

## **Appendix D Biological**

- D-1 Table D-1 Plant Species Observed in the Project Study Area
- D-2 Table D-2 Wildlife Species Observed in the Project Study Area
- D-3 Dry Season Biological Survey Report
- D-4 Wet Season Biological Survey Report
- D-5 Final Biological Technical Report
- D-6 IPaC Letter July 13, 2022 (Project Study Area)
- D-7 IPaC Letter January 17, 2023 (Proposed Action Area)
- D-8 Biological and Aquatic Resource Compensatory Mitigation Plan April 14, 2022
- D-9 ESA Section 7 Consultation with USFWS, November 2022
- D-10 Biological Assessment
- D-11 Biological Opinion

**D-1 Table D-1 Plant Species Observed in the Project Study Area**

**Table D-1 Plant Species Observed in the Project Study Area.**

<b>Family</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Introduced (Non-native)</b>
Muskroot	<i>Sambucus nigra</i>	blue elderberry	
Amaranth	<i>Amarnathus albus</i>	prostrate pigweed	Yes
Carrot	<i>Conium maculatum</i>	poison hemlock	Yes
	<i>Eryngium castrense</i>	Great Valley eryngo	
	<i>Foeniculum vulgare</i>	fennel	Yes
	<i>Torilis arvensis</i>	spreading hedgeparsley	Yes
Sunflower	<i>Baccharis pilularis</i>	coyote brush	
	<i>Carduus pycnocephalus</i>	Italian plumeless thistle	Yes
	<i>Centaurea solstitialis</i>	yellow star-thistle	Yes
	<i>Dittrichia graveolens—stinkwort1</i>	stinkwort	Yes
	<i>Erigeron canadensis—Canadian horseweed</i>	Canadian horseweed	
	<i>Holocarpha virgata—yellowflower tarweed</i>	yellowflower tarweed	
	<i>Hypochaeris glabra</i>	smooth cat's ear	Yes
	<i>Hypochaeris radicata</i>	hairy cat's ear	Yes
	<i>Lactuca serriola</i>	prickly lettuce	Yes
	<i>Matricaria discoidea</i>	disc mayweed	
	<i>Psilocarphus brevissimus</i>	short woollyheads	
	<i>Sonchus arvensis</i>	field sowthistle	Yes
	<i>Xanthium strumarium</i>	cocklebur	
Borage	<i>Plagiobothrys bracteatus</i>	bracted popcornflower	
Mustard	<i>Brassica nigra</i>	black mustard	Yes
	<i>Lepidium latifolium</i>	perennial pepper weed	Yes
Pink	<i>Spergularia rubra</i>	red sandspurry	Yes
Morning-Glory	<i>Convolvulus arvensis</i>	field bindweed	Yes
Gourd	<i>Cucurbita foetidissima</i>	Missouri gourd	
Spurge	<i>Croton setiger</i>	dove weed	
Legume	<i>Lupinus microcarpus</i>	valley lupine	
	<i>Trifolium hirtum</i>	rose clover	Yes
Oak	<i>Quercus agrifolia</i>	coast live oak	
	<i>Quercus lobata</i>	valley oak	
Geranium	<i>Erodium botrys</i>	longbeak stork's bill	Yes
	<i>Erodium cicutarium</i>	redstem stork's bill	Yes
Walnut	<i>Juglans hindsii</i>	Northern California black walnut	
Mint	<i>Trichostema lanceolatum</i>	vinegarweed	
Loosestrife	<i>Lythrum hyssopifolia</i>	hyssop loosestrife	Yes
Mallow	<i>Malva parviflora</i>	cheeseweed mallow	Yes

Evening Primrose	<i>Epilobium brachycarpum</i>	tall annual willowherb	
	<i>Epilobium ciliatum</i>	fringed willowherb	
Buckwheat	<i>Polygonum aviculare</i>	prostrate knotweed	Yes
	<i>Rumex crispus</i>	curly dock	Yes
	<i>Rumex dentatus</i>	toothed dock	Yes
	<i>Rumex pulcher</i>	fiddle dock	Yes
Buttercup	<i>Ranunculus aquatilis</i>	white water crowfoot	
	<i>Ranunculus sceleratus</i>	cursed buttercup	
Rose	<i>Rubus armeniacus</i>	Himalayan blackberry	Yes
Willow	<i>Populus fremontii</i>	Fremont cottonwood	
	<i>Salix gooddingii</i>	Goodding's willow	
Nightshade	<i>Solanum elaeagnifolium</i>	silverleaf nightshade	Yes
Vervain	<i>Phyla nodiflora</i>	turkey tangle fogfruit	
Grape	<i>Vitis californica</i>	California wild grape	
Sedge	<i>Cyperus eragrostis</i>	tall flatsedge	
	<i>Eleocharis macrostachya</i>	pale spike rush	
Rush	<i>Juncus balticus</i>	Baltic rush	
	<i>Juncus effusus</i>	soft rush	
Grass	<i>Alopecurus saccatus</i>	Pacific foxtail	
	<i>Avena barbata</i>	slender oat	Yes
	<i>Avena fatua</i>	wild oat	Yes
	<i>Briza minor</i>	little quakinggrass	Yes
	<i>Bromus diandrus</i>	ripgut brome	Yes
	<i>Bromus hordeaceus</i>	soft brome	Yes
	<i>Crypsis schoenoides</i>	swamp pricklegrass	Yes
	<i>Cynodon dactylon</i>	Bermudagrass	Yes
	<i>Elymus caput-medusae</i>	medusahead	Yes
	<i>Festuca myuros</i>	rat-tail fescue	Yes
	<i>Festuca perennis</i>	perennial rye grass	Yes
	<i>Gastridium phleoides</i>	nit grass	Yes
	<i>Hordeum marinum</i>	seaside barley	Yes
	<i>Hordeum murinum</i>	mouse barley	Yes
	<i>Melica californica</i>	California melicgrass	
	<i>Phalaris aquatica</i>	Harding grass	Yes
	<i>Poa secunda</i>	onesided bluegrass	
	<i>Polypogon monspeliensis</i>	annual rabbitsfoot grass	Yes
Brodiaea	<i>Brodiaea elegans</i>	harvest brodiaea	
	<i>Triteleia laxa</i>	Ithuriel's spear	
Cattail	<i>Typha latifolia</i>	broadleaf cattail	

**D-2 Table D-2 Wildlife Species Observed in the Project Study Area**

**Table D-2 Wildlife Species Observed in the Project Study Area.**

Scientific Name	Common Name	Secondary Observation <sup>1</sup>	Introduced (Non-native)
<b>Birds</b>			
<i>Agelaius phoeniceus</i>	red-winged blackbird		
<i>Agelaius tricolor</i>	tricolored blackbird	Yes	
<i>Euphagus cyanocephalus</i>	Brewer's blackbird		
<i>Molothrus ater</i>	brown-headed cowbird1		Yes
<i>Falco peregrinus anatum</i>	American peregrine falcon		
<i>Buteo jamaicensis</i>	red-tailed hawk		
<i>Buteo swainsoni</i>	Swainson's hawk	Yes	
<i>Elanus leucurus</i>	white-tailed kite		
<i>Haliaeetus leucocephalus</i>	bald eagle		
<i>Circus hudsonius</i>	northern harrier		
<i>Ardea alba</i>	great egret		
<i>Ardea herodias</i>	great blue heron		
<i>Corvus brachyrhynchos</i>	American crow		
<i>Pica nuttalli</i>	yellow-billed magpie		
<i>Cathartes aura</i>	turkey vulture		
<i>Athene cunicularia</i>	burrowing owl	Yes	
<i>Zenaida macroura</i>	mourning dove		
<i>Charadrius vociferus</i>	killdeer		
<i>Sturnus vulgaris</i>	European starling		Yes
<i>Anas platyrhynchos</i>	mallard		
<i>Branta canadensis</i>	Canada goose		
<i>Antigone canadensis tabida</i>	greater sandhill crane		
<i>Melospiza melodia</i>	song sparrow		
<i>Vireo sp.</i>	Vireo species		
<b>Mammals</b>			
<i>Canis latrans</i>	coyote	Yes	
<i>Vulpes vulpes</i>	red fox		
<i>Lepus californicus</i>	black-tailed jackrabbit		
<i>Taxidea taxus</i>	American badger	Yes	
<i>Thomomys bottae</i>	Botta's pocket gopher		
<i>Otospermophilus beecheyi</i>	California ground squirrel		
<b>Reptiles</b>			
<i>Thamnophis sirtalis</i>	common garter snake		
Order Testudines	turtle (freshwater)	Yes	
<b>Amphibians</b>			
<i>Pseudacris regilla</i>	northern pacific treefrog	Yes	
<b>Invertebrates</b>			
<i>Corixa sp.</i>	water boatmen		
Order Trombidiformes	water mites		
<i>Linderiella occidentalis</i>	California linderiella		
<i>Cyzicus californicus</i>	clam shrimp		

Order Cladocera	water fleas		
Class Copepoda	copepods (freshwater)		
Class Ostracoda	seed shrimp		

<sup>1</sup>Secondary observation of presence such as nest, den, burrow, skat/larvae, and/or tracks

**D-3 Dry Season Biological Survey Report**



February 11, 2021

12957

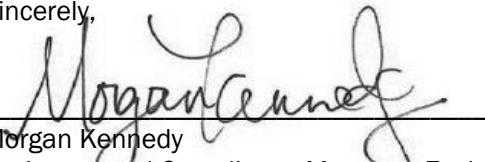
Samantha Lantz and Ian Perkins-Taylor  
USFWS, Sacramento Field Office  
Listing and Recovery Division  
2800 Cottage Way W-2605  
Sacramento, CA 95825-1888

**Subject:** *U.S. Fish and Wildlife Service Dry Season Protocol Survey Letter Report for Federally Listed Branchiopods, Sloughhouse Solar Project, Sacramento County, California (USFWS#2020-TA-3007)*

Dear Ms. Lantz and Mr. Perkins-Taylor:

This U.S. Fish and Wildlife Service (USFWS) Dry Season Protocol Survey Letter Report (Report) for federally listed branchiopods has been prepared in accordance with the USFWS *Survey Guidelines for the Listed Large Branchiopods*<sup>1</sup> and to fulfill reporting requirements in accordance with the 10(a)(1)(A) permit holders recovery permits. . This Report provides a complete overview of the dry season surveys conducted for the Sloughhouse Solar Project (Project). If you have any questions regarding this Report, or need any additional information, please feel free to call or email me at (916) 661-2498, mkennedy@dudek.com.

Sincerely,



Morgan Kennedy  
Environmental Compliance Manager, Ecologist

- Att.: A) USFWS Dry Season Survey Request and Authorization.  
B) Dry Soil Analysis for the Detection of Federally-Listed Large Branchiopods at the Proposed Sloughhouse Project, Sacramento County, California (USFWS# 2020-TA-3007) (Helm Biological Consulting 2021)  
C) Figure 1- Project Location  
D) Figure 2- Project Soils  
E) Figure 3- Project Hydrology  
F) Figure 4- Project Vegetation Communities and Land Cover  
G) Figure 5- USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods  
H) Photo Record

---

<sup>1</sup> USFWS (U.S. Fish and Wildlife Service). November 13, 2017. Survey Guidelines for the Large Listed Branchiopods. United State Department of the Interior. USFWS, Pacific Southwest Region. Accessed October-November 2020. <https://www.fws.gov/ventura/docs/species/protocols/vpshrimp/shrimp2017.pdf>.

# 1 Introduction

This Report documents the results of the dry season surveys for vernal pool branchiopods conducted within the Project Study Area (PSA) located in south eastern Sacramento County, California. Surveys focused on the determination of presence/no presence for the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and federally endangered vernal pool tadpole shrimp (*Lepidurus packardii*). Surveys were performed in accordance with the protocols listed above. No dry season surveys have been previously conducted as part of the Project.

The request to conduct dry season surveys was submitted to the USFWS on September 28, 2020 and approved by the USFWS on September 29, 2020 (Attachment A). Dry season surveys were conducted over nine total days within the PSA in October and November 2020. Dry season surveys were led and performed by Section 10(a)(1)(A) permitted Dudek biologists Heather Moine (TE-60147A-1) and Paul Lemons (TE-051248-6). Each permitted biologist was supported by Dudek biologists with appropriate field experience including Laura Burris, Anna Godinho, Emily Scricca, and Allie Sennett. Soil samples were submitted to Dr. Brent Helm at Helm Biological Consulting<sup>2</sup> (HBC) to process the dry soil samples for the presence of cysts from fairy shrimp and tadpole shrimp and to culture cysts to identify to species-level, as permitted as a special condition in the 10(a)(1)(A) permit held by HBC (Attachment B). A summary of dry season survey dates, PSA environmental conditions, and biologists conducted the surveys is provided in Table 1 below.

**Table 1. Summary of Dry Season Survey Dates, Site Conditions, and Biologists Present**

Date of Survey	Site Conditions	Permitted Biologist	Assisting Biologists
October 13, 2020	66–90 °F; 0–10% cloud cover; 0–6 mph wind	Heather Moine <sup>a</sup>	Allie Sennett
October 14, 2020	62–91 °F; 0% cloud cover; 1–7 mph wind	Heather Moine	Allie Sennett
October 15, 2020	57–90 °F; 0% cloud cover; 0–5 mph wind	Heather Moine	Emily Scricca
October 19, 2020	55–89 °F; 0% cloud cover; 0–4 mph wind	Heather Moine	Laura Burris
October 20, 2020	54–88 °F; 0% cloud cover; 0–4 mph wind	Heather Moine, Paul Lemons <sup>b</sup>	Laura Burris, Anna Godinho, Emily Scricca, and Allie Sennett
October 21, 2020	54–88 °F; 0% cloud cover; 0–4 mph wind	Heather Moine, Paul Lemons	Laura Burris, Anna Godinho, Emily Scricca, and Allie Sennett
October 22, 2020	56–78 °F; 0% cloud cover; 0–6 mph wind	Heather Moine	Anna Godinho, Allie Sennett
October 23, 2020	45–59 °F; 0% cloud cover; 0–3 mph wind	Heather Moine	Anna Godinho
November 11, 2020	42–58 °F; 80–90% cloud cover; 0–4 mph wind	Heather Moine	Anna Godinho, Allie Sennett

<sup>a</sup> Heather Moine (TE-60147A-1)

<sup>b</sup> Paul Lemons (TE-051248-6)

<sup>2</sup> Helm Biological Consulting. Contact: Dr. Brent Helm (TE-795930-10.2), 4600 Karchner Road, Sheridan, CA 95681, 530-633-0220.

## 2 Project Setting

### 2.1 Location

The approximately 741.20-acre PSA is located at the southwest corner of the intersection of Meiss Road and Dillard Road in the unincorporated community of Sloughhouse within south eastern Sacramento County. The PSA excludes existing solar facilities within the site. The PSA is primarily used for cattle grazing or other agricultural operations, and there is an existing solar facility located in the southeast corner of the site (Attachment C). Project location details are detailed as follows:

- County: Sacramento.
- Public Land Survey System: Cosumnes Land Grant.
- U.S. Geological Survey (USGS) 7.5-Minute Quadrangle (Quad): Sloughhouse.
- Latitude, Longitude: 38.473731, -121.184568 (centroid, decimal degrees).
- Assessor Parcel Numbers (APNs): 12601100010000, 12601100030000.
- Elevation Range: 95 to 160 feet above mean sea level (amsl).
- Average Elevation: 128 feet amsl.
- PSA: 741.20 acres.

