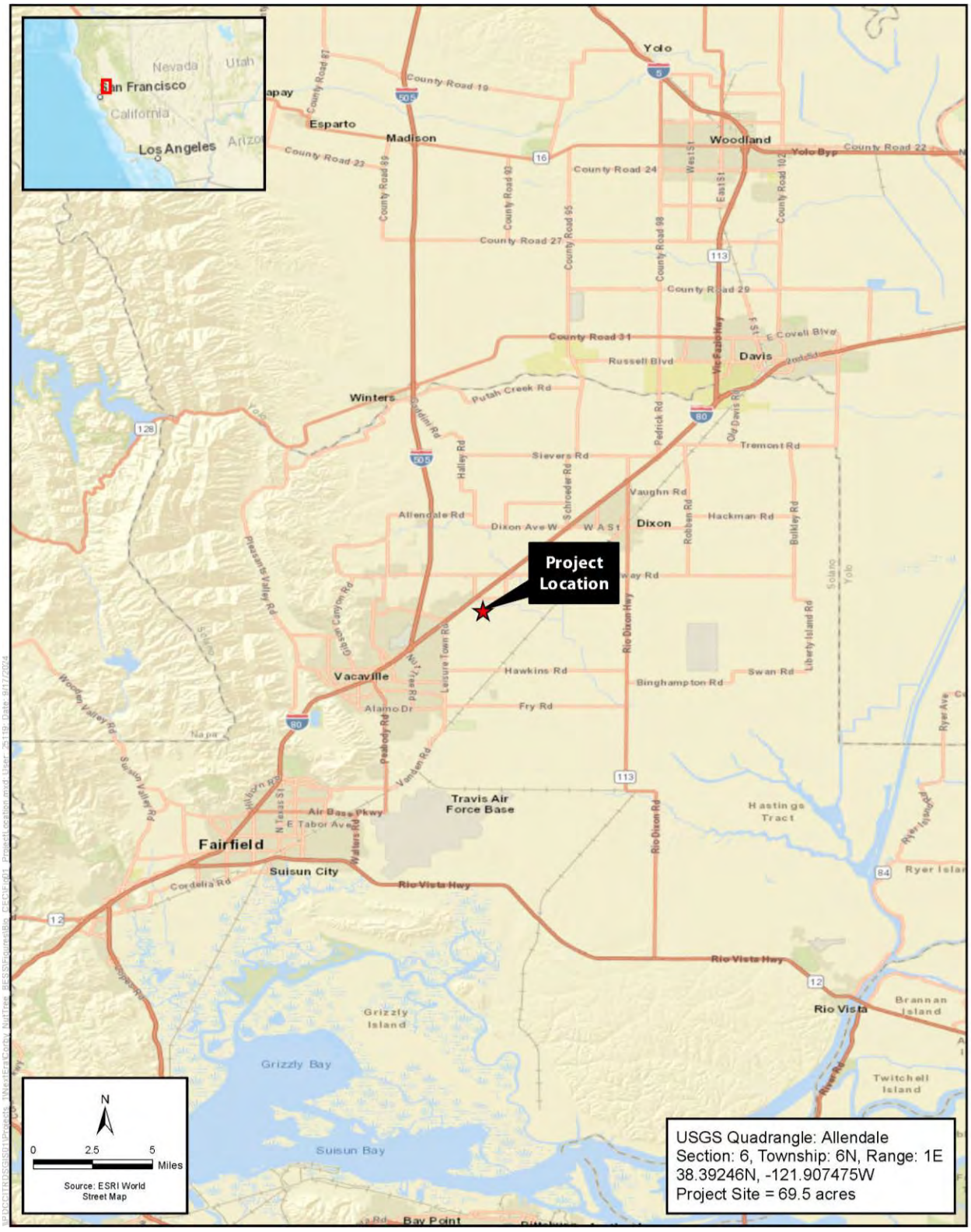

Figure 1. Project Location

1.2 Project Description

The Project will include a 300-megawatt (MW) battery energy storage system, associated Project substation, inverters, and other ancillary facilities, such as fencing, roads, a retention basin, and a supervisory control and data acquisition (SCADA) system (Figure 2). The proposed Project site is currently used as agricultural land for row crops. The surrounding land is also in agricultural use, including orchards to the south, irrigated pastures to the east and west, and rural residential use to the north.

The Project will connect to the Pacific Gas and Electric (PG&E) Vaca-Dixon Substation across I-80 and northwest of the Project site, using an approximately 1.1-mile long 230-kilovolt (kV) generation tie (gen-tie) line, portions of which will be installed overhead and underground. The underground portion of the gen-tie line will run east-west parallel to and crossing Kilkenny Road, either within acquired easements on adjacent parcels (Underground Route Option #1) or within the Kilkennney Road right-of way (Underground Route Option#2).

The overhead portions will include two structures on the Project site, four structures between Kilkenny Road and I-80 on private land owned by the Applicant, and up to four structures north of I-80 on PG&E-owned property adjacent to the Vaca-Dixon Substation, for a total of up to ten overhead gen-tie structures.

To accommodate the interconnection of the Project, PG&E will install a new 230-kV Double Bus (DB) Bay structure with associated foundations and supports on approximately 0.6 acres of the existing substation. This new bay will house four switch support structures and associated equipment for the new 230-kV connection. In addition, PG&E will also construct, own, and operate the portion of the gen-tie between the point of change of ownership (POCO) pole immediately south of I-80 and the first point of interconnection at the Vaca-Dixon Substation, including five of the ten structures.

The Project will be unstaffed after construction, with operational control from an offsite control room through the SCADA system. Operational staff will perform periodic inspections and maintenance as necessary.

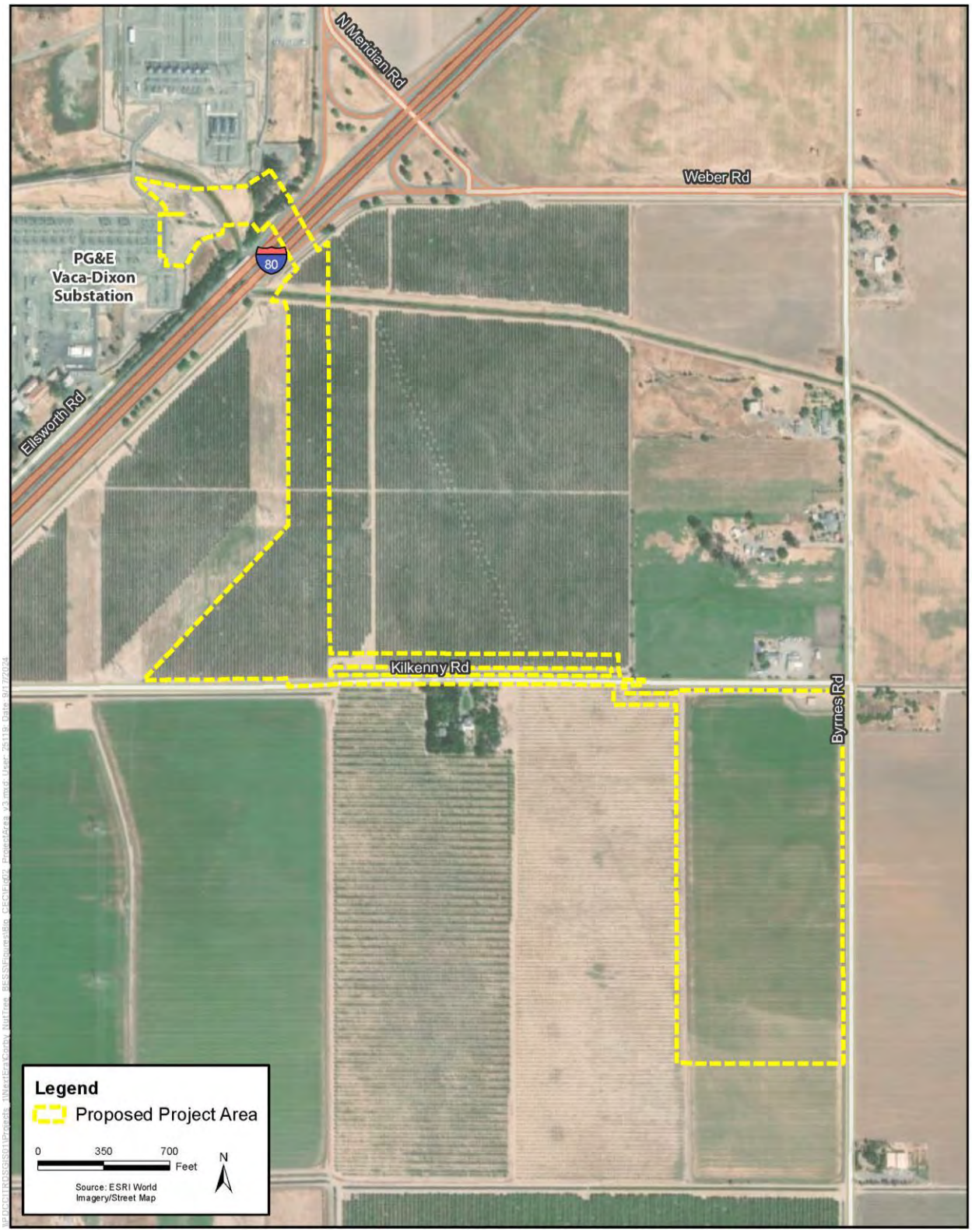

Figure 2. Project Area

1.3 Regulatory Setting

This section provides an overview of the major laws and regulations that may apply to biological resources that may be affected by the Project.

1.3.1 Federal Regulations

1.3.1.1 Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over species listed as threatened or endangered under Section 9 of the federal Endangered Species Act (ESA). ESA protects listed species from harm, or *take*, which is broadly defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." For any project involving a federal agency in which a listed species could be affected, the federal agency must consult with USFWS in accordance with Section 7 of ESA. USFWS issues a biological opinion and, if the Project does not jeopardize the continued existence of the listed species, issues an incidental take permit. When no federal context is present, proponents of a project affecting a listed species must consult with USFWS and apply for an incidental take permit under ESA Section 10. Section 10 requires an applicant to submit a habitat conservation plan that specifies project impacts and mitigation measures.

1.3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC Section 703, et seq.), enacted in 1918, provides for protection of international migratory birds and authorizes the Secretary of the Interior to regulate the taking of migratory birds. The MBTA of 1918 provides that it shall be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird. On December 22, 2017, the U.S. Department of the Interior's Office of the Solicitor issued a legal, revised interpretation (Opinion M-37050) of the MBTA's prohibition on the take of migratory bird species. Opinion M-37050 concludes that "consistent with the text, history, and purpose of the MBTA, the statute's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs." According to the Opinion M-37050, take of a migratory bird, its nest, or eggs that is incidental to another lawful activity does not violate the MBTA, and the MBTA's criminal provisions do not apply to those activities. Opinion M-37050 may affect how MBTA is interpreted but it does not legally change the regulation itself. The current list of species protected by the MBTA can be found in Title 50 CFR Section 10.13. The list includes nearly all birds native to the United States.

1.3.1.3 Clean Water Act

The Clean Water Act (CWA) was passed by Congress in 1972 with a broad mandate "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The chief purpose of the CWA is to establish the basic structure for regulating discharges of pollutants into Waters of the United States. The CWA operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool.

Section 404 of the CWA prohibits the discharge of dredged or fill material into Waters of the U.S. without a permit from the Army Corps of Engineers. Any activity that involves a discharge of dredged or fill material into Waters of the United States, including wetlands, is subject to regulation by the U.S. Army Corps of Engineers. *Waters of the United States* is defined to encompass navigable Waters of the United States; interstate waters; all other waters where their use, degradation, or destruction could affect interstate or foreign commerce; tributaries of any of these waters; and wetlands that meet any of these criteria or are adjacent to any of these waters or their tributaries. *Wetlands* are defined under Section 404 as those areas that are inundated or saturated by surface water 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. Jurisdictional wetlands must meet three wetland delineation criteria.

- They support hydrophytic vegetation (i.e., plants that grow in saturated soil).
- They have hydric soil types (i.e., soils that are wet or moist enough to develop anaerobic conditions).
- They have wetland hydrology.

In addition, Section 401 of the CWA (33 USC 1341) requires applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into Waters of the United States must apply for water quality certification from the state. Therefore, all projects with a federal component that may affect the quality of Waters of the state (including projects that require federal approval, such as a CWA Section 404 permit) must comply with CWA Section 401.

1.3.2 State Regulations

1.3.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of endangered and threatened species; however, habitat destruction is not included in the state's definition of *take*. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. CDFW administers CESA and authorizes take through Section 2081 agreements.

1.3.2.2 Fully Protected Species

The California Fish and Game Code (CFGC) provides protection from take for a variety of species, referred to as *fully protected species*. Section 5050 lists fully protected amphibians and reptiles, Section 3515 lists fully protected fish, Section 3511 lists fully protected birds, and Section 4700 lists fully protected mammals. The CFGC defines *take* as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research or authorized pursuant to an approved Natural Community Conservation Plan, all take of fully protected species is prohibited.

1.3.2.3 California Fish and Game Code

Section 3503 - Prohibits the take, possession, or needless destruction of the nest or eggs of any bird.

Section 3503.5 - Protects birds of prey (including eagles, hawks, falcons, kites, osprey, and owls) and prohibits the take, possession, or destruction of birds and their nests.

Section 3513 – Specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA

Section 3800 – It is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the California Fish and Game Commission or a mitigation plan approved by CDFW for mining operations.

1.3.2.4 Lake or Streambed Alteration Agreements

In addition to regulating listed and special-status species, CDFW regulates activities that would interfere with the natural flow—or substantially alter the channel, bed, or bank—of a lake, river, or stream. These activities are regulated under CFGC Sections 1600–1616 and require a streambed alteration agreement. Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. CDFW may require avoidance or minimization of vegetation removal, use of standard erosion control measures, limitations on the use of heavy equipment, limitations on work periods to avoid impacts on fish and wildlife, and restoration of degraded sites or compensation for permanent habitat losses, among other conditions.

1.3.2.5 California Environmental Quality Act

Section 15380 in the CEQA Guidelines addresses situations in which a project under review may have a significant effect on a species that has not been listed under the ESA, California ESA, or Native Plant Protection Act, but may meet the definition of endangered, rare, or threatened. Animal species identified as Species of Special Concern by CDFW, birds identified as Birds of Conservation Concern by USFWS, and plants identified by the CNPS as rare, threatened, or endangered may meet the CEQA definition of rare.

1.3.2.6 Species of Special Concern

Species of Special Concern are defined by CDFW as species, subspecies, or distinct populations of an animal native to California that are not legally protected under the federal ESA, California ESA, or CFGC, but fit one of the following criteria:

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

Depending on the policy of the lead agency, projects that result in significant impacts on Species of Special Concern may be considered significant under CEQA.

1.3.2.7 Sensitive Natural Communities

CDFW maintains the California Natural Community List, which provides a list of vegetation alliances, associates, and special stands as defined in the Manual of California Vegetation (Sawyer et al. 2009), along with their state and global rarity ranks. Natural communities with a state rarity rank of S1, S2, or S3 are considered sensitive. Depending on the policy of the lead agency, projects that result in significant impacts on sensitive natural communities may be considered significant under CEQA.

1.3.2.8 California Rare Plant Rank

The CNPS maintains the Inventory of Rare and Endangered Plants of California (CNPS 2023), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting these criteria are assigned to one of six California Rare Plant Ranks.

Depending on the policy of the lead agency, substantial impacts on plants ranked 1A, 1B, 2, and 3 are typically considered significant under CEQA Guidelines § 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 4 and at the discretion of the CEQA lead agency.

1.3.3 Local Plans and Ordinances

1.3.3.1 Solano County General Plan

The Solano County General Plan (2008) is a guide for both land development and conservation in the unincorporated portions of the county. The Resources Section's (Chapter 4) purpose is to identify the goals, policies, and implementation measures to protect natural, cultural, and open space resources.

1.3.3.2 Solano Multi-Species Habitat Conservation Plan

The Solano Multi-Species Habitat Conservation Plan (2012) establishes a framework for complying with federal and state regulations for endangered species while accommodating future urban growth, development of infrastructure, and ongoing operations and maintenance activities associated with flood control, irrigation facilities, and other public infrastructure undertaken by or under the permitting authority/control of the Habitat Conservation Plan participants within the plan area. Covered activities under the Habitat Conservation Plan include development; irrigation district service area inclusions, expansions, and annexations; operation and maintenance activities of public facilities; recreation facilities and management; management, enhancement, habitat restoration/ construction, monitoring, scientific collection, and associated compatible activities on designated reserves; mitigation sites/banks; open space lands and adjacent lands; and relocation of covered species. The Project would not be considered a covered activity/project under the Solano Multi-Species Habitat Conservation Plan.

Chapter 2
Methods

The potential presence of biological resources in the Project Area was determined through a desktop review of publicly available information, preliminary site reconnaissance survey, and species-specific field surveys focused on special-status species identified as having a higher likelihood to occur during the assessment process. Evaluation of biological resources varied by resource type according to CCR (2023) standards.

- 10 miles from Project Area: sensitive biological resources (wildlife and plant species)(20 CCR Div. 2 Ch. 5 App. B §13(A))
- 1 mile of the Project Area: list of the species and habitat(s) actually observed and those with a potential to occur (20 CCR Div. 2 Ch. 5 App. B §13(B))
- 1,000 feet from the outer edge of linear facility corridors: list of the species and habitat(s) observed and those with a potential to occur (20 CCR Div. 2 Ch. 5 App. B §13(B))
- 250 feet from the edge of disturbance: state and federal jurisdictional features including state waters (20 CCR Div. 2 Ch. 5 App. B §13(B[iii]))

2.1 Special-Status Species Definition

For the purpose of this report, *special-status species* are plants and animals that are legally protected under ESA, CESA, or other regulations, or species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are those species in any of the categories listed below.

- Species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA.
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380).
- Animals fully protected in California (CFGC Section 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Animal Species of Special Concern to the CDFW (2024a).
- Birds of Conservation Concern (USFWS 2024a).
- Bats identified as medium or high priority on the Western Bat Working Group regional priority species matrix (Western Bat Working Group 2023).
- Plants listed as rare under the California Native Plant Protection Act (CFGC 1900 et seq.).

- Plants considered by CDFW and the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (Rare Plant Ranks 1B and 2) (CDFW 2024a; CNPS 2024).
- Plants identified by CDFW and CNPS about which more information is needed to determine their status, and plants of limited distribution (Rare Plant Ranks 3 and 4), which may be included as special-status species on the basis of local significance or recent biological information (CDFW 2024a; CNPS 2024).

2.2 Literature Review

The following primary resources were reviewed to determine the potential for special-status species to occur within or in the vicinity of the Project Area.

- The occurrence of state- and federally listed or special-status wildlife and plant species were queried using CDFW CNDDB data for 13 7.5-minute USGS quadrangles USGS quadrangles within 10 miles of the Project Area (CDFW 2024b).
- The occurrence of federally designated wildlife and aquatic resources for the Project Areas was queried using USFWS Information, Planning, and Consultation (IPaC) System Resource Report (USFWS 2024a).
- CNPS' Inventory of Rare and Endangered Plants and Plant Communities of California was queried for the 13 7.5-minute USGS quadrangles within 10 miles of the Project Area (CNPS 2024). The CNPS inventory list for 13 quadrangles was cross referenced with CNDDB rare plant occurrence data within 10 miles of the Project Area to assist in determining the likelihood of occurrence at the Project Area.
- Sensitive Natural Community data were queried within 10 miles of the Project Area using the occurrence of Important Bird Areas, sensitive plant communities and designated critical habitat, (Audubon 2024; CNPS 2024; USFWS 2024a).
- Spatial and tablature data used in the aquatic resource delineation survey within 250 feet of the Project Area included Natural Resources Conservation Service (NRCS) climate and soil data, Arid West Regional Wetland Plant List reports, and USFWS National Wetlands Inventory data (NRCS 2024a, NRCS 2024b, USACE 2022, USFWS 2024b).
- Wildlife movement and connectivity within 10 miles of the Project Area was evaluated using models found in the CDFW BIOS6 Viewer and included the Habitat Connectivity Viewer and Ungulate Migration Viewer. Datasets in the viewers included models from CDFW Terrestrial Connectivity Project (CDFW 2024b), the California Essential Habitat Connectivity Project (Spencer et al. 2013) among other sources.

In addition to the primary resources listed above, aerial imagery (Google Earth 2024), gray and white reports from resource agencies, non-governmental organizations, and academic entities, as cited throughout this document, were reviewed to determine the likelihood for occurrences of sensitive biological resources within or in the vicinity of the Project Area.

2.3 Field Surveys

2.3.1 Reconnaissance Survey

ICF biologist Rachel Bennett conducted a reconnaissance-level field survey 250 feet from the edge of disturbance for the Project Area and gen-tie line location on June 1, 2023. The Project Area was surveyed on foot using field maps and aerial imagery to ensure site coverage. Inaccessible areas were surveyed from Weber Road with binoculars. Special attention was given to identifying portions of the Project Area with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring onsite were characterized and biological information was collected including potential aquatic resources, vegetation communities, plant and animal species directly observed, special habitat features, representative site photographs. A list of wildlife observed during this survey is included in Appendix B. Representative photographs of the Project Area are included in Appendix C.

2.3.2 Swainson's Hawk Nest Survey

ICF biologist Ross Wilming conducted Swainson's hawk surveys for the Project Area on the following dates: 3/16/2023 (Period I); 4/13/14 and 4/19/2023 (Period III); and 6/27/2023–6/29/2023 (Period V). Surveys followed recommendations outlined in the *Recommended Timing and Methodology for Swainson's hawk Nesting Surveys in California's Central Valley* prepared by the Swainson's Hawk Technical Advisory Committee (2000). The majority of the surveys were conducted using a vehicle ("windshield surveys"); walking was required at some locations where vehicle access or parking was unavailable (e.g., no road shoulder, private driveway/roads). Locational data collected during previous surveys (Survey I and III) in ArcGIS Field Maps on an iPad 6 was used to navigate the survey area; close-up photographs of nests and birds were collected using a Canon Powershot SX710HS; binoculars (8×42), and a spotting scope (20-60×60) were used to observe birds, locate nests, and aid in the identification of wildlife observed on the Project site. Trees and known nests (documented during the Period I and III surveys) were surveyed from multiple angles to increase the chance of detecting nests or raptors, and windows were rolled down during windshield surveys to allow hearing raptor vocalizations. Observations of individuals and activity at nests were documented in the survey area.

2.3.3 Burrowing Owl Nest Survey

ICF biologists Kaitlin Kozlowski and Austin Kozlowski conducted surveys in accordance with the recommendations in Appendix D of the California Department of Fish and Game's (now CDFW) *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). Survey 1 was conducted on May 23-24, 2024, Survey 2 was conducted on June 17, 2024, and Survey 3 was conducted on July 10, 2204. The survey area consisted of a 500-foot buffer of all Project components, including the PG&E Corby Bay Expansion Area, transmission and gen-tie lines/corridors, gen-tie laydown areas, and the area within the Project boundary (Figure 2). Biologists conducted the surveys on foot and used binoculars (10×42) throughout the surveys and a spotting scope (20-60×60) as needed to maximize visual coverage of inaccessible portions of the survey area and to aid in wildlife identification. Access to select parcels within the 500-foot buffer along Kilkenny Road and Byrnes Road were restricted due to private property, so these portions of the survey area were assessed from the road and adjacent parcels where access was provided.

The biologists assessed the suitability of habitat within the survey area to support burrowing owl use.In addition, observations of burrowing owls, burrows of sufficient size for burrowing owl use, and any burrow surrogates (e.g., culverts or pipes large enough to allow owl use but small enough to exclude predators, rubble piles) were documented, if present. Any sign of burrowing owl presence (e.g., tracks, feathers, whitewash, cast pellets, prey remains, egg and shell fragments, nest burrow decoration materials, and possible perches) at or near the burrow(s) and/or burrow surrogates were also recorded. Opportunistic observations of other occupied raptor nests were also noted. GPS coordinates of suitable burrows and burrow surrogates, burrowing owl observations, and occupied raptor nests were recorded from an iPhone 13 mini and iPad 10 using the ArcGIS Field Maps application. Photographs were taken on an iPhone 13 mini and a Canon R6 camera with a 70–200mm lens to aid in documentation of habitat, burrowing owls and/or signs of their presence, and observations of other raptors.

2.4 Aquatic Resources Assessment

A preliminary aquatic resource assessment to identify potential Waters of the U.S. and Waters of the State was conducted within the Project Area concurrent with the reconnaissance-level field survey conducted by ICF Biologist Rachel Bennett on June 1, 2023. The survey was conducted on foot using both maps and aerial imagery to look for evidence of aquatic resources, wetland vegetation, hydrology, streams, and bed and bank features. All aquatic resources identified were mapped using ArcGIS Field Maps.

Following the preliminary aquatic resources assessment, a formal delineation field effort was conducted on May 28, 2024, by ICF wetland ecologist Joe Sanders. During the fieldwork, Mr. Sanders surveyed the entire Study Area, such that visual coverage was 100%. The interior of the PG&E substation was not accessible so that area was delineated remotely. The delineation field work and mapping were consistent with the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), as well as the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0; USACE 2008). In order to be classified as a “wetland” under the 1987 Manual and Regional Supplement, an area must normally have evidence of 1) wetland hydrology, 2) hydric soil indicators, and 3) wetland vegetation.

Vascular plants were identified using the Jepson Manual: Vascular Plants of California (Baldwin et al. 2012), and nomenclature and associated wetland ratings follow the National Wetland Plant List (USACE 2022). Field data were collected in the Study Area representative of the vegetation, soils, and hydrology across the vegetation communities and feature types. Representaitve photographs of the Study Area are included as Appendix C.

All accessible features, including data points, aquatic feature extents and vegetation communities were recorded using a Global Positioning System unit (EOS Arrow 100) with real-time differential correction and an instrument-rated mapping accuracy of less than 1 meter. Features that were not accessible were remotely mapped. Acreage of aquatic features were calculated using ArcGIS. Survey results of the wetlands and other waters of the U.S. found in the Project Area are briefly described in Section 3.2; the full delineation report is included in Appendix D.

2.5 Special-Status Species Assessment

Tables 1 and 2 in Chapter 3, *Results*, list the special-status species that have potential to occur in the Project Area. Each species was evaluated for its potential to occur in the Project Area through literature review and field observations and is categorized as defined below.

- **None/Absent:** No suitable habitat (including soils & elevation) and/or the species is not known to occur within the vicinity of the Project Area based on CNDDB records or other documentation.
- **Low:** Species is not likely to occur because of marginal habitat quality, distance from known occurrences, or lack of recent occurrences within or in the vicinity of the Project Area.
- **Moderate:** Some or all of the species' life history requirements are provided by habitat in the Project Area; populations may not be known to occur in the Project Area or immediate vicinity but are known to occur in the region.
- **High/Present**: All of the species' life history requirements can be met by habitat present in the Project Area, populations are known to occur in the Project Area or immediate vicinity, and/or species was observed during surveys in the vicinity of the Project Area.

Species determined to have a moderate or high likelihood to occur or were observed during field surveys are discussed in greater detail in separate sections.

Chapter 3
Results

3.1 Land Cover Types

A *land cover type* is defined as the dominant character of the land surface discernible from aerial photographs and field verified, as determined by vegetation, water, or human uses. Land cover types are the most widely used units in analyzing ecosystem function, habitat diversity, natural communities, wetlands and streams, and covered species habitat. Vegetation communities or land cover types observed within the Project Area included five upland land cover types and four aquatic land cover types (Figure 3).

3.1.1 Upland Land Cover Types

Upland land cover types were the dominant land cover group in the Project Area. The heavily managed landscape is consistent with the developed nature of land cover along and directly adjacent to the I-80 corridor. Five broad upland land cover types were classified within the Project Area including annual grassland, developed/disturbed, fallow farmland, non-native forest and orchard. Land cover types within the Project Area are consistent with types found within the Study Area and were not classified as sensitive per CDFW, CNPS, or other designations.

3.1.1.1 Annual Grassland

Annual grasslands consisted primarily of non-native grass species and occurred around the PG&E substation and dominated by non-native annual grasses and forbs including wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*) yellow star thistle (*Centaurea solstitialis*), radish (*Raphanus* sp.) and filarees (*Erodium* spp.).

3.1.1.2 Developed/Disturbed

Developed/disturbed areas within the Project Area included portions along the gen-tie route that intersected with I-80 and the Vaca-Dixon substation which is located north of I-80 and includes the substation expansion. Narrow margins along roads and fields where vegetation management and other reoccurring disturbance occurs were also considered developed/disturbed.

3.1.1.3 Fallow Farmland

Fallow farmland was land that was not currently being used for crop cultivation in the current vegetation cycle. The 65-acre battery storage area is almost entirely composed of fallow farmland.

3.1.1.4 Non-Native Forest

Non-native forest was located along the northern margin of I-80 and was dominated by olive trees (*Olea europea*) and red gum (*Eucalyptus camaldulensis*) with oleander (*Nerium oleander*) and other non-native and ruderal plant species.