### 2.2 Soils

According to the Natural Resources Conservation Service<sup>3</sup>, 16 soil units are present within the PSA (Attachment D). Each soil unit, typical landform or geomorphic position within the landscape, drainage class (i.e., frequency and duration of wet periods in conditions similar to those in which it was developed), hydric listing, and total area is detailed in Table 2 below.

**Table 2. Summary of Soil Units Within the Project Study Area (PSA)**

Soil Map Unit Name	Landform	Drainage Class	Hydric?	Total Area (acres)
Bruella sandy loam, 0–2% slopes	Terraces	Well-drained	No	27.11
Bruella sandy loam, 2–5% slopes	Terraces	Well-drained	No	34.84
Columbia sandy loam, drained, 0–2% slopes, occasionally flooded	Flood plains	Somewhat poorly drained	Yes	17.93

---

<sup>3</sup> USDA (U.S. Department of Agriculture). 2021. "Web Soil Survey". USDA, Natural Resources Conservation Service, Soil Survey Staff. Accessed February 2021. <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

**Table 2. Summary of Soil Units Within the Project Study Area (PSA)**

Soil Map Unit Name	Landform	Drainage Class	Hydric?	Total Area (acres)
Galt clay, 0–1% slopes, MLRA 17	Basin floors on fan remnants	Somewhat poorly drained	Yes	33.0
Galt clay, 0–4% slopes, MLRA 17	Basin floors on fan remnants	Moderately well drained	Yes	126.62
Hadselville-Pentz complex, 2–30% slopes	Hills	Moderately well drained to well drained	No	231.74
Peters clay, 1–8% slopes	Hills	Well drained	No	56.94
Redding gravelly loam, 0–8% slopes, MLRA 17	Fan remnants	Moderately well drained	No	15.29
Reiff fine sandy loam, 0–2% slopes, occasionally flooded	Flood plains	Well drained	No	96.11
Sailboat silt loam, drained, 0–2% slopes, occasionally flooded, MLRA 17	Flood plains on natural levees	Somewhat poorly drained	Yes	3.50
San Joaquin silt loam, 0–3% slopes	Terraces	Moderately well drained	No	14.02
San Joaquin silt loam, 3–8% slopes	Terraces	Moderately well drained	No	54.45
San Joaquin-Durixeralfs complex, 0–1% slopes	Terraces	Moderately well drained to well drained	No	0.25
San Joaquin-Galt complex, leveled, 0–1% slopes	Terraces	Moderately well drained	Yes	2.83
San Joaquin-Galt complex, 0–3% slopes	Terraces	Moderately well drained	Yes	17.35
San Joaquin-Xerarents complex, leveled, 0–1% slopes	Terraces	Moderately well drained to well drained	No	6.32

Source: USDA 2021

### 2.3 Watershed and Hydrology

The PSA is located within the Upper Cosumnes River watershed, which drains approximately 180 square miles of land in El Dorado, Amador, and Sacramento Counties (Hydrological Unit Code 1804001306<sup>4</sup>. A complex of seasonally inundated aquatic features generally drains the Project in a southwesterly direction, and the Cosumnes River flows within the western boundary of PSA. The western half of the PSA is located within the National Flood Hazard Layer 1% 100-year floodplain of the Cosumnes River<sup>5</sup>. However, the Cosumnes River within the PSA is bounded by levees intended to contain the river and protect against overtopping during a normal rain year (Attachment E).

<sup>4</sup> CDFW (California Department of Fish and Wildlife). 2020. Biogeographic Information and Observation System: BIOS viewer version 5.94.01. Accessed December 2020. <http://www.dfg.ca.gov/biogeodata/bios/>.

<sup>5</sup> Federal Emergency Management Agency (FEMA). 2019. National Flood Hazard Layer 1% 100-Year Floodplain. Accessed December 2020. <https://www.fema.gov/flood-maps/products-tools/national-flood-hazard-layer>.

## 2.4 Vegetation Communities and Land Cover

General vegetation communities and land cover types were documented within the PSA during the dry season surveys (Attachment F) and include the following:

- Agricultural/ (Low Density) Developed/ Urban- This land cover type includes areas that have been completely altered by human activities and contain little to no vegetation or a composite of agricultural cover crops and escaped cultivars. Such areas include buildings, paved and gravel roadways and trails, gravel lots, and other constructed environments. Disturbed/developed areas on the PSA include two residences along Meiss Road.
- California Annual Grassland- This is the dominant vegetation community present in the PSA. Dominant species in this community include soft brome (*Bromus hordeaceus*), medusa head (*Elymus caput-medusae*), and narrow tarweed (*Holocarpha virgata*). The shrub and tree layer are absent from this vegetation community. There are numerous aquatic features that occur throughout the grassland.
- Valley Oak Woodland- This general vegetation community specifically includes a composite mixed riparian woodland and valley foothill riparian. Valley oak woodland comprises the riparian corridor adjacent to the Cosumnes River, a portion of which is located within the PSA. Valley oak (*Quercus lobata*) was the dominant overstory species, with a lesser abundance of Fremont's cottonwood (*Populus fremontii*), Goodding's black willow (*Salix gooddingii*), Northern California walnut (*Juglans hindsii*), and coast live oak (*Quercus agrifolia*). Shrubs occurred intermittently and included Himalayan blackberry (*Rubus armeniacus*) and California grape (*Vitis californica*). The herbaceous layer was dominated by disturbance-tolerant upland species, including yellow star-thistle (*Centaurea solstitialis*), Italian plumeless thistle (*Carduus pycnocephalus*), and non-native grasses like those described for California annual grassland.

## 3 Methodology

### 3.1 Field Survey and Soil Collection

For the dry season surveys, soil samples were collected from the bottom of each known aquatic resource when the soil was very dry, and a small 6-inch hand trowel was used to excavate between ten samples (approximately 100 milliliter each) and 100 samples (approximately 100 milliliter each) of soil. Samples were collected equidistantly along two generally perpendicular transects (lengthwise [transect A] and widthwise [transect B]), incorporating the deepest regions of the aquatic feature, and thoroughly sampling the aquatic feature surface area. Immediately after sample collection, the soil was carefully placed into plastic sample bag and labeled according to aquatic feature, transect, and position. Sample bags from each aquatic feature were then placed into a larger bag for organization.

### 3.2 Soil Processing

Soil samples were collected from the aquatic features and submitted in November 2020 for processing by HBC, authorized USFWS Recovery Permit number TE-795930-10.2 of Section 10(a)(1)(A) of the Federal Endangered

Species Act, 16 U.S.C. 1531 et seq., and its implementing regulations. At the HBC laboratory, a brine solution was prepared by mixing table salt (NaCl) with lukewarm tap water in a large container. The collected soil material was placed in the brine solution. The soil material was then gently worked by hand to breakdown any persistent soil structure. The organic material rising to the top of the brine solution was skimmed off and placed in a 600-micron diameter pore-size sieve stacked atop a 75-micron diameter pore-size sieve. The soil material was processed through the top sieve by flushing it with lukewarm tap water while gently rubbing it with a soft-bristle brush. The soil retained from the 75-micron diameter pore size sieve was then removed and thinly ( $\approx 1.0$  millimeter) spread into plastic petri dishes and examined.

### 3.3 Cyst Culturing

The contents of each petri dish were examined under a 10 to 252-power zoom binocular microscope. A minimum of 30 minutes was spent searching the contents of each petri dish for large branchiopod cysts (embryonic eggs). HBC’s large branchiopod cyst collection and scanning electron micrographs of cysts were used to identify and compare any cysts observed within the soil samples. This processing method (described above) favors the detection of cysts belonging to the genera *Branchinecta*, *Lepidurus*, and *Streptocephalus* since these three genera have species that are federally listed. Evidence of other aquatic macroinvertebrates encountered were also noted on the laboratory datasheet. Please view the attached dry season report by HBC for more detailed information regarding dry season soil analysis (Attachment B).

## 4 Results

Soil samples were collected from a total of 67 aquatic resource features (Attachment G). All soil samples were collected by Dudek and processed and analyzed by HBC for evidence of large branchiopods. No evidence of federally listed large branchiopods (i.e., cysts belonging to the genus *Branchinecta* or *Lepidurus* or carapaces of *Lepidurus*) were observed in the soils collected. However, cysts belonging to the non-listed California fairy shrimp (*Linderiella occidentalis*) were observed in the soils collected from six features (ID-01, P-02, SW-17, SW-18, SWS-07, and VP-15). A complete summary of results has been provided in Table 3 below. Additionally, photo plates of the PSA and various aquatic features samples have been provided (Attachment H).

**Table 3. Results Summary of Dry Season Soil Samples**

Feature ID	Insects Exo-Skeletons	Micro-Turbellarian Cysts	Cladocera Ephyppia	Ostracod Cysts/Carapaces	Hydracarina	Nematoda	Collembola	Abundance of <i>Linderiella occidentalis</i> Cysts <sup>a</sup>
D-01	X		X				X	
ED-02	X	X	X			X	X	
ED-05		X	X				X	
ID-01	X	X	X	X	X	X	X	Low

**Table 3. Results Summary of Dry Season Soil Samples**

Feature ID	Insects Exo-Skeletons	Micro-Turbellarian Cysts	Cladocera Ehipippia	Ostracod Cysts/Carapaces	Hydracarina	Nematoda	Collembola	Abundance of <i>Linderiella occidentalis</i> Cysts <sup>a</sup>
P-02	X	X	X	X		X	X	Low
SW-01	X						X	
SW-03	X	X				X	X	
SW-05						X	X	
SW-06	X	X				X	X	
SW-07	X	X	X				X	
SW-08	X					X	X	
SW-09	X					X	X	
SW-10	X					X	X	
SW-13	X	X				X	X	
SW-15	X	X	X	X	X		X	
SW-17	X	X	X	X		X	X	Low
SW-18	X	X				X	X	Low
SW-19	X	X	X	X	X	X	X	
SW-20	X	X	X	X		X	X	
SW-21		X				X	X	
SW-22	X		X	X		X	X	
SW-23	X	X				X	X	
SW-24	X	X			X	X	X	
SW-25	X		X			X	X	
SW-26	X	X				X	X	
SW-27	X	X				X	X	
SW-28	X	X	X			X	X	
SW-29	X	X	X	X		X	X	
SW-30	X	X	X			X	X	
SW-32	X					X	X	
SW-34	X	X	X	X		X		
SW-36	X					X	X	
SW-37		X	X	X		X	X	
SW-38	X	X				X	X	
SW-39			X					
SW-41	X	X				X	X	
SW-43	X	X	X			X	X	
SW-44	X	X	X			X	X	
SW-45	X	X	X	X			X	
SW-46	X	X	X	X		X	X	
SW-47	X	X	X			X	X	
SW-48	X	X	X			X	X	
SW-50						X	X	

**Table 3. Results Summary of Dry Season Soil Samples**

Feature ID	Insects Exo-Skeletons	Micro-Turbellarian Cysts	Cladocera Ehippia	Ostracod Cysts/Carapaces	Hydracarina	Nematoda	Collembola	Abundance of <i>Linderiella occidentalis</i> Cysts <sup>a</sup>
SWS-02	X	X	X			X	X	
SWS-04	X	X	X	X	X	X	X	
SWS-05	X	X		X		X	X	
SWS-06	X						X	
SWS-07	X	X	X	X	X	X	X	Low
SWS-09	X	X				X	X	
SWS-10	X	X	X	X		X		
SWS-11		X	X			X	X	
SWS-40	X	X		X	X	X	X	
VP-01	X	X	X	X	X	X	X	
VP-02		X	X	X		X	X	
VP-03	X	X	X			X	X	
VP-04						X	X	
VP-05	X		X				X	
VP-06	X		X		X		X	
VP-07	X	X	X	X		X	X	
VP-09				X		X	X	
VP-10	X	X				X	X	
VP-11	X	X	X			X	X	
VP-12	X	X	X	X	X	X	X	
VP-13	X	X	X	X		X	X	
VP-14	X	X	X	X		X	X	
VP-15	X	X	X	X	X	X	X	Low
VP-16	X	X	X	X		X	X	

Source: Helm Biological Consulting 2021 (Attachment B)

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



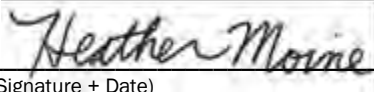
Ms. Samantha Lantz

Subject: USFWS Dry Season Protocol Survey Letter Report for Federally Listed Branchiopods, Sloughhouse  
Solar Project, Sacramento County, CA

---

## 5 Conclusion

I certify that the information in this Report for the dry season surveys conducted within the PSA and attached exhibits fully and accurately represents my work (also see Attachment B).



2/11/2021

(Signature + Date)

Heather Moine (TE-60147A-1)  
Senior Biologist, Dudek



2/11/2021

(Signature + Date)

Paul Lemons (TE-051248-6)  
Senior Biologist, Dudek



# Attachment A

---

USFWS Dry Season Survey Request and Authorization

**From:** [Lantz, Samantha M](#)  
**Sent:** Tuesday, September 29, 2020 10:23 AM  
**To:** [Morgan Kennedy](#)  
**Cc:** [David Hochart](#); [Michael Henry](#); [Perkins-Taylor, Ian E](#)  
**Subject:** Re: (EXTERNAL) FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

---

You may consider this email authorization to conduct wet season and dry season surveys for large listed branchiopods in the proposed Sloughhouse Project survey area in Sacramento County, per the conditions of the relevant recovery permits (TE-53771B; TE-031848; TE-051248; TE-60147A; TE-813545) and as specified in your email request dated September 28, 2020.

Remember to carry a copy of your permit(s) while doing the work and to follow the terms and conditions of the permit(s), including the reporting requirements. In your report(s), please include which activities were authorized, the names of all persons involved in each activity, their recovery permit numbers, if applicable, and the date of this authorization, to help ensure that we correctly record the fulfillment of the reporting requirement under this authorization. We ask that you use UTM coordinates for all spatial data. Please use **Service reference number 2020-TA-3007** and send reports to me and Ian Perkins-Taylor (biologist in our Sac Valley division) (cced here).

Best,

Sam

---

Samantha Lantz, PhD  
Fish and Wildlife Biologist  
USFWS, Sacramento Field Office  
Listing and Recovery Division  
2800 Cottage Way W-2605  
Sacramento, CA 95825-1868  
Phone: 916-414-6526  
Pronouns: she/her/hers

In an effort to slow the spread of the coronavirus (COVID-19), staff in the Sacramento Fish and Wildlife Office have implemented an aggressive telework schedule. At this time, we are responding to requests for information via email or phone as often as possible as we do not have the in-office capacity to support regular mail service. We appreciate your understanding.

---

September 25, 2020

12957

U.S. Fish and Wildlife Service  
Pacific Southwest Region (Region 8)  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825  
916.414.6600

**Subject:** *Request to the U.S. Fish and Wildlife Service to Conduct Wet and Dry Season Large Listed Branchiopod Surveys, Proposed Sloughhouse Project, Sacramento County, California*

Dear Sir or Madam:

Dudek is providing this request to the U.S. Fish and Wildlife Service (USFWS) to conduct both wet season and dry season surveys for large listed branchiopods (i.e., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) in the proposed Sloughhouse Project (Project) survey area (Attachment 1).

## Proposed Project and Survey Area

The survey area for the proposed Project could include a total of approximately 741.20 acres, pending on-going proposed Project design efforts (Attachment 2). According to the USFWS, the survey area is located in 'Survey Zone A' of California for listed large branchiopods.

## Potential Branchiopod Habitat

For the purpose of this request, Dudek evaluated potential branchiopod habitat within the survey area based on the following desktop data resources:

- California Aquatic Resources Inventory (CARI).<sup>1</sup>
- National Wetland Inventory (NWI).<sup>2</sup>
- South Sacramento Habitat Conservation Plan (SSHCP) land cover types.<sup>3</sup>
- U.S. Geological Society (USGS) National Hydrography dataset (NHD).<sup>4</sup>

The desktop evaluation of potential branchiopod habitat in the survey area found a total of 41.27 acres of potential habitat, as summarized in Table 1 below.

---

<sup>1</sup> SFEI (San Francisco Estuary Institute and the Aquatic Science Center). CARI. 2020. Accessed September 2020. <https://www.sfei.org/cari>.

<sup>2</sup> USFWS. 2020. NWI. Accessed September 2020. <https://www.fws.gov/wetlands/>.

<sup>3</sup> Sacramento County. 2019. SSHCP. Accessed September 2020. <https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/SSHCPPlan.aspx>.

<sup>4</sup> USGS. 2020. National Hydrography. Accessed September 2020. <https://www.usgs.gov/core-science-systems/ngp/national-hydrography>.

**Table 1. Summary of Potential Branchiopod Habitat Feature Types in Proposed Project Survey Area**

Aquatic Feature Type	Total of Individual Features in the Survey Area	Total Acreage of Features in Survey Area
Freshwater emergent wetland	4	13.92
Freshwater pond	3	1.32
Depressional seasonal feature	6	3.94
Individual vernal pool	79	17.34
Swale	45	4.00
Other- Depressional	1	0.75
<b>Totals</b>	<b>138</b>	<b>41.27</b>

The survey area does not contain USFWS Designated Critical Habitat (DCH). Specifically, there are DCH occurrences of vernal pool fairy shrimp (Unit VERFS 14B), and vernal pool tadpole shrimp (Unit VERTS 9A) approximately 1.4 miles southwest of the survey area.

## Survey Request Overview

Dudek would like to initiate dry season surveys as soon as possible in the survey area pending USFWS approval. If possible, the dry season surveys would be conducted before the 2020 through 2021 wet season (i.e., prior to November 1). In the case that precipitation events occur prior to the dry season survey timing detailed above, the dry season surveys for the proposed Project will be shifted to the following dry season (i.e., beginning May 2020).

Wet season surveys would commence approximately two weeks following the first precipitation events of the wet season (i.e., mid-November 2020); specifically when aquatic features hold greater than three centimeters of water 24 hours after a rain event. Wet season surveys would then continue every 14 days until the aquatic feature dries, or a minimum of 90 consecutive days of inundation have occurred. If pools dry down during the wet season and then inundate again, surveys will be re-initiated for those pools even if the 90 days of inundation have already occurred.

## Dry Season Survey

The dry season surveys will be conducted in accordance with the USFWS *Survey Guidelines for the Listed Large Branchiopods*<sup>5</sup>. Soil samples will be collected from the top centimeter, or one to three centimeters below overburden, of the aquatic features that have the potential to be branchiopod habitat. Soil samples will be collected when they are dry to avoid damaging or destroying cysts. A hand trowel, or similar instrument, will be used to collect approximately one liter volume sample per aquatic feature. Soil samples will be collected in chunks. The soil from each sampling location will be stored in separate bags and labeled with the specific location details from within the aquatic feature from which the sample was taken. A sketch of the aquatic feature

<sup>5</sup> USFWS. May 31, 2015. Survey Guidelines for the Large Listed Branchiopods. United State Department of the Interior. USFWS, Pacific Southwest Region. Accessed September 2020. [https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/VernalPoolBranchiopodSurveyGuidelines\\_20150531.pdf](https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/VernalPoolBranchiopodSurveyGuidelines_20150531.pdf).

showing the specific location of each soil sample location will be drawn. Photographs and field notes of each survey areas physical characteristics will also be recorded.

Per the USFWS guidelines, soil samples will be collected, stored, sieved, and cysts will be identifies as genus *Branchinecta* or *Lepidurus* if possible. Soil samples containing any residual moisture initially will be adequately ventilated and allowed to air dry thoroughly before storage of the sample. The bags containing the soil samples will be kept out of direct sunlight in order to avoid excessively heating the sample.

A total of 10 soil samples of approximately 100 ml each will to be taken from each aquatic feature, for a total soil sample volume of approximately one liter per aquatic feature.

In addition to the dry season survey request, Dudek would also like to request permission to culture/hydrate cysts in the laboratory once soils have been prepared. This will allow for the identification of adult branchiopods to the species-level. Specifically, washed and sieved soil fractions from the 300 um and 150 um sieves will be examined under a dissecting microscope for fairy shrimp or tadpole shrimp cysts. The process will be repeated until all individual soil samples have been examined. All sieved material will be processed and dried as quickly as possible, preferably within one hour from the initial wetting. Cyst density information for each soil sample location will be calculated by dividing the total number of cysts recovered by the total amount of soil from the individual aliquots from that soil sample location. Total cyst density information for each soil sample location will be reported for each species in terms of the following: none; 1 to 25 cysts/100 ml soil; 26 to 50 cysts/100 ml soil; 51 to 100 cysts/100 ml soil; 101 to 199 cysts/100 ml soil; or more than 200 cysts/100 ml soil. If cysts can be identified to the species-level, then one of three methods to determine species will be applied: 1) hydrate and grow them out, though this is not always feasible due to the many factors that go into hatching and growing fairy shrimp; 2) suspend the survey and agree that they are of a listed species; or (3) complete a subsequent wet season survey according to the full protocol. Voucher specimens of adult branchiopods will be preserved, identified to the species level and transferred to an approved repository.

The results of the dry season survey will be documented within a protocol-level report. The report will include a discussion of the survey methodology and adequacy, including a description of any resource documents referenced and field survey methods used during the survey work. The report will include appropriate tables and graphics to meet the reporting requirements of the USFWS. According to USFWS requirements, the report will be submitted within 90 days of completing the survey.

## Wet Season Survey

Protocol-level wet season surveys will also be conducted in accordance with the USFWS guidelines and timing during the wet season as identified above. At each wet season visit, representative portions of the bottom, edges, and vertical water column of the aquatic feature shall be adequately sampled using a seine, dip net or aquarium net appropriate for the size of the feature. As part of the wet season surveys, Dudek will also sample water quality (i.e., pH, total dissolved solids/electro-conductivity, and temperature), and document empirical observations made at each aquatic feature surveyed. Photographs and field notes on each survey areas physical characteristics will be recorded.

The results of the wet season survey will be documented within a protocol-level report. The report will include a discussion of the survey methodology and adequacy, including a description of any resource documents referenced

and field survey methods used during the survey work. The report will include appropriate tables and graphics to meet the reporting requirements of the USFWS. According to USFWS requirements, the report will be submitted within 90 days of completing the survey.

## Survey Personnel

Dudek may employ several of our permitted biologists to conduct wet and dry season surveys in the proposed Project survey area. Each permitted biologist will be accompanied by one or more supporting biological staff that have had appropriate field experience to assist in these surveys. Table 2 below lists all Dudek biologists that hold a Recovery 10(a)(1)(a) Permit, and/or supporting biological field staff that that Dudek has is requesting to have approved to conduct large listed branchiopod surveys in the proposed Project survey area.

**Table 2. Dudek Survey Personnel Reference**

Name (Title)	USFWS 10(a)(1)(A) Recovery Permit	Survey Designation
Bergman, Erin	TE53771B-2	Biologist- Lead
Burris, Laura	N/A	Field Biologist- Support
Godinho, Anna	N/A	Field Biologist- Support
Henry, Ryan	TE031848-4	Biologist- Lead
Henry, Michael	N/A	Field Biologist- Support
Keating, Paul	N/A	Field Biologist- Support
Kennedy, Morgan	N/A	Field Biologist- Support
Leis, Michelle	N/A	Field Biologist- Support
Lemons, Paul	TE051248-6	Biologist- Lead
Moine, Heather	TE60147A-1	Biologist- Lead
Ortega, Brock	TE813545-9	Biologist- Lead
Scricca, Emily	N/A	Field Biologist- Support
Sennett, Allie	N/A	Field Biologist- Support

If you have any questions regarding this request, please feel free to contact me anytime at morgkennedy@gmail.com, 916.661.2498. Thank you for your consideration.

Sincerely,



Morgan Kennedy  
Environmental Compliance Manager

- Att.: 1) Figure 1. Project Location Map  
2) Figure 2. Project Survey Area Map  
3) Figure 3. Project Area and Preliminary Survey Location Map

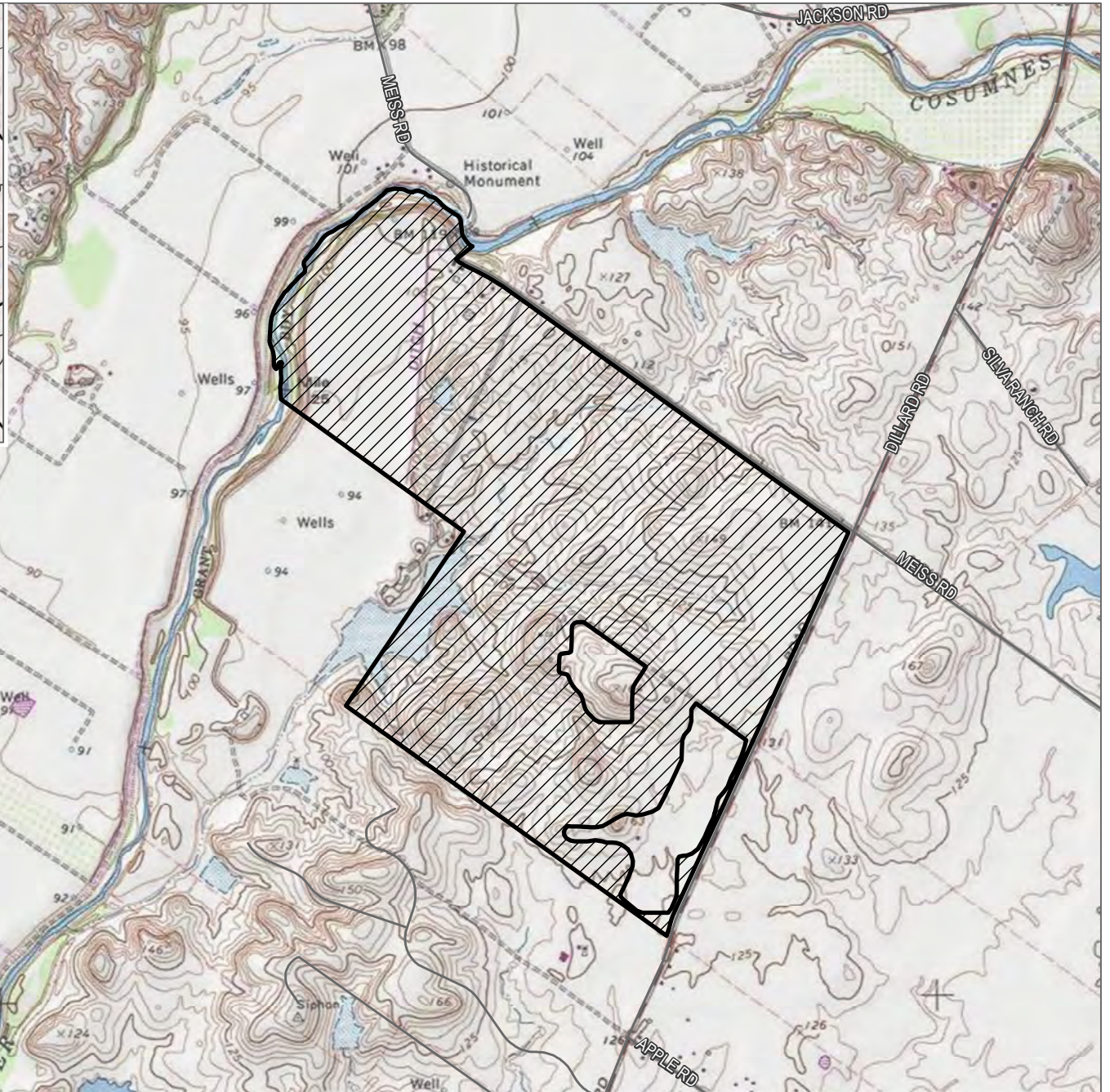
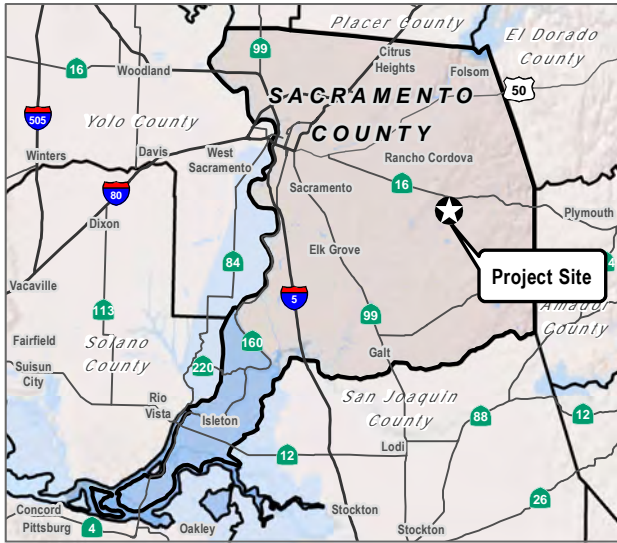



# Attachment 1

---

Figure 1. Project Location Map

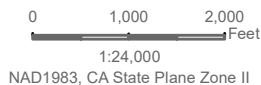




 Survey Area Boundary (741.20 acres)