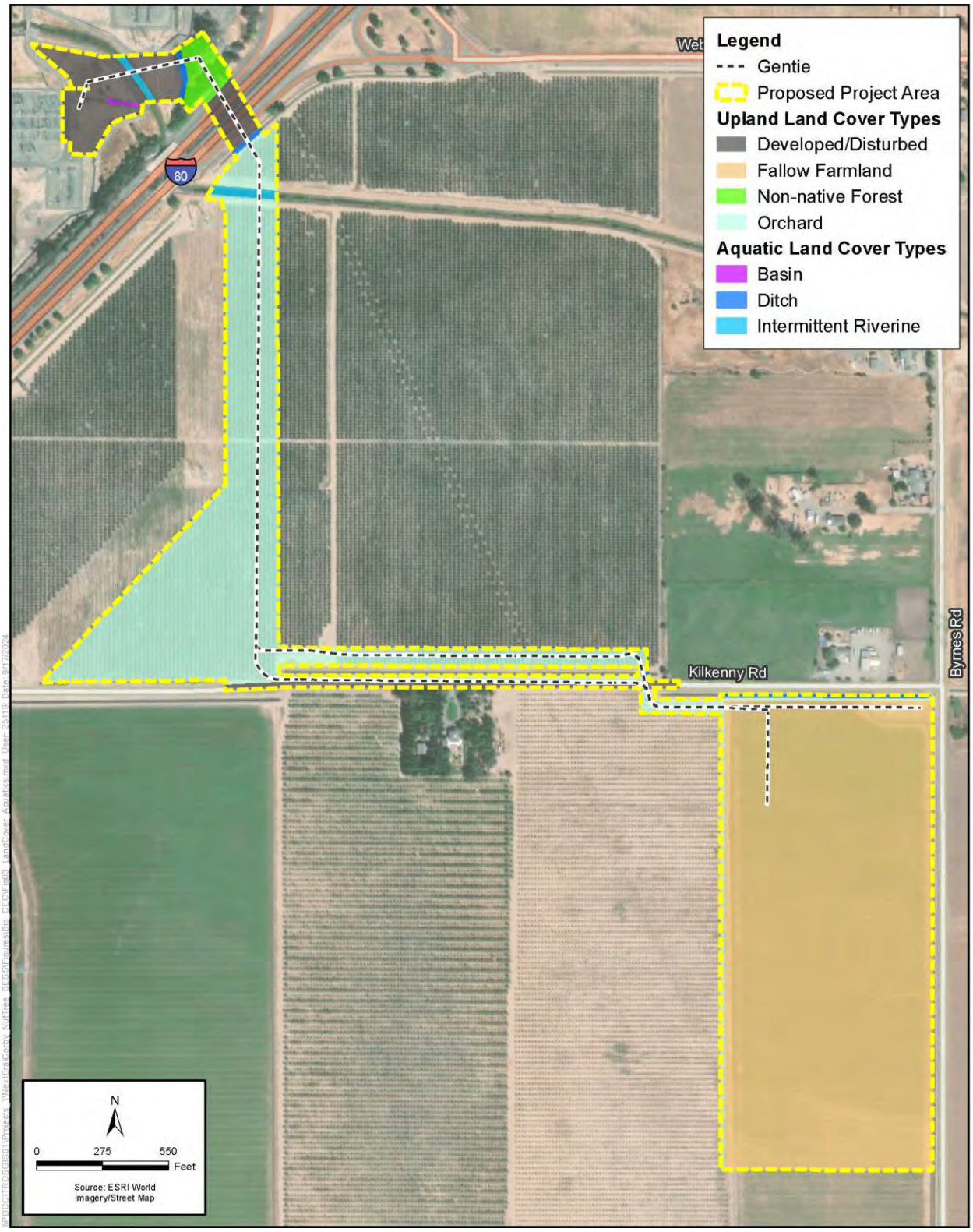

Figure 3. Land Cover/Aquatic Features

3.1.1.5 Orchard

Orchard (almond, cherry/plum) accounts for a large portion of the Project Area where the gen-tie line will be constructed. There is orchard to the west and northwest of the battery storage site. Orchard accounts for a small portion along the western side of the 65-acre battery storage area.

3.1.2 Aquatic Land Cover Types

Aquatic land cover types within 250 feet of the Project Area represented 1.69% of the wetland delineation area. Four types of aquatic resources were delineated for a total of 2.96 acres within 175.05 acres that included the Project Area and lands within 250 feet (Figure 4). Aquatic land cover types consisted of the following:

- 0.02 acre of basin;
- 1.932 acres of ditches;
- 0.932 acres of intermittent riverine; and
- 0.076 acre of seasonal wetland.

Characteristics of aquatic resources were general isolated, ephemeral or intermittent and confined to defined channels. Full results of the field delineation are presented in Appendix D and include figures, supporting climate and rainfall data, soils report, photographs, and data forms. The following sections include a brief description of each aquatic land cover type.

3.1.2.1 Basin

There was one mapped basin in the Study Area encompassing 0.02 acre. The feature occurs within the PG&E substation and was not observable during the field survey. The feature was mapped using aerial imagery. This feature likely drains surface runoff from the substation and could regularly be maintained, and it appears to be excavated in uplands. This feature does not fit well within the Cowardin classification system (Cowardin et al. 1979).

3.1.2.2 Ditch

There were 13 mapped ditches in the Study Area encompassing 1.932 acres. Features outside of the substation were mapped based on the presence of an ordinary high-water mark and features within the substation were mapped remotely. These features either receive pumped water for irrigation purposes, drain impervious areas within the substation, or drain orchards. Mapped ditches vary in their bottom composition including both concrete-lined bottoms and soil bottoms. These features appear to be subject to regular maintenance and are excavated in uplands. None of the mapped ditches appear to be realigned natural features. These features do not fit well within the Cowardin classification system (Cowardin et al. 1979).

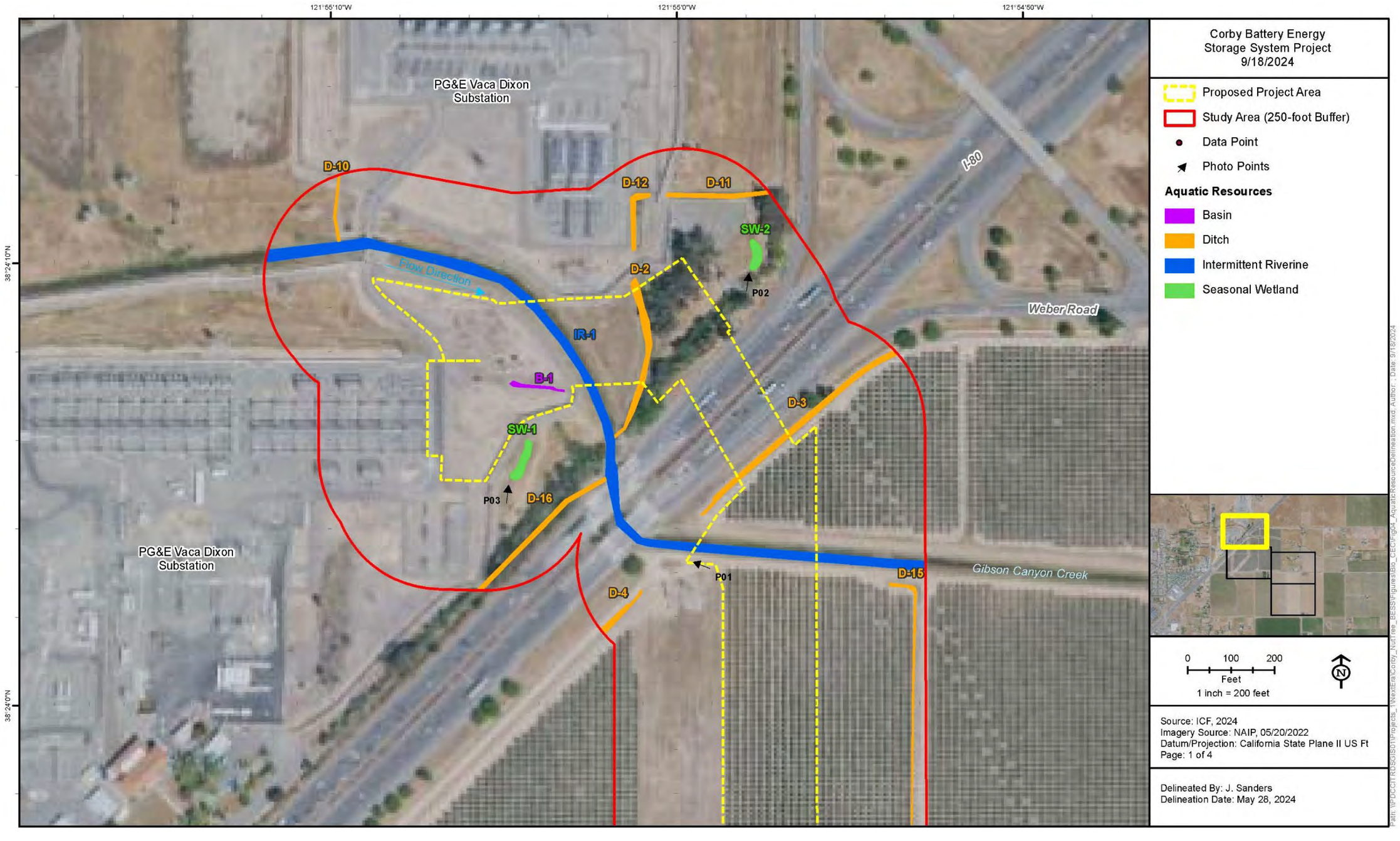

Figure 4. Aquatic Resources Delineation Map, Sheet 1 of 4

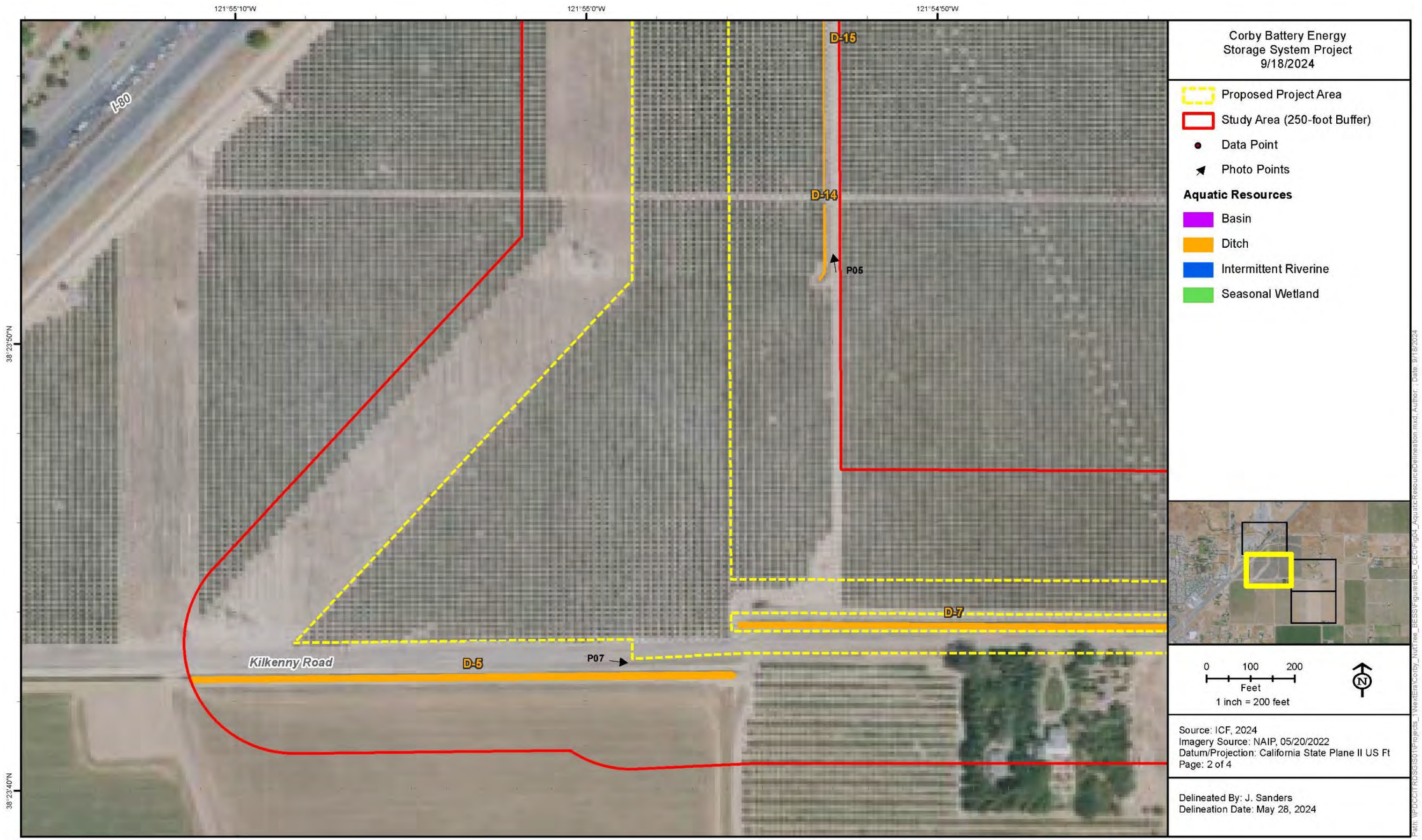

Figure 4. Aquatic Resources Delineation Map, Sheet 2 of 4

Figure 4. Aquatic Resources Delineation Map, Sheet 3 of 4

Figure 4. Aquatic Resources Delineation Map, Sheet 4 of 4

3.1.2.3 Intermittent Riverine

There was one mapped occurrence of an intermittent riverine feature encompassing 0.932 acres and is a reach of Gibson-Canyon Creek. This feature is identified on a USGS map as a dotted blue line, indicating an intermittent hydrologic regime. This feature likely flows part of the year and dries up in the late summer. Low flows were observed during the May 28, 2024 survey. This feature appears to be subject to some maintenance as the banks are mostly straight and some of it is concrete lined, which indicates some realignment of this feature. This feature was mapped in the field based on the presence of an ordinary high-water mark. This feature could be classified as *riverine, intermittent* by the Cowardin classification system (Cowardin et al. 1979).

3.1.2.4 Seasonal Wetland

There were two mapped seasonal wetlands present in the Study Area encompassing 0.076 acres. Both features occur near but on the exterior of the substation. Both features were dominated by hydrophytic vegetation including creeping wildrye (*Elymus triticoides*), curly dock (*Rumex crispus*), hyssop loosestrife (*Lythrum hyssopifolia*), and seaside barley (*Hordeum marinum*). Prevalent algal matting was observed within both mapped seasonal wetlands. No formal data points were collected within these features due to sensitive underground infrastructure nearby but were mapped based on the presence hydrophytic vegetation and primary hydrology indicators and were bounded by upland non-native annual grassland. These features could be classified as *Palustrine, Emergent* by the Cowardin classification system (Cowardin et al. 1979).

3.2 Sensitive Natural Communities

Four sensitive natural communities for a total 12 occurrences have been documented to occur within the 13 USGS quadrangles that overlap the 10-mile Study Area (CDFW 2024b). Sensitive Natural Communities include Coastal and Valley Freshwater Marsh (1 occurrence), Coastal Brackish Marsh (3 occurrence), Valley Needlegrass Grassland (4 occurrences), and Northern Claypan Vernal Pool (4 occurrences). No occurrences of natural communities have been reported from the Allendale 7.5-minute USGS quadrangle where the Project is located. The nearest sensitive plant community is Valley Needlegrass Grassland community 6.5 miles south of the Project Area within the Jepson Grasslands managed by the Solano Lands Trust. Based on field surveys, aerial imagery, and historical occurrences, no sensitive natural communities or riparian habitat are present within or 1 mile from the Project Area.

The Project Area is not located within an Important Bird Area as classified by the Audubon Society (Audubon 2024). The nearest IBA is the globally important Jepson Grasslands located 6.5 mi south of the Project Area, at the nearest point. The grasslands surround Travis Airforce Base and connect a matrix of dry agricultural fields and pastureland to the edge of the San Pablo Delta ecosystem.

The Project Area is not located within USFWS designated critical habitat for any federally list wildlife or plant species (USFWS 2024a). The nearest designated critical habitat is for delta smelt (*Hypomesus transpacificus*) located 3.5 miles east of the Project Area, at the nearest point. Delta smelt critical habitat is expansive, covering hundreds of square miles of aquatic and upland habitat along waterways of the eastern San Fransisco Bay Area and interior valleys.

3.3 Wildlife Movement and Connectivity

A functional network of connected wildlands is essential to continued support of California's diverse natural communities in the face of human development and climate change. Corridors along drainages, valleys, and other features facilitate wildlife movement and connectivity between areas of suitable habitat; the corridors (e.g., linkages) and associated habitats are essential to population viability.

Multiple conservation planning initiatives modeled wildlife connectivity and movement in the greater San Fransisco Bay Area including Solano County, where the Project is located (CDFW 2024c; Penrod et al. 2001, 2013; Spencer et al. 2010). Models identified large areas of relatively natural habitat blocks that support native biodiversity (landscape blocks) and areas essential for ecological connectivity between them (linkages). Ecologically high-value areas within landscape blocks and linkages that lack formal protection but are essential to movement and connectivity were identified as part of the Critical Linkages Network. Although there is no definitive model to evaluate conservation planning opportunities for wildlife, various California assembly bills and pieces of legislation[1] have passed that require wildlife movement and habitat connectivity to be considered during permitting and land management actions.

A coalition of more than 125 organizations built upon previous modeling efforts to identify wildlife movement and habitat connectivity in the nine-county San Fransisco Bay Area and regions to the north and south to identify connectivity to the broader landscape (Penrod et al. 2013). Landscape blocks and linkages were modeled using a hierarchical framework that incorporated biological and human-built environments, including species-specific connectivity models for state and federal special status species. Potential cores and patches of breeding habitat were identified for each species. Potential breeding habitat was defined as an area that had a high habitat suitability ranking and was large enough to support breeding and other activities within the focal species' home range or territory. Potential breeding habitat was categorized in two size classes: 1) *potential core*, defined as a continuous area of suitable habitat large enough to sustain at least 50 individuals; potential cores are probably capable of supporting the species for several generations, and 2) *breeding patch*, defined as an area of suitable habitat large enough to support successful reproduction by a pair of individuals (perhaps more if home ranges overlap greatly) but smaller than a potential core area. Patches are useful to the species if they are linked through dispersal to other patches and core areas. Areas that did not meet the requirements for a potential core or breeding patch but still contributed to the landscape design were considered *less than patch*.

According to connectivity models, wildlife movement corridors and linkages that connect areas of suitable wildlife habitat are absent within the Project Area. The Project Area and immediate surrounding area is classified by CDFW's Terrestrial Connectivity Areas of Conservation Emphasis (ACE) as having limited connectivity opportunity (CDFW 2024c). No big game migration data from CDFW suggests this area is an important linkage or corridor for big game species. The Project Area is outside essential connectivity areas, natural landscape blocks and least cost corridors or linkages as modeled by the California Essential Habitat Connectivity Project and associated models (Spencer et al. 2010, Penrod et al. 2013). The highly modified landscape along the I-80 corridor includes

[1] AB-2785 Wildlife Conservation: Habitat Connectivity (2008); AB-498 Wildlife Conservation: Wildlife Corridors (2015); AB-2087 Regional Conservation Investment Strategies (2016); CA Fish and Game Code §1930.5 (2021); SB-790 Wildlife Connectivity Actions: Compensatory Mitigation Credits (2021)

fragmented habitat, transportation barriers, and anthropogenic disturbances that contribute to the low biological value for wildlife movement and habitat connectivity.

3.4 Special-Status Species

Reviews of species lists from CDFW, CNPS, and USFWS returned 34 special-status plant species, 2 sensitive natural communities, and 33 special-status wildlife species that occurred within the 10 mile Study Area (Table 2) (Figure 5). Following the dicot plant group, the bird group had the second highest number of special-status species but the greatest number of records of all groups, primarily composed of Swainson's hawk (63%) and burrowing owl (28%).

Based on the results of the CNDDB records search and biological surveys performed during the site visits, no special-status plant species were identified as having a moderate or high potential to occur within the Project Area (Table 3). ICF identified three bird species to have a moderate or high/present potential to occur within the Project Area including burrowing owl, Swainson's hawk, and white-tailed kite (Table 4). These species are discussed below in greater detail. None of the 36 special-status plant species are anticipated to occur within the Project Area. Combined with the highly developed/disturbed characteristics of the Project Area, specialized habitat requirements (e.g., vernal pools or serpentine soils), elevational differences, and other factors that influenced the unique niche requirements of rare plants excluded nearly all species documented in the Study Area and broader 13 USGS quadrangle area.

Table 2. Special-status animal and plant species within the 10-mile Study Area of the Corby Energy Battery Storage System, Solano County, California.

Species Group	# Species	# Records
Animals		
Amphibians	2	52
Birds	11	315
Crustaceans	5	93
Insects	8	34
Mammals	4	6
Mollusks	1	1
Reptiles	2	18
Sub-total	*33*	*519*
Plants		
Dicots	28	137
Monocots	6	15
Sensitive Communities	2	4
Sub-total	*36*	*156*
Grand Total	69	675

Source: CDFW CNDDB 2024b

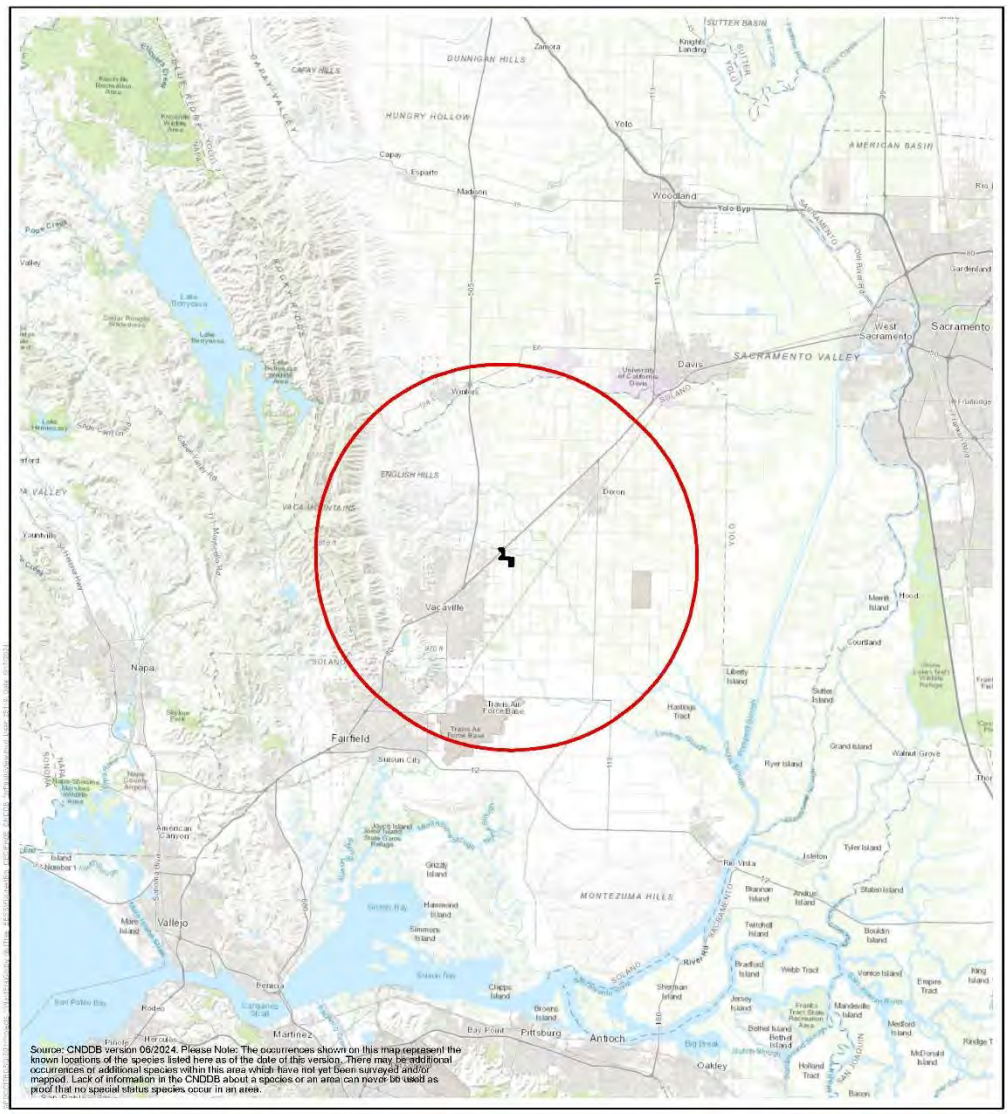

Figure 5. CNBBD Occurrences within 10 Miles of Project Area (Public Version)

Table 3. Special-Status Plants Known to Occur or with Potential to Occur within the Nine-Quad Vicinity of the Project Area