SOURCE: USGS 7.5-Minute Series Sloughouse Quadrangle

**DUDEK**



**FIGURE 1**

**Project Location Map**

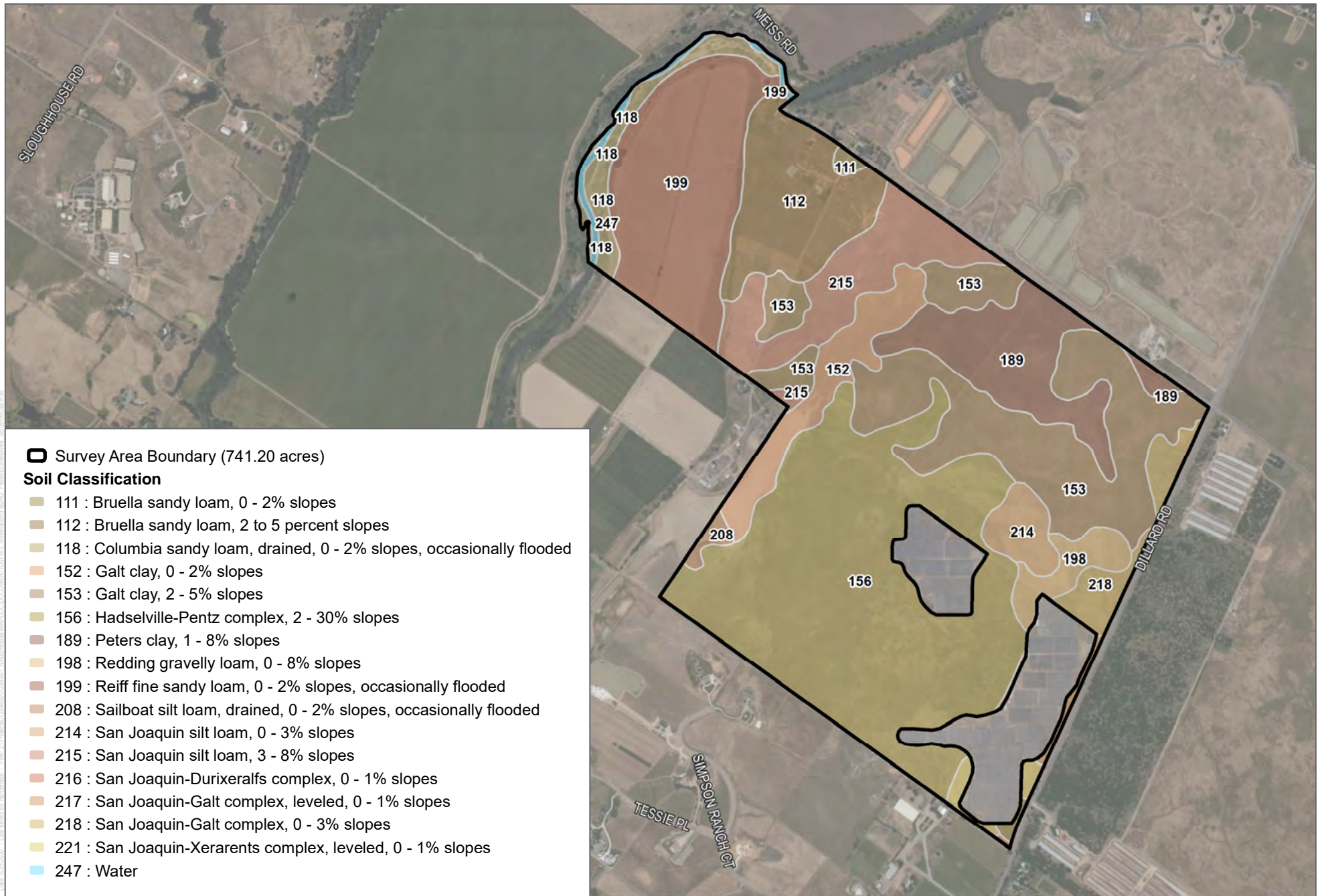
Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



# Attachment 2

---

Figure 2. Project Survey Area Map



SOURCE: Bing Maps 2019, USDA 2019, Sacramento County

**DUDEK**



**FIGURE 2**

**Project Survey Area Map**

Sloughhouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughhouse, Sacramento County



# Attachment 3

---

Figure 3. Project Area and Preliminary Survey Locations Map



SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

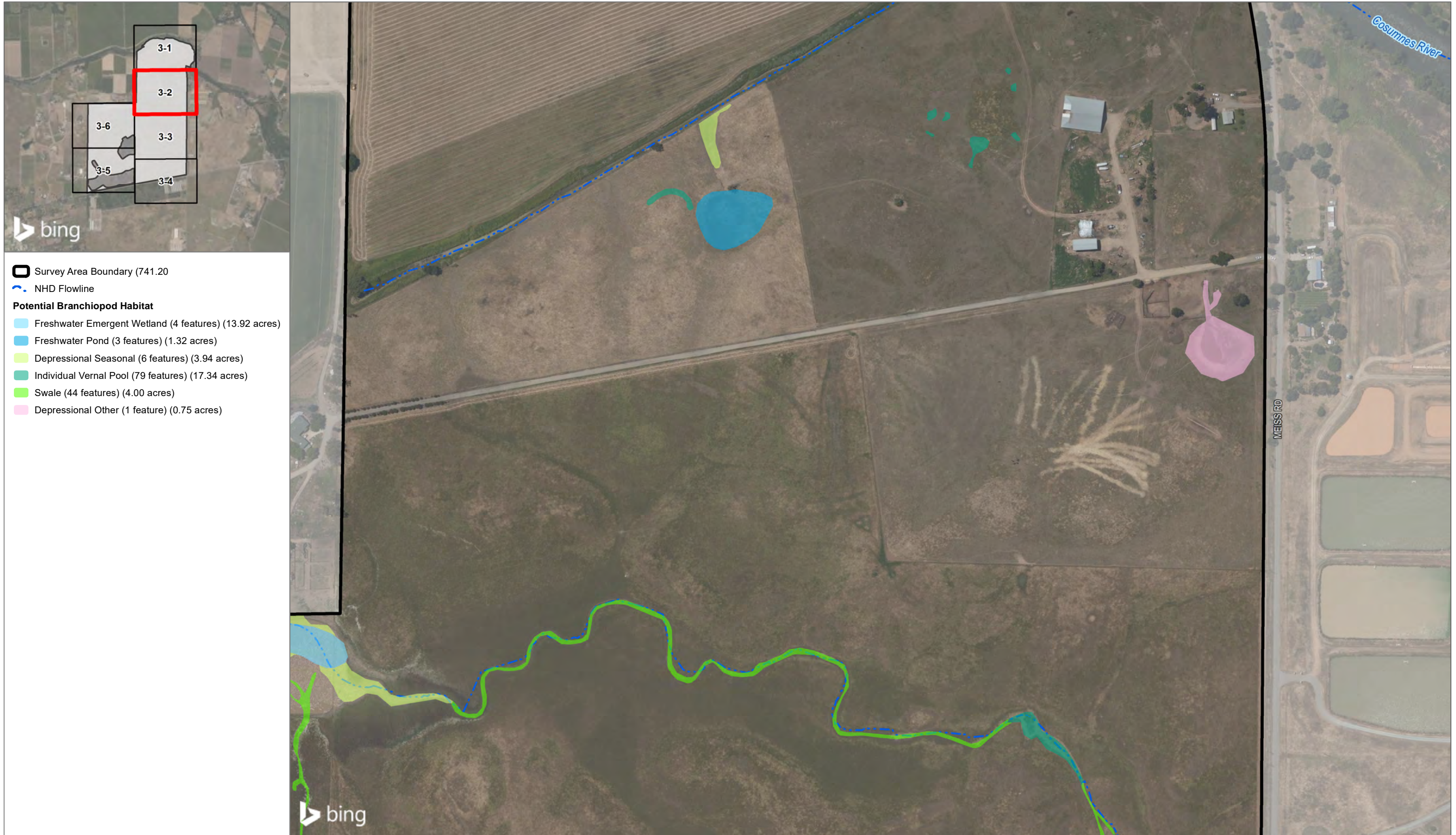
**DUDEK**

0 137.5 275 Feet  
1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-1**

Project Area and Preliminary Survey Locations Map

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

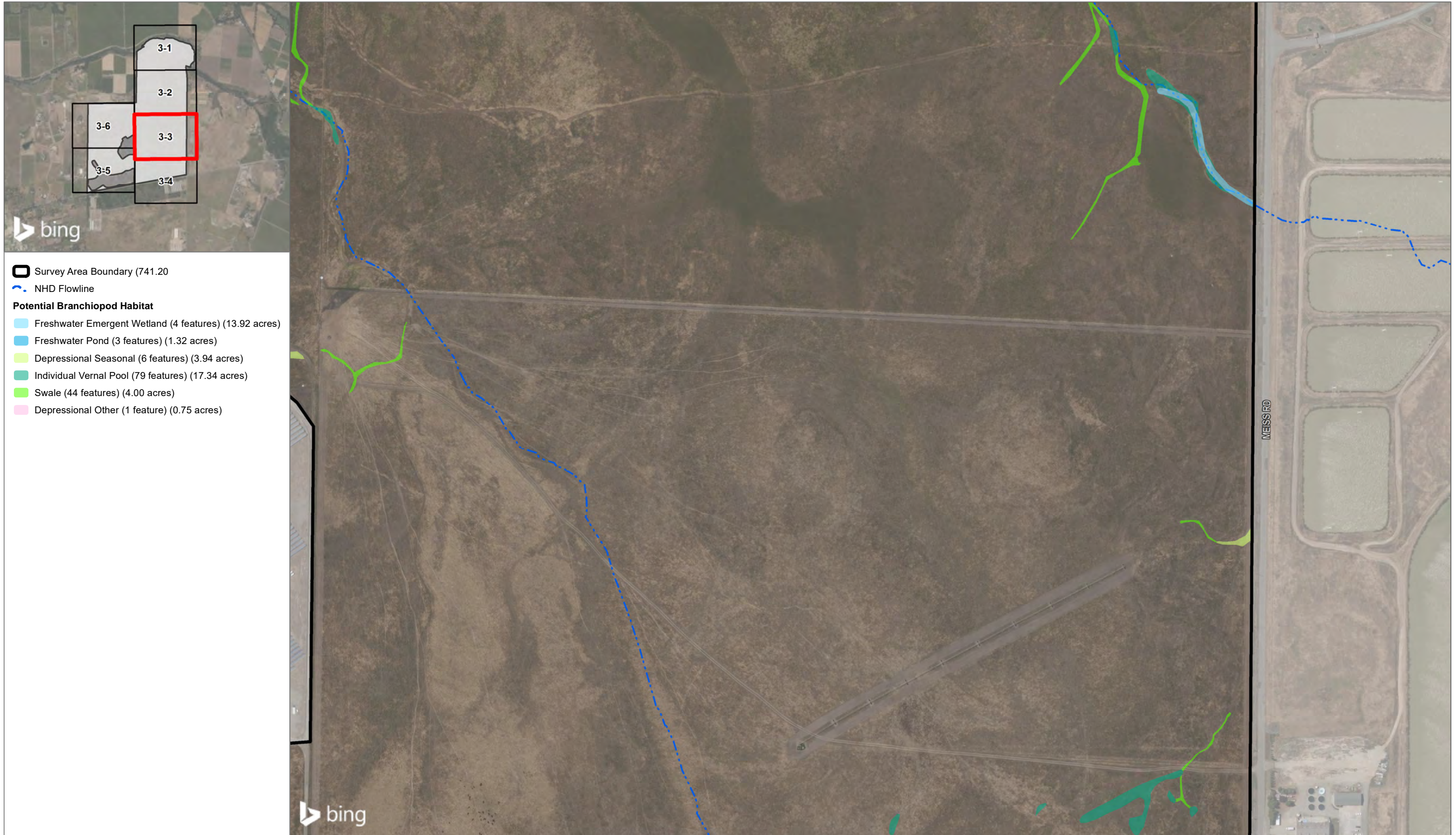
**DUDEK**

0 137.5 275 Feet  
1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-2**

**Project Area and Preliminary Survey Locations Map**

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



- Survey Area Boundary (741.20)
- ~ NHD Flowline
- Potential Branchiopod Habitat**
- Freshwater Emergent Wetland (4 features) (13.92 acres)
- Freshwater Pond (3 features) (1.32 acres)
- Depressional Seasonal (6 features) (3.94 acres)
- Individual Vernal Pool (79 features) (17.34 acres)
- Swale (44 features) (4.00 acres)
- Depressional Other (1 feature) (0.75 acres)

SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

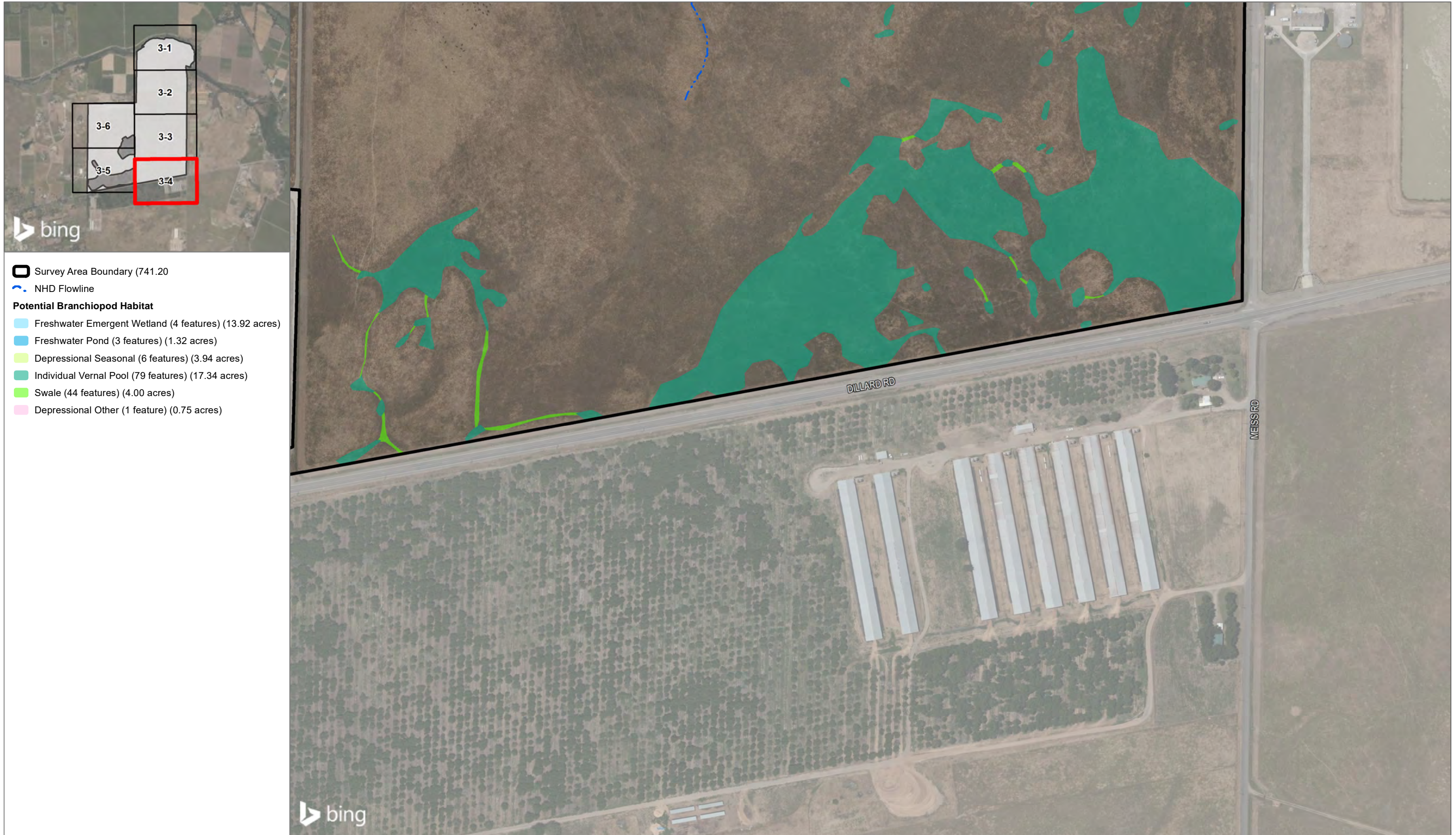
**DUDEK**

0 137.5 275 Feet  
1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-3**

Project Area and Preliminary Survey Locations Map

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



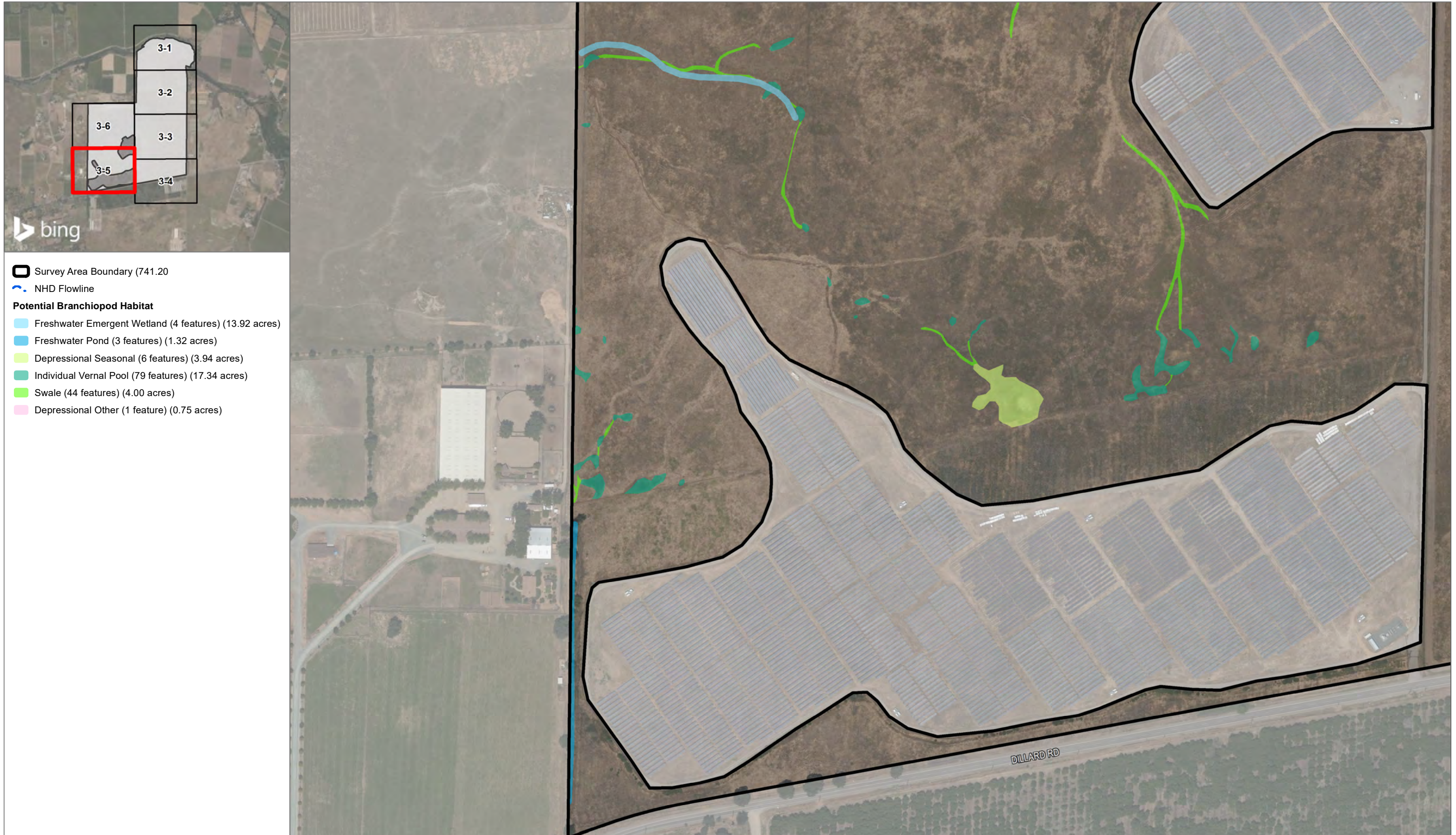
- Survey Area Boundary (741.20)
- ~ NHD Flowline
- Potential Branchiopod Habitat**
- Freshwater Emergent Wetland (4 features) (13.92 acres)
- Freshwater Pond (3 features) (1.32 acres)
- Depressional Seasonal (6 features) (3.94 acres)
- Individual Vernal Pool (79 features) (17.34 acres)
- Swale (44 features) (4.00 acres)
- Depressional Other (1 feature) (0.75 acres)

SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

**FIGURE 3-4**

Project Area and Preliminary Survey Locations Map





SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

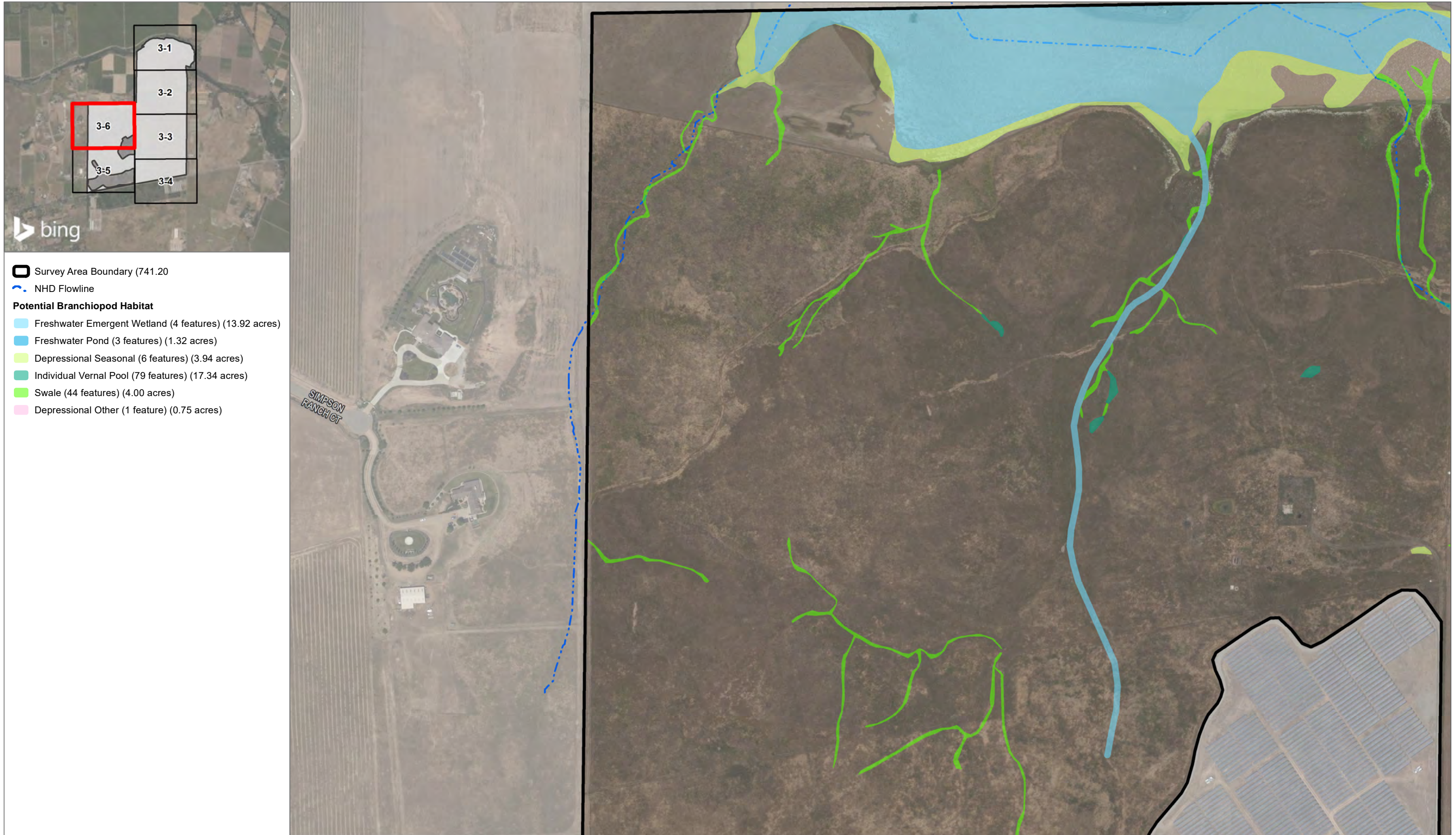
**DUDEK**

0 137.5 275 Feet  
1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-5**

Project Area and Preliminary Survey Locations Map

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

**DUDEK**

1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-6**

**Project Area and Preliminary Survey Locations Map**

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



# Attachment B

---

Dry Soil Analysis for the Detection of Federally-Listed Large  
Branchiopods at the Proposed Sloughhouse Project,  
Sacramento County, California (USFWS#2020-TA-3007)  
(Helm Biological Consulting 2021)

**DRY SOIL ANALYSIS  
FOR THE  
DETECTION OF  
FEDERALLY-LISTED LARGE BRANCHIOPODS  
AT THE  
PROPOSED SLOUGHHOUSE PROJECT,  
SACRAMENTO COUNTY, CALIFORNIA  
(USFWS# 2020-TA-3007)**



*Prepared for:*



**DUDEK**  
858 Lincoln Way, Suite 208  
Auburn, CA 95603  
*Contact: Morgan Kennedy*  
(530) 863-4276 ext. 3976

*Prepared by:*



**HELM BIOLOGICAL CONSULTING**  
4600 Karchner Road  
Sheridan, CA 95681  
*Contact: Dr. Brent Helm*  
(530) 633-0220

**January 2021**



**DRY SOIL ANALYSIS  
FOR THE  
DETECTION OF  
FEDERALLY-LISTED LARGE BRANCHIOPODS  
AT THE  
PROPOSED SLOUGHHOUSE PROJECT,  
SACRAMENTO COUNTY, CALIFORNIA  
(USFWS# 2020-TA-3007)**

**INTRODUCTION**


Helm Biological Consulting (HBC), a division of Tansley Team, Inc., was contracted by Dudek to perform an analysis of soils collected from dry seasonally inundated depressions (hereafter “basins”) at the Proposed Sloughhouse Project (hereafter “Project”), for the presence of large branchiopods (fairy shrimp, tadpole shrimp) that are listed as threatened or endangered under the federal Endangered Species Act (e.g., vernal pool fairy shrimp [*Branchinecta lynchi*] and the vernal pool tadpole shrimp [*Lepidurus packardii*]).

The Project could include a total of approximately 741.20 acres, pending on-going proposed Project design efforts (Figure 1). The Project is located immediately west of Dillard Road, south of Meiss Road, and east of the Consumes River in Sacramento County, California. Additionally, the Project is located in an unsectioned portion of Township 7 North, Range 7 East, and Mt. Diablo Base & Meridian (MDB&M) of the Sloughhouse U.S. Geological Survey (USGS) 7.5-minute quadrangle map. The Project’s approximate center coordinates (World Geodetic System 1984 [WGS84]) are: 38.471667°, -121.180248°.

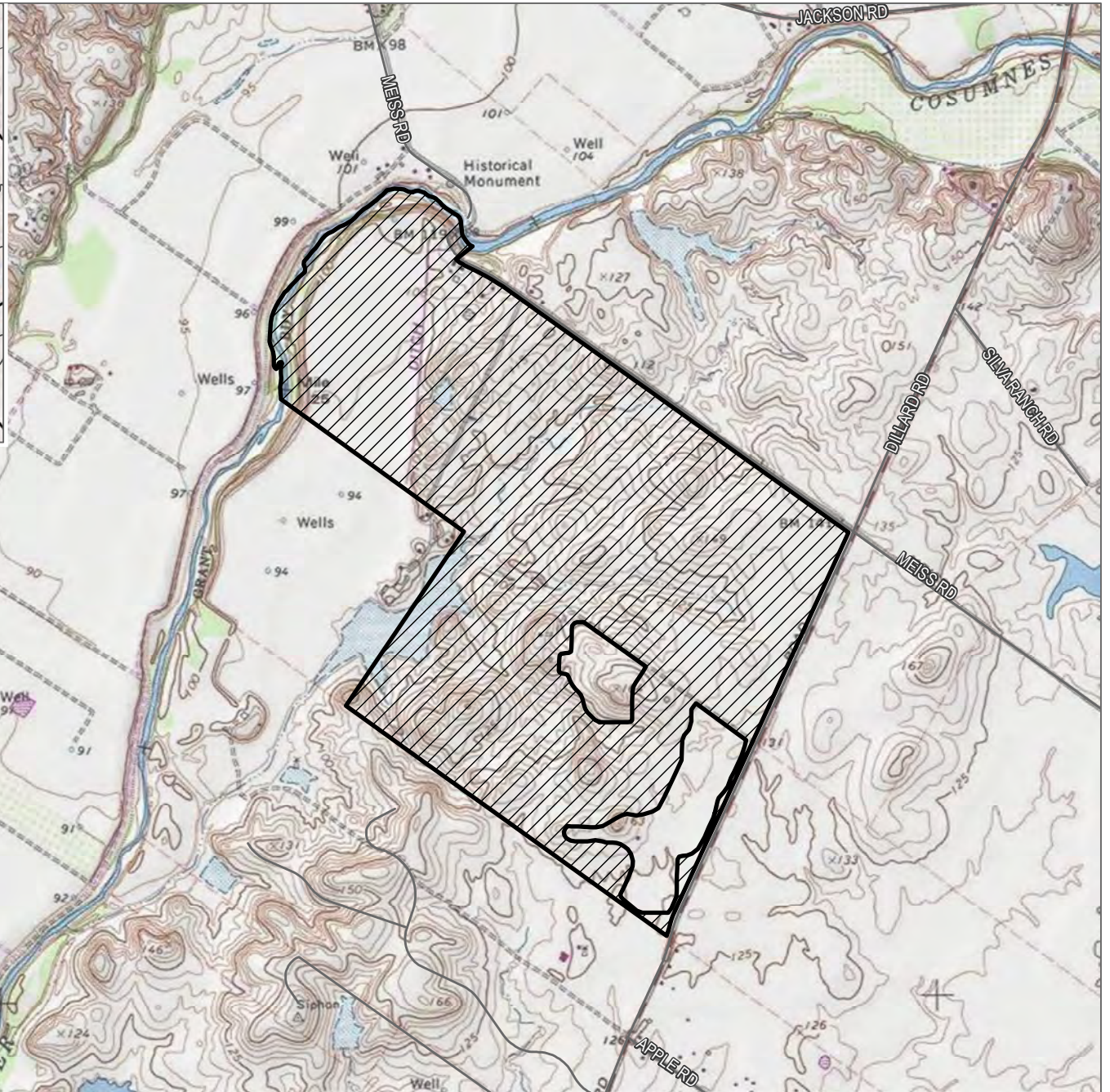
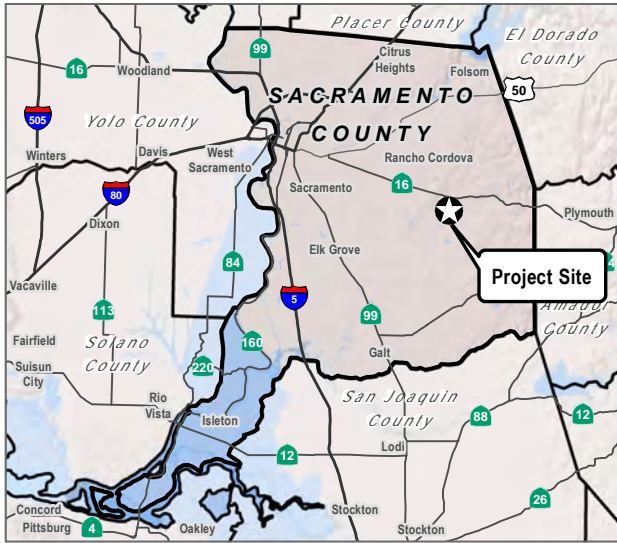
The remainder of this report discusses the methods and results of the soil examinations to determine the presence of federally-listed large branchiopods at the Project.