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Modest rockcress *Arabis modesta*	–/–/4.3/G3/S3	Lake, Napa, Siskiyou, Solano, and Trinity counties.	Chaparral and lower montane coniferous forest; 395–2,625 feet.	Mar–July	**None**. No potential habitat present, outside known elevation range of species.
Contra Costa Manzanita *Arctostaphylos manzanita ssp. Laevigata*	–/–/1B.2/G5T2/S2	Found only in Contra Costa County.	Rocky chaparral; 1410–3,610 feet.	Jan–Mar	**None**. No potential habitat present, outside known elevation range of species.
Ferris' milk-vetch *Astragalus tener* var. *ferrisiae*	–/–/1B.1/G2T1/S1	Butte, Glenn, Colusa, and Yolo counties.	Meadows and seeps (vernally mesic), valley and foothill grassland, which is occasionally subalkaline flats; 5–245 feet.	April–May	**None**. No potential habitat present. 1 record in Study Area.
Alkali milk-vetch *Astragalus tener* var. *tener*	–/–/1B.2/G2T1/S1	Merced, Solano, and Yolo counties.	Playas and grasslands with adobe clay soils and alkaline vernal pools; 5–195 feet.	Mar–June	**None.** No potential habitat present. 17 records in Study Area.
Heartscale *Atriplex cordulata var. cordulata*	–/–/1B.2/G3T2/S2	Western Central Valley and valleys of adjacent foothills.	Alkaline flats and scalds, sandy soils in Chenopod scrub, valley and foothill grassland, meadows and seeps; below 1,835 feet.	April–Oct	**None**. No potential habitat present. 4 records in Study Area.
Crownscale *Atriplex coronata var. coronata*	–/–/4.2/G4T3/S3	Inland valleys and foothills; Alameda, Contra Costa, Fresno, Kern, Kings, Merced, Monterey, San Benito, San Luis Obispo, Solano, Stanislaus, Tulare counties.	Chenopod scrub, Valley and foothill grassland, Vernal pools; 5–1,935 feet.	Mar–Oct	**None**. No potential habitat present.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Brittlescale *Atriplex depressa*	–/–/1B.2/G2/S2	Western Central Valley and valleys in foothills on west side of Central Valley.	Mesic areas in alkali grassland, alkali meadow, and alkali scrub; 5–1,050 feet.	May–Oct	**None**. No potential habitat present. 5 records in Study Area.
Vernal pool smallscale *Atriplex persistens*	–/–/1B.2/G2/S2	Colusa, Glenn, Madera, Merced, Solano, and Tulare Counties. Likely extirpated from Stanislaus County.	Alkaline vernal pools; 35–375 feet.	June–Oct	**None.** No potential habitat present. 3 records in Study Area.
Pappose tarplant *Centromadia parryi* ssp. *parryi*	–/–/1B.2/G3T2/S2	North and Central Coast Ranges, the southern Sacramento Valley; occurrences in Butte, Colusa, Glenn, Lake, Napa, San Mateo, and Solano counties.	Chaparral, coastal prairie, coastal salt marshes and swamps, meadows and seeps, alkaline soils in vernally mesic valley and foothill grassland; below 1,380 feet.	May–Nov	**None**. No potential habitat present. 4 records in Study Area.
Parry's rough tarplant *Centromadia parryi* ssp. *rudis*	–/–/4.2/G3T3/S3	Western Central Valley including Butte, Colusa, Glenn, Lake, Merced, Modoc, Sacramento, San Joaquin, Stanislaus, and Yolo counties.	Vernal pools, valley and foothill grassland; below 330 feet.	May–Oct	**None**. No potential habitat present.
Hispid salty bird's beak *Chloropyron mole* ssp. *hispidum*	–/–/1B.1/G2T1/S1	Alameda, Kern, Merced, Placer, and Solano counties.	Meadows and seeps (alkaline), playas, valley and foothill grasslands; 5–510 feet.	June–Sept	**None**. No potential habitat present. 1 record in Study Area.
Soft salty bird's-beak *Chloropyron molle ssp. molle*	E/CR/1B.2/G2T1/S1	Contra Costa, Napa, Solano, and Sonoma counties	Marshes and swamps (coastal salt); below 10 feet.	Jun-Nov	**None**. No potential habitat present.
Bolander's water-hemlock *Cicuta maculate* var. *bolanderi*	–/–/ 2B.1/G5T4T5/S2?	Northern/eastern San Francisco Bay area and Western Central Valley including Contra Costa, Marin, Sacramento, and Solano Counties.	Brackish, coastal, and freshwater marshes and swamps; below 655 feet.	July–Sept	**None**. No potential habitat present. 1 record in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Suisun thistle *Cirsium hydrophilum var. hydrophilum*	E/–/1B.1/G2T1/S1	Southern Solano County	Marshes and swamps (salt); below 5 feet.	Jun-Sep	**None**. No potential habitat present.
Recurved larkspur *Delphinium recurvatum*	–/–/1B.2/G2?/S2?	East Bay south through Santa Barbara and San Luis Obispo counties.	Alkaline soils in chenopod scrub, cismontane woodland, valley and foothill grassland; 10–2,590 feet.	Mar–June	**None**. No potential habitat present. 1 record in Study Area.
Dwarf downingia *Downingia pusilla*	–/–/2B.2/GU/S2	Inner North Coast Ranges, southern Sacramento Valley, northern and central San Joaquin Valley.	Wet areas in valley and foothill grassland, vernal pools; 5–1,460 feet.	Mar–May	**None**. No potential habitat present. 17 records in Study Area.
Small spikerush *Eleocharis parvula*	–/–/4.3/G5/S3	Isolated over wide range in Alameda, Contra Costa, Humboldt, Marin, Napa, Orange, San Luis Obispo, Solano, Sonoma, and Ventura counties	Marshes and swamps; 5–910 feet.	Apr–Sep	**None**. No potential habitat present.
Jepson's coyote-thistle *Eryngium jepsonii*	–/–/ 1B.2/G2/S2	Alameda, Contra Costa, Napa, San Mateo, Solano, and Yolo counties	Valley and foothill grassland, Vernal pools; 10–985 feet.	Apr–Aug	**None**. No potential habitat present
San Joaquin spearscale *Extriplex joaquinana*	–/–/1B.2/G2/S2	Eastern San Francisco Bay Area, west edge of Central Valley from Glenn County to Fresno County.	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland; 5–2,740 feet.	Apr–Oct	**None**. No potential habitat present. 4 records in Study Area.
Stinkbells *Fritillaria agrestis*	–/–/4.2/G2/S2	Alameda, Contra Costa, Fresno, Kern, Mendocino, Monterey, Merced, Monterey, Mariposa, Placer, Sacramento, Santa Barbara, San Benito, San Luis Obispo, San Mateo, Stanislaus, and Tuolumne counties.	Chaparral, cismontane woodland, pinyon and juniper woodland, valley, and foothill grassland, on clay or serpentinite substrate; 35–5,100 feet.	Mar–June	**None**. No potential habitat present.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Fragrant fritillary *Fritillaria liliacea*	–/–/1B.2/G2/S2	San Francisco Bay Area from Sonoma County to Monterey County.	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland, often serpentinite; 10–1,345 feet.	Feb–Apr	**None**. No potential habitat present. 4 records in Study Area.
Adobe-lily *Fritillaria pluriflora*	–/–/ 1B.2/G2G3/S2S3	Northern Central Valley and Western edge of Central Valley including Butte, Colusa, Glenn, Lake, Napa, Solano, Tehama, and Yolo counties.	Chaparral, cismontane woodland, valley and foothill grassland, often adobe; 195–2,315 feet.	Feb–Apr	**None**. No potential habitat present, outside known elevational range of species. 2 records in Study Area.
Boggs Lake hedge-hyssop *Gratiola heterosepala*	–/E/1B.2/G2/S2	Inner North Coast Ranges, Central Sierra Nevada foothills, Sacramento Valley and Modoc Plateau in Fresno, Lake, Lassen, Madera, Merced, Modoc, Placer, Sacramento, Shasta, Siskiyou, San Joaquin, Solano, and Tehama counties.	Clay soils in areas of shallow water, lake margins of swamps and marshes, vernal pool margins; 35–7,790 feet.	Apr–Aug	**None**. No potential habitat present. 6 records in Study Area.
Hogwallow starfish *Hesperevax caulescens*	–/–/4.2/G3/S3	Broadly ranging in California, primarily in Great Valley and adjacent foothills, also in South Coast Ranges, Peninsular Ranges.	Mesic clay soils in valley and foothill grassland, shallow vernal pools; below 1,655 feet.	Mar–June	**None**. No potential habitat present.
Brewer's western flax *Hesperolinon breweri*	–/–/1B.2/G2/S2	Alameda, Contra Costa, Napa, and Solano counties.	Generally serpentine slopes in chaparral and grasslands; 100–3,100 feet.	May–July	**None**. No potential habitat present. 2 records in Study Area.
Woolly rose-mallow *Hibiscus lasiocarpos* var. *occidentalis*	–/–/1B.2/G5T3/S3	Central Valley, including the Delta, from Butte County to San Joaquin County.	Freshwater marshes and swamps; below 395 feet.	June–Sep	**None**. No potential habitat present. 1 record in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Carquinez goldenbush *Isocoma arguta*	–/–/1B.1/G1/S1	Contra Costa and Solano counties.	Alkaline soils in valley and foothill grasslands; 5–65 feet.	Aug–Dec	**None**. No potential habitat present. 4 records in Study Area.
Alkali-sink goldfields *Lasthenia chrysantha*	–/–/1B.1/G2/S2	Fresno, Kern, Kings, Madera, Merced, Sacramento, Solano, Stanislaus, Tulare counties.	Vernal pools; below 655 feet.	Feb–Apr	**None**. No vernal pools present. 2 records in Study Area.
Contra Costa goldfields *Lasthenia conjugens*	E/–/1B.1/G1/S1	Alameda, Contra Costa, Marin, Monterey, Napa, Solano, and Sonoma counties.	Mesic areas in Cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools; below 1,540 feet.	Mar–June	**None**. No potential habitat present. 8 records in Study Area.
Ferris' goldfields *Lasthenia farrisiae*	–/–/4.2/G3/S3	Central Valley, east San Francisco Bay Area, eastern edge Central Coast.	Vernal pools; 65–2,295 feet.	Feb–May	**None**. No vernal pools present.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	–/–/1B.1/G4T2/S2	Through Central Valley, primarily distributed along Southern California coast.	Coastal salt marshes and swamps, playas, vernal pools; 5–405 feet.	Feb–June	**None**. No potential habitat present. 1 record in Study Area.
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	–/–/1B.2/G5T2/S2	San Francisco east bay and western edge of Central Valley.	Brackish and freshwater marshes and swamps; below 15 feet.	May–July	**None.** No potential habitat present.
Colusa layia *Layia septentrionalis*	–/–/1B.2/G2/S2	Sacramento Valley and northern Bay Area.	Sandy, serpentinite soil in chaparral, cismontane woodland, valley and foothill grassland; 330–3,595 feet.	Apr–May	**None.** No potential habitats present, outside known elevational range of species.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Legenere *Legenere limosa*	–/–/1B.1/G2/S2	Lower Sacramento Valley, also from North Coast Ranges, northern San Joaquin Valley, and the Santa Cruz Mountains.	Vernal pools; 5–2,885 feet.	Apr–June	**None**. No vernal pools present. 8 records in Study Area.
Heckard's pepper-grass *Lepidium latipes* var. *heckardii*	–/–/1B.2/G4T1/S1	Southern Sacramento Valley in Glenn, Merced, Sacramento, Solano, and Yolo counties.	Alkaline flats in valley and foothill grassland; 5–655 feet.	Mar–May	**None.** No potential habitat present. 2 records in Study Area.
Bristly leptosiphon *Leptosiphon aureus*	–/–/4.2/G4?/S4?	Bay Area and North Coast predominately, scattered occurrences in Central Valley.	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland; 180–4,920 feet.	Apr–July	**None.** No potential habitats present, outside known elevational range of species.
Jepson's leptosiphon *Leptosiphon jepsonii*	–/–/1B.2/G2G3/S2S3	Lake, Napa, Solano, Sonoma, and Yolo counties.	Usually volcanic, chaparral, cismontane woodland, valley and foothill grassland; 330–1,640 feet.	Mar–May	**None.** No potential habitats present, outside known elevational range of species.
woolly-headed lessingia *Lessingia hololeuca*	–/–/3/G2G3/S2S3	Coastal mountains, SF Bay Area, and inland valleys including Solano and Yolo counties	Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland; 50–1,000 feet.	Jun–Oct	**None** Typically found in clay and serpentine soils which are not present.
Mason's lilaeopsis *Lilaeopsis masonii*	–/CR/1B.1/G2/S2	Southern Sacramento Valley, Sacramento–San Joaquin River Delta, northeast San Francisco Bay Area in Alameda, Contra Costa, Marin, Napa, Sacramento, San Joaquin, Solano, and Yolo counties.	Freshwater or brackish marsh, riparian scrub, in tidal zone; below 35 feet.	Apr–Nov	**None.** No potential habitat present. 1 record in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Delta mudwort *Limosella australis*	–/–/2B.1/G4G5/S2	Contra Costa, Sacramento, San Joaquin, and Solano counties.	Usually streambanks or mud banks, freshwater or brackish marshes and swamps, riparian scrub; below 10 feet.	May–Aug	**Low**. Gibson-Canyon Creek may provide marginal habitat.
Napa lomatium *Lomatium repostum*	–/–/4.2/G2G3/S2S3	Lake, Napa, Solano, and Sonoma counties.	Flat to steep slopes in chaparral, broadleafed upland forest, and cismontane woodland; 295–4,725 feet.	Mar–June	**None.** No potential habitats present, outside known elevational range of species.
Heller's bush-mallow *Malacothamnus helleri*	–/–/3.3/G2Q/S2	Colusa, Lake, Napa, and Yolo counties.	Chaparral (sandstone), riparian woodland (gravel); 1,000–2,085 feet.	May–July	**None.** No potential habitats present, outside known elevational range of species.
Three-ranked hump moss *Meesia triquetra*	–/–/4.2/G5/S4	Eastern valley foothills and Sierra Nevada Mountain. Southern Solano County occurrence in Delta region.	Bogs and fens, Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest (mesic); 4,265–9690 feet.	July	**None.** No potential habitats present, outside known elevational range of species.
Marsh microseris *Microseris paludosa*	–/–/1B.2/G2/S2	Along coast and into coastal foothills; rare Solano County occurrence associated with Delta.	Cismontane woodland, Closed-cone coniferous forest, Coastal scrub, Valley and foothill grassland. 15–1,165 feet	Apr–Jul	**None.** No potential habitats present.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Sylvan microseris *Microseris sylvatica*	–/–/4.2/G4/S4	Alameda, Butte, Contra Costa, Fresno, Kern, Napa, San Benito, Tulare, and Yolo counties.	Chaparral, cismontane woodland, Great Basin scrub, pinyon and juniper woodland, valley and foothill grassland; 150–4,920 feet.	Mar–June	**None.** No potential habitats present.
Little mousetail *Myosurus minimus* ssp. *apus*	–/–/3.1/G5T2Q/S2	Central Valley and South Coast from Butte County south to San Diego County; Baja California.	Valley and foothill grassland, alkaline vernal pools; 65–2,100 feet.	Mar–June	**None.** No potential habitats present.
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	–/–/1B.1/G4T2/S2	Inner North Coast Range, western Sacramento Valley: Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Tehama, and Yolo counties.	In mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools; 15–571 feet.	Apr–June	**None**. No potential habitat present. 14 records in Study Area.
Colusa grass *Neostapfia colusana*	T/E/1B.1/G1/S1	Central Valley with scattered occurrences from Colusa to Merced counties.	Vernal pools, in adobe clay soils; 15–655 feet.	May–Aug	**None**. No vernal pools present. 4 records in Study Area.
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	T/E/1B.1/G1/S1	Fresno, Madera, Merced, Solano, and Tulare counties.	Vernal pools; 35–2,475 feet.	Apr–Sept	**None**. No vernal pools present. 1 record in Study Area.
Gairdner's yampah *Perideridia gairdneri* ssp. *gairdneri*	–/–/ 4.2/G5T3T4/S3S4	Southern North Coast, Bay Area, and Central Coast.	Vernally mesic, broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, and vernal pools; 0–2,000 feet.	June–Oct	**None**. No potential habitat present.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Bearded popcornflower *Plagiobothrys hystriculus*	–/–/1B.1/G2/S2	Montezuma Hills in Napa, Solano, and Yolo counties.	Mesic valley and foothill grassland, vernal pool margins; below 900 feet.	Apr–May	**None**. No potential habitat present. 11 records in Study Area.
Delta woolly-marbles *Psilocarphus brevissimus var. multiflorus*	–/–/4.2/G4T3/S3	Solano and San Diego counties	Vernal pools; 35–1,640 feet.	May–June	**None**. No potential habitat present.
California alkali grass *Puccinellia simplex*	–/–/1B.2/G2/S2	San Francisco Bay Area, Great Valley, Tehachapi Mountains, western Mojave Desert.	Seasonally wet alkaline wetlands, sinks, flats, vernal pools, and lake margins; 5–3,050 feet.	Mar–May	**None**. No potential habitat present. 2 records in Study Area.
Lobb's aquatic buttercup *Ranunculus lobbii*	–/–/4.2/G4/S3	North Coast, Bay Area, northern Central Coast.	Mesic habitats in cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pools; 50–1,540 feet.	Feb–May	**None**. No potential habitat present.
Sanford's arrowhead *Sagittaria sanford*	–/–/1B.2/G3/S3	Northern CA through interior valleys into Los Angeles County; mostly extirpated.	Marshes and swamps (shallow freshwater); below 2,135 feet.	May–Nov	**None**. No potential habitat present.
Keck's checkerbloom *Sidalcea keckii*	E/–/1B.1/G2/S2	Fresno, Merced, and Tulare Counties; similar species from Inner North Coast Ranges in Colusa, Napa, Solano, and Yolo Counties treated as this species until further studies completed.	Cismontane woodland, valley and foothill grassland, in clay and serpentinine substrates; 245–2,135 feet.	Apr–May	**None**. No potential habitat present. 4 records in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	–/–/1B.2/G5T2/S2	Alameda, Contra Costa, Napa, and Solano counties	Marshes and swamps, Meadows and seeps; below 835 feet.	Feb–May	**None**. No potential habitat present.
Northern slender pondweed *Stuckenia filiformis* ssp. *alpina*	–/–/2B.2G5T5/S2S3	San Joaquin Valley, San Francisco Bay Area, and the central high Sierra Nevada.	Shallow freshwater marshes and swamps; 985–7,055 feet.	May–July	**None**. No potential habitat present.
Suisun Marsh aster *Symphyotrichum lentum*	–/–/1B.2/G2/S2	Sacramento–San Joaquin Delta, Suisun Marsh, Suisun Bay: Contra Costa, Napa, Sacramento, San Joaquin, and Solano counties.	Brackish and freshwater marshes and swamps; below 10 feet.	May–Nov	**None**. No potential habitat present. 4 records in Study Area.
Two-fork clover *Trifolium amoenum*	E/–/1B.1/G1/S1	Marin and San Mateo Counties, potentially extirpated from Napa, Solano, and Sonoma counties.	Coastal bluff scrub, valley and foothill grasslands (sometimes serpentinite); 15–1,360 feet.	Apr–June	**None**. No potential habitat present. 4 records in Study Area.
Saline clover *Trifolium hydrophilum*	–/–/1B.2/G2/S2	Sacramento Valley, central western California.	Marshes and swamps, mesic alkaline areas in valley and foothill grasslands, vernal pools; below 985 feet.	Apr–June	**None**. No potential habitat present. 6 records in Study Area.
Crampton's tuctoria *Tuctoria mucronata*	E/E/1B.1/G1/S1	Southwestern Sacramento Valley in Solano and Yolo counties.	Mesic valley and foothill grassland, vernal pools; 15–35 feet.	Apr–Aug	**None**. No potential habitat present. 2 records in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR/GR/SR	California Distribution	Habitats	Blooming Period	Likelihood to Occur in Project Area
Oval-leaved viburnum *Viburnum ellipticum*	–/–/2B.3/G4G5/S3?	Bay Area and central North Coast with scattered locations in the Central Valley and Shasta Area.	Chaparral, cismontane woodland, lower montane coniferous forest; 705–4,595 feet.	May–June	**None.** No potential habitat present, outside known elevational range of species. 1 record in Study Area.

Status explanations:

Federal List (USFWS)
- E = listed as endangered under ESA.
- T = listed as threatened under ESA.
- – = no listing.

State List (CDFW)
- E = listed as endangered under CESA.
- CR = listed as so rare that it may become endangered under CESA. Designation stems from the Native Plant Protection Act of 1977.
- – = no listing.

California Rare Plant Rank (CRPR; CNPS)
- 1A = List 1A species: presumed extinct in California.
- 1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
- 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
- 3 = List 3 species: more information is needed.
- 4 = List 4 plants: limited distribution of infrequent throughout a broader area in California.

CRPR Code Extensions:
- 0.1 = seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat.
- 0.2 = fairly endangered in California (20–80% of occurrences threatened).
- 0.3 = not very threatened in California (less than 20% of occurrences threatened).

Global Rank (GR) (NatureServe)
- GX = presumed extinct: virtually no likelihood of rediscovery.
- GH = possibly extinct: known only from historical occurrences but still some hope of rediscovery.
- G1 = critically imperiled: very high risk of extinction due to extreme rarity (often 5 or fewer populations) steep declines, or other factors.
- G2 = imperiled: high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
- G3 = vulnerable: moderate risk of extinction or elimination due to a restricted range, relatively few populations (often 80 or fewer), or other factors.
- G4 = apparently secure: uncommon but not rare; some cause for long-term concern due to declines or other factors.
- G5 = secure: common; widespread and abundant.
- GNR = unranked: global rank not yet assessed.
- GU = unrankable: currently unrankable due to a lack of information or due to substantially conflicting information about status or trends.
- G#G# = range rank: numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty about the exact status of a taxon or community.

G#T# = infraspecific taxon: status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' Global Rank.
? = Qualifier: inexact numeric rank — represents a rank qualifier, denoting an inexact or uncertain numeric rank.
Q = Qualifier: questionable taxonomy — the distinctiveness at the current level is questionable.
C = Qualifier: captive or cultivated only — presumed or possibly extinct or eliminated in the wild but extant in cultivation or in captivity

State Rank (SR)(CNDDB)

SX = presumed extirpated: species believed to be extirpated from the state.
SH = possibly extirpated (Historical): species occurred historically in the state, and there is some possibility that it may be rediscovered.
S1 = critically imperiled: extreme rarity (often 5 or fewer occurrences) or other factor(s) making it especially vulnerable to extirpation.
S2 = imperiled: rarity (often 20 or fewer), or other factors making it very vulnerable to extirpation from the nation or state.
S3 = vulnerable: relatively few populations (often 80 or fewer), or other factors making it vulnerable to extirpation.
S4 = apparently secure: uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 = secure: common, widespread, and abundant in the state.
SNR = unranked: state conservation status not yet assessed.
SU = unrankable: unrankable due to a lack of information or due to substantially conflicting information about status or trends.
S#S# = range rank: numeric range rank (e.g., S2S3) used to indicate any range of uncertainty about the status of the species or community.
? = Qualifier: inexact or uncertain: — represents a rank qualifier, denoting an inexact or uncertain numeric rank.

Table 4. Special-Status Animals Known to Occur or with Potential to Occur within the Nine-Quad Vicinity of the Project Area

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Invertebrates				
Conservancy fairy shrimp *Branchinecta conservatio*	E/–/G2/S2	Northern two-thirds of the Central Valley. It ranges from Vina Plains of Tehama County; Sacramento NWR in Glenn County; Jepson Prairie Preserve and surrounding area east of Travis Air Force Base, Solano County; Mapes Ranch west of Modesto, Stanislaus County.	Large vernal pools and seasonal wetlands, ~1 acre in size.	**None**. No vernal pool habitat within Project Area. 13 records in Study Area.
Vernal pool fairy shrimp *Branchinecta lynchi*	T/–/–/G3/S3	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County.	Common in vernal pools; also found in sandstone rock outcrop pools.	**None**. No vernal pool habitat within Project Area. 33 records in Study Area.
Vernal pool tadpole shrimp *Lepidurus packardi*	T/–/–/G3/S3	Shasta County south to Merced County.	Vernal pools and ephemeral stock ponds.	**None**. No vernal pool habitat within Project Area. 25 records in Study Area.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/–/–/G3T3/S3	Throughout the Central Valley.	Riparian and oak savanna habitats with elderberry shrubs and streamside habitats below 3,000 feet above sea level. Elderberry shrub is the host plant.	**None**. Elderberry shrubs not observed in or around the Project Area. 7 records in Study Area.
Monarch butterfly *Danaus plexippus*	FC/–/–G4T1T2Q/S2	Throughout California and overwinter along the California Coast and central Mexico.	Open habitats including fields, meadows, weedy areas, marshes, and roadsides. Monarch butterflies roost in wind-protected tree groves (such as eucalyptus) with nectar and water sources nearby. Caterpillar host plants are native milkweeds.	**Low**. Adults may forage and migrate through the site, but no host milkweed plants were found in the Project Area during surveys.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Delta green ground beetle *Elaphrus viridis*	FT/–/–/G1/S1	Jepson Prairie Region of Solano County.	Large vernal pools, playa pools.	**None**. No vernal pool habitat within Project Area. 13 records in Study Area.
Crotch bumble bee *Bombus crotchii*	–/C/–/G2/S2	Throughout the Pacific Coast, Western Desert, and adjacent foothills throughout most of the state's southwestern region.	Found in open grassland and scrub. Nests underground in abandoned rodent burrows. Colonies are annual and only the newly mated queens overwinter. The queens emerge from hibernation in early spring to search for nest sites. Host plant food includes milkweed (*Asclepias* sp.), pincushion (*Chaenactis* sp.), lupine (*Lupinus* sp.), bur clover (*Medicago* sp.), phacelia (*Phacelia* sp.), and sage (*Salvia* sp.).	**Low.** Project Area is within the range of the species; however, common foraging plants are absent. 1 record in Study Area.
Western bumble bee *Bombus occidentalis occidentalis*	–/SC/G3/S1	High elevation sites in northern California and a few sites on the northern California coast.	Nests underground in squirrel burrows, in mouse nests, and in open west-southwest facing slopes bordered by trees. Visits a wide variety of wildflowers. Plant genera it is most commonly associated with are *Cirsium*, *Erigonum*, *Solidago*, "Aster," *Ceonothus*, *Centaurea*, and *Penstemon*.	**None.** Project Area outside current range. 3 records in Study Area.
Fish				
Green sturgeon – southern DPS pop. 1 *Acipenser medirostris*	FT/–/G2T1/S1	Sacramento, San Joaquin, Stanislaus, Klamath, and Trinity rivers.	The species spawns in large river systems with well-oxygenated water, with temperatures from 8.0 to 14°C.	**None**. No suitable habitat within the Project Area.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Longfin smelt *Spirinchus thaleichthys*	FC/ST/G5/S1	Within California, mostly in the Sacramento River–San Joaquin River Delta, but also in Humboldt Bay, Eel River estuary, and Klamath River estuary. Also found in South San Francisco Bay and sloughs in Coyote Creek, Alviso Slough, and nearby salt ponds.	Salt or brackish estuary waters with freshwater inputs for spawning.	**None**. No suitable habitat within the Project Area.
Amphibians				
California tiger salamander – central California DPS *Ambystoma californiense*	T/T/G2G3T3/S3	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Sonoma County south to Santa Barbara County.	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.	**None**. No suitable habitat within the Project Area. 46 records in Study Area.
Foothill yellow-legged frog – north coast DPS *Rana boylii*	–/SSC/G3T4/S4	The north coast DPS extends north of San Francisco Bay through the Coast Range and Klamath Mountains to the northern limit and east through the Cascade Range.	Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. Usually found near riffles with rocks and sunny banks nearby.	**None**. No suitable habitat within the Project Area. 6 records in Study Area.
Western spadefoot *Spea hammondii*	–/SSC/G2G3/S3S4	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in Southern California.	Shallow streams with riffles; seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands.	**None**. No suitable habitat within the Project Area.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Reptiles				
Western pond turtle *Actinemys marmorata*	FC/SSC/G1/S1	California range includes Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada Mountains.	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests. Nests are typically constructed in upland habitat within 0.25 mile of aquatic habitat.	**Low**. Gibson-Canyon Creek is the only suitable aquatic habitat; however, the banks are likely too steep for species utilization. 17 records in Study Area.
Giant garter snake *Thamnophis gigas*	T/T/G2/S2	Wetlands in the Sacramento and San Joaquin Valleys from Chico, south to the Mendota Wildlife Area in Fresno County.	Sloughs, canals, low-gradient streams, and freshwater marshes where there is a prey base of small fish and amphibians. Irrigation ditches and rice fields. Requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	**None**. Gibson-Canyon Creek is the only suitable aquatic habitat; however, the Project Area outside current known range of the species. 1 record in Study Area.
Birds				
White-tailed kite *Elanus leucurus*	–/FP/G5/S3S4	Lowland areas west of Sierra Nevada Mountains from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border.	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	**Present.** Observed during surveys. Suitable foraging and nesting habitat in vicinity of Project Area. 5 records in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Bald eagle *Haliaeetus leucocephalus*	P/E, FP/G5/S3	Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin; reintroduced into central coast; winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County.	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, or stream, or the ocean.	**Low.** No suitable nesting or foraging habitat (large lakes, reservoirs, or rivers) in or near the Project Area. 1 record in Study Area.
Northern harrier *Circus cyaneus*	–/SSC/G5/S3	Throughout lowland California; has been recorded in fall at high elevations.	Grasslands, meadows, marshes, and seasonal and agricultural wetlands providing tall cover.	**Low**. Suitable nesting and foraging habitat is present in the vicinity of the Project Area. 2 records in Study Area.
Swainson's hawk *Buteo swainsoni*	–/T/G5/S4	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland in Yolo County.	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields.	**Present**. Species observed during surveys; suitable foraging and nesting habitat within Project Area. 200 records in Study Area.
American peregrine falcon *Falco peregrinus anatum*	–/FP/G4T4/S3S4	Widespread in California during winter, breeds in the coast of southern and central California, inland northern coastal mountains, Klamath Mountains, Cascade Range, and Sierra Nevada.	Open country, near cliffs urban areas, and coast.	**None.** No suitable foraging or nesting habitat present. 1 records in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
California black rail *Laterallus jamaicensis coturniculus*	–/T, FP/G3T1/S2	Approximately 90% are found in the tidal salt marshes of the northern San Francisco Bay region, primarily in San Pablo and Suisun Bays. Smaller populations occur in San Francisco Bay, the outer coast of Marin County, freshwater marshes in the foothills of the Sierra Nevada, and in the Colorado River area.	Nests and forages in saline, freshwater, or brackish emergent marshes with gently grading slopes and upland refugia with vegetative cover beyond the high-water line.	**None.** No suitable foraging or nesting habitat present.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT/SE/G5T2T3/S1	Scattered locations throughout California. Breeding population along Colorado River, Sacramento and Owen Valley, along South Fork of Kern River, Santa Ana River and Amargosa River. May be present along San Luis Rey River.	Deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation. In Sacramento Valley, also utilizes adjacent orchards, especially walnut. Nests in sites with some willows, dense low-level or understory foliage, high humidity, and wooded foraging spaces.	**None.** No suitable foraging or nesting habitat present.
Golden eagle *Aquila chrysaetos*	P/FP/G5/S3	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as the Central Valley	Nests in cliffs and escarpments or tall trees; forages in annual grasslands, chaparral, or oak woodlands that provide abundant medium and large-sized mammals for prey.	**Low.** Marginal foraging habitat, and no suitable nesting habitat present.
Burrowing owl *Athene cunicularia*	–/SSC/G4/S2	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast.	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows.	**Moderate.** Surveys conducted in 2024 did not detect burrowing owl in the study area. Marginal nesting and foraging habitat is present. 88 records in Study Area.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Yellow-breasted chat *Icteria virens*	–/SSC/G1/S1	Varied throughout California, most common in northwest. Southern Coast Range from Santa Clara County to San Diego County, sometimes in Sacramento and San Joaquin Valleys.	Associated with shrubby willow riparian habitat with an open canopy and dense sub-canopy.	**None**. No suitable habitat present. 1 record in Study Area.
Grasshopper sparrow *Ammodramus savannarum*	–/SSC/G5/S3	Central Valley and foothills, west slope of Sierra Nevada, Coast Ranges, and coastal areas from Del Norte County south to San Diego County; rare breeder in the Shasta Valley area of Siskiyou County.	Occurs in short to medium height dry grasslands with scattered shrubs in the Central Valley, Sierra foothills, and south coast; found in prairies and pastures scattered in largely forested areas along north coast; nests on ground in grass or at base of shrub.	**Low.** Marginal habitat within Project vicinity. 2 records in Study Area.
Tricolored blackbird *Agelaius tricolor*	–/T/G1G2/S2	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	**None**. No suitable habitat present. 11 records in Study Area.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	–/SSC/G5T3/S3	San Francisco Bay south along coast to San Diego.	Salt marshes.	**None**. No suitable habitat present.

Common Name *Scientific Name*	Status[a] Federal/State/ GR/SR	California Distribution	Habitats	Likelihood to Occur in the Project Area
Mammals				
Pallid bat *Antrozous pallidus*	–/SSC/G4/S3 WBWG High	Throughout California, rom Shasta to Kern County and the northwest coast, primarily at lower and mid-elevations.	Occurs in a variety of habitats but most common in dry, rocky areas; day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, tree hollows, and various human structures (e.g., bridges, barns, porches).	**None**. No suitable habitat present.
Townsend's big-eared bat *Corynorhinus townsendii*	–/SSC/G4/S3 WBWG High	Widespread throughout California, from low desert to mid-elevation montane habitats.	Roosts in caves, tunnels, mines, buildings, and other cave-like spaces. Will night roost in more open settings, including under bridges.	**None**. No suitable habitat present. 2 records in Study Area.
Western red bat *Lasiurus blossevillii*	–/SSC/G4/S3 WBWG High	Found from Shasta County south to Mexico and west of the Sierra/Cascade crest and deserts; winter range includes western lowlands and coastal regions south of San Francisco Bay.	Found primarily in riparian and wooded habitats; occurs at least seasonally in urban areas; day roosts within foliage of trees; found in fruit orchards and sycamore riparian habitats in the Central Valley.	**Low.** Orchards surrounding the Project Area may provide suitable roosting habitat. 1 record in Study Area.
Suisun shrew *Sorex ornatus sinuosus*	–/–/ SSC/G5T1T2Q/S1S2	Tidal and brackish marsh communities along the north shore of San Pablo and Suisun Bays.	Salt and brackish marshes with low, dense vegetation.	**None**. No suitable habitat present.
American badger *Taxidea taxus*	–/–/SSC/G5/S3	Throughout most of California except northern North Coast area.	Shrub, forest, and herbaceous cover types with friable soils for digging burrows.	**None**. No suitable habitat present. 2 records in Study Area.

DPS = Distinct Population Segment
BCC = Bird of Conservation Concern

Status explanations:

Federal

E = listed as endangered under ESA
T = listed as threatened under ESA
P = protected under the Bald and Golden Eagle Protection Act
– = no listing

State

E = listed as endangered under CESA
T = listed as threatened under CESA
C = candidate status under CESA
FP = fully protected under the California Fish and Game Code
SSC = Species of Special Concern in California
WL = watch list
– = no listing

Global Rank (GR) (NatureServe)

GX = presumed extinct: virtually no likelihood of rediscovery.
GH = possibly extinct: known only from historical occurrences but still some hope of rediscovery.
G1 = critically imperiled: very high risk of extinction due to extreme rarity (often 5 or fewer populations) steep declines, or other factors.
G2 = imperiled: high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 = vulnerable: moderate risk of extinction or elimination due to a restricted range, relatively few populations (often 80 or fewer), or other factors.
G4 = apparently secure: uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = secure: common; widespread and abundant.
GNR = unranked: global rank not yet assessed.
GU = unrankable: currently unrankable due to a lack of information or due to substantially conflicting information about status or trends.
G#G# = range rank: numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty about the exact status of a taxon or community.
G#T# = infraspecific taxon: status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' Global Rank.
? = Qualifier: inexact numeric rank — represents a rank qualifier, denoting an inexact or uncertain numeric rank.
Q = Qualifier: questionable taxonomy — the distinctiveness at the current level is questionable.
C = Qualifier: captive or cultivated only — presumed or possibly extinct or eliminated in the wild but extant in cultivation or in captivity

State Rank (SR)(CNDDB)

SX = presumed extirpated: species believed to be extirpated from the state.
SH = possibly extirpated (Historical): species occurred historically in the state, and there is some possibility that it may be rediscovered.
S1 = critically imperiled: extreme rarity (often 5 or fewer occurrences) or other factor(s) making it especially vulnerable to extirpation.
S2 = imperiled: rarity (often 20 or fewer), or other factors making it very vulnerable to extirpation from the nation or state.
S3 = vulnerable: relatively few populations (often 80 or fewer), or other factors making it vulnerable to extirpation.
S4 = apparently secure: uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 = secure: common, widespread, and abundant in the state.
SNR = unranked: state conservation status not yet assessed.
SU = unrankable: unrankable due to a lack of information or due to substantially conflicting information about status or trends.
S#S# = range rank: numeric range rank (e.g., S2S3) used to indicate any range of uncertainty about the status of the species or community.
? = Qualifier: inexact or uncertain: — represents a rank qualifier, denoting an inexact or uncertain numeric rank.

Other:

Western Bat Working Group (WBWG)

High Priority: Species are imperiled or at high risk of imperilment.

3.4.1 White-Tailed Kite

White-tailed kite (CDFW Fully Protected) was observed foraging and perching within the 0.5 mile survey buffer during the 2023 raptor nest survey that focused on Swainson's hawk nest occupancy. Remnant grasslands and fallow agricultural fields provide suitable foraging habitat while patches of non-native forest along the I-80 corridor provide suitable nesting habitat. There are five historical CNDDB records for white-tailed kite nests within the 10-mile Study Area. (CDFW 2024b). The species is considered a relatively common yearlong resident in the California inland valleys and coastal areas and often associated with open grasslands and farmlands that provide foraging habitat. Based on the presence of suitable nesting and forging habitat, and known occupancy in the vicinity of the Project Area, white-tailed kite are considered to be present within the Project Area.

3.4.2 Swainson's Hawk

Swainson's hawk (California Threatened) was observed nesting in 2023 within 0.5 miles of the Project Area. Two pairs of Swainson's hawk were observed during the survey area with active nests (Figure 6). [redacted] Historical records of nesting Swainson's hawk compose the majority (63%) of all CNDDB records of bird species located within the 10-mile Study Area (CDFW 2024b). Large, scattered trees, utility towers, adjacent farmland, and annual grasslands found within the Project vicinity provide suitable nesting and foraging habitat for Swainson's hawk. Based on the presence of suitable nesting and forging habitat, and known occupancy in the vicinity of the Project Area, Swainson's hawk are considered present within the Project Area.

3.4.3 Burrowing Owl

Burrowing owl (CDFW Species of Special Concern) was observed incidentally in 2023 [redacted] during Swainson's hawk nest surveys. Suitable nesting and foraging habitat is present in the fallow agricultural fields and grasslands within the Project Area and focal surveys for burrowing owl were completed in 2024 to further characterize the potential for occurrence. The surveys in 2024 did not document the presence of burrowing owls within the study area. Historical records of nesting burrowing owl compose the second largest (28%) proportion of all CNDDB records of special-status birds located within the 10-mile Study Area (CDFW 2024b). One historical burrowing owl occurrence (#713) is located approximately 1.33 miles from the Project Area (CDFW 2024b). Unique features such as mounded banks of agricultural ditches, California ground squirrel (*Otospermophilus beecheyi*) burrows, and piles of discarded concrete pipes within the Project Area may provide suitable nesting, wintering, and foraging habitat for burrowing owl. Although no burrowing owls were observed during surveys in 2024, based on the presence of suitable nesting and forging habitat, and known occupancy in the region surrounding the Project Area, burrowing owl are considered to have a moderate potential to occur in the Project Area in the future.

Figure 6. Swainson's Hawk 2023 Nest Survey Results has been filed separately under a request for confidential designation

3.5 Non-Special-Status Migratory Birds and Raptors

Non-special-status migratory birds have the potential to nest and forage in the Project Area. All native migratory birds (i.e., excludes non-native, human-introduced species such as house sparrow [*Passer domesticus*], European starling [Sturnus vulgaris]) qualify for protection under the MBTA (Section 1.3.1.2). This protection extends to the majority of bird species in California. Although limited, trees and shrubs in the Project Area including orchards and non-native forest provide suitable habitat for tree- and shrub-nesting birds such as yellow-billed magpie (*Pica nuttalli*), loggerhead shrike (*Lanius ludovicianus*). Gravel roads in the Project Area may be used for nesting by killdeer (*Charadrius vociferus*). Electrical towers in the Project Area also provide suitable nesting habitat for raptors, and some other birds such as common raven (*Corvus corax*). The breeding season for migratory birds varies by species but generally extends from February through August.

Chapter 4
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Appendix A

California Department of Fish and Wildlife, California Native Plant Society, and U. S. Fish and Wildlife Species Lists

California Natural Diversity Database reports have been filed under a request for confidential designation.

California Native Plant Society

CNPS Rare Plant Inventory

Search Results

63 matches found. Click on scientific name for details

Search Criteria: Quad is one of [**3812127:3812128:3812136:3812137:3812138:3812146:3812147:3812148:3812157:3812158:3812231:3812241:3812251**]

▲ SCIENTIFIC NAME	COMMON NAME	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	GENERAL HABITATS	LOWEST ELEVATION (FT)	HIGHEST ELEVATION (FT)	CA ENDEMIC
Arabis modesta	modest rockcress	Mar-Jul	None	None	G3	S3	4.3	Chaparral, Lower montane coniferous forest	395	2625	
Arctostaphylos manzanita ssp. *laevigata*	Contra Costa manzanita	Jan-Mar(Apr)	None	None	G5T2	S2	1B.2	Chaparral (rocky)	1410	3610	Yes
Astragalus tener var. *ferrisiae*	Ferris' milk-vetch	Apr-May	None	None	G2T1	S1	1B.1	Meadows and seeps (vernally mesic), Valley and foothill grassland (subalkaline flats)	5	245	Yes
Astragalus tener var. *tener*	alkali milk-vetch	Mar-Jun	None	None	G2T1	S1	1B.2	Playas, Valley and foothill grassland (adobe clay), Vernal pools	5	195	Yes
Atriplex cordulata var. *cordulata*	heartscale	Apr-Oct	None	None	G3T2	S2	1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland (sandy)	0	1835	Yes
Atriplex coronata var. *coronata*	crownscale	Mar-Oct	None	None	G4T3	S3	4.2	Chenopod scrub, Valley and foothill grassland, Vernal pools	5	1935	Yes
Atriplex depressa	brittlescale	Apr-Oct	None	None	G2	S2	1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland, Vernal pools	5	1050	Yes
Atriplex persistens	vernal pool smallscale	Jun-Oct	None	None	G2	S2	1B.2	Vernal pools (alkaline)	35	375	Yes
Centromadia parryi ssp. *parryi*	pappose tarplant	May-Nov	None	None	G3T2	S2	1B.2	Chaparral, Coastal prairie, Marshes and swamps (coastal salt), Meadows and seeps, Valley and foothill grassland (vernally mesic)	0	1380	Yes

Centromadia parryi ssp. *rudis*	Parry's rough tarplant	May-Oct	None	None	G3T3	S3	4.2	Valley and foothill grassland, Vernal pools	0	330	Yes
Chloropyron molle ssp. *hispidum*	hispid salty bird's-beak	Jun-Sep	None	None	G2T1	S1	1B.1	Meadows and seeps, Playas, Valley and foothill grassland	5	510	Yes
Chloropyron molle ssp. *molle*	soft salty bird's-beak	Jun-Nov	FE	CR	G2T1	S1	1B.2	Marshes and swamps (coastal salt)	0	10	Yes
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	Jul-Sep	None	None	G5T4T5	S2?	2B.1	Marshes and swamps (brackish, coastal, freshwater)	0	655	
Cirsium hydrophilum var. *hydrophilum*	Suisun thistle	Jun-Sep	FE	None	G2T1	S1	1B.1	Marshes and swamps (salt)	0	5	Yes
Delphinium recurvatum	recurved larkspur	Mar-Jun	None	None	G2?	S2	1B.2	Chenopod scrub, Cismontane woodland, Valley and foothill grassland	10	2590	Yes
Downingia pusilla	dwarf downingia	Mar-May	None	None	GU	S2	2B.2	Valley and foothill grassland (mesic), Vernal pools	5	1460	
Eleocharis parvula	small spikerush	(Apr)Jun-Aug(Sep)	None	None	G5	S3	4.3	Marshes and swamps	5	9910	
Eryngium jepsonii	Jepson's coyote-thistle	Apr-Aug	None	None	G2	S2	1B.2	Valley and foothill grassland, Vernal pools	10	985	Yes
Extriplex joaquinana	San Joaquin spearscale	Apr-Oct	None	None	G2	S2	1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland	5	2740	Yes
Fritillaria agrestis	stinkbells	Mar-Jun	None	None	G3	S3	4.2	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland	35	5100	Yes
Fritillaria liliacea	fragrant fritillary	Feb-Apr	None	None	G2	S2	1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland	10	1345	Yes
Fritillaria pluriflora	adobe-lily	Feb-Apr	None	None	G2G3	S2S3	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland	195	2315	Yes
Gratiola heterosepala	Boggs Lake hedge-hyssop	Apr-Aug	None	CE	G2	S2	1B.2	Marshes and swamps (lake margins), Vernal pools	35	7790	
Hesperevax caulescens	hogwallow starfish	Mar-Jun	None	None	G3	S3	4.2	Valley and foothill grassland (mesic clay), Vernal pools (shallow)	0	1655	Yes
Hesperolinon breweri	Brewer's western flax	May-Jul	None	None	G2	S2	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland	100	3100	Yes

Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	Jun-Sep	None	None	G5T3	S3	1B.2	Marshes and swamps (freshwater)	0	395	Yes
Isocoma arguta	Carquinez goldenbush	Aug-Dec	None	None	G1	S1	1B.1	Valley and foothill grassland (alkaline)	5	65	Yes
Lasthenia chrysantha	alkali-sink goldfields	Feb-Apr	None	None	G2	S2	1B.1	Vernal pools	0	655	Yes
Lasthenia conjugens	Contra Costa goldfields	Mar-Jun	FE	None	G1	S1	1B.1	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools	0	1540	Yes
Lasthenia ferrisiae	Ferris' goldfields	Feb-May	None	None	G3	S3	4.2	Vernal pools (alkaline, clay)	65	2295	Yes
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	Feb-Jun	None	None	G4T2	S2	1B.1	Marshes and swamps (coastal salt), Playas, Vernal pools	5	4005	
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	Marshes and swamps (brackish, freshwater)	0	15	Yes
Layia septentrionalis	Colusa layia	Apr-May	None	None	G2	S2	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland	330	3595	Yes
Legenere limosa	legenere	Apr-Jun	None	None	G2	S2	1B.1	Vernal pools	5	2885	Yes
Lepidium latipes var. *heckardii*	Heckard's pepper-grass	Mar-May	None	None	G4T1	S1	1B.2	Valley and foothill grassland (alkaline flats)	5	655	Yes
Leptosiphon aureus	bristly leptosiphon	Apr-Jul	None	None	G4?	S4?	4.2	Chaparral, Cismontane woodland, Coastal prairie, Valley and foothill grassland	180	4920	Yes
Leptosiphon jepsonii	Jepson's leptosiphon	Mar-May	None	None	G2G3	S2S3	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland	330	1640	Yes
Lessingia hololeuca	woolly-headed lessingia	Jun-Oct	None	None	G2G3	S2S3	3	Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland	50	1000	Yes
Lilaeopsis masonii	Mason's lilaeopsis	Apr-Nov	None	CR	G2	S2	1B.1	Marshes and swamps (brackish, freshwater), Riparian scrub	0	35	Yes
Limosella australis	Delta mudwort	May-Aug	None	None	G4G5	S2	2B.1	Marshes and swamps (brackish, freshwater), Riparian scrub	0	10	
Lomatium repostum	Napa lomatium	Mar-Jun	None	None	G3	S3	4.2	Broadleafed upland forest, Chaparral, Cismontane woodland	295	4725	Yes

Malacothamnus helleri	Heller's bushmallow	May-Jul	None	None	G2Q	S2	3.3	Chaparral (sandstone), Riparian woodland (gravel)	1000	2085	Yes
Meesia triquetra	three-ranked hump moss	Jul	None	None	G5	S4	4.2	Bogs and fens, Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest (mesic)	4265	9690	
Microseris paludosa	marsh microseris	Apr-Jun(Jul)	None	None	G2	S2	1B.2	Cismontane woodland, Closed-cone coniferous forest, Coastal scrub, Valley and foothill grassland	15	1165	Yes
Microseris sylvatica	sylvan microseris	Mar-Jun	None	None	G4	S4	4.2	Chaparral, Cismontane woodland, Great Basin scrub, Pinyon and juniper woodland, Valley and foothill grassland	150	4920	Yes
Myosurus minimus ssp. *apus*	little mousetail	Mar-Jun	None	None	G5T2Q	S2	3.1	Valley and foothill grassland, Vernal pools (alkaline)	65	2100	
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	Apr-Jul	None	None	G4T2	S2	1B.1	Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Valley and foothill grassland, Vernal pools	15	5710	Yes
Neostapfia colusana	Colusa grass	May-Aug	FT	CE	G1	S1	1B.1	Vernal pools (adobe clay)	15	655	Yes
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Apr-Sep	FT	CE	G1	S1	1B.1	Vernal pools	35	2475	Yes
Perideridia gairdneri ssp. *gairdneri*	Gairdner's yampah	Jun-Oct	None	None	G5T3T4	S3S4	4.2	Broadleafed upland forest, Chaparral, Coastal prairie, Valley and foothill grassland, Vernal pools	0	2000	Yes
Plagiobothrys hystriculus	bearded popcornflower	Apr-May	None	None	G2	S2	1B.1	Valley and foothill grassland (mesic), Vernal pools (margins)	0	900	Yes
Psilocarphus brevissimus var. *multiflorus*	Delta woolly-marbles	May-Jun	None	None	G4T3	S3	4.2	Vernal pools	35	1640	Yes
Puccinellia simplex	California alkali grass	Mar-May	None	None	G2	S2	1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools	5	3050	

Ranunculus lobbii	Lobb's aquatic buttercup	Feb-May	None	None	G4	S3	4.2	Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools	50	1540	
Sagittaria sanfordii	Sanford's arrowhead	May-Oct(Nov)	None	None	G3	S3	1B.2	Marshes and swamps (shallow freshwater)	0	2135	Yes
Sidalcea keckii	Keck's checkerbloom	Apr-May(Jun)	FE	None	G2	S2	1B.1	Cismontane woodland, Valley and foothill grassland	245	2135	Yes
Spergularia macrotheca var. *longistyla*	long-styled sand-spurrey	Feb-May	None	None	G5T2	S2	1B.2	Marshes and swamps, Meadows and seeps	0	835	Yes
Stuckenia filiformis ssp. *alpina*	northern slender pondweed	May-Jul	None	None	G5T5	S2S3	2B.2	Marshes and swamps (shallow freshwater)	985	7055	
Symphyotrichum lentum	Suisun Marsh aster	(Apr)May-Nov	None	None	G2	S2	1B.2	Marshes and swamps (brackish, freshwater)	0	10	Yes
Trifolium amoenum	two-fork clover	Apr-Jun	FE	None	G1	S1	1B.1	Coastal bluff scrub, Valley and foothill grassland (sometimes serpentinite)	15	1360	Yes
Trifolium hydrophilum	saline clover	Apr-Jun	None	None	G2	S2	1B.2	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools	0	985	Yes
Tuctoria mucronata	Crampton's tuctoria or Solano grass	Apr-Aug	FE	CE	G1	S1	1B.1	Valley and foothill grassland (mesic), Vernal pools	15	35	Yes
Viburnum ellipticum	oval-leaved viburnum	May-Jun	None	None	G4G5	S3	2B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest	705	4595	

Showing 1 to 63 of 63 entries

Suggested Citation:

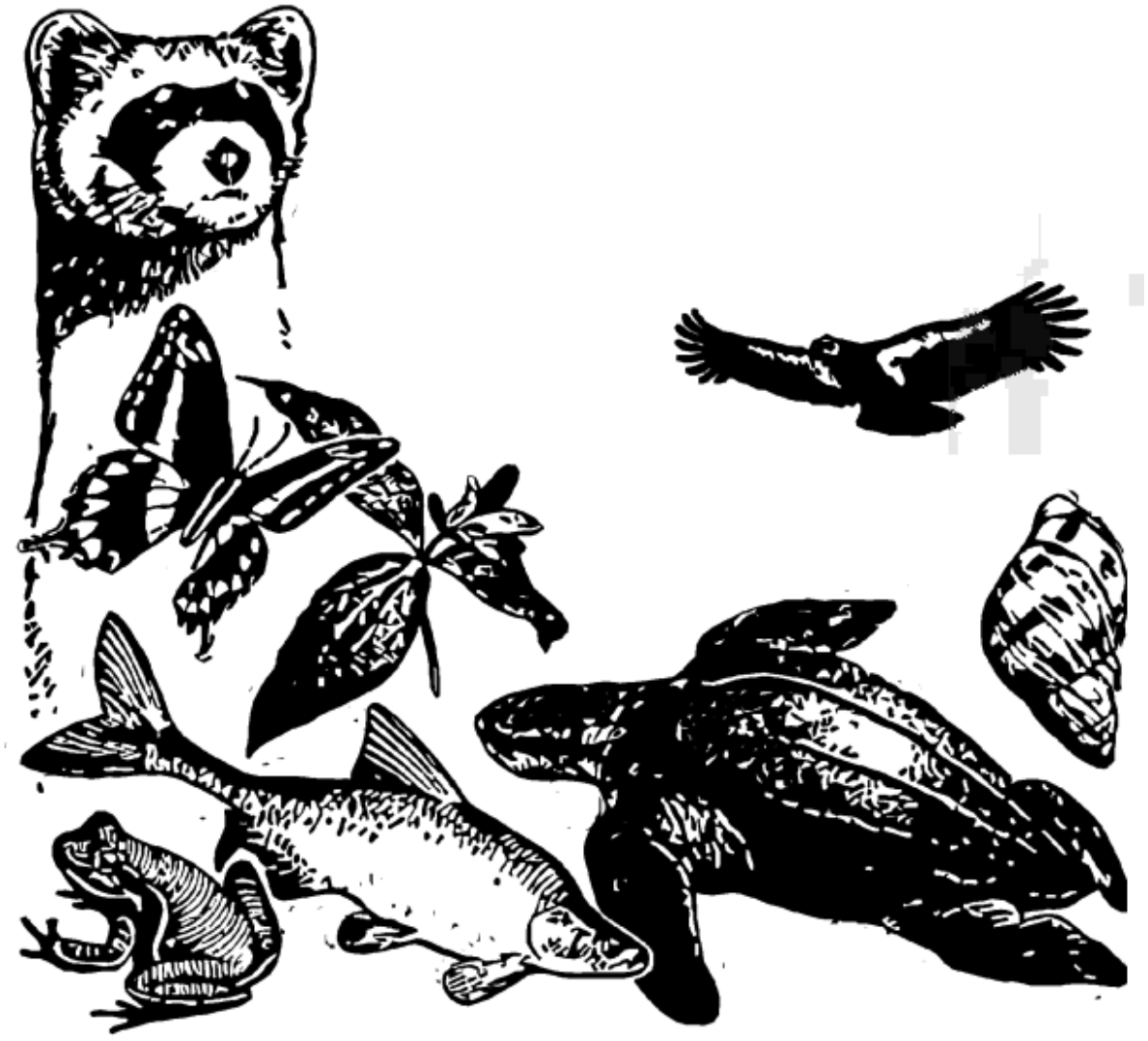
California Native Plant Society, Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 20 June 2024].

U.S. Fish & Wildlife Service

Corby Energy Storage System

Habitat Assessment Guidelines (1 Species)

Generated June 11, 2024 06:11 PM UTC, IPaC v6.110.0-rc5



IPaC - Information for Planning and Consultation (https://ipac.ecosphere.fws.gov/): A project planning tool to help streamline the U.S. Fish and Wildlife Service environmental review process.

Table of Contents

Species Document Availability

Species with habitat assessment guidelines

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*

Species without habitat assessment guidelines available

California Tiger Salamander *Ambystoma californiense*

Conservancy Fairy Shrimp *Branchinecta conservatio*

Monarch Butterfly *Danaus plexippus*

Northwestern Pond Turtle *Actinemys marmorata*

Vernal Pool Fairy Shrimp *Branchinecta lynchi*

Vernal Pool Tadpole Shrimp *Lepidurus packardi*

Western Spadefoot *Spea hammondii*

Habitat Assessment Guidelines - California Tiger Salamander and 7 more species

Published by Sacramento Fish And Wildlife Office for the following species included in your project

- California Tiger Salamander *Ambystoma californiense*
- Conservancy Fairy Shrimp *Branchinecta conservatio*
- Vernal Pool Fairy Shrimp *Branchinecta lynchi*
- Vernal Pool Tadpole Shrimp *Lepidurus packardi*
- Western Spadefoot *Spea hammondii*
- Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*
- Monarch Butterfly *Danaus plexippus*
- Northwestern Pond Turtle *Actinemys marmorata*

Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle
(*Desmocerus californicus dimorphus*)

May 2017

Service Contact

The Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) (Framework) was prepared by the U.S. Fish and Wildlife Service's Sacramento Fish and Wildlife Office. If you have questions regarding the Framework, please call (916) 414-6600. To download a copy of the Framework please visit:
https://www.fws.gov/sacramento/documents/VELB_Framework.pdf

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1.0 Introduction

The U.S. Fish and Wildlife Service (Service) is issuing this Framework to assist Federal agencies and non-federal parties in evaluating the potential effects of their projects on the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB), listed as threatened under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). This framework can be consulted during the development of any project that may affect VELB or its habitat. It is intended to help project applicants assess potential effects to the VELB and develop measures to avoid, minimize, and compensate for adverse effects to the species or its habitat. It may also help determine whether those projects will require incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit. Proposed projects that will have large landscape level impacts, are likely to provide a net conservation benefit, or will involve riparian restoration may need a different or more detailed analysis than what is provided here. Applicants and agencies proposing these, or similar types of projects, should discuss the project with the Service early in the planning process. The Framework may still provide guidance for an effects analysis, but these projects may exercise more flexibility when implementing conservation measures and compensation.

The primary goal of this document is to articulate a conceptual ecological model for the species. This framework represents the Sacramento Fish and Wildlife Office's current analytical approach for evaluating and assessing adverse effects to the VELB. It will be updated as new information becomes available. As always, the Service welcomes dialog and discussion with our partners in assessing impacts for particular projects and encourages project proponents to consult with the Service early in project development whenever possible.

The VELB is protected under the Act wherever it is found. Visual surveys for the VELB, which includes looking for adults and/or exit holes, are currently the only approved method of surveying for the species and are not entirely reliable for determining presence or absence (see below). Visual surveys, habitat assessments, and mitigation site monitoring do not require a section 10(a)(1)(A) recovery permit. Inquiries about other survey methods, recovery permits, and research should be directed to the Listing and Recovery Division at (916) 414-6600.

1.1 Previous Federal Actions

The VELB was listed as a threatened species under the Act on August 8, 1980 (Federal Register 45: 52803-52807). Concurrent with the final listing rule, two areas in Sacramento County were designated as critical habitat for the VELB (Appendix A). The first area, referred to as the "Sacramento Zone", is enclosed by California State Route 160 to the north, the Western Pacific railroad tracks to the west/southwest, and by Commerce Circle to the east. The second area, referred to as the "American River Parkway Zone", is actually two separate areas along the south bank of the American River in Rancho Cordova. A recovery plan for VELB was completed on June 28, 1984; however, due to a lack of information regarding VELB life history, distribution, and habitat requirements, the recovery plan

only described interim actions and not precise recommendations (Service 1984). For more information about VELB, its designated critical habitat, and the VELB recovery plan, please visit: https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=7850.

On September 10, 2010, the Service was petitioned to delist the VELB and on August 19, 2011, the Service responded with a 90-day finding that determined the petition contained substantial information indicating that delisting VELB may be warranted (Federal Register 76: 51929-51931). On October 2, 2012, the Service published a proposed rule to delist VELB and to remove the species' critical habitat designation (Federal Register 77: 60238-60276). However, after receiving additional information regarding VELB, the Service did not delist the species and published the September 17, 2014, Withdrawal of the Proposed Rule to Remove the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife (Federal Register 79: 55874-55917) (Withdrawal Rule). The August 8, 1980, final listing rule and the Withdrawal Rule both described habitat loss as the primary threat to the species.

2.0 Life History

The VELB is a small (0.5 - 0.8 in.) wood-boring beetle in the *Cerambycid* family. It is sexually dimorphic and the females are indistinguishable from the more widespread California elderberry longhorn beetle (*Desmocerus californicus californicus*). Elderberry shrubs (*Sambucus* spp.) are the obligate larval host plants for the VELB (Collinge et al. 2001, Holyoak 2010) and their larvae go through several developmental stages (instars) within the elderberry shrub (Greenberg 2009). Eggs are laid individually on leaves or at the junctions of the leaf stalk and main stem (Barr 1991). Upon hatching, the larvae bore into the elderberry stem (Halstead and Oldham 1990) and create feeding galleries in the pith (Burke 1921, Barr 1991). Prior to pupation, the larvae creates an exit hole, plugs the hole with wood shavings, and returns to the gallery where it pupates (Halstead and Oldham 1990). Approximately 1 month later, the adult beetle emerges from the stem through the previously created exit hole (Burke 1921). Adult emergence, mating, and egg-laying, occurs in the spring and summer (March to July), typically coinciding with the elderberry flowering period (Burke 1921, Halstead and Oldham 1990). Under laboratory conditions, adult males typically live 4 to 5 days, while females can live up to 3 weeks (Arnold 1984). The only identifiable exterior evidence of elderberry use by VELB is the exit hole created by the larvae.

3.0 Range and Habitat Description

The VELB is protected wherever found. The current presumed range extends throughout the Central Valley (https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=7850). The range extends from approximately Shasta County in the north to Fresno County in the south including the valley floor and lower foothills. The majority of VELB have been documented below 152 meters (500 feet) in elevation. Areas above 152 meters (500 feet) with suitable habitat and known VELB occurrences in that drainage may contain VELB populations in certain circumstances. The Service can assist in determining the likelihood of occupancy above 500 feet.

3.1 Habitat

Historically, the Central Valley had large (3.2-8.0 km wide), undisturbed expanses of riparian vegetation associated with the watersheds that drained the west side of the Sierra Nevada Mountains and the east side of the Coast Mountain Range. These watershed systems were highly dynamic and their floodplains supported a wide corridor of riparian vegetation (Katibah 1984) in a diverse mosaic of structures and species assemblages from early successional to mature gallery forest (Gilbart 2009).

During the last 150 years California's Central Valley riparian forests have experienced extensive vegetation loss due to expansive agricultural and urban development (Katibah 1984), and in many places, have dwindled to discontinuous, narrow corridors. Natural areas bordering the rivers, which once supported vast tracts of riparian vegetation, became prime agricultural land (Thompson 1961). As agriculture and urbanization expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping have further reduced riparian vegetation to small, isolated fragments (Katibah 1984). In many places, flood control levees have been installed adjacent to and parallel with the river, effectively sectioning the riparian forest habitat into discrete communities on either side of the levee. In recent decades, riparian areas in the Central Valley have continued to decline as a result of ongoing agricultural conversion, urban development, stream channelization and channel hardening.

Elderberry shrubs are common in the Central Valley where they grow naturally in a variety of riparian and non-riparian vegetative communities (Vaghti and Greco 2007). Most elderberry presence within the Central Valley is determined by broad scale hydrologic regimes such as the relative elevation of floodplain and floodplain width, and secondarily by sediment texture and topography (Fremier and Talley 2009). Elderberry shrubs are most common on higher and older riparian terraces, where the roots of the plant are able to reach the water table and where the plants are not inundated for long periods (Talley 2005; Vaghti et al. 2009). Elderberry shrubs can be found on historic floodplain terraces above the river, on levees (both on the river and land sides), and along canals, ditches, and areas where subsurface flow provides water to elderberry roots. Elderberry shrubs typically occur in most vegetation communities that occupy historic and current floodplains and terraces, to the top of channel walls in deeply incised rivers (i.e., the Tuolumne and Stanislaus Rivers), and to the top of and on the land-side of levees where woody plants create savannas or patchy woodlands. Elderberry can be a canopy or subcanopy species depending on the hydrology, vegetation composition, or disturbance at a particular site and it can occur as individual shrubs, clumps, clusters, and groves. In non-riparian settings, elderberries occur either singly or in groups in valley oak and blue oak woodland and annual grasslands. It is not known whether elderberries in this setting are also associated with a shallow water table or other shallow water sources. In natural areas, elderberry shrubs have also been shown to grow best with little canopy cover from associated vegetation (Talley 2005).

The historic distribution of the VELB closely matched the distribution of the elderberry host plant, which was patchily found throughout the Central Valley riparian forests and occasionally adjacent uplands (non-riparian). The Service recognizes habitat for VELB as including both riparian and non-riparian areas where elderberry shrubs are present. Riparian habitat includes all areas that are either influenced by surface or subsurface water flows along streams, rivers, and canals (including the landside of levees) and areas that have the vegetation communities similar to those defined below.