“We certify that the information in this survey report and attached exhibits fully and accurately represents our work.”

Brent P. Helm      Signature       Date 01-25-2021  
(TE-795930-10.2)

Sean M. O'Brien      Signature       Date 01-25-2021  
(TE-795930-10.2)



 Survey Area Boundary (741.20 acres)

SOURCE: USGS 7.5-Minute Series Sloughouse Quadrangle

**DUDEK**



0 1,000 2,000 Feet  
1:24,000  
NAD1983, CA State Plane Zone II

**FIGURE 1**

**Project Location Map**

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County

## METHODS

Methods followed U.S. Fish and Wildlife Service's (USFWS 2017) *Survey Guidelines for Listed Large Branchiopods* for dry-season sampling and consisted of first soil collection and then soil processing and analysis as described below.

### SOIL COLLECTION

Dry soils were collected on October 13-16, 19-22, November 11, 2020 by Heather Moine of Dudek as authorized by USFWS under permit numbers TE-60147A-1 of Section 10(a)(1)(A) of the federal Endangered Species Act (ESA), 16 U.S.C. 1531 et seq., and its implementing regulations (Appendix A). Heather Moine was supported by Laura Burris, Allie Sennett, Anna Godhino, Paul Lemons (USFWS permit # TE-051248-6), and Emily Scricca.

A small 6-inch hand trowel was used to excavate ten samples (approximately 100 milliliter each) of dry soil from the bottom of each seasonal feature. Soil samples were collected equidistantly along two perpendicular transects (lengthwise [transect A] and widthwise [transect B]), incorporating the deepest region of the seasonal feature. If neither transect passed within the second deepest region of the seasonal feature, another soil sample was taken to specifically include it; however, no more than ten soils samples were extracted from a set of perpendicular transects.

Dry season surveys were conducted prior to the completion of the U.S. Army Corps of Engineers (USACE)-level aquatic resources delineation to meet overarching Project schedules. As such, some aquatic resource features were not sampled because they were not identified as an aquatic resource during the delineation process and/or they were not considered federally-listed large branchiopod habitat.

The collected soils were delivered to HBC for subsequent processing and analysis as described below.

### SOIL PROCESSING AND ANALYSIS

Soil samples obtained from Dudek were processed and analyzed by Dr. Brent Helm of HBC as authorized by the USFWS under recovery permit number TE-795930-10.2 of Section 10(a)(1)(A) of the federal ESA, 16 U.S.C. 1531 et seq., and its implementing regulations (Appendix A). In HBC's laboratory, a brine solution was prepared by mixing table salt (NaCl) with lukewarm tap water in a large container. The collected soil material was placed in the brine solution. The soil material was then gently worked by hand to breakdown any persistent soil structure. The organic material rising to the top of the brine solution was skimmed off and placed in a 600-micron diameter pore-size sieve stacked atop a 75-micron diameter pore-size sieve. The soil material was processed through the top sieve by flushing it with lukewarm tap water





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

The contents of each petri dish were examined under a 10 to 252-power zoom binocular microscope. A minimum of 0.5-hour was spent searching the contents of each petri dish for large branchiopod cysts (embryonic eggs). Dr. Helm's large branchiopod cyst reference collection and scanning electron micrographs of cysts (Belk 1989, Brendock *et al.* 2008, Gilchrist 1978, Hill and Shepard 1998, Mura 1991, and Rabet 2010) were used to identify and compare any cysts observed within the soil samples. This processing method (described above) favors the detection of cysts belonging to the genera *Branchinecta*, *Lepidurus*, and *Streptocephalus* since these three genera have species that are federally listed. Evidence of other aquatic macroinvertebrates encountered was also noted on the laboratory data sheet.

## RESULTS

### SOIL COLLECTION

Dudek collected soils from a total of 67 features within the Project (Exhibit A).

### SOIL PROCESSING AND ANALYSIS

All of the soils collected by Dudek were processed and analyzed for evidence of large branchiopods. No evidence of federally-listed large branchiopods (i.e., cysts belonging to the genus *Branchinecta* or *Lepidurus* or carapaces of *Lepidurus*) were observed in the soils collected (Table 1). However, cysts belonging to the non-listed California fairy shrimp (*Lindieriella occidentalis*) were observed in the soils collected from six features (ID-01, P-02, SW-17, SW-18, SWS-07, and VP-15). Representative photographs of the aquatic resource features occurring at the Project are provided in Appendix B.

Table 1. Results of Dry-Season Sampling at the Proposed Sloughhouse Project

Feature ID	Invertebrates Present (X)							Abundance of <i>Lindieriella occidentalis</i> Cysts
	Insects Exo-skeletons	Micro-turbellarian Cysts	Cladocera Ephyppia	Ostracod Cysts/ Carapaces	Hydracarina	Nematoda	Collembola	
D-01	X		X				X	
ED-02	X	X	X			X	X	
ED-05		X	X				X	
ID-01	X	X	X	X	X	X	X	Low
P-02	X	X	X	X		X	X	Low
SW-01	X						X	
SW-03	X	X				X	X	
SW-05						X	X	
SW-06	X	X				X	X	
SW-07	X	X	X				X	
SW-08	X					X	X	
SW-09	X					X	X	
SW-10	X					X	X	
SW-13	X	X				X	X	
SW-15	X	X	X	X	X		X	
SW-17	X	X	X	X		X	X	Low
SW-18	X	X				X	X	Low
SW-19	X	X	X	X	X	X	X	
SW-20	X	X	X	X		X	X	
SW-21		X				X	X	
SW-22	X		X	X		X	X	

Table 1. Results of Dry-Season Sampling at the Proposed Sloughhouse Project

Feature ID	Invertebrates Present (X)							Abundance of <i>Linderiella occidentalis</i> Cysts
	Insects Exo-skeletons	Micro-turbellarian Cysts	Cladocera Ehippia	Ostracod Cysts/ Carapaces	Hydracarina	Nematoda	Collembola	
SW-23	X	X				X	X	
SW-24	X	X			X	X	X	
SW-25	X		X			X	X	
SW-26	X	X				X	X	
SW-27	X	X				X	X	
SW-28	X	X	X			X	X	
SW-29	X	X	X	X		X	X	
SW-30	X	X	X			X	X	
SW-32	X					X	X	
SW-34	X	X	X	X		X		
SW-36	X					X	X	
SW-37		X	X	X		X	X	
SW-38	X	X				X	X	
SW-39			X					
SW-41	X	X				X	X	
SW-43	X	X	X			X	X	
SW-44	X	X	X			X	X	
SW-45	X	X	X	X			X	
SW-46	X	X	X	X		X	X	
SW-47	X	X	X			X	X	
SW-48	X	X	X			X	X	
SW-50						X	X	
SWS-02	X	X	X			X	X	
SWS-04	X	X	X	X	X	X	X	
SWS-05	X	X		X		X	X	
SWS-06	X						X	
SWS-07	X	X	X	X	X	X	X	Low
SWS-09	X	X				X	X	
SWS-10	X	X	X	X		X		
SWS-11		X	X			X	X	
SWS-40	X	X		X	X	X	X	
VP-01	X	X	X	X	X	X	X	
VP-02		X	X	X		X	X	
VP-03	X	X	X			X	X	
VP-04						X	X	
VP-05	X		X				X	
VP-06	X		X		X		X	
VP-07	X	X	X	X		X	X	
VP-09				X		X	X	
VP-10	X	X				X	X	

Table 1. Results of Dry-Season Sampling at the Proposed Sloughhouse Project

Feature ID	Invertebrates Present (X)							Abundance of <i>Lindieriella occidentalis</i> Cysts
	Insects Exo-skeletons	Micro-turbellarian Cysts	Cladocera Ehippia	Ostracod Cysts/ Carapaces	Hydracarina	Nematoda	Collembola	
VP-11	X	X	X			X	X	
VP-12	X	X	X	X	X	X	X	
VP-13	X	X	X	X		X	X	
VP-14	X	X	X	X		X	X	
VP-15	X	X	X	X	X	X	X	Low
VP-16	X	X	X	X		X	X	

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

### LITERATURE CITED

- Belk, D. 1989. Identification of species in the Conchostraca genus *Eulimnadia* by egg shell morphology. *Journal of Crustacean Biology*. 9(1): 115-125.
- Brendock, L., D. C. Rogers, J. Olesen, S. Weeks, and W. R. Hoch. 2008. Global diversity of large branchiopods (Crustacea: Branchiopoda) in freshwater. *Hydrobiologia*. 595: 167-176.
- California Department of Fish and Wildlife (CDFW). 2021. California Natural Diversity Data Base. Available online at: <https://www.wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>.
- Gilchrist, B. M. 1978. Scanning electron microscope studies of the egg shell in some Anostraca (Crustacea: Branchiopoda). *Cell Tiss. Res.* 193: 337-351.
- Hill, R. E., and W. D. Shepard. 1998. Observation on the identification of California anostracan cysts. *Hydrobiologia* 359: 113-123.
- Mura, G. 1991. SEM morphology of resting eggs in the species of the genus *Branchinecta* from North America. *J. Crust. Biol.* 11: 432-436.
- Rabet, N. 2010. Revision of the egg morphology of *Eulimnadia* (Crustacea, Branchiopoda, Spinicaudata). *Zoosystema* 32 (3): 373-391.
- U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS). 2017. Survey guidelines for the listed large branchiopods. 24 pp. Dated: 31 May 2015 (Revised November 13, 2017).



**EXHIBIT A.**  
**AQUATIC RESOURCES AT THE PROJECT**



- Project Study Area Boundary (741.20 Acres)
- 2-foot Contours
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)

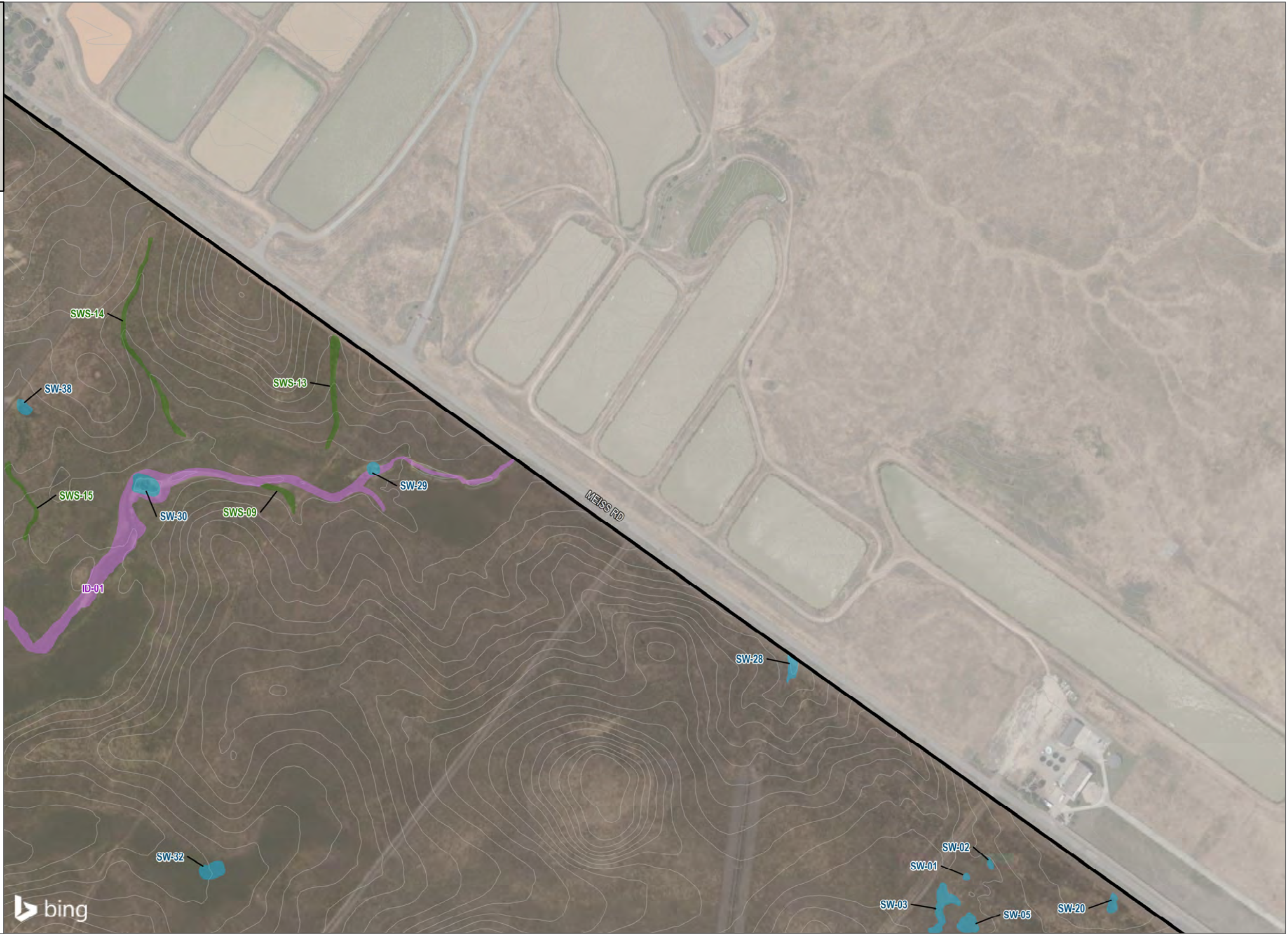


SOURCE: Bing Maps 2020, Sacramento 2019





- Project Study Area Boundary (741.20 Acres)
- 2-foot Contours
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)