Riparian vegetation communities within the California Central Valley can be described as valley-foothill forest habitat, which includes many different forest associations. Non-riparian habitat includes valley oak and blue oak woodland and annual grassland. The following habitat descriptions have been adapted from Mayer and Laudenslayer (1988) (https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats).

Within California, valley-foothill riparian habitats occur in the Central Valley and the lower foothills of the Cascade, Sierra Nevada, and Coast mountain ranges. Riparian habitats show a wide range of both species and structural diversity. The valley-foothill riparian habitat is found in association with riverine, grassland, oak woodland, and agricultural habitats. Canopy height is about 30 meters in a mature riparian forest, with a canopy cover of 20 to 80 percent. Most trees are winter deciduous. There is a subcanopy tree layer and an understory shrub layer. Wild grapes (*Vitis californica*) frequently provide up to 50 percent of the ground cover and festoon trees to heights of 20-30 meters. Herbaceous vegetation constitutes about one percent of the cover, except in open areas where tall forbs and shade-tolerant grasses occur. Many non-native invasive species can also be found, and are sometimes common, in riparian habitat. Oak woodland, oak savanna, and elderberry savanna can occur as both riparian and non-riparian communities.

Dominant riparian canopy layer species include cottonwood (*Populus* sp.), California sycamore (*Platanus racemosa*), willow (*Salix* spp.) black walnut (*Juglans* spp.) and valley oak (*Quercus lobata*). Subcanopy trees include boxelder (*Acer negundo*) and Oregon ash (*Fraxinus latifolia*), and typical understory shrub layer plants include wild grape, wild rose (*Rosa* sp.), blackberry (*Rubus* sp.), poison oak (*Toxicodendron diversilobum*), and buttonbush (*Cephalanthus occidentalis*), and willows. The herbaceous layer consists of sedges (*Carex* sp.), rushes, grasses, miner's lettuce (*Claytonia* sp.), mugwort (*Artemisia* sp.), poison-hemlock (*Conium maculatum*), and hoary nettle (*Urtica dioica*). Many non-native woody species occur with elderberry including tree-of-heaven (*Ailanthus altissima*) and black locust (*Robinia pseudoacacia*)

Elderberry shrubs can be a common understory plant in both non-riparian valley oak and blue oak woodland habitats. Valley oak woodland is generally found at lower elevations than blue oak woodlands, but the two habitat types transition into each other in the lower foothill regions. Annual grasses and forbs dominate the herbaceous layer in both woodland habitat types (Mayer and Laudenslayer 1998) and both intergrade with annual grassland. Valley oak woodland can occur from savanna-like conditions to denser forest-like conditions, with tree density tending to increase along

natural drainages. Valley oak woodlands are almost exclusively dominated by valley oak, but may also contain sycamore, black walnut, blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizeni*), and boxelder. Understory shrubs may include species such as, wild grape, toyon (*Heteromeles arbutifolia*), and California coffeeberry (*Frangula californica*). Blue oak woodlands can also occur from savanna-like conditions to denser forest-like conditions with a nearly closed canopy. Blue oak woodland is comprised of 85 to 100 percent blue oak trees, but may contain interior live oak and valley oak.

Common shrub associates include poison-oak, California coffeeberry, buckbrush (*Ceanothus cuneatus*), California buckeye (*Aesculus californica*), and manzanita (*Arctostaphylos* sp.). Within both of these habitats, elderberry may be found in the understory as well as in small clumps within the upland savanna. Elderberry shrubs are also often found away from riparian areas where ditches, irrigation, groundwater, or other features allow the plant to receive enough moisture and as ornamental plantings in regularly maintained landscaped areas.

3.1.1 Use of Riparian Habitat

Research suggests that the VELB occurs throughout the Central Valley in metapopulations (Collinge et al. 2001). Metapopulations are defined as a system of discrete subpopulations that may exchange individuals through dispersal or migration (Breininger et al. 2012, Nagelkerke et al. 2002). The VELB metapopulation occurs throughout contiguous intact riparian habitat as subpopulations that shift spatially and temporally within drainages, resulting in a patchwork of occupied and unoccupied habitat. Removal of suitable habitat (whether occupied or unoccupied) can increase the distance between occupied and unoccupied patches. Because its physical dispersal capability is limited, this fragmentation decreases the likelihood of successful colonization of unoccupied habitat (Collinge et al. 2001). As a consequence, the subpopulations are more vulnerable to stochastic events that may reduce or eliminate the subpopulation. The loss of multiple subpopulations can have an adverse impact on the long-term persistence and health of the metapopulation. Therefore, maintaining contiguous areas of suitable habitat is critical for maintaining the VELB.

At the local level, it appears that much of the variation in VELB occupancy of elderberry shrubs results from variables such as elderberry condition, water availability, elderberry density, and the health of the riparian habitat (Talley et al. 2007). This research indicates that healthy riparian systems supporting dense elderberry clumps are the primary habitat of VELB (Barr 1991, Collinge et al. 2001, Talley et al. 2006, Talley et al. 2007). Elderberry shrubs typically have a clumped distribution across the landscape (Figure 1) although they can occur singly. Upon emergence, VELB typically stay within the local clump (Talley et al 2007). Talley et al. (2007) found that much of the time, distances between stems with exit holes averaged 25-50 meters (65-165 feet) apart. At larger scales, average distances between these occupied clumps ranged from 200 meters (656 feet) up to 800 meters (2,625 feet) (Figure 1).

Because the elderberry is the sole host plant of the VELB, any activities that adversely impact the elderberry shrub may also adversely impact the VELB. Adverse impacts to elderberry shrubs can occur

either at a habitat scale or at an individual shrub scale. Activities that reduce the suitability of an area for elderberry plants or elderberry recruitment and increase fragmentation may have adverse impacts to mating, foraging, and dispersal of VELB. The patchy nature of VELB habitat and habitat use makes the species particularly susceptible to adverse impacts from habitat fragmentation.

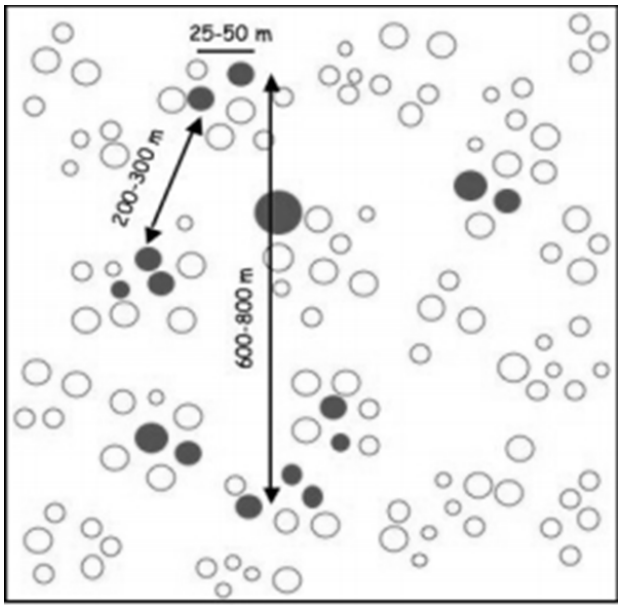

Figure 1. Schematic diagram of the spatial population structure of the valley elderberry longhorn beetle. Open circles represent unoccupied elderberry shrubs, closed circles are occupied by the valley elderberry longhorn beetle. Aggregation sizes and distances used are those found on the American River Parkway, where occupied clumps are approximately 25-50 meters apart, distances between aggregations of occupied clumps are approximately 200-300 meters, and the extent of the cluster of aggregations is 600-800 meters (Talley et al. 2006).

Determining whether an individual plant or clump is occupied by VELB can be challenging. Often the only external evidence that a VELB is present is the small exit hole made by the larva as it leaves the stem. Traditional exit hole surveys can help identify the past use of a particular shrub by VELB, but not its current occupancy. This difficulty makes assessing the likelihood of presence of individual VELB difficult. However, Talley et al. (2007) found that 73% of shrubs with old exit holes also had new exit holes, indicating that presence of an exit hole in the shrub increases the likelihood that that shrub or nearby shrubs are occupied. Therefore, impacts to individual shrubs with exit holes are reasonably likely to result in impacts to individual VELB, but the likelihood of adverse effects may not always be ascertained simply by the presence of exit holes (or the lack of). A more thorough analysis of nearby occurrences, surrounding habitat, and elderberry density is needed to fully address adverse impacts. In general, because of the difficulty in detecting VELB, the patchy nature of its distribution, and the importance of unoccupied habitat to maintain connectivity between VELB metapopulations, any

impacts to riparian habitat with elderberry shrubs present are likely to result in adverse effects to VELB.

3.1.2 Use of Non-Riparian Habitat

Much of the existing research has focused on the VELB's use of riparian habitat. In non-riparian habitats, a patchwork of individual shrubs provides opportunity for VELB occupancy, but it is unknown if the movement and distribution patterns remain consistent with the patterns found in riparian areas. In non-riparian areas, adverse effects to of VELB are likely to occur as a result of impacts to any elderberry shrub with exit holes, and adverse effects may result from disturbance to elderberry shrubs reasonably close to riparian areas or known VELB populations.

4.0 Occupancy Determination in Non-Riparian Habitat and Appropriate Surveys

The decision tree shown in Figure 2 is used by the Sacramento Fish and Wildlife Office to assess the effect of any proposed project on the VELB. It is recommended that proposed project sites within the range of the VELB be surveyed by a qualified biologist for the presence of elderberry shrubs. If elderberry shrubs are found on or within 50 meters (165 feet) of the project site, we recommend that the habitat be assessed to determine if the project area is in riparian or non-riparian habitat. Depending on the size, duration and/or type of proposed project, the larger area surrounding the project site may also be surveyed for the presence and number of elderberry shrubs.

If the project site is non-riparian and contains elderberry shrubs, we use exit hole surveys to evaluate the site for potential occupancy. Exit hole surveys are not essential in riparian areas, but may be conducted in order to assess the level and significance of adverse effects. The presence of exit holes in a shrub increases the likelihood that the shrub is occupied by VELB; however, a lack of exit holes does not preclude occupancy by the VELB. In the absence of exit holes we recommend that a biologist evaluate the project area using the following criteria (also shown in Figure 2):

1. Is there a riparian area, elderberry shrubs, or known VELB records within 800 meters (2,526 feet) of the proposed project?

   Isolated, non-riparian elderberry clumps are less likely to be occupied or become colonized by VELB and those beyond 800 meters (2,526 feet) from the nearest elderberry clump become increasingly less likely to be occupied. Therefore, a qualified biologist can assess the distance of the elderberry shrub from the nearest riparian area, elderberry shrub, and known occupied elderberry location.
2. Was the site continuous with a historical riparian corridor?

   Fragmentation of riparian corridors in the Central Valley has resulted in the isolation of elderberry shrubs or clusters that may provide important linkages between or within riparian corridors. A qualified biologist can evaluate the project location in the context of the historical riparian system. Isolated elderberry clumps that were part of a historic riparian vegetative community may still support VELB.

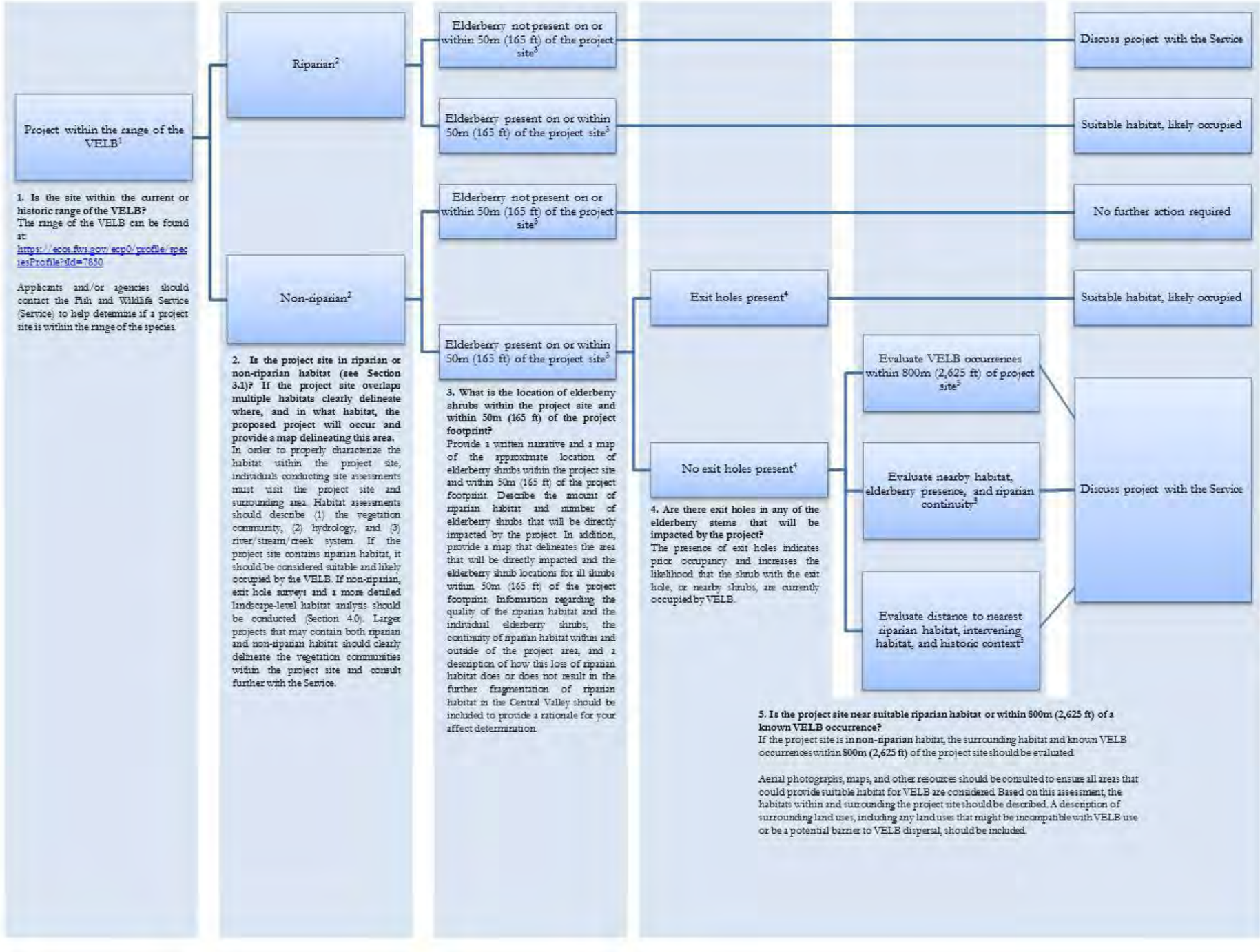

Figure 2. Decision tree to determine the likelihood of a particular elderberry shrub being occupied by valley elderberry longhorn beetle.

5.0 Conservation Measures

We encourage the development of proposed project designs that avoid riparian habitat and/or elderberry shrubs whenever possible. If elderberry shrubs occur on or within 50 meters (165 feet) of the project area, adverse effects to VELB may occur as a result of project implementation. If the project may affect VELB or its habitat, appropriate avoidance and minimization measures are recommended.

5.1 Avoidance and Minimization Measures

The following measures are recommended for incorporation into a proposed project to avoid and minimize effects to VELB and/or its habitat. Not all measures may be appropriate for every project, and agencies/applicants should coordinate with the Service to determine which measures may be needed. The text in this section and Section 5.2 is intended to provide language that may be used by agencies/applicants to describe avoidance and minimization measures for their proposed project.

Fencing. All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.

Avoidance area. Activities that may damage or kill an elderberry shrub (e.g., trenching, paving, etc.) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.

Worker education. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non-compliance.

Construction monitoring. A qualified biologist will monitor the work area at project-appropriate intervals to assure that all avoidance and minimization measures are implemented. The amount and duration of monitoring will depend on the project specifics and should be discussed with the Service biologist.

Timing. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July).

Trimming (See 5.3). Trimming may remove or destroy VELB eggs and/or larvae and may reduce the health and vigor of the elderberry shrub. In order to avoid and minimize adverse effects to VELB when trimming, trimming will occur between November and February and will avoid the removal of any branches or stems that are ≥ 1 inch in diameter. Measures to address regular and/or large scale maintenance (trimming) should be established in consultation with the Service.

Chemical Usage. Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 30 meters (98 feet) of an elderberry shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

Mowing. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

Erosion Control and Re-vegetation. Erosion control will be implemented and the affected area will be re-vegetated with appropriate native plants.

5.2 Transplanting

In order to protect VELB larvae to the greatest extent possible, we recommend that all elderberry shrubs with stems greater than 1 inch in diameter be transplanted under the following conditions:

1. If the elderberry shrub cannot be avoided.
2. If indirect effects will result in the death of stems or the entire shrub.

Removal of entire elderberry plants without disturbance to the surrounding habitat is uncommon, but may occur on certain projects. The removal may either include the roots or just the removal of the aboveground portion of the plant. We encourage project applicants to attempt to remove the entire root ball and transplant the shrub, if possible. In order to minimize the fragmentation of VELB habitat, the Service encourages applicants to relocate elderberry shrubs as close as possible to their original location. Elderberry shrubs may be relocated adjacent to the project footprint if: 1) the planting location is suitable for elderberry growth and reproduction; and 2) the project proponent is able to protect the shrub and ensure that the shrub becomes reestablished. If these criteria cannot be met, the shrub may be transplanted to an appropriate Service-approved mitigation site. Any elderberry shrub that is unlikely to survive transplanting because of poor condition or location, or a shrub that would be extremely difficult to move because of access problems, may not be appropriate for transplanting. The following transplanting guidelines may be used by agencies/applicants in developing their VELB conservation measures:

Monitor. A qualified biologist will be on-site for the duration of transplanting activities to assure compliance with avoidance and minimization measures and other conservation measures.

Exit Holes. Exit-hole surveys will be completed immediately before transplanting. The number of exit holes found, GPS location of the plant to be relocated, and the GPS location of where the plant is transplanted will be reported to the Service and to the California Natural Diversity Database (CNDDB).

Timing. Elderberry shrubs will be transplanted when the shrubs are dormant (November through the first two weeks in February) and after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the shrub and increase transplantation success.

Transplanting Procedure. Transplanting will follow the most current version of the ANSI A300 (Part 6) guidelines for transplanting (http://www.tcia.org/).

Trimming Procedure. Trimming will occur between November and February and should minimize the removal of branches or stems that exceed 1 inch in diameter.

5.3 Impacts to Individual Shrubs

In certain instances, impacts to elderberry shrubs, but not the surrounding habitat may occur. This could take the form of trimming or complete removal of the plant. Trimming elderberry shrubs may result in injury or death of eggs, larva, or adults depending on the timing and extent of the trimming. Since the larva feed on the elderberry pith while they are developing, any trimming that could affect the health of the plant and cause the loss of stems may kill any larva in those stems. No adverse impacts to the VELB will occur if trimming does not remove stems/branches that are ≥1 inch in diameter and is conducted between November and February. Trimming that occurs outside of this window or removes branches ≥ 1 inch in diameter may result in adverse effects to VELB. In order to assess the risk of take from trimming activities, we recommend the following be evaluated:

1. Conduct an exit hole survey on the plant
2. Evaluate the surrounding habitat (riparian vs. non-riparian).
3. Evaluate the potential suitability of the plant to provide VELB habitat.
    a. Riparian plants are much more likely to be occupied or colonized by VELB.
    b. Plants in non-riparian locations should be evaluated using the criteria in Figure 2.

6.0 Compensatory Mitigation

For all unavoidable adverse impacts to VELB or its habitat, we recommend that lead agencies and project applicants coordinate with the Service to determine the appropriate type and amount of compensatory mitigation. For plants in riparian areas, compensation may be appropriate for any impacts to VELB habitat. In non-riparian areas, compensation is typically appropriate for occupied shrubs (Figure 2). Appropriate compensatory mitigation can include purchasing credits at a Service-approved conservation bank, providing on-site mitigation, or establishing and/or protecting habitat for VELB.

It is recommended that the permanent loss of VELB habitat be replaced with habitat that is commensurate with the type (riparian or non-riparian) and amount of habitat lost. Suitable riparian habitat may be replaced, at a minimum of 3:1 for all acres that will be permanently impacted by the project (Table 1). Suitable non-riparian habitat may be replaced, at a minimum of 1:1 for all acres that will be permanently impacted by the project (Table 1). We typically recommend that any shrub that will be adversely impacted by the project be transplanted to a Service-approved location.

We encourage agencies and/or applicants to propose appropriate compensation for all individual shrubs that will be impacted by the project. Strong compensation proposals consider the location of the plant (riparian or non-riparian) and the potential for the plant to be occupied by VELB (exit

holes present, likely occupied). Projects that only directly affect individual shrubs may consider replacing habitat based on the amount of effects that occur, the location of the shrub (riparian or non-riparian), and the presence of exit holes (non-riparian only) (Table 2). Impacts to individual shrubs in riparian areas may be replaced by the purchase of 2 credits at a Service-approved bank for each shrub that will be trimmed regardless of the presence of exit holes. If the shrub will be completely removed by the activity, the entire shrub may be transplanted to a Service-approved location in addition to the credit purchase. We recommend impacts to individual shrubs in non-riparian areas be replaced through a purchase of 1 credit at a Service-approved bank for each shrub that will be trimmed if exit holes have been found in any shrub on or within 50 meters (165 feet) of the project area. If the shrub will be completely removed by the activity, we suggest that the entire shrub be transplanted to a Service-approved location in addition to a credit purchase.

Table 1. Potential Valley Elderberry Longhorn Beetle Habitat-Level Compensation Examples

Habitat	Compensation Ratio [1]	Total Acres of Disturbance	Acres of Credits	Total Credit Purchase [2]
Riparian	3:1	1.2 acres	3.6 acres	87.8
Non-riparian	1:1	0.5 acre	0.5 acre	12.1

[1] acre(s) of credits: acre(s) of disturbance

[2] One credit (unit) = 1,800 sq. ft.

Table 2. Valley Elderberry Longhorn Beetle Shrub-Level Impact Compensation

Habitat	Compensation Ratio[1]	If the entire shrub will be removed
Riparian	2:1	Transplant the shrub + 2:1 compensation
Non-riparian (exit holes present)	1:1	Transplant the shrub + 1:1 compensation

[1] number of credits: number of shrubs trimmed

[2] One credit (unit) = 1,800 sq. ft. or 0.041 acre

The compensation scenarios in Table 1 are examples of the amount of habitat (riparian or non-riparian) that may be appropriate to compensate for a project's adverse impacts. Additional examples can be found in Appendix B. The amount of compensation deemed appropriate to offset effects to VELB will take into consideration the effects of the project and desired conservation outcome. The compensation examples in this Framework are for illustrative purposes only. Alternative methods for determining compensation should be coordinated with the Service. Currently, compensation at Service-approved VELB banks is partitioned into 1,800 sq. ft. basins.

Under this scheme, a single credit equals 1,800 sq. ft. or 0.041 acres. In order to calculate the total compensation credits needed for impacts to VELB, the total amount of disturbance in square feet should be calculated, the appropriate ratio applied, and the total number divided by 1,800.

We recommend that any project that occurs in suitable habitat (riparian or non-riparian) compensate for that loss in proportion to the total amount of habitat that will be disturbed as a result of project implementation. The acreage of habitat lost can be assessed based on all permanent surface disturbance including access routes and staging areas.

6.1 Compensatory Mitigation Proposals

If the lead agency or applicant is not purchasing credits at a Service-approved bank, they may compensate for habitat loss through on- or off-site mitigation. The Service has issued interim standards for the long-term management and protection of mitigation sites (https://www.fws.gov/endangered/improving_esa/). Those proposing on-site compensation, off-site habitat creation/enhancement, or those proposing to create a Service-approved conservation bank should work closely with the Service during the planning and development process. It is recommended that all plans adhere to the following criteria that are specific to VELB:

Site Selection and Development. Proposals using a strategic approach to ecosystem protection and restoration that will promote VELB metapopulation dynamics are preferred. Criteria for a suitable mitigation site may include abiotic factors such as soils, water availability, and prior land use as well as the proximity of the site to existing riparian habitat and known VELB records. Appropriate site selection is critical for achieving conservation success. A site that has incompatible soils or hydrology may not be able to meet the success criteria. Proposals that protect or enhance existing riparian habitat are preferred and the proposal should detail what, if any, measures will be needed to restore the site to ensure that it is suitable for elderberry survival.

Planting Plan. We recommend all proposals be designed to meet the desired distribution and density for elderberry shrubs and native associates that will be planted at the mitigation site in accordance with 1-3 below. The planting plan should be specific to the site and factors that will influence the success of the elderberry and native associate plantings. The plan should seek to establish a diverse natural riparian community with a complex vegetation structure. Native associates should include a mix of woody trees, shrubs, and other natives appropriate for the site. Stock of either seedlings or cuttings should be obtained from local sources. The number of elderberry and native associate plantings should be based on the desired distribution and density outcome proposed in the planting plan. The Service encourages planting plans that promote spatial and structural diversity within the mitigation site. We recommend planting plans be designed to meet the following goals:

1. Maximize the number of stems between 2 (0.8 inches) and 12 centimeters (4.7 inches). Talley et al. (2007) found stems within this size range had the largest proportion of VELB exit holes.
2. Minimize competition for sunlight and water. Native associates, particularly trees, can influence the long-term success of the mitigation site. Native associates should be planted at a ratio of 1 native associate for every 3 elderberry plants to avoid competition for sunlight and water with the elderberry plantings.
3. Achieve an average elderberry stem density of 240 stems/acre. This was the average stem density Vaghti et al. (2009) found for elderberry shrubs along the major river systems within the VELB range. The Service and lead agency or applicant should assess this goal after 5 years.

Buffer. A buffer area may be needed between the mitigation site and adjacent lands, depending on adjacent land-use. An appropriate buffer distance can be developed in coordination with the Service when proposing compensation. Although the buffer would be considered part of the mitigation site, the acreage of the buffer may not be considered compensation.

Success Standards. We recommend that the site management plan and/or planting plan specify timelines for achievement of the success standards for the site, as stated below. These timelines should reflect the impacts that the site is intended to compensate for, the specific abiotic factors at the site that could influence establishment, or any credit release criteria that need to be met. Standards for VELB mitigation banks can be found in Appendix C. These standards were developed specifically for mitigation banks, but can be broadly applied to all compensatory mitigation for VELB. Some of the timelines described in the standards may not be applicable in all situations, but agencies and applicants should work with the Service to develop success standards that best meet the goals of their individual compensatory mitigation proposal. We suggest that all compensatory mitigation meet the following:

1. A minimum of 60% of the initial elderberry and native associate plantings must survive over the first 5 years after the site is established. As much as feasible, shrubs should be well distributed throughout the site; however, in some instances underlying geologic or hydrologic issues might preclude elderberry establishment over some portion of the site. If significant die back occurs within the first 3 years, replanting may be used to meet the 60% survival criteria. However, replanting efforts should be concentrated to areas containing surviving elderberry plants. In some instances overplanting may be used to offset the selection of a less suitable site.
2. After 5 years, the site must show signs of recruitment. A successful site should have evidence of new growth on existing plantings as well as natural recruitment of elderberry. New growth is characterized as stems < 3 cm (1.2 inches) in diameter. If

no signs of recruitment are observed, the agency or applicant should discuss possible remedies with the Service.

Monitoring. Specific monitoring protocols and reporting timelines for the mitigation site should be developed in coordination with the Service. The population of VELB, the general condition of the mitigation site, and the condition of the elderberry and associated native plantings in the mitigation site should be monitored at appropriate intervals. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be conducted by a Service-approved biologist. Surveys must include:

1. A search for VELB exit holes in elderberry stems, noting the precise locations and estimated ages of the exit holes. The location of shrubs with exit holes should be mapped with a GPS. Because adult VELB are rarely encountered, targeted surveys for adults are not required. However, surveyors should record all adult VELB seen. Record photographs should be taken for all observations of adult VELB and their location mapped with a GPS. All exit hole or adult VELB observations should be reported to CNDDB.
2. An evaluation of the success standards outlined above.
3. An evaluation of the adequacy of the site protection (fencing, signage, etc.) and weed control efforts in the mitigation site. Dense weeds and grasses such as Bermuda grass (*Cynodon dactylon*) are known to depress elderberry recruitment and their presence should be controlled to the greatest extent practicable.
4. An assessment of any real or potential threats to VELB and its host plant, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, and excessive weed growth.
5. A minimum of 10 permanent photographic monitoring locations should be established to document conditions present at the mitigation site. Photographs should be included in each report.

Reports. A reporting timeline should also be developed during the development of monitoring protocols for the mitigation site. Reports submitted to the Service should present and analyze the data collected from the monitoring surveys. Copies of original field notes, raw data, photographs, and a vicinity map of the site (including any adult VELB sightings and/or exit hole observations) of the mitigation site must be included with the report. Copies of the report (including any applicable Service file number) must be submitted within 6 months of the survey to the Service (Field Supervisor) at the following address:

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825.

7.0 Other Activities

The Framework may not be applicable for restoration, floodway maintenance, and other large scale habitat modification activities. These activities and the potential effects to VELB and its habitat should be considered on a project-by-project basis and discussed with the Service. We recommend that project proponents consider the effects to the species on a landscape level and ultimately seek to protect, preserve, and restore the continuity of VELB habitat. These and similar activities that may adversely impact the VELB and its habitat at landscape scales should consider avoidance, minimization, and compensation strategies that are appropriate for the specific project. Compensation may not be appropriate for those projects that impact only individual elderberry shrubs or result in a net benefit to VELB. Some possible conservation measures to consider for these large scale projects include:

1. Transplanting all affected elderberries to a similar on-site location.
2. Maintaining patches of appropriate habitat in areas where large-scale removal of elderberry shrubs will occur.
3. Scale trimming, removal, and other activities that allow VELB to persist within the area.

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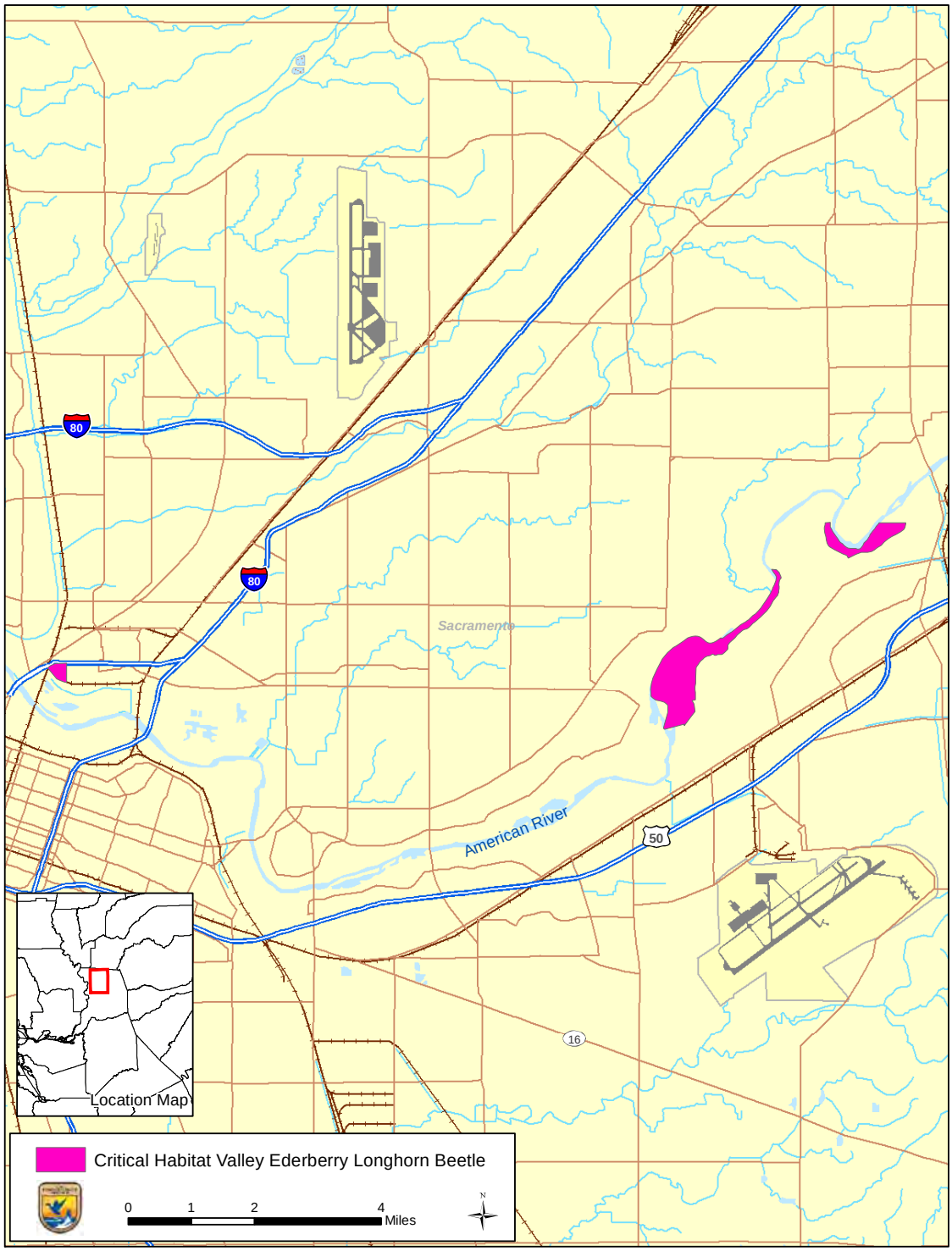
Appendix A. Valley Elderberry Longhorn Beetle Critical Habitat



Appendix B. Compensation Examples

#1. An applicant is proposing to repair a bridge over Putah Creek. The project will require excavation within the channel and a re-contour of approaches to the new bridge. Pre-construction surveys noted that 3 elderberry shrubs in riparian habitat were within the project area, 2 of these shrubs will be directly impacted by the excavation work. The third shrub will be avoided using the appropriate avoidance and minimization measures. During the project, 0.5 acre of riparian habitat will need to be removed. The applicant has proposed to transplant the 2 directly affected elderberry shrubs to a Service-approved conservation bank and purchase 1.5 acres of credits at the conservation bank.

> Conclusion: The project contains 3 elderberry shrubs on or within 50m of the project area. The project will result in the fragmentation of riparian habitat through the loss of 0.5 acres of riparian habitat. The compensation of 3:1 is appropriate for this project because it will be removing riparian habitat. The transplanting of the shrubs is appropriate because they would be directly impacted by the project.

#2. A new bike path will be constructed through an oak woodland/elderberry savanna. Pre-construction surveys identified one elderberry shrub within 0.10 acre of oak woodland/elderberry savanna that will be adversely affected by the proposed action. Exit holes were found on the elderberry shrub. The applicant also identified a conservation area that is suitable for oak woodland/elderberry savanna. Associated natives adjacent to the conservation area are blue oak (Q. douglasii), interior live oak, sycamore, poison oak, and wild grape. The applicant and the Service have agreed that transplanting the elderberry shrub into the conservation area and planting the conservation area with non-riparian habitat at a 1:1 ratio is appropriate to off-set the impacts to the VELB from the construction of this project.

> Conclusion: The project contains 1 elderberry shrub on or within 50m of the project area. The project will result in the loss of 0.10 acre of non-riparian, elderberry savanna habitat. The proposed compensation of planting the identified conservation area at a 1:1 ratio using the species listed above is appropriate for the project since it will be removing non-riparian habitat. The transplanting of the one shrub into the conservation area is appropriate because it will be directly impacted by the project and the presence of exit holes suggests it was recently occupied by VELB.
>
> The total area required for the conservation plantings are a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. A total of 0.10 acre (1 x 0.10 = 0.10 acre = 4,356 square feet) will be required for the plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period (see Section 5).

#3. Construction of a cell tower will require the removal of two isolated elderberry shrubs and the temporary loss of a minimal amount of grassland habitat. The project location is 3 miles east of the Feather River. The project site is not near a water course or any other shrubs within 800m. The shrubs were surveyed and do not exhibit exit holes.

Conclusion: The project area contains two non-riparian shrubs on or within 50m of the project area. Since both shrubs lack exit holes, other factors need to be considered to determine the likeliness of occupancy. A review of occurrence data reveals there are no known VELB occurrences within 800m of the project site and historical imagery shows the project site has never been a part of, or connected to, riparian habitat. Based on the specifics of this scenario, the two elderberry shrubs within the project area are not likely to be occupied..

Appendix C. VELB Mitigation Bank Standards

The following was prepared by Sacramento Fish and Wildlife Office conservation banking staff as part of an effort to standardize and make transparent the process for establishing Valley Elderberry Longhorn Beetle (VELB) conservation banks. The credit release schedule and performance standards are intended to be practical, while promoting the success of the plantings. This document is not a comprehensive review of VELB literature, and is subject to revision.

Credit Release Schedule

The credit release schedule and performance standards are designed to ensure that the VELB conservation bank plantings will be self-sustaining after the irrigation is turned-off (before the start of year 5), so the credit release schedule is longer than it would be without irrigation, and credits will not be released prior to the year indicated. Credits will be released per the following schedule, slightly modified from the May 2008 Statewide Banking Template:

Table 1. Credit release schedule.

Credit Release	Action	Credits to be Released
1	Bank Establishment	15%
2	Service Acceptance of As-builts*	25%
3	Meet Year 2 Performance Standards, and endowment funded 15%	15%
4	Meet Year 3 Performance Standards, and endowment funded 40%	15%
5	Meet Year 5 Performance Standards, and endowment funded 70%	15%
6	Meet Year 7 Performance Standards, and endowment funded 100%	15%

*Review to be accomplished within 60 days of receipt of complete as-built drawings.
Note: endowment can be funded on an accelerated schedule, if the bank sponsor so desires.

Performance Standards

Performance standards apply to the credit releases upon the third release. If the elderberry population is too large for direct census, then sampling methods may be used, and they must be thoroughly described in the proposed bank's development and management plans, and will be subject to Service approval. Sample size must be adequate to assess the health of the population, as determined by a qualified plant ecologist[1]. Qualifications should be submitted with proposal.

Performance standards are based on survival without re-planting, and on baseline conditions of health and vigor of the elderberry plantings. If performance standards are not met, then the bank sponsor will meet with the Service to determine a course of action.

Table 2. Performance Standards.

Credit Release #	Monitoring Year	Performance Standards
3	Year 2	• 60% survival of original planted elderberries without re-planting[2], and all survivors categorized as "normal"[3] to "exceptionally vigorous"[3] • 60% survival of associates without re-planting[2] • Irrigation ok
4	Year 3	• Maintain 60% survival of original planted elderberries without re-planting[2], and all survivors categorized as "normal"[3] to "exceptionally vigorous"[3] • Maintain 60% survival of associates without re-planting[2] • Irrigation ok
5	Year 5	• Maintain 60% survival of original planted elderberries without re-planting[2] • Maintain 60% survival of associates without re-planting[2] • No more than 10% decline in overall health of *Sambucus* from baseline conditions[4] • No irrigation[5] • Fertilizer application prohibited
6	Year 7	• Maintain 60% survival of original planted elderberries without re-planting[2] • Maintain 60% survival of associates without re-planting[2] • No more than 10% decline in overall health of *Sambucus* from baseline conditions[4] • No irrigation[5] • Fertilizer application prohibited

[1]Qualified plant ecologist is defined as a person who:

a) holds a bachelor's degree or higher in botany, plant ecology or related plant science, or demonstrates experience equivalent to such education, and

b) shows demonstrated expertise in ecological sampling/experimental design beyond obtaining an academic degree, and

c) has 2+ years experience in collecting and analyzing botanical field data beyond obtaining an academic degree

[2]If re-planting, then time-clock begins again, with no additional credit releases until performance standards for the monitoring year in which the re-planting occurred has been met. Re-planting must be approved by the Service in advance.

[3]See Vigor and Vitality, below.

[4]Years 2, 3 and 4 are used to establish the baseline condition. See Baseline Conditions, below.

[5]If irrigation continues beyond the end of monitoring year 4, credit release #'s 5 and 6 will be delayed beyond the years indicated in Table 2.

Vigor and Vitality

Observations made by a qualified plant ecologist during the late spring/early summer will be used to determine the vigor and vitality of surviving shrubs for the year 2 and 3 performance standards, and photographs should clearly document this. The following scale will be used (from Mueller-Dombois and Ellenberg, 1974):

- Very feeble, never flowering/fruiting
- Feeble
- Normal
- Exceptionally vigorous

Baseline Conditions

Observations made by a qualified plant ecologist during late spring/early summer will be used to determine the baseline conditions of the planted elderberries. Sampling is allowable where the population of planted elderberries is extensive, and must be thoroughly described in the bank's development and management plans. The following measurements will be used to determine baseline conditions (Elzinga, et. al., 1998):

- Height
- # of inflorescences per shrub
- # of stems per shrub
- # of stems over 1" diameter per shrub
- Volume of plant (height x cover)

These measurements will be averaged for surviving shrubs over years 2, 3 and 4. Condition of the planted elderberries in years 5 and 7 will be compared to the baseline. Photographs should clearly document the baseline condition.

Monitoring Reports

Monitoring reports will be required during the establishment period for years 2-7, and should clearly document the progress of the plantings. All surveys must be thoroughly described, and copies of any field notes or data sheets from the current year included. Photographic documentation of elderberry and associate condition during the field surveys is required, and should clearly show the condition of all shrubs sampled. If sampling, describe sampling design. Each report should be comprehensive, and include data summaries and other pertinent information from previous monitoring years.

Requirements for long-term monitoring and reporting, including due dates, should be discussed in the bank's development and management plans.

References for Appendix C

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Corby Energy Storage System

LOCATION

Solano County, California

DESCRIPTION

Some(-Battery energy storage system, associated Project substation, inverters, and other ancillary facilities, such as fencing, roads, a retention basin, and a supervisory control and data acquisition system-)

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Reptiles

NAME	STATUS
Northwestern Pond Turtle Actinemys marmorata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened
Western Spadefoot Spea hammondii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS

Conservancy Fairy Shrimp Branchinecta conservatio — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/8246

Vernal Pool Fairy Shrimp Branchinecta lynchi — Threatened
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp Lepidurus packardi — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/2246

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

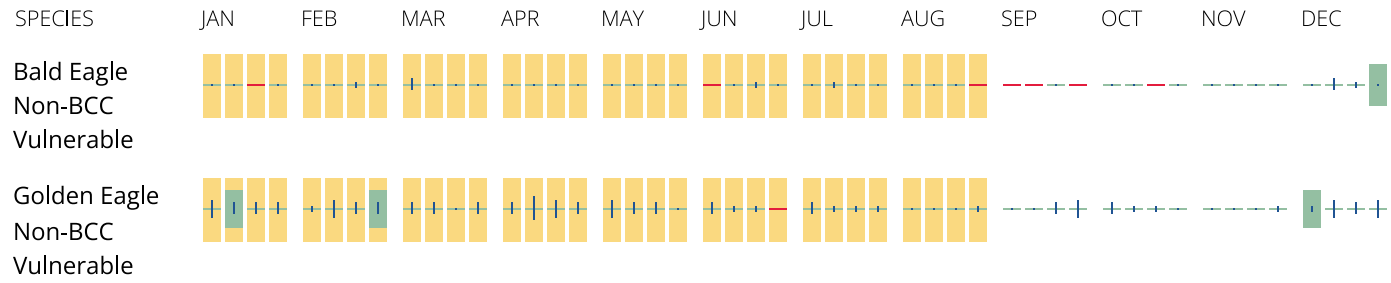
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey effort – no data



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Belding's Savannah Sparrow Passerculus sandwichensis beldingi — Breeds Apr 1 to Aug 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8

Bullock's Oriole Icterus bullockii — Breeds Mar 21 to Jul 25
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Gull Larus californicus — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Spinus lawrencei — Breeds Mar 20 to Sep 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Northern Harrier Circus hudsonius — Breeds Apr 1 to Sep 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8350

Nuttall's Woodpecker Dryobates nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Santa Barbara Song Sparrow Melospiza melodia graminea — Breeds Mar 1 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/5513

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Western Gull Larus occidentalis — Breeds Apr 21 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

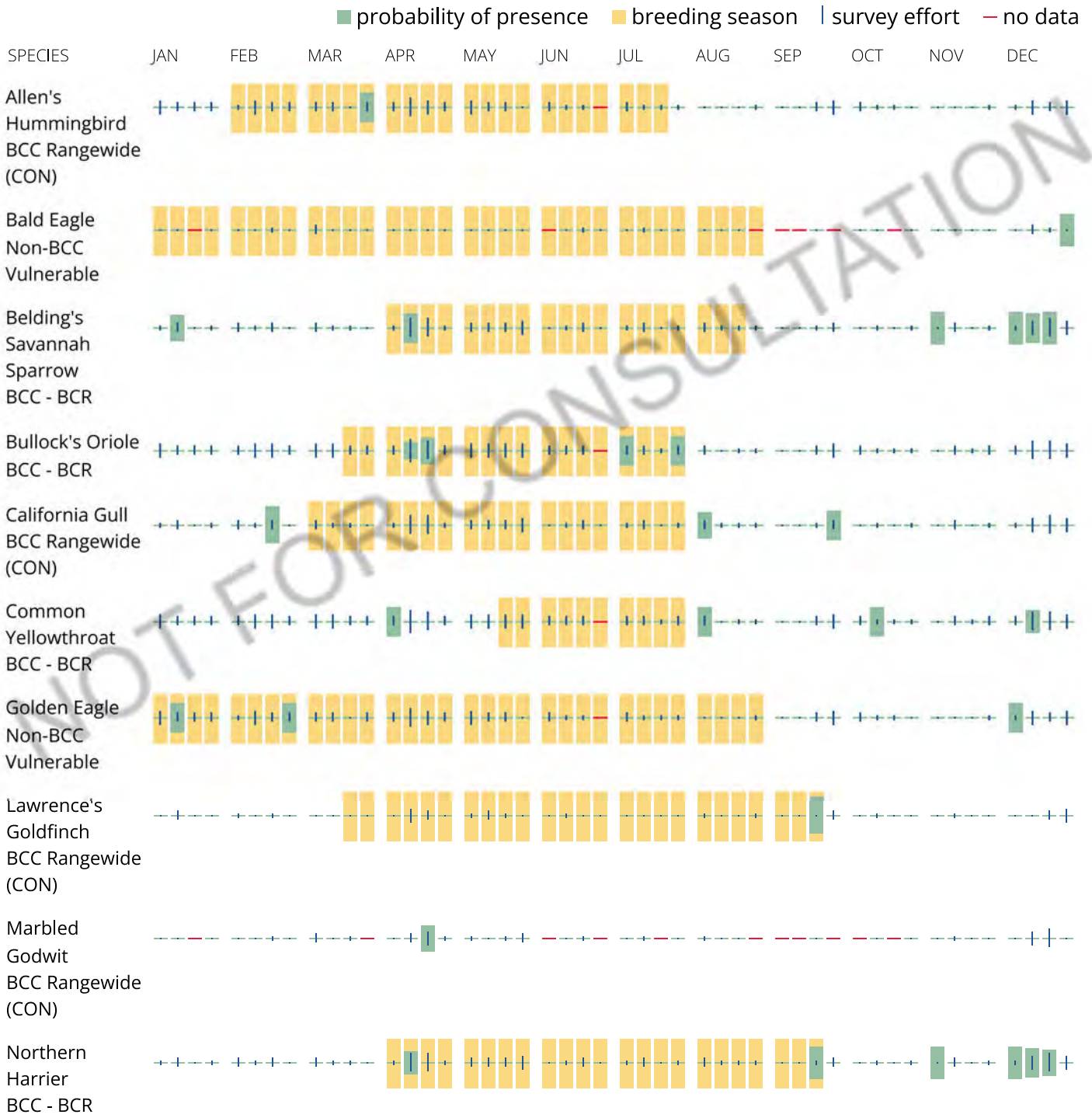
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid

cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to

you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PEM1Cx

RIVERINE

R2UBHx
R5UBFx
R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

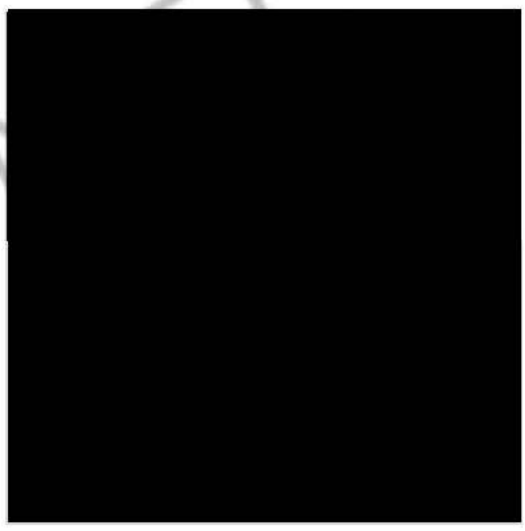
Project information

NAME

Corby Energy Storage System

LOCATION

Solano County, California



DESCRIPTION

Some(-Battery energy storage system, associated Project substation, inverters, and other ancillary facilities, such as fencing, roads, a retention basin, and a supervisory control and data acquisition system-)

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Reptiles

NAME	STATUS
Northwestern Pond Turtle Actinemys marmorata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened
Western Spadefoot Spea hammondii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS

Conservancy Fairy Shrimp Branchinecta conservatio — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/8246

Vernal Pool Fairy Shrimp Branchinecta lynchi — Threatened
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp Lepidurus packardi — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/2246

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

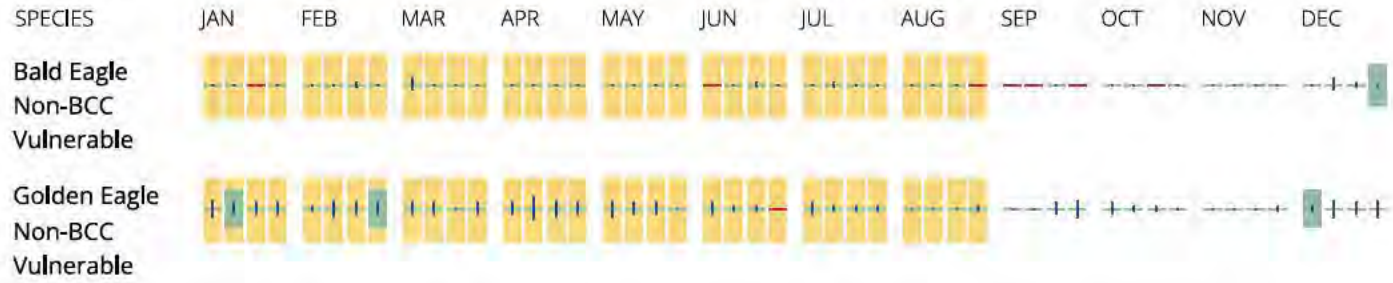
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15

Bald Eagle *Haliaeetus leucocephalus* — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Belding's Savannah Sparrow *Passerculus sandwichensis beldingi* — Breeds Apr 1 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8

Bullock's Oriole *Icterus bullockii* — Breeds Mar 21 to Jul 25

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Gull *Larus californicus* — Breeds Mar 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat *Geothlypis trichas sinuosa* — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle *Aquila chrysaetos* — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch *Spinus lawrencei* — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Marbled Godwit *Limosa fedoa* — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Northern Harrier Circus hudsonius — Breeds Apr 1 to Sep 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8350

Nuttall's Woodpecker Dryobates nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Santa Barbara Song Sparrow Melospiza melodia graminea — Breeds Mar 1 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/5513

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Western Gull Larus occidentalis — Breeds Apr 21 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

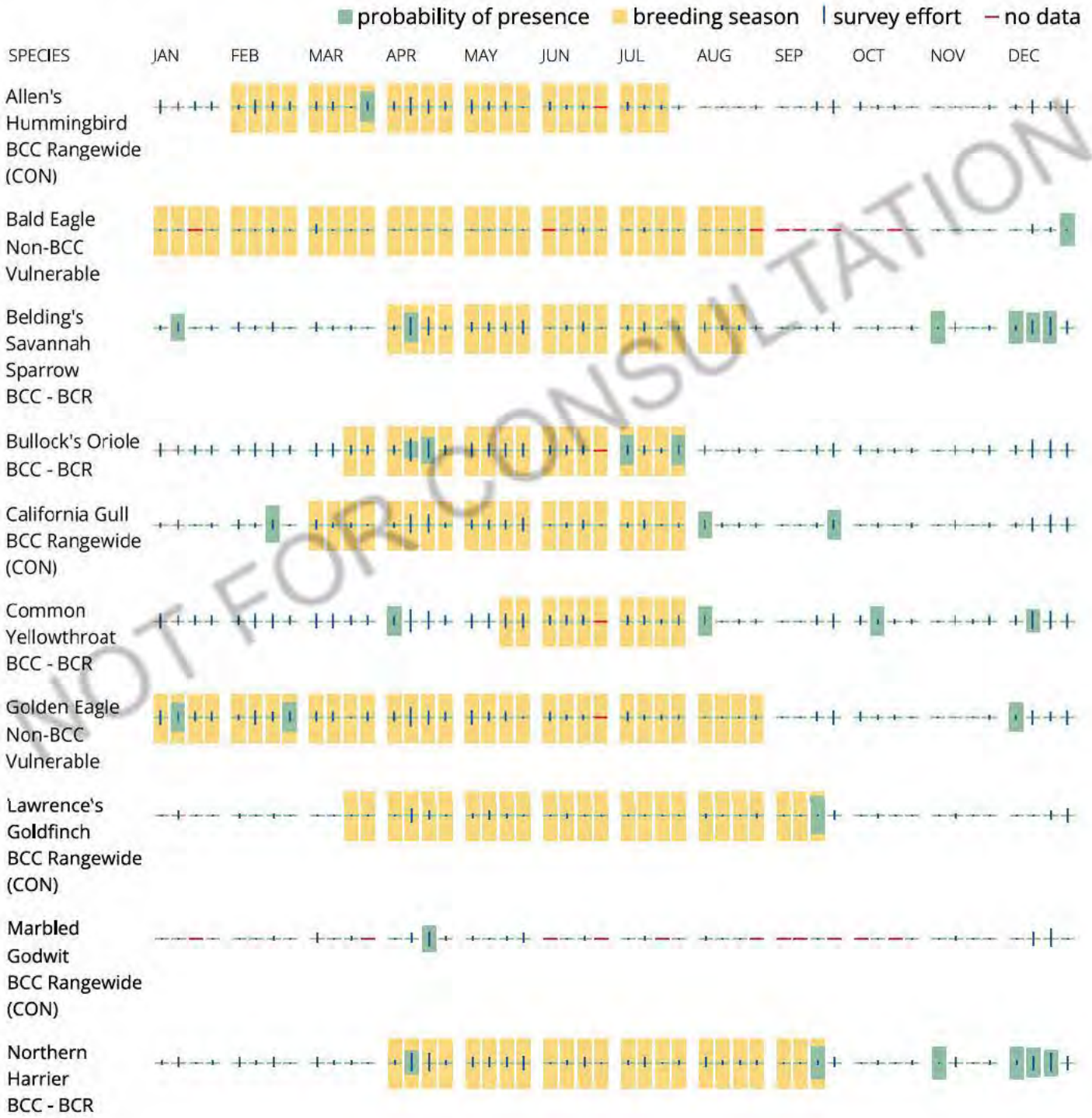
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

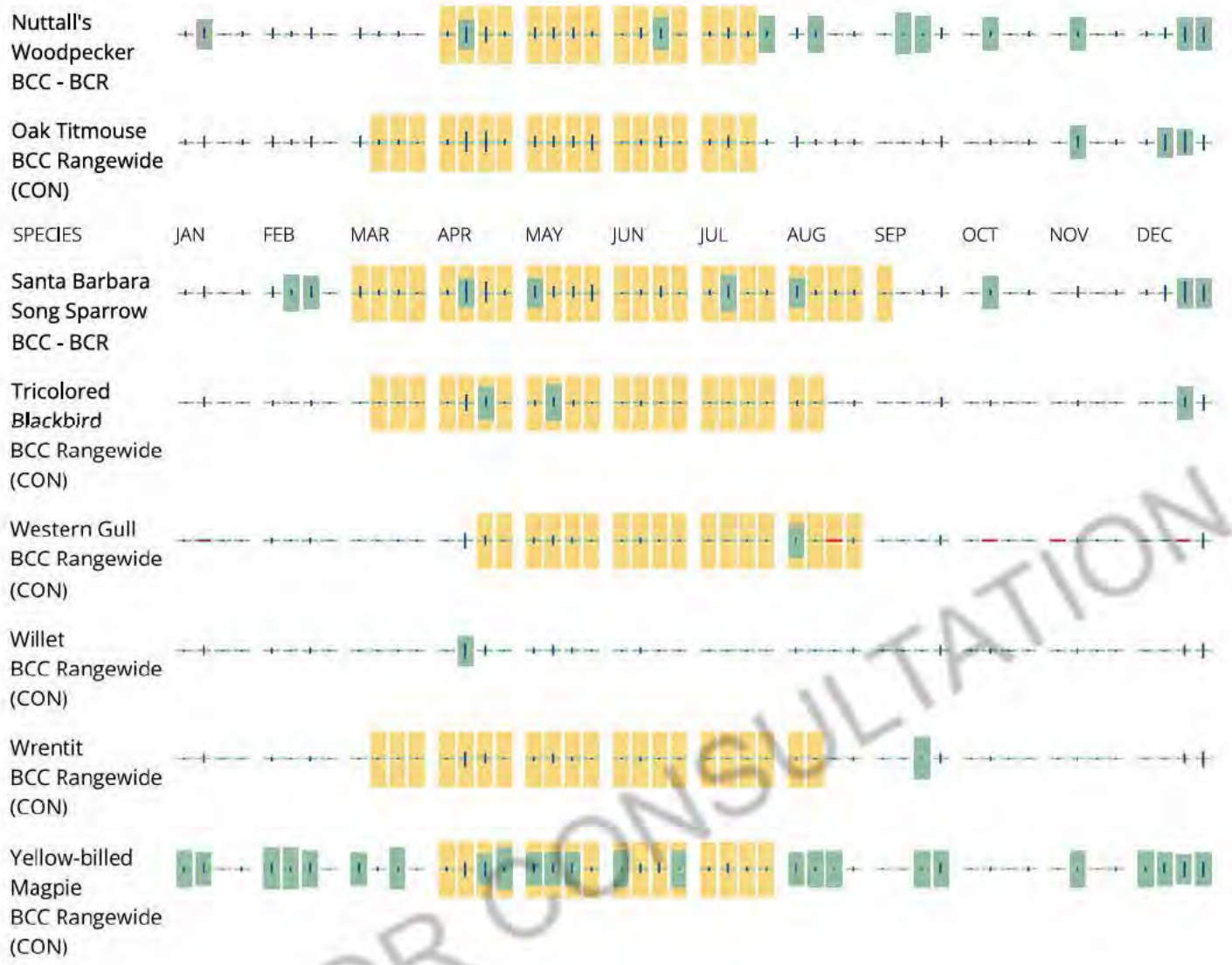
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid

cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to

you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PEM1Cx

RIVERINE

R2UBHx
R5UBFx
R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix B
Species Observed

Appendix B. Species observations during biological surveys conducted 2023–2024 at the Corby Battery Energy Storage System Project, Solano County, California

		Survey Type[a]			
Common Name	**Scientific Name**	**2023 Site Recon**	**2023 SWHA Survey**	**2024 BUOW Survey**	**2024 Waters Survey**
Plants					
Bur clover	*Medicago polymorpha*				X
Cockle burr	*Xanthium strumarium*	X			
Common sow thistle	*Sonchis oleraceus*	X			
Common toad rush	*Juncus bufonius*				X
Curley dock	*Rumex crispus*				X
Field bind weed	*Convolvulus arvensis*	X			
Filaree species	*Erodium spp.*				X
Hyssop loosestrife	*Lythrum hyssopifolia*				X
Italian rye grass	*Festuca perennis*				X
Oat species	*Avena spp.*	X			X
Oleander	*Nerium oleander*				X
Olive	*Olea europea*				X
Prairie flameleaf sumac	*Rhus lanceolata*	X			
Prickly lettuce	*Lactuca serriola*				X
Prostrate knotweed	*Polygonum aviculare*				X
Purple thistle	*Centaurea calcitrapa*	X			
red gum	*Eucalyptus camaldulensis*				X
Ripgut brome	*Bromus diandrus*				X
Seaside barley	*Hordeum marinum*				X
Slender oat	*Avena barbata*				X
Tall annual willowherb	*Epilobium brachycarpum*				X
Wild mustard	*Sinapis arvensis*	X			
Wild radish	*Raphanus raphanistrum*	X			
Yellow star thistle	*Centaurea solstitialis*				X
Birds					
American crow	*Corvus brachyrhynchos*	X	X	X	
American kestrel	*Falco sparverius*		X		
American robin	*Turdus migratorius*			X	
Anna's hummingbird	*Calypte anna*		X		
Barn swallow	*Hirundo rustica*		X		

Common Name	Scientific Name	Survey Type[a]			
		2023 Site Recon	2023 SWHA Survey	2024 BUOW Survey	2024 Waters Survey
Black phoebe	*Sayornis nigricans*	X			
Brewer's blackbird	*Euphagus cyanocephalus*	X	X		
Burrowing owl	*Athene cunicularia*		X		
Bushtit	*Psaltriparus minimus*		X		
Canada goose	*Branta canadensis*		X		
California quail	*Callipepla californica*		X	X	
California scrub-jay	*Aphelocoma californica*		X	X	
Common raven	*Corvus corax*		X		
Cooper's hawk	*Accipiter cooperii*		X		
Cliff swallow	*Petrochelidon pyrrhonota*			X	
Double-crested cormorant	*Phalacrocorax auritus*		X		
Eurasian collared-dove	*Streptopelia decaocto*		X		
European starling	*Sturnus vulgaris*		X		
Golden-crowned sparrow	*Zonotrichia atricapilla*		X		
Great blue heron	*Ardea herodias*			X	
Great egret	*Ardea alba*		X	X	
House finch	*Haemorhous mexicanus*	X	X	X	
House sparrow	*Passer domesticus*		X		
Hutton's vireo	*Vireo huttoni*		X		
Mallard	*Anas platyrhynchos*		X		
Killdeer	*Charadrius vociferus*			X	
Loggerhead shrike	*Lanius ludovicianus*		X		
Mourning dove	*Zenaida macroura*	X	X	X	
Northern mockingbird	*Mimus polyglottos*	X	X	X	
Nuttall's woodpecker	*Picoides nuttallii*		X		
Peacock	*Pavo cristatus*	X			
Red-tailed hawk	*Buteo jamaicensis*	X	X	X	
Red-shouldered hawk	*Buteo lineatus*		X		
Red-winged blackbird	*Agelaius phoeniceus*		X	X	
Rock dove	*Columba livia*		X		
Say's phoebe	*Sayornis saya*		X		
Summer tanager	*Piranga rubra*		X		
Swainson's hawk	*Buteo swansonii*	X	X	X	
Turkey vulture	*Cathartes aura*		X	X	
Western kingbird	*Tyrannus verticalis*		X		
Western meadowlark	*Sturnella neglecta*		X		
White-crowned sparrow	*Zonotrichia leucophrys*		X		

Common Name	Scientific Name	Survey Type[a]			
		2023 Site Recon	2023 SWHA Survey	2024 BUOW Survey	2024 Waters Survey
White-winged dove	*Zenaida asiatica*		X		
White-tailed kite	*Elanus leucurus*		X		
Wild turkey	*Meleagris gallopavo*		X	X	
Yellow-billed magpie	*Pica nuttalli*		X		
Yellow-rumped warbler	*Setophaga coronata*		X		
Mammals					
Black-tailed jackrabbit	*Lepus californicus*		X	X	
California ground squirrel	*Otospermophilus beecheyi*	X		X	
Tree squirrel	*Sciurus sp.*			X	
Reptiles					
Pacific gophersnake	*Pituophis catenifer catenifer*			X	
Western fence lizard	*Sceloporus occidentalis*	X	X	X	

2023 Site Recon = Reconnaissance-level field visit (June 1); 2023 SWHA Survey = Swainson's hawk nesting survey (March 16–June 29); 2024 BUOW Survey = Burrowing owl survey (May 23–*current*); 2024 Waters Survey = Aquatic Delineation Survey (May 28)

Appendix C
Representative Site Photos

Photo 1. Battery storage area southwest corner – Facing northeast.