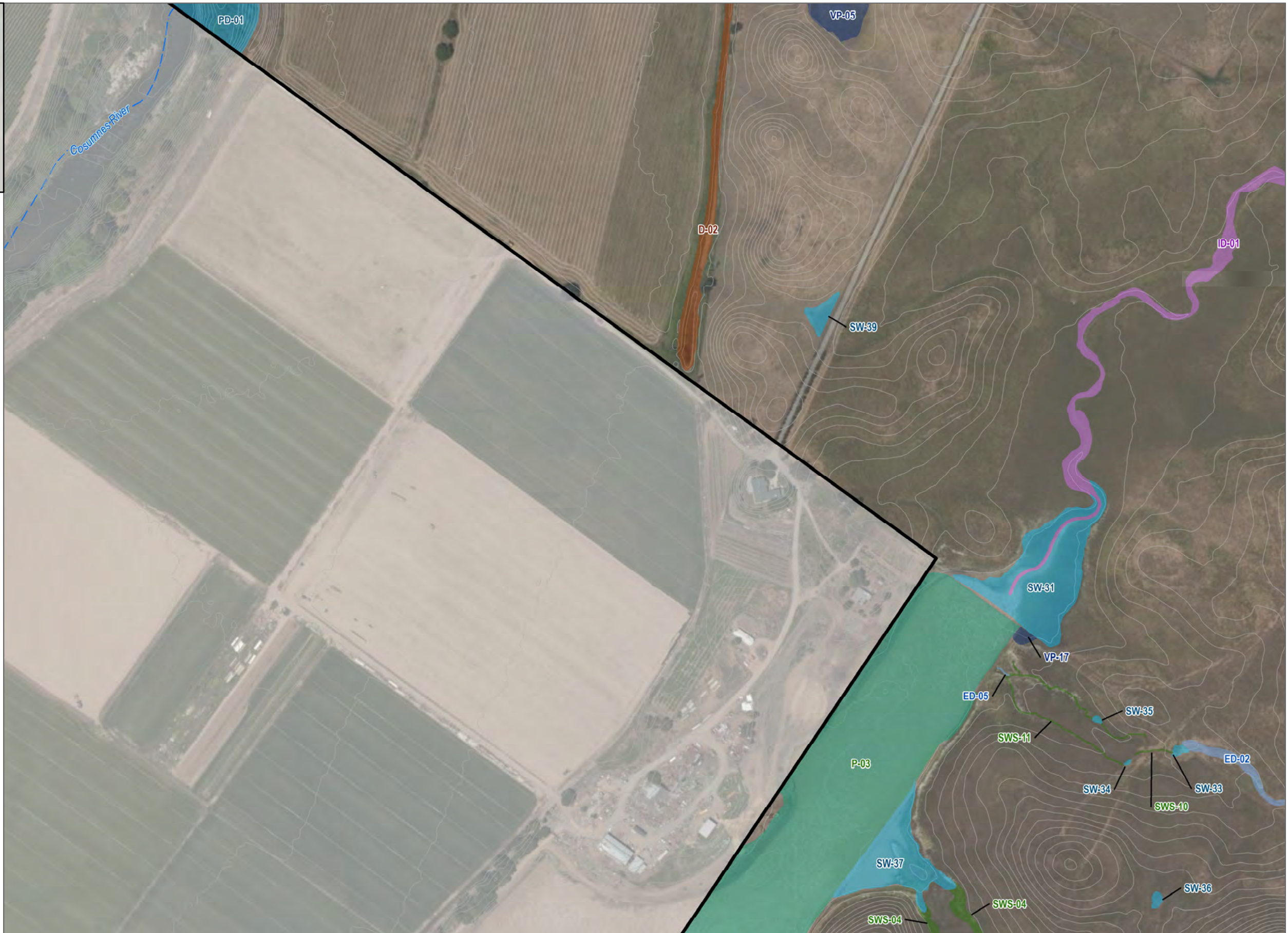
SOURCE: Bing Maps 2020, Sacramento 2019







- Project Study Area Boundary (741.20 Acres)
- 2-foot Contours
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)



SOURCE: Bing Maps 2020, Sacramento 2019





- Project Study Area Boundary (741.20 Acres)
- 2-foot Contours
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)

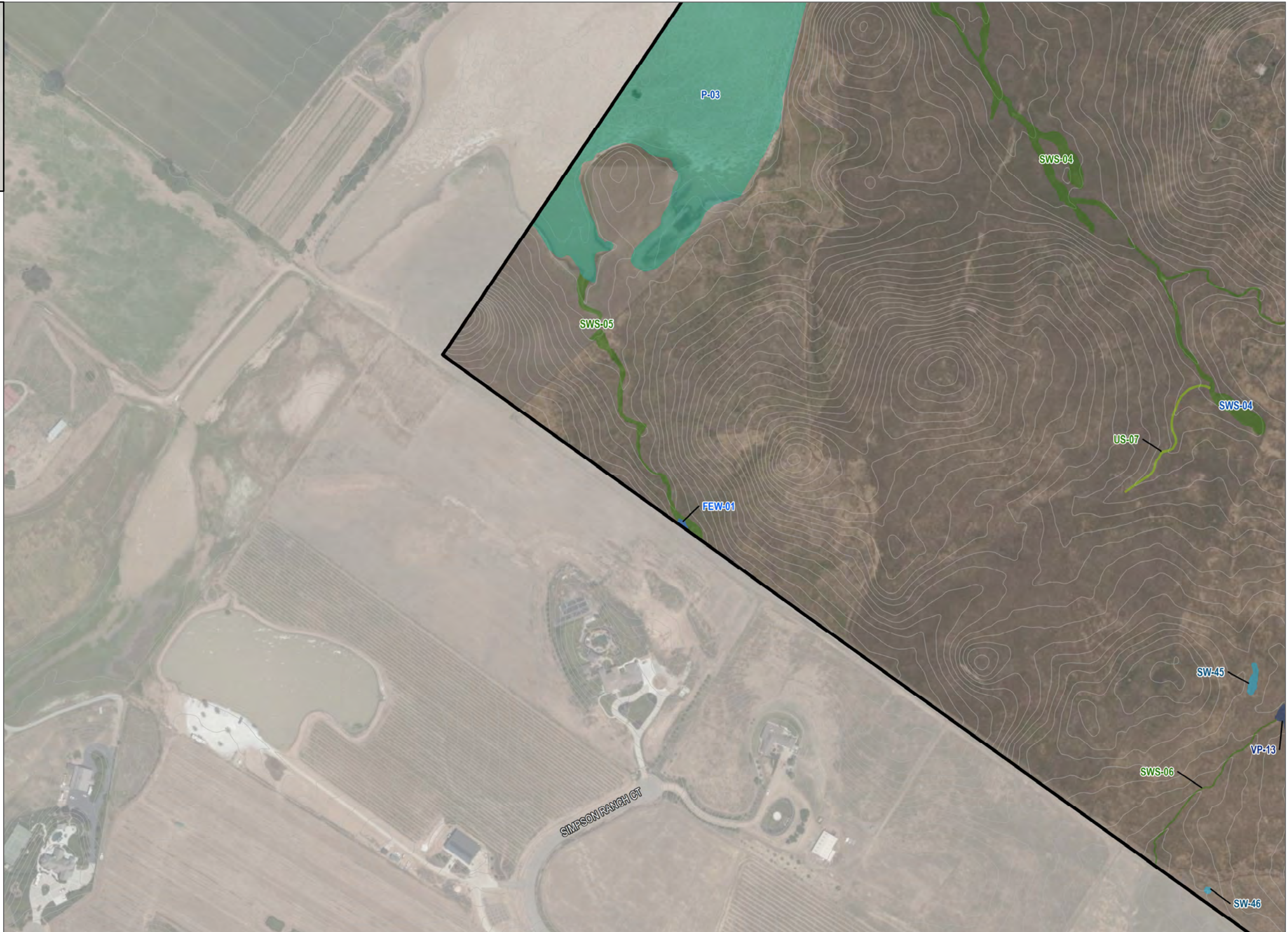


SOURCE: Bing Maps 2020, Sacramento 2019



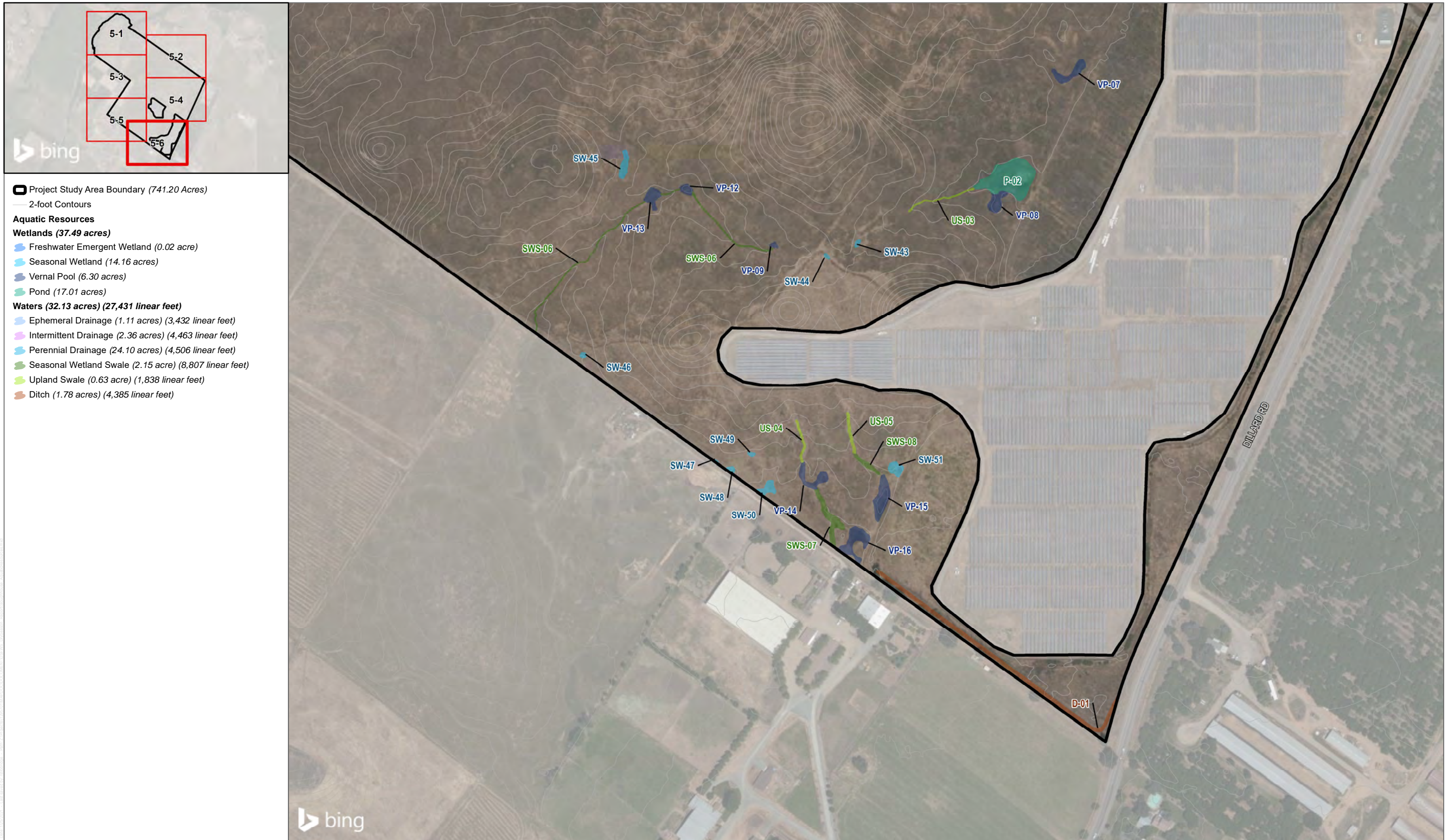


- Project Study Area Boundary (741.20 Acres)
- 2-foot Contours
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)



SOURCE: Bing Maps 2020, Sacramento 2019





- Project Study Area Boundary (741.20 Acres)
- 2-foot Contours
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)

SOURCE: Bing Maps 2020, Sacramento 2019





**APPENDIX A.**  
**USFWS AUTHORIZATION**

**From:** [Lantz, Samantha M](#)  
**Sent:** Tuesday, September 29, 2020 10:23 AM  
**To:** [Morgan Kennedy](#)  
**Cc:** [David Hochart](#); [Michael Henry](#); [Perkins-Taylor, Ian E](#)  
**Subject:** Re: [EXTERNAL] FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

---

You may consider this email authorization to conduct wet season and dry season surveys for large listed branchiopods in the proposed Sloughhouse Project survey area in Sacramento County, per the conditions of the relevant recovery permits (TE-53771B; TE-031848; TE-051248; TE-60147A; TE-813545) and as specified in your email request dated September 28, 2020.

Remember to carry a copy of your permit(s) while doing the work and to follow the terms and conditions of the permit(s), including the reporting requirements. In your report(s), please include which activities were authorized, the names of all persons involved in each activity, their recovery permit numbers, if applicable, and the date of this authorization, to help ensure that we correctly record the fulfillment of the reporting requirement under this authorization. We ask that you use UTM coordinates for all spatial data. Please use **Service reference number 2020-TA-3007** and send reports to me and Ian Perkins-Taylor (biologist in our Sac Valley division) (cced here).