Photo 2. Battery storage area northwest corner – Facing east.

Photo 3. Orchard east of battery storage area – Facing southwest.

Photo 4. Orchard and agricultural ditch (gen-tie route) – Facing west.

Photo 5. Agricultural ditch along north side of Project Area – Facing east.

Photo 6. Gibson-Canyon Creek, orchards on both sides– Facing east.

Photo 7. Gibson-Canyon Creek – Facing west.

Photo 8. Potential BUOW habitat elements – burrows & discarded pipes. North of battery storage area, within gen-tie route. Facing northeast.

Photo 9. Grassland north of Weber Road – Facing northeast.

Photo 10. Grassland north of Weber Road – Facing northwest.

Appendix D

Aquatic Resources Delineation Report

Aquatic Resources Delineation Report has been provided separately as Application Appendix 4.4-D.

APPENDIX 4.4-B: CNDDB PLANT AND HABITAT RECORDS SEARCH

This Appendix is filed under a request for confidential designation

APPENDIX 4.4-C: CNDDB WILDLIFE RECORDS SEARCH

This Appendix is filed under a request for confidential designation

APPENDIX 4.4-D: AQUATIC RESOURCES DELINEATION REPORT

CORBY BATTERY ENERGY STORAGE SYSTEM PROJECT - AQUATIC RESOURCES DELINEATION REPORT

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ICF. 2024. *Aquatic Resources Delineation Report, Corby Battery Energy Storage System Project*. September. (ICF 104188.0.011) Sacramento, CA. Prepared for Corby Energy Storage, LLC. San Francisco, CA.

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List of Acronyms and Abbreviations

°F	degrees Fahrenheit
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CWA	Clean Water Act
MLRA	Major Land Resource Area
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
PG&E	Pacific Gas & Electric
Procedures	the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to waters of the State
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
SWRCB	State Water Resources Control Board

Summary

This report documents the extent of aquatic resources within an approximately 177.887-acre study area in Solano County for the Corby Battery Energy Storage System Project.

The study area consists of proposed Project elements plus a 250-foor buffer. The purpose of this delineation is to describe all aquatic resources in the study area and to identify the extent of potentially jurisdictional federal and state aquatic resources within and adjacent to the project site to support federal and state regulatory permitting processes pursuant to Sections 401 and 404 of the Clean Water Act (CWA; 33 United States Code §1251 et seq. [1972]), as well as Section 13260 of the Porter-Cologne Act, and Section 1600 et seq. of the California Fish and Game Code. The delineation field work and mapping were consistent with the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), as well as the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0; USACE 2008).

A total of 2.960 acres (9,047 linear feet) of aquatic resources were delineated in the study area (Appendix A) consisting of the following:

- 0.020 acre of basin;
- 1.932 acres (7,138 linear feet) of ditches;
- 0.932 acre (1,909 linear feet) of intermittent riverine; and
- 0.076 acre of seasonal wetland.

Based on the results of the delineation, the study area contains waters of the U.S., under U.S. Army Corps of Engineers (USACE) jurisdiction (intermittent riverine features). The study area contains basins, ditches, and seasonal wetlands which would be under the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB; Region 5) as waters of the State. Lastly, several ditches with a connection to other local streams, as well as the intermittent riverine features, would be regulated by the California Department of Fish and Wildlife (CDFW) under Section 1600 et. seq. of the California Fish and Game Code. The study area also contains numerous other ditches which would not be regulated by CDFW under California Fish and Game Code because they are human-made ditches, excavated in uplands, and flow is controlled with gates and other structures; they are not rivers, streams, or lakes.

Chapter 1
Setting

1.1 Study Area

The study area occurs in the city of Vacaville in Solano County and falls within the U.S. Geological Survey (USGS) Allendale 7.5-minute quadrangle (Figure 1-1). The study encompasses approximately 175.053 acres and falls within Sections 36, 31 and 6, Townships 7N and 6N, and Ranges 1E and 1W.

1.2 Climate

The study area occurs in the Great Valley Region of the California Floristic Province (Baldwin et al. 2012). The regional climate is characterized by hot, dry summer months with relatively cool, wet winters. Data from the nearby Vacaville Nut Tree AP Asos weather station was reviewed for temperature and precipitation averages (NCRS 2024a). The average high temperatures range from 94.8°F in July to 57.6°F in December, and the average low temperatures range from 37.9°F in December to 59.8°F in July. The total average annual precipitation is 21.7 inches, with precipitation falling as rain. In the project region, the previous wet winter season rainfall totaled 22.7 inches, which is approximately 105% of the annual average (NCRS 2024a). No rainfall was recorded during the May 28, 2024, delineation survey or in the preceding week. The Antecedent Precipitation Tool was run for the survey date in the study area and results indicate the survey occurred during "normal conditions" during the "dry season." A full export of the Antecedent Precipitation Tool is provided in **Appendix B.**

1.3 Topography

Elevations in the study area range from approximately 76 feet elevation to 86 feet elevation. Most of the study area consists of a flattened agricultural field, roads and a substation with little to no microtopography. However, there are excavated ditches present within the study area, as well as a riverine feature which are concave and linear.

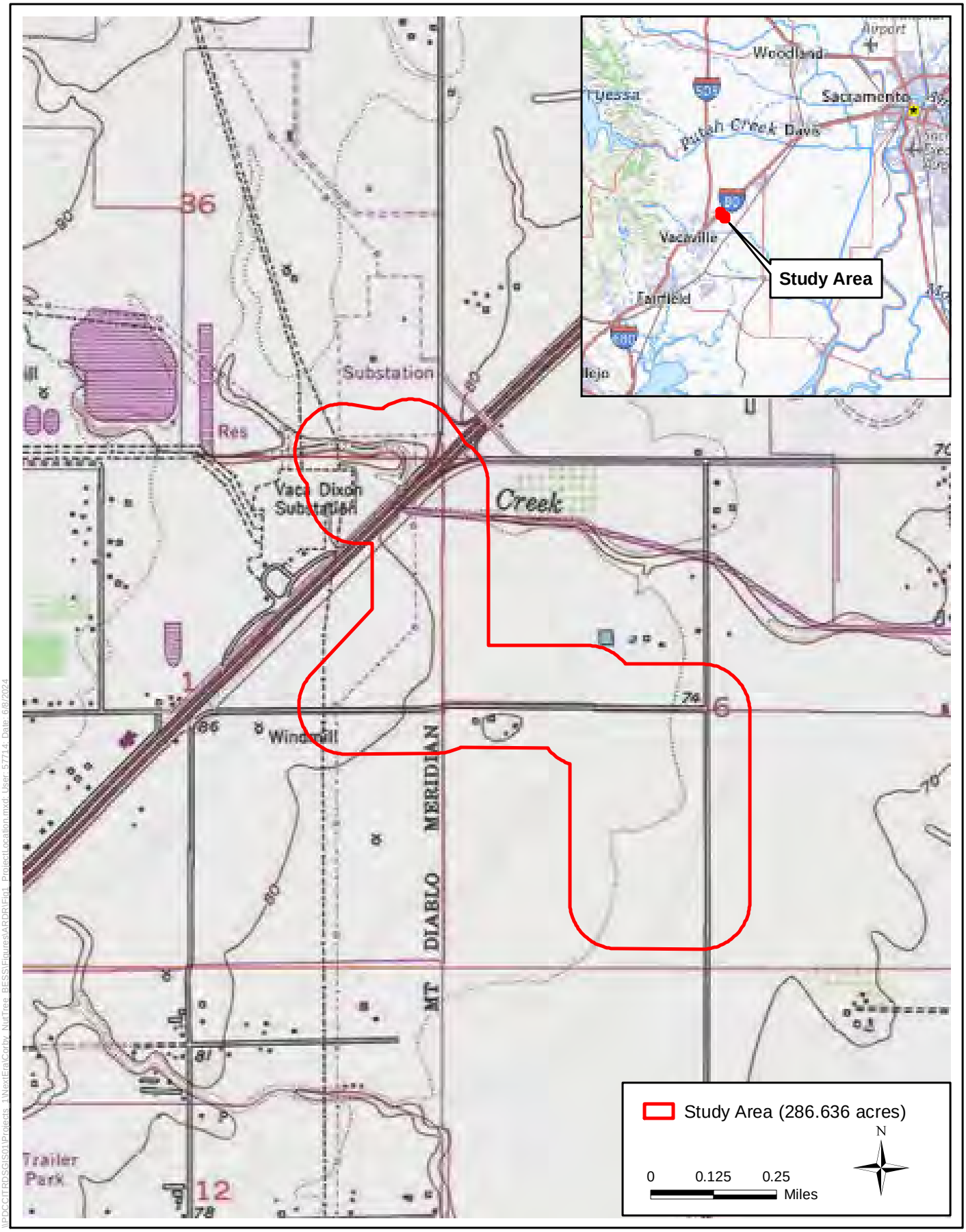

Figure 1-1
Study Area USGS Map

1.4 Hydrology

The study area is within the Ulatis Creek (HUC 1802016305) watershed boundary. There is a mapped reach of Gibson Canyon Creek, which is identified on a USGS as an intermittent stream by a dotted blue line.

1.5 Land Use

Land use in the study area includes agriculture, a developed substation, roadways, home residences, and dry farming throughout most of the study area.

1.6 Soils

Soil map units in the study area include the following:

- Capay Clay, 0% slopes, Major Land Resource Area (MLRA) 17
- Clear Lake clay, 0 to 2% slopes, MLRA 17
- San Ysidro sandy loam, 0 to 2% slopes
- San Ysidro sandy loam, thick surface, 0 to 2% slopes
- Water
- Yolo loam, clay substratum

Of these map units in the study area, "Clear Lake clay, 0 to 2% slopes, MLRA 17" and "Water" are considered hydric by the NRCR (NRCS 2024b). A full soils report is provided in Appendix C.

1.7 Vegetation

The study area supports four vegetation communities: agriculture, nonnative grassland, nonnative forest, and ruderal. Unvegetated disturbed and developed areas are also present. Agriculture comprises most of the study area, with these areas primarily being used as orchards. Nonnative grassland primarily occurs around the Pacific Gas & Electric (PG&E) substation and is dominated by nonnative annual grasses and forbes including wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), yellow star thistle (*Centaurea solstitialis*), radish (*Raphanus* sp.) and filarees (*Erodium* spp.). Nonnative forest is dominated by olive trees (*Olea europea*) and red gum (*Eucalyptus camaldulensis*) with some oleander (*Nerium oleander*) as well. Ruderal areas occur along developed roads and along farm roads and are dominated by similar species to nonnative annual grassland, but these areas are regularly disturbed for maintenance purposes. Disturbed areas do not support vegetation but support exposed, bare soil. Lastly, developed areas include impervious areas including roadways and the PG&E substation.

1.8 Regulatory Setting

1.8.1 U.S. Army Corps of Engineers

The regulation defining the extent of waters of the U.S. has changed a number of times since the enactment of the CWA. On January 18, 2023, the Environmental Protection Act (EPA) and the USACE published the final rule with a revised definition of WoUS in the *Federal Register* (FR doc. 2022-28595), became effective March 20, 2023. This Rule replaced the pre-2015 definition of waters of the U.S., which was recently in effect starting on September 2, 2021.

On May 25, 2023, the U.S. Supreme Court decided *Sackett v. Environmental Protection Agency*, which considered the jurisdictional extent of waters of the U.S. On August 29, 2023, the Agencies issued a final rule to conform the definition of "waters of the United States" to the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v. Environmental Protection Agency*. This definition established the scope of USACE and EPA authority under the CWA. The conforming rule, *Revised Definition of "Waters of the United States;" Conforming* (33 Code of Federal Regulations [CFR] 328.3(a)(1)–(5)), became effective September 8, 2023, and states the following.

a.) Waters of the United States means:

1) Waters which are:
    i) 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;
    ii) The territorial seas; or
    iii) Interstate waters;
2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;
4) Wetlands adjacent to the following waters:
    i) Waters identified in paragraph (a)(1) of this section; or
    ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;
5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section.

The categories of exclusions, or non-jurisdictional aquatic features are listed in paragraph (b) of the new rule. Under this rule, where a feature satisfies the terms of an exclusion, it is excluded from jurisdiction even where the feature would otherwise be jurisdictional under paragraphs (a)(2)

through (5) of this rule. Paragraph (a)(1) waters are not subject to the exclusions. The exclusions, or non-jurisdictional waters include:

1. Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;
2. Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the Environmental Protection Agency;
3. Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;
4. Artificially irrigated areas that would revert to dry land if the irrigation ceased;
5. Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;
6. Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;
7. Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of WOTUS; and
8. Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.

Wetlands are defined in 33 CFR 328.I)(1) as follows.

- The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Adjacent is defined in 33 CFR 328.3(c)(2) as having a "continuous surface connection."

1.8.2 State Water Resources Control Board / Regional Water Quality Control Board

In California, the State Water Resources Control Board (SWRCB) and nine RWQCBs regulate activities within state and federal waters under Section 401 of the CWA and the Porter-Cologne Water Quality Act (Porter-Cologne Act). The SWRCB defines waters of the State broadly to include "any surface water or groundwater, including saline waters, within the boundaries of the state." The SWRCB and RWQCBs do not have regulations or guidance defining the extent of non-wetland waters of the State. The lateral limits of potential non-wetland waters of the State were mapped using the same methods for determining an ordinary high water mark (OHWM) as described above in Section

2.2.1, *Review of Existing Information*, because the Central Valley RWQCB has accepted this method for delineating waters of the State.

1.8.2.1 Wetland Delineation

On April 2, 2019, the SWRCB adopted the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to waters of the State (Procedures; SWRCB 2021). The Procedures became effective on May 28, 2020, and define "wetland" as follows.

> An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The Procedures provide that natural wetlands, wetlands created by modification of surface waters of the State, and certain artificial wetlands are considered waters of the State. The Procedures provide that RWQCBs shall rely on a wetland delineation from a final Aquatic Resources Delineation Report verified by the USACE to determine the extent of wetland waters of the State where USACE has verified such a delineation. If any potential wetland areas have not been delineated in a final Aquatic Resources Delineation Report verified by the USACE, the limits of such potential wetland waters of the State shall be identified using the same wetland delineation methods per the USACE as described in Section 2.2.1, except that a lack of vegetation (i.e., less than 5% areal coverage of plants during the peak of the growing season) does not preclude an area from meeting the definition of a wetland when hydric soils and wetland hydrology are present (SWRCB 2021).

1.8.3 California Department of Fish and Wildlife

Pursuant to Sections 1600 et al. of the California Fish and Game Code, California Department of Fish and Wildlife (CDFW) regulates any activity that would substantially divert or obstruct the natural flow—or substantially change or use any material from the bed, channel, or bank—of any river, stream, or lake. CDFW jurisdiction relies on the presence of a lake and/or streambed and associated riparian habitat. CDFW regulation under California Fish and Game Code Section 1602 requires that all lakes and streams on a project site are identified in order to assess the proposed activity's potential impacts on these aquatic resources.

1.8.3.1 Lake, Streambed, and Associated Riparian Habitat Delineation

CDFW defines lakes as "natural lakes or man-made reservoirs" (14 California Code of Regulations § 1.56). The historic hydrologic regime is defined as circa 1800 to the present. In addition, streams are a "body of water that flows at least periodically or intermittently through a bed or channel having banks and that supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 California Code of Regulations § 1.72). Riparian habitat refers to vegetation and habitat associated with a stream. CDFW-jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond the banks of a stream. Isolated riparian habitat (i.e., where riparian vegetation does not appear associated with channel) is not considered CDFW-jurisdictional.

Historical court cases have further extended CDFW jurisdiction to include watercourses that seemingly disappear but re-emerge elsewhere. Under the CDFW definition, a watercourse need not exhibit evidence of an OHWM to be claimed as jurisdictional. Water features such as vernal pools

and other seasonal swales—where the defined bed and bank are absent and the feature is not contiguous or closely adjacent to other jurisdictional features—are generally not asserted to fall within CDFW jurisdiction under Section 1600. CDFW generally does not assert jurisdiction over human-made water bodies unless they are located where such natural features were previously located or where they are contiguous with existing or prior natural jurisdictional areas.

Based on the above, potential CDFW-jurisdictional aquatic resources include lakes and/or streambeds and their associated riparian habitats. The lateral extent of potential CDFW jurisdiction is interpreted to be "bank to bank" for a streambed or to the "dripline" of riparian habitat and/or wetland boundary if present.

Chapter 2
Methods

2.1 Review of Existing Information

The following sources of information were reviewed in conjunction with field work.

- Allendale USGS 7.5-minute topographic quadrangles
- Google Earth aerial imagery (Google 2024)
- National Wetlands Inventory maps (USFWS 2024)
- Natural Resources Conservation Service soils map (NRCS 2024b)
- Arid West Regional Wetland Plant List (USACE 2022)

2.2 Field Delineation and Mapping

A formal delineation field effort was conducted on May 28, 2024, by ICF wetland ecologist Joe Sanders. Aquatic resources (wetlands and waters of the U.S.) were delineated within the study area which consists of project elements and a 250 foot buffer. During the fieldwork, Mr. Sanders surveyed the entire study area, such that visual coverage was 100%. The interior of the PG&E substation was not accessible so that area was delineated remotely. The delineation field work and mapping were consistent with the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), as well as the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0; USACE 2008). In order to be classified as a "wetland" under the 1987 Manual and Regional Supplement, an area must normally have evidence of 1) wetland hydrology, 2) hydric soil indicators, and 3) wetland vegetation.

Vascular plants were identified using the Jepson Manual: Vascular Plants of California (Baldwin et al. 2012), and nomenclature and associated wetland ratings follow the National Wetland Plant List (USACE 2022). Field data were collected in the study area representative of the vegetation, soils, and hydrology across the vegetation communities and feature types. Representaitve photographs of the study area are included as Appendix D.

All accessible features, including data points, aquatic feature extents and vegetation communities were recorded using a Global Positioning System unit (EOS Arrow 100) with real-time differential correction and an instrument-rated mapping accuracy of less than 1 meter. Features that were not accessible were remotely mapped. Acreage of aquatic features were calculated using ArcGIS.

Chapter 3
Results

Results of the field delineation are presented below. Supporting information including climate and rainfall data, a soils report, photographs, and data forms are provided in **Appendices B-E**.

A total of 2.960 acres (9,047 linear feet) of aquatic resources were delineated in the approximately 175.053-acre study area consisting of four aquatic resource types. **Table 3-1** below presents all aquatic features delineated in the study area by feature type. **Appendix A** depicts delineated aquatic features in the study area.

Table 3-1. Aquatic Resources Summary

Feature ID	Acres	Linear Feet
Basin		
B-1	0.020	N/A
Basin Subtotal	*0.020*	*N/A*
Ditch		
D-10	0.022	152
D-11	0.055	237
D-12	0.042	160
D-14	0.021	171
D-15	0.096	1,013
D-16	0.098	194
D-2	0.123	370
D-3	0.170	585
D-4	0.032	130
D-5	0.427	1,243
D-7	0.491	1,569
D-8	0.316	1,133
D-9	0.039	181
Ditch Subtotal	*1.832*	*7,138*
Intermittent Riverine		
IR-1	0.932	1,909
Intermittent Riverine Subtotal	*1.932*	*7,138*
Seasonal Wetland		
SW-1	0.042	N/A
SW-2	0.034	N/A
Seasonal Wetland Subtotal	*0.076*	*N/A*
Total Aquatic Features	**2.960**	**9,047**

3.1.1 Basin

There is one mapped in the study area encompassing 0.020 acre. This feature occurs within the PG&E substation and was not observable during the field survey. This feature was mapped using

aerial imagery. This feature likely drains surface runoff from the substation and could regularly be maintained, and it appears to be excavated in uplands. This feature does not fit well within the Cowardin classification system (Cowardin et al. 1979).

3.1.2 Ditch

There are thirteen mapped ditches in the study area encompassing 1.932 acres and extending 7,138 linear feet. Features outside of the substation were mapped based on the presence of an OHWM and features within the substation were mapped remotely. These features either receive pumped water for irrigation purposes, drain impervious areas within the substation, or drain orchards. Mapped ditches vary in their bottom composition including both concrete-lined bottoms (Appendix C, photo P04) and soil bottoms (Appendix C, photos P05 and P07). These features appear to be subject to regular maintenance and are excavated in uplands. None of the mapped ditches appear to be realigned natural features. These features do not fit well within the Cowardin classification system (Cowardin et al. 1979).

3.1.3 Intermittent Riverine

There is one mapped occurrence of an intermittent riverine feature encompassing 0.932 acres and extending 1,909 linear feet and is a reach of Gibson Canyon Creek. This feature is identified on a USGS map as a dotted blue line, indicating an intermittent hydrologic regime. This feature likely flows part of the year and dries up in the late summer. Low flows were observed during the May 28, 2024, survey. This feature appears to be subject to some maintenance as the banks are mostly straight and some of it is concrete lined, which indicates some realignment of this feature. This feature was mapped in the field based on the presence of an OHWM. This feature could be classified as *riverine, intermittent* by the Cowardin classification system (Cowardin et al. 1979).

3.1.4 Seasonal Wetland

There are two mapped seasonal wetlands present in the study area encompassing 0.076 acre. Both features occur near but on the exterior of the substation. Both features were dominated by hydrophytic vegetation including creeping wildrye (*Elymus triticoides*), curly dock (*Rumex crispus*), hyssop loosestrife (*Lythrum hyssopifolia*), and seaside barley (*Hordeum marinum*). Prevalent algal matting was observed within both mapped seasonal wetlands. No formal data points were collected within these features due to sensitive underground infrastructure nearby but were mapped based on the presence hydrophytic vegetation and primary hydrology indicators and were bounded by upland nonnative annual grassland. These features could be classified as *Palustrine, Emergent* by the Cowardin classification system (Cowardin et al. 1979).

Chapter 4
Preliminary Jurisdictional Analysis

The sections below describe the anticipated agency jurisdiction for aquatic resources mapped in the study area. A final determination on the regulation of delineated aquatic resources will be made by each agency.

4.1 U. S. Army Corps of Engineers

All mapped ditches appear to be excavated in uplands, are not realigned natural features, and are subject to maintenance. Some of these ditches also receive pumped water for irrigation purposes. These features would therefore likely not be considered jurisdictional under Section 404 of the CWA per CFR 328.3.b.3 and CFR 328.3.b.4.

All mapped basins appear to be excavated in uplands and isolated and would therefore likely not be considered jurisdictional under Section 404 of the CWA. Similarly, the mapped seasonal wetlands are also isolated from other aquatic features and would therefore likely not be considered jurisdictional under Section 404 of the CWA per CFR 328.3.b.3 and CFR 328.3.b.4.

Lastly, the mapped intermittent riverine feature, consisting of a reach of Gibson Canyon Creek, appears to eventually drain into Cache Slough, a tidal body of water. It is therefore likely the mapped intermittent riverine feature within the study area would be considered jurisdictional under Section 404 of the CWA per CFR 328.3.b.3

4.2 State Water Resources Control Board/Regional Water Quality Control Board

4.2.1 Section 401

SWRCB would regulate the intermittent riverine feature (a reach of Gibson Canyon Creek) under Section 401 of the CWA because it would be under USACE jurisdiction pursuant to Section 404 of the CWA.

SWRCB would not regulate ditches, basins, or seasonal wetlands under Section 401 of the CWA because the waters/wetlands would not be under USACE jurisdiction pursuant to Section 404 of the CWA.

4.2.2 Porter-Cologne Act

The ditches and basins identified within the study area would be under the jurisdiction of the State Water Board pursuant to the Porter-Cologne Act and definition of a water of the State because they are “surface waters” within the State, and a Waste Discharge Requirement authorization from the Central Valley RWQCB would be needed for any temporary or permanent impacts to the aquatic features. These features meet the criteria to be considered waters of the State.

For the seasonal wetlands delineated in the study area: (1) they have continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation. Therefore, the seasonal wetlands meet the State wetland criteria on this basis.

4.3 California Department of Fish and Wildlife

CDFW regulates activities that substantially affect the bed and bank of a stream, lake, or river. The mapped intermittent riverine features would therefore likely be regulated by CDFW under Section 1600 et. seq. of the Fish and Game Code. The mapped seasonal wetlands and basins likely would not be regulated under CDFW since they are not streams, lakes, or rivers. The mapped ditches could be regulated by CDFW if they are channelizing a stream or have an upstream or downstream connection to other waters. The mapped ditch features that do have a connection with a stream are D-10, D-2, D-12, D-11, and D-16, and these features could be regulated by CDFW. The remainder of the mapped ditches do not have a surface connection with a stream and therefore would likely not be regulated by CDFW.

Chapter 5
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Appendix A

Aquatic Resources Delineation Map

121°55'30"W 121°55'20"W 121°55'10"W 121°55'0"W 121°54'50"W 121°54'40"W 121°54'30"W

38°24'20"N
38°24'10"N
38°24'0"N

PG&E Vaca Dixon Substation

D-10
D-11
D-1
IR-1
Flow Direction
D-12
SW-2
P02
D-2
B-1
SW-1
P03
D-3
IR-1
P01
B-2
D-16
D-4
D-15
D-14
P05
I-80
Weber Road

PG&E Vaca Dixon Substation

Feature_ID	Acres	Linear Ft
B-1	0.020	
B-2	0.287	
D-1	0.013	41
D-2	0.123	365
D-3	0.170	581
D-4	0.126	440
D-5	0.440	1265
D-6	0.055	198
D-7	0.491	1579
D-8	0.316	1155
D-9	0.102	428
D-10	0.064	414
D-11	0.122	543
D-12	0.042	173
D-13	0.051	370
D-14	0.021	175
D-15	0.096	1008
D-16	0.160	710
IR-1	1.217	2451
SW-1	0.042	
SW-2	0.034	

Corby Battery Energy Storage System Project
6/8/2024

Study Area (286.636 acres)

Data Point

PhotoPoints

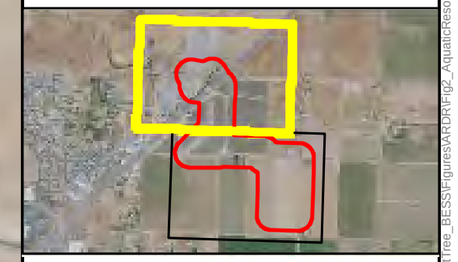
Aquatic Resources within the Study Area

Basin (0.307 acre)

Ditch (2.394 acres)

Intermittent Riverine (1.217 acres; 2,451 linear ft)

Seasonal Wetland (0.076 acre)



0 200 400
Feet
1 inch = 400 feet

Source: ICF, 2024
Imagery Source: NAIP, 05/20/2022
Datum/Projection: California State Plane II US Ft
Page: 1 of 2

Delineated By: J. Sanders
Delineation Date: May 28, 2024

Path: \\PDCCIT\RDSci\SD11\Projects_1\NextEra\Corby_Nut Tree_BESS\Figures\ARDR\Fig2_AquaticResourceDelineationMap.mxd; Author: ; Date: 6/8/2024

ICF

Appendix A
Aquatic Resources Delineation Map

121°55'10"W 121°55'0"W 121°54'50"W 121°54'40"W 121°54'30"W 121°54'20"W

38°23'50"N 38°23'40"N 38°23'30"N 38°23'20"N

D-6 Kilkenny Road P07 D-5 D-7 P04 D-8 D-9 D-13 Byrnes Road P06 Data Point 001

Feature_ID	Acres	Linear Ft
B-1	0.020	
B-2	0.287	
D-1	0.013	41
D-2	0.123	365
D-3	0.170	581
D-4	0.126	440
D-5	0.440	1265
D-6	0.055	198
D-7	0.491	1579
D-8	0.316	1155
D-9	0.102	428
D-10	0.064	414
D-11	0.122	543
D-12	0.042	173
D-13	0.051	370
D-14	0.021	175
D-15	0.096	1008
D-16	0.160	710
IR-1	1.217	2451
SW-1	0.042	
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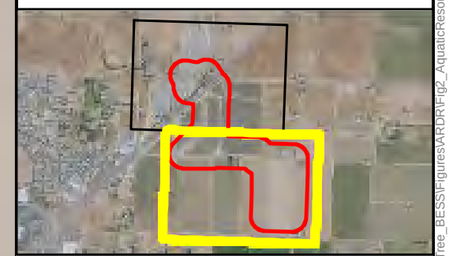


0 200 400
Feet
1 inch = 400 feet

N

Source: ICF, 2024
Imagery Source: NAIP, 05/20/2022
Datum/Projection: California State Plane II US Ft
Page: 2 of 2

Delineated By: J. Sanders
Delineation Date: May 28, 2024

Path: \\PDCCITRDSGIS01\Projects_1\Nextera\Corby_NatTree_BESS\Figures\ARDR\Fig2_AquaticResourceDelineationMap.mxd; Author: ; Date: 6/8/2024

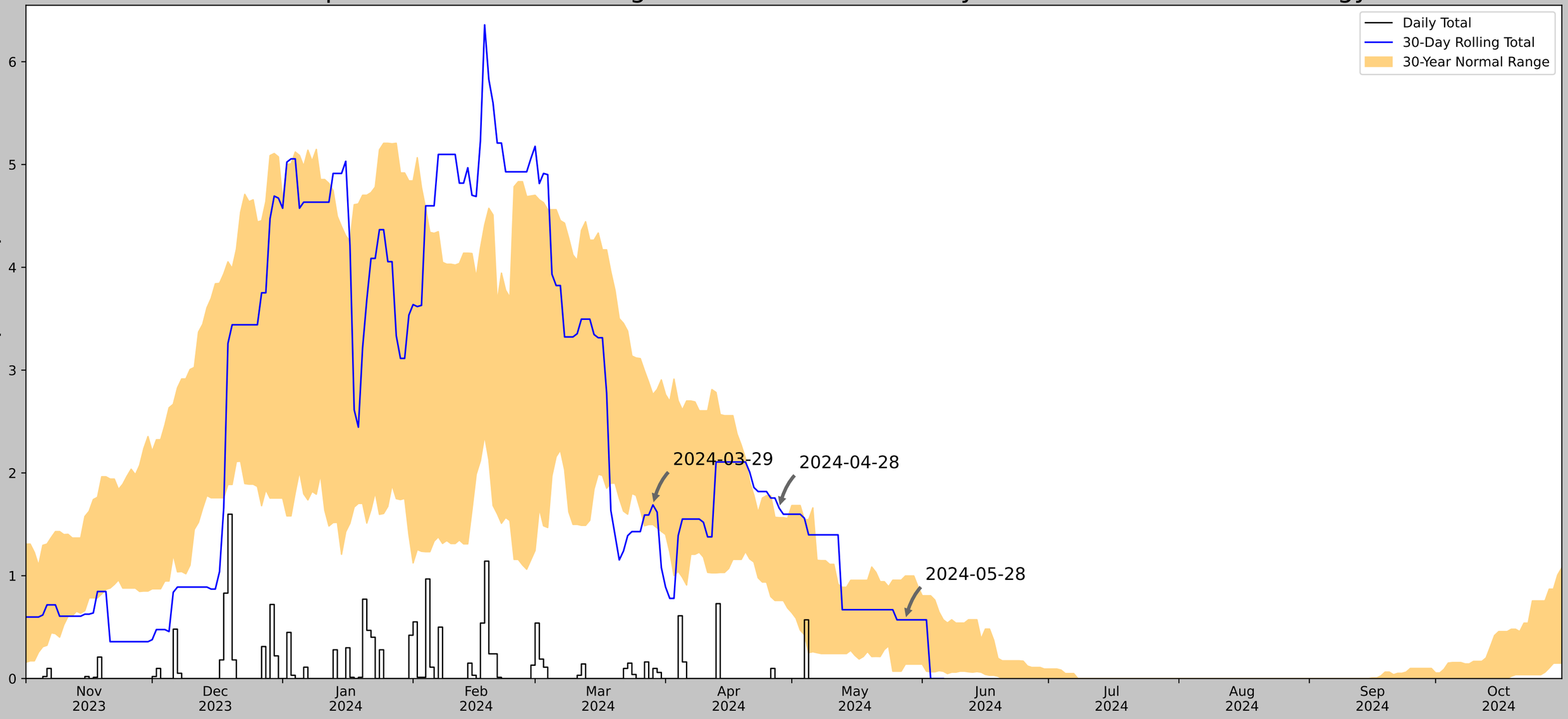
ICF

Appendix A
Aquatic Resources Delineation Map

Appendix B

Antecedent Precipitation Tool Export

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	38.235614, -121.545464
Observation Date	2024-05-28
Elevation (ft)	-4.94
Drought Index (PDSI)	Incipient wetness (2024-04)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-28	0.139764	0.998032	0.570866	Normal	2	3	6
2024-04-28	0.758661	1.565354	1.65748	Wet	3	2	6
2024-03-29	1.497638	2.762599	1.688976	Normal	2	1	2
Result							Normal Conditions - 14

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
SACRAMENTO AP ASOS	38.5067, -121.4961	19.029	18.92	23.969	8.968	11341	90
SACRAMENTO 2.0 SE	38.5499, -121.4374	34.121	4.356	15.092	2.026	3	0
SACRAMENTO 5 ESE	38.5553, -121.4183	38.058	5.381	19.029	2.524	8	0

Appendix C
Soils Report

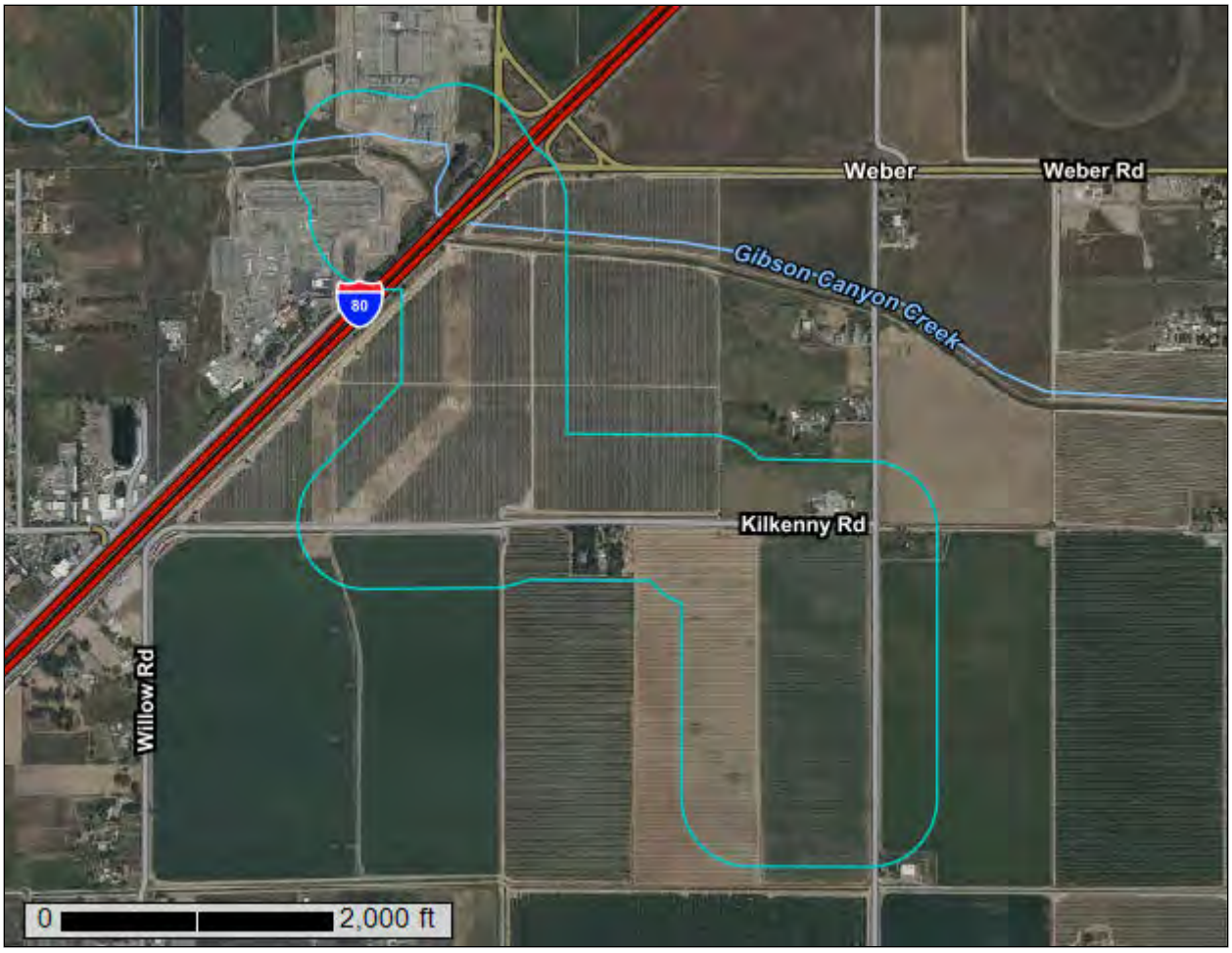
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Solano County, California



June 8, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:11,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Solano County, California
Survey Area Data: Version 18, Sep 11, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cc	Capay clay, 0 percent slopes, MLRA 17	5.4	1.9%
CeA	Clear Lake clay, 0 to 2 percent slopes, MLRA 17	41.1	14.3%
SeA	San Ysidro sandy loam, 0 to 2 percent slopes	141.5	49.4%
SfA	San Ysidro sandy loam, thick surface , 0 to 2 percent slopes	61.6	21.5%
W	Water	1.0	0.3%
Yr	Yolo loam, clay substratum	36.1	12.6%
Totals for Area of Interest		**286.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Solano County, California

Cc—Capay clay, 0 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2w8dk
Elevation: 10 to 80 feet
Mean annual precipitation: 20 to 24 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 318 to 326 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Capay and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capay

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Flood basin silty and clayey alluvium derived from metamorphic and sedimentary rock over fan alluvium derived from metamorphic and sedimentary rock

Typical profile

Ap - 0 to 5 inches: clay
Bk - 5 to 21 inches: silty clay
Bkss1 - 21 to 32 inches: silty clay
Bkss2 - 32 to 40 inches: silty clay
B'k1 - 40 to 50 inches: silty clay loam
B'k2 - 50 to 62 inches: silty clay loam
2B'k3 - 62 to 81 inches: clay loam
2B'k4 - 81 to 88 inches: sandy clay loam
2B'k5 - 88 to 102 inches: fine sandy loam

Properties and qualities

Slope: 0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 50 to 102 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.5 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: No

Minor Components

Pescadaro

Percent of map unit: 5 percent
Landform: Basin floors
Hydric soil rating: Yes

Omni

Percent of map unit: 5 percent
Landform: Basin floors
Hydric soil rating: Yes

Clear lake

Percent of map unit: 5 percent
Landform: Basin floors
Hydric soil rating: Yes

CeA—Clear Lake clay, 0 to 2 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2vbt0
Elevation: 10 to 260 feet
Mean annual precipitation: 15 to 23 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 260 to 290 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Clear lake and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake

Setting

Landform: Basin floors
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Basin alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

Ag - 0 to 13 inches: clay

Bssg1 - 13 to 19 inches: clay
Bssg2 - 19 to 45 inches: clay
Bkss - 45 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 48 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to moderately saline (1.0 to 15.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C/D
Ecological site: R017XY901CA - Clayey Basin Group
Hydric soil rating: Yes

Minor Components

Capay

Percent of map unit: 5 percent
Hydric soil rating: No

Sacramento

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Omni

Percent of map unit: 4 percent
Landform: Basin floors
Hydric soil rating: Yes

Unnamed

Percent of map unit: 2 percent
Hydric soil rating: No

SeA—San Ysidro sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h9md
Elevation: 30 to 100 feet
Mean annual precipitation: 16 to 22 inches

Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 250 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

San ysidro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Ysidro

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 54 inches: sandy clay loam
H4 - 54 to 68 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 12 to 20 inches to abrupt textural change
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Antioch

Percent of map unit: 8 percent
Hydric soil rating: No

San ysidro, thick surface

Percent of map unit: 7 percent
Hydric soil rating: No

SfA—San Ysidro sandy loam, thick surface , 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h9mg
Elevation: 30 to 100 feet
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 250 to 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

San ysidro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Ysidro

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 54 inches: sandy clay loam
H4 - 54 to 68 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 14 to 30 inches to abrupt textural change
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Antioch
Percent of map unit: 8 percent
Hydric soil rating: No

San ysidro
Percent of map unit: 7 percent
Hydric soil rating: No

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Yr—Yolo loam, clay substratum

Map Unit Setting
National map unit symbol: h9n4
Elevation: 20 to 150 feet
Mean annual precipitation: 18 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 240 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Yolo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yolo

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile
H1 - 0 to 28 inches: loam
H2 - 28 to 45 inches: loam
H3 - 45 to 60 inches: clay

Properties and qualities
Slope: 0 to 2 percent

Depth to restrictive feature: 40 to 60 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R017XY905CA - Dry Alluvial Fans and Terraces
Hydric soil rating: No

Minor Components

Reiff

Percent of map unit: 5 percent
Hydric soil rating: No

Yolo

Percent of map unit: 4 percent
Hydric soil rating: No

Brentwood

Percent of map unit: 3 percent
Hydric soil rating: No

Sycamore

Percent of map unit: 3 percent
Hydric soil rating: No

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Appendix D
Photographs

Photo P01. Facing west, photo of intermittent riverine feature IR-1, a reach of Gibson Canyon Creek.

Photo P02. Facing north, photo of mapped seasonal wetland SW-2.

Photo P03. Facing north, photo of mapped seasonal wetland SW-1.

Photo P04. Facing east, photo of mapped ditch D-8.

Photo P05. Facing north, photo of mapped ditch D-14.

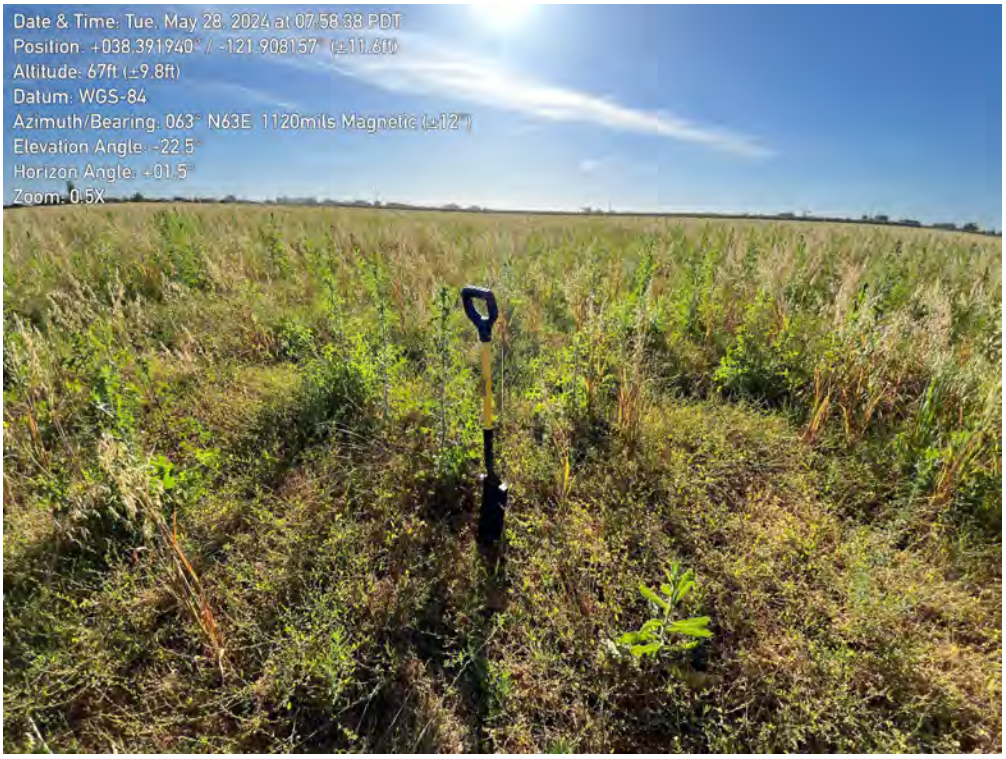

Photo P06. Facing east, photo of non-wetland data point 001 within a fallow field.

Photo P07. Facing east, photo of mapped ditch D-7.

Appendix E

Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Corby Battery Energy Storage System Project City/County: Solano County Sampling Date: 05/28/2024

Applicant/Owner: Next Era State: CA Sampling Point: 001

Investigator(s): J. Sanders Section, Township, Range: S6, T6N, R1E

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 38.39192194 Long: -121.90793744 Datum:

Soil Map Unit Name: San Ysidro sandy loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✓, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Fallow field that was recently converted from an orchard. Flattened field that likely was historically disced. Vegetation sampled is representative of entire field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Avena barbata	5		UPL
2. Festuca perennis	4		FAC
3. Lactuca serriola	5		FACU
4. Medicago polymorpha	9	Y	FACU
5. Lythrum hyssopifolia	2		OBL
6. Juncus bufonius	15	Y	FACW
7. Polygonum aviculare	9	Y	FAC
8. Epilobium brachycarpum	1		FAC
	50 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-24	10 yr 3/2	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX 4.4-E: PRELIMINARY CORRESPONDENCE BETWEEN APPLICANT AND AGENCIES

Gordon, Jack

From: Omercajic, Nadan
Sent: Monday, September 23, 2024 10:57 AM
To: Blinn, Brenda@Wildlife; Knight, Eric@Energy
Cc: Lawrence, Craig; Sinclair, Crystal@Wildlife; Quillman, Gabriele@Wildlife; Grefsrud, Marcia@Wildlife; Urry, Doug
Subject: RE: Corby Energy Storage Project - SWHA Nest Coordination
Attachments: Corby - Proposed SWHA Measures_09162024.pdf

Hi Brenda,

I am following up on our previous conversation RE: the SWHA nest next to the Vaca-Dixon substation. As promised, please find attached our applicant proposed measures that we plan to include in our Opt-In application to the CEC.

After consulting with several biologists both internally and on the consultant side, we believe we can avoid impacts to the nest / species through constructing towers and energizing the line outside of Nesting / Breeding Season. We have also provided measures that will help protect avian species during operations.

Please let me know if you have any questions or comments. Thanks!

Nadan Omercajic | Environmental Project Manager
NextEra Energy Resources, LLC
One California Street
San Francisco, CA 94111
Mobile: [redacted]
Nadan.Omercajic@NextEraEnergy.com

From: Blinn, Brenda@Wildlife <Brenda.Blinn@wildlife.ca.gov>
Sent: Wednesday, August 7, 2024 8:54 AM
To: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Omercajic, Nadan <Nadan.Omercajic@nexteraenergy.com>
Cc: Lawrence, Craig <Craig.Lawrence@nexteraenergy.com>; Sinclair, Crystal@Wildlife <Crystal.Sinclair@wildlife.ca.gov>; Quillman, Gabriele@Wildlife <Gabriele.Quillman@wildlife.ca.gov>; Grefsrud, Marcia@Wildlife <Marcia.Grefsrud@wildlife.ca.gov>
Subject: RE: Corby Energy Storage Project - SWHA Nest Coordination

HI All- I'm in a full day meeting on Monday, the 12th but am available Tuesday 1-2:30, Thursday 1:30-2:30, but only Friday after 2pm. The preferred day/time would be Tuesday 1-2:30 to accommodate all DFW staff.

Thanks,

Brenda

From: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Sent: Wednesday, August 7, 2024 8:16 AM
To: Omercajic, Nadan <Nadan.Omercajic@nexteraenergy.com>; Blinn, Brenda@Wildlife <Brenda.Blinn@wildlife.ca.gov>
Cc: Lawrence, Craig <Craig.Lawrence@nexteraenergy.com>; Sinclair, Crystal@Wildlife <Crystal.Sinclair@wildlife.ca.gov>; Quillman, Gabriele@Wildlife <Gabriele.Quillman@wildlife.ca.gov>
Subject: RE: Corby Energy Storage Project - SWHA Nest Coordination

Hi Nadan and Brenda –

I will be on vacation next week but would ask one of CEC's biologists to attend. Looks like our best chances for a meeting are Monday and Tuesday, 1-2:30, Thursday 10:30-2:30, and Friday (no constraints prior to 2:30).

Thanks,
Eric

Eric Knight
Manager
Siting & Environmental Branch
Siting, Transmission &
Environmental Protection
Division
California Energy Commission
[redacted]

From: Omercajic, Nadan <Nadan.Omercajic@nexteraenergy.com>
Sent: Wednesday, August 7, 2024 8:05 AM
To: Blinn, Brenda@Wildlife <Brenda.Blinn@wildlife.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Cc: Lawrence, Craig <Craig.Lawrence@nexteraenergy.com>; Sinclair, Crystal@Wildlife <Crystal.Sinclair@wildlife.ca.gov>; Quillman, Gabriele@Wildlife <Gabriele.Quillman@wildlife.ca.gov>
Subject: RE: Corby Energy Storage Project - SWHA Nest Coordination

Hi Brenda,

Hope you are having a good week. Following up on this thread – do you and your team have availability next week (week of 8/12) to discuss the Corby project?

Thanks,

Nadan Omercajic | Environmental Project Manager
NextEra Energy Resources, LLC
One California Street
San Francisco, CA 94111
Mobile: [redacted]
Nadan.Omercajic@NextEraEnergy.com

From: Omercajic, Nadan
Sent: Thursday, July 25, 2024 9:30 AM
To: Blinn, Brenda@Wildlife <Brenda.Blinn@wildlife.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Cc: Lawrence, Craig <Craig.Lawrence@nexteraenergy.com>; Sinclair, Crystal@Wildlife <Crystal.Sinclair@wildlife.ca.gov>; Quillman, Gabriele@Wildlife <Gabriele.Quillman@wildlife.ca.gov>
Subject: RE: Corby Energy Storage Project - SWHA Nest Coordination

Thanks Brenda, looking forward to meeting you and the rest of the team!

@Knight, Eric I know we briefly discussed the SWHA at the Vaca-Dixon Sub and our plan to consult with CDFW prior to the formal CEC pre-app meeting. Please let us know if you want to be included on this meeting and any future CDFW consults before we submit our application.

Nadan Omercajic | Environmental Project Manager
NextEra Energy Resources, LLC
One California Street
San Francisco, CA 94111
Mobile: [redacted]
Nadan.Omercajic@NextEraEnergy.com

From: Blinn, Brenda@Wildlife <Brenda.Blinn@wildlife.ca.gov>
Sent: Wednesday, July 24, 2024 8:46 AM
To: Omercajic, Nadan <Nadan.Omercajic@nexteraenergy.com>
Cc: Lawrence, Craig <Craig.Lawrence@nexteraenergy.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Sinclair, Crystal@Wildlife <Crystal.Sinclair@wildlife.ca.gov>; Quillman, Gabriele@Wildlife <Gabriele.Quillman@wildlife.ca.gov>
Subject: RE: Corby Energy Storage Project - SWHA Nest Coordination

Hi Nadan. Thanks for reaching out. I'm not aware of this project since it was previously managed under a different unit but our region has a new renewable energy unit now which I supervise and we would take lead on the project. I'd also like to introduce Crystal Sinclair and Gabriele Quillman (cc:d) who are the Senior Environmental Scientist Specialists in the unit.

I'm cc:ing Eric Knight from the CEC since we like to engage the CEC in project-related meetings during the AB205 pre-consultation process. If Eric and his staff would like to participate in the meeting, it may be easier to send out a doodle poll. If not, I can provide some days in the coming weeks that CDFW is available.

Regards,

Brenda Blinn
Senior Environmental Scientist (Supervisory)
California Department of Fish and Wildlife

Bay Delta Region
Habitat Conservation Program
Tel (cell): [redacted]

From: Omercajic, Nadan <Nadan.Omercajic@nexteraenergy.com>
Sent: Monday, July 22, 2024 11:35 AM
To: Blinn, Brenda@Wildlife <Brenda.Blinn@wildlife.ca.gov>
Cc: Lawrence, Craig <Craig.Lawrence@nexteraenergy.com>
Subject: Corby Energy Storage Project - SWHA Nest Coordination

Hi Brenda,

I am reaching out on behalf of the NextEra Corby Project. I understand that we have previously consulted with CDFW (Alex Single) regarding the SWHA nest over I-80 next to the Vaca-Dixon Substation. The agency did not express concern at the time, but we are now pursuing a different permitting pathway via the CEC AB-205 opt-in process and would like to align ahead of our formal CEC Pre-App meeting. Do you have time to meet and discuss sometime next week?

Looking forward to working with you and your team in region 3! Thanks,

Nadan Omercajic | Environmental Project Manager
NextEra Energy Resources, LLC
One California Street
San Francisco, CA 94111
Mobile: [redacted]
Nadan.Omercajic@NextEraEnergy.com

Mitigation Measure BIO-1: Construct Overhead Power Lines and Associated Equipment Following Suggested Practices to Reduce Bird Electrocutions and Collisions with Power Lines. The Project Proponent will ensure that new transmission lines and associated equipment will be properly fitted with wildlife protective devices to isolate and insulate structures to prevent injury or mortality of birds, to the extent feasible. Protective measures shall consider the guidelines provided in *Suggested Practices for Avian Protection on Power Lines, The State of the Art in 2006* (Avian Power Line Interaction Committee 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (Avian Power Line Interaction Committee 2012), or the current Avian Power Line Interaction Committee guidelines in place at the time the transmission lines are installed, and will include insulating hardware or conductors against simultaneous contact, using poles that minimize impacts on birds, and increasing the visibility of conductors or wires to prevent or minimize bird collisions.

Mitigation Measure BIO-2: Construction Timing to Avoid Swainson's Hawk Nest Disturbance. The Project Proponent will, to the maximum extent feasible, limit construction and vegetation removal within 0.25 mile of known nests, to outside of the nesting season for Swainson's Hawk, between September 15 and March 1, to avoid impacting nesting individuals.

Mitigation Measure BIO-3: Conduct Focused Surveys for Nesting Swainson's Hawk Prior to Construction and Implement Protective Measures During Construction. If construction will occur during the breeding season for Swainson's Hawk, March 1 through September 15, the Project Proponent will retain qualified wildlife biologists (experienced with raptor identification and behaviors) to conduct focused surveys for Swainson's hawk nesting before construction begins. Survey methodology will follow the Swainson's Hawk Technical Advisory Committee's survey methodology (Swainson's Hawk Technical Advisory Committee 2000). Focused surveys for Swainson's hawk nesting will be conducted in the proposed disturbance area and in a buffer area of 0.25 mile around the disturbance area. The portions of the Swainson's hawk survey buffer area containing unsuitable nesting habitat and/or with an obstructed line of sight to the disturbance area will not be surveyed. No active Swainson's hawk nest trees will be removed during the nesting season.

If the wildlife biologists find an active Swainson's hawk, a 0.25-mile no-work buffer will be implemented between construction activities and the active nest(s) until it has been determined that the young have fledged or as otherwise approved through consultation with CDFW. The wildlife biologists will mark the no-work buffer with stakes and signs and will check the location to ensure that the signs are in place and the buffer is being maintained. No work will be authorized within the buffer during the breeding season, except for vehicle travel.

If a 0.25-mile buffer around the nest cannot be maintained, the Project Proponent and a qualified wildlife biologist will consult with CDFW about alternative protective measures that are sufficient to minimize the risk of nest disturbance, such as a reduced buffer with full-time nest monitoring by a qualified wildlife biologist. If nesting SWHA exhibit agitated behavior indicating stress, the qualified wildlife biologist monitor will have the authority to stop construction in that area until the Project Proponent has consulted with CDFW to determine if additional measures are required.