Best,

Sam

~~~~~

Samantha Lantz, PhD  
Fish and Wildlife Biologist  
USFWS, Sacramento Field Office  
Listing and Recovery Division  
2800 Cottage Way W-2605  
Sacramento, CA 95825-1888  
Phone: 916-414-6526  
Pronouns: she/her/hers

In an effort to slow the spread of the coronavirus (COVID-19), staff in the Sacramento Fish and Wildlife Office have implemented an aggressive telework schedule. At this time, we are responding to requests for information via email or phone as often as possible as we do not have the in-office capacity to support regular mail service. We appreciate your understanding.

---

**From:** Morgan Kennedy <mkennedy@dudek.com>  
**Sent:** Tuesday, September 29, 2020 9:41 AM  
**To:** Lantz, Samantha M <samantha\_lantz@fws.gov>  
**Cc:** David Hochart <dhochart@dudek.com>; Michael Henry <mhenry@dudek.com>; Paul Lemons <plemons@dudek.com>  
**Subject:** RE: [EXTERNAL] FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

Good Morning Samantha,

Yes, please move forward with processing the request for surveys, excluding Paul Lemons.



---

## APPENDIX B. REPRESENTATIVE PHOTOGRAPHS



Photo 1: Freshwater Emergent Wetland (FEW)-01.



Photo 2: Representative photo of a seasonal wetland (SW-03) on site.





Photo 3: Another representative photo of a seasonal wetland (SW-33) on site.



Photo 4: Representative photo of a pond (Pond-01) on site.



Photo 5: Pond-03 (pictured) was actively being graded during the October/November field surveys.

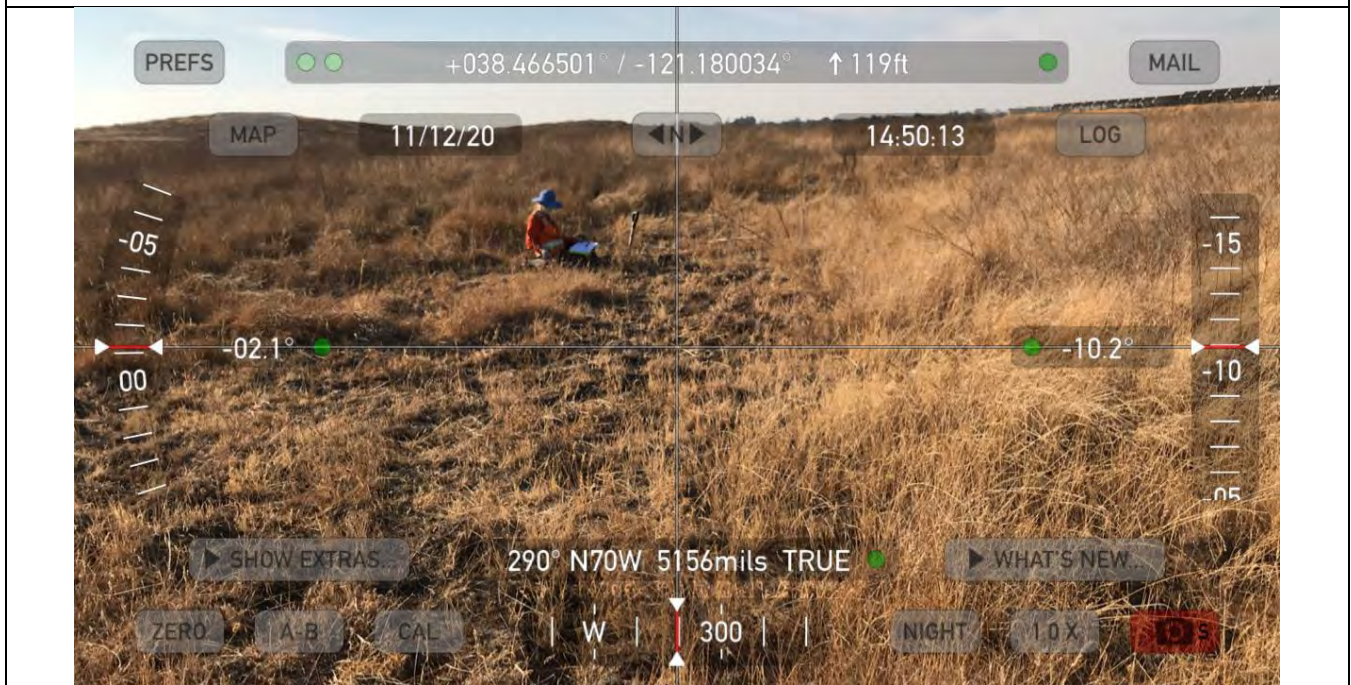
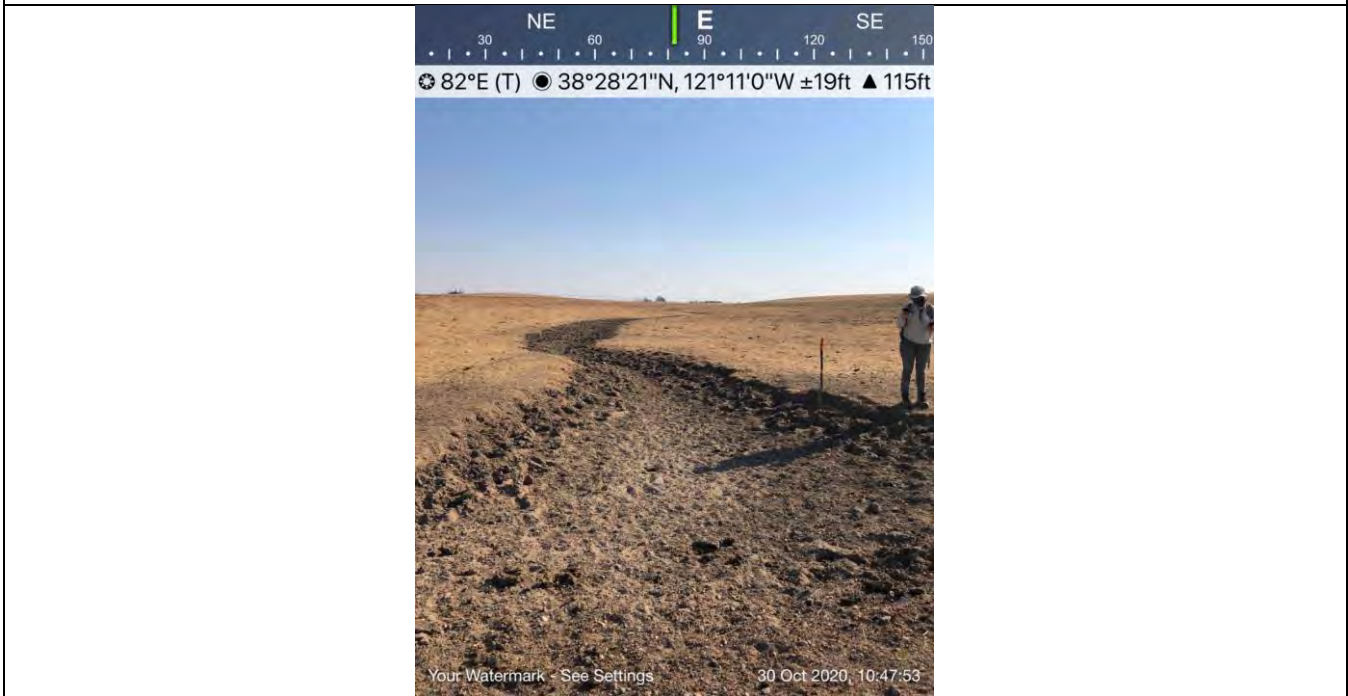


Photo 6: Representative photo of a vernal pool (VP-07) on site showing the concentric rings of hydrophytic vegetation.



**Photo 7:** Representative photo of Ditch-02, which was inundated at the time of the October/November field survey and contained mostly upland vegetation.



**Photo 8:** Representative photo of an ephemeral drainage (ED-02) on site.

APPENDIX A  
PHOTO LOG



**Photo 9:** The intermittent drainage (ID-01) on site at its intersection with Meiss Road.



**Photo 10:** A portion of the Cosumnes River (Perennial Drainage-01) flows within the western boundary of the project site.



**Photo 11:** Representative photo of a seasonal wetland swale (SWS-06) on site.



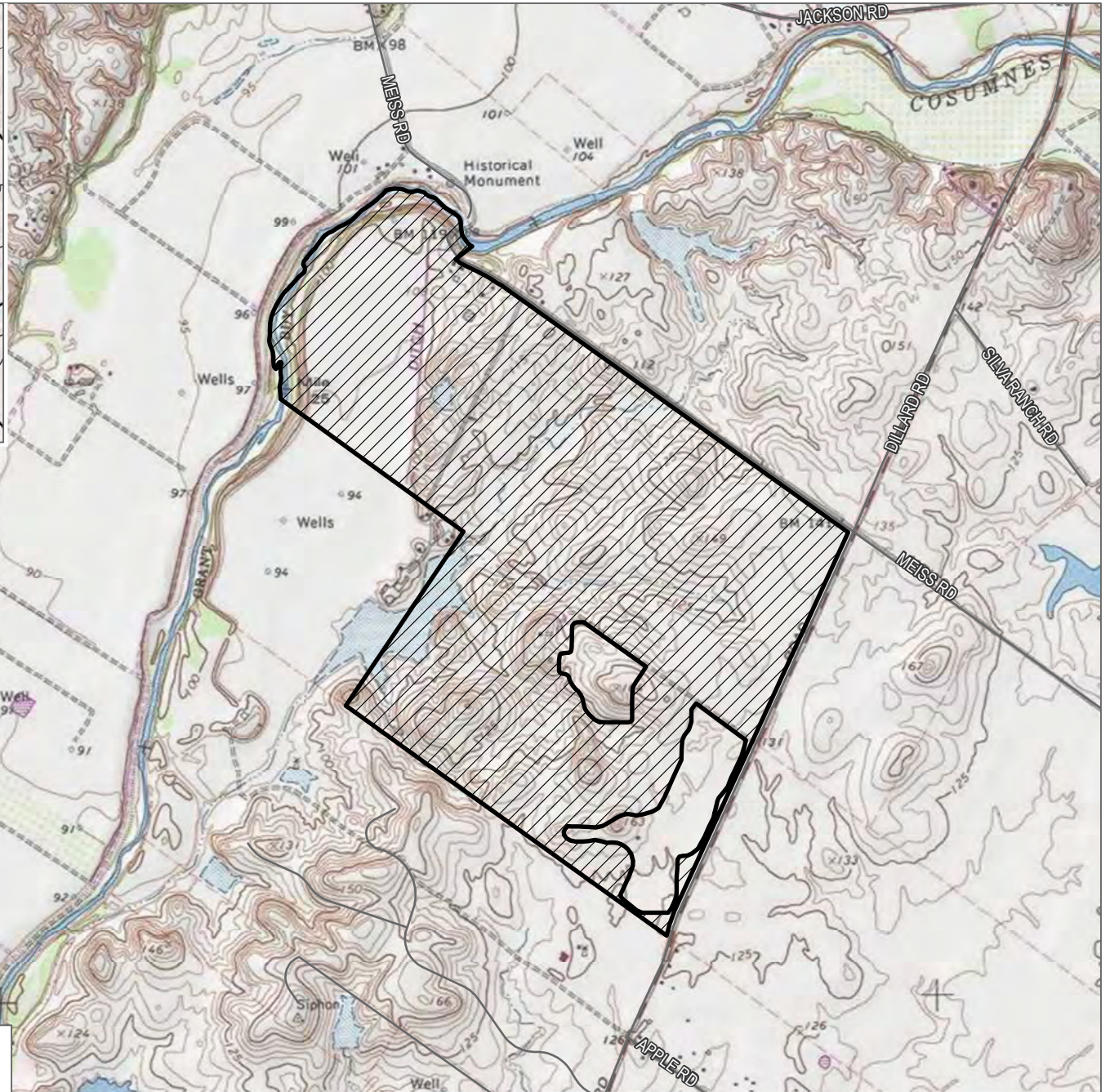
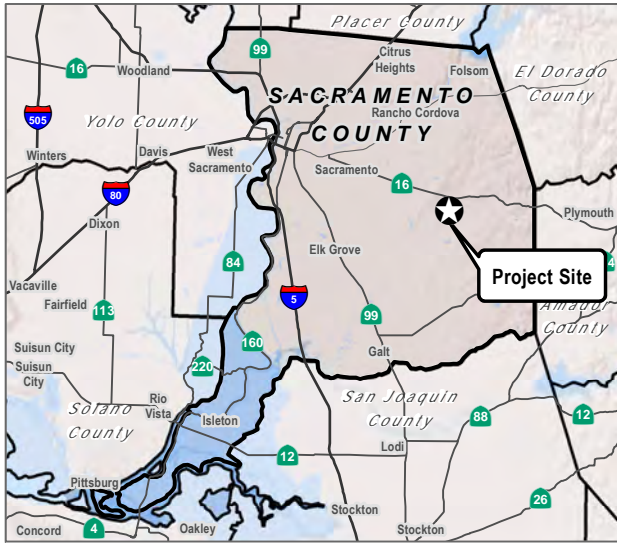
**Photo 12:** Representative photo of an upland swale (US-04) on site.



# Attachment C

---

Figure 1- Project Location



 Project Study Area Boundary (741.20 acres)

SOURCE: USGS 7.5-Minute Series Sloughouse Quadrangle

**DUDEK**



0 1,000 2,000 Feet  
1:24,000  
NAD1983, CA State Plane Zone II

**FIGURE 1**

**Project Location Map**

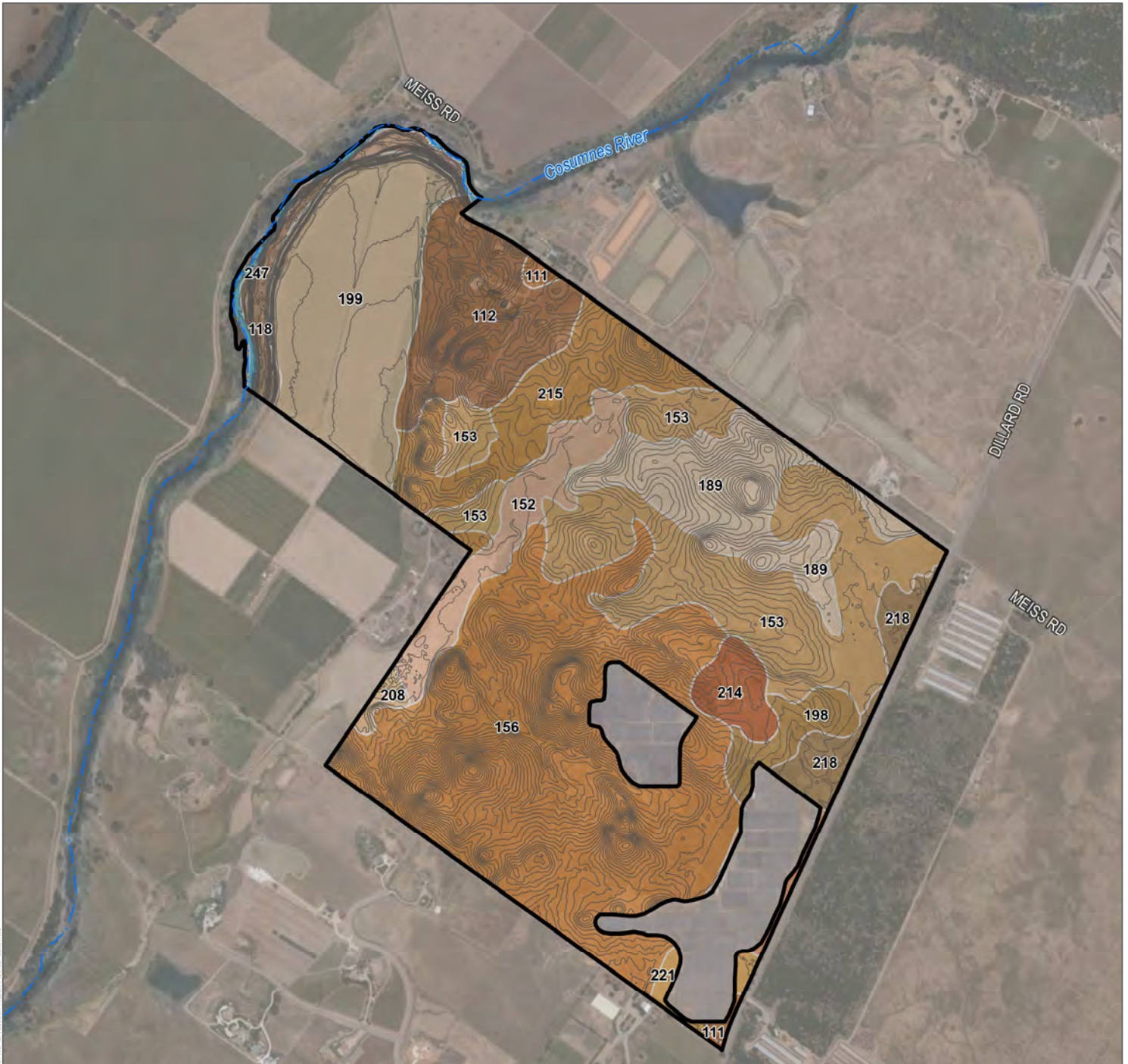


# Attachment D

---

Figure 2- Project Soils





Project Study Area Boundary (741.20 acres)

NHD Flowline

2-foot Contours

**Soil Classification**

- 111 : Bruella sandy loam, 0 - 2% slopes
- 112 : Bruella sandy loam, 2 to 5 percent slopes
- 118 : Columbia sandy loam, drained, 0 - 2% slopes, occasionally flooded
- 152 : Galt clay, 0 - 2% slopes
- 153 : Galt clay, 2 - 5% slopes
- 156 : Hadselville-Pentz complex, 2 - 30% slopes
- 189 : Peters clay, 1 - 8% slopes

- 198 : Redding gravelly loam, 0 - 8% slopes
- 199 : Reiff fine sandy loam, 0 - 2% slopes, occasionally flooded
- 208 : Sailboat silt loam, drained, 0 - 2% slopes, occasionally flooded
- 214 : San Joaquin silt loam, 0 - 3% slopes
- 215 : San Joaquin silt loam, 3 - 8% slopes
- 216 : San Joaquin-Durixeralfs complex, 0 - 1% slopes
- 217 : San Joaquin-Galt complex, leveled, 0 - 1% slopes
- 218 : San Joaquin-Galt complex, 0 - 3% slopes
- 221 : San Joaquin-Xerarents complex, leveled, 0 - 1% slopes
- 247 : Water

SOURCE: Bing Maps 2020, Sacramento County 2019, USDA 2019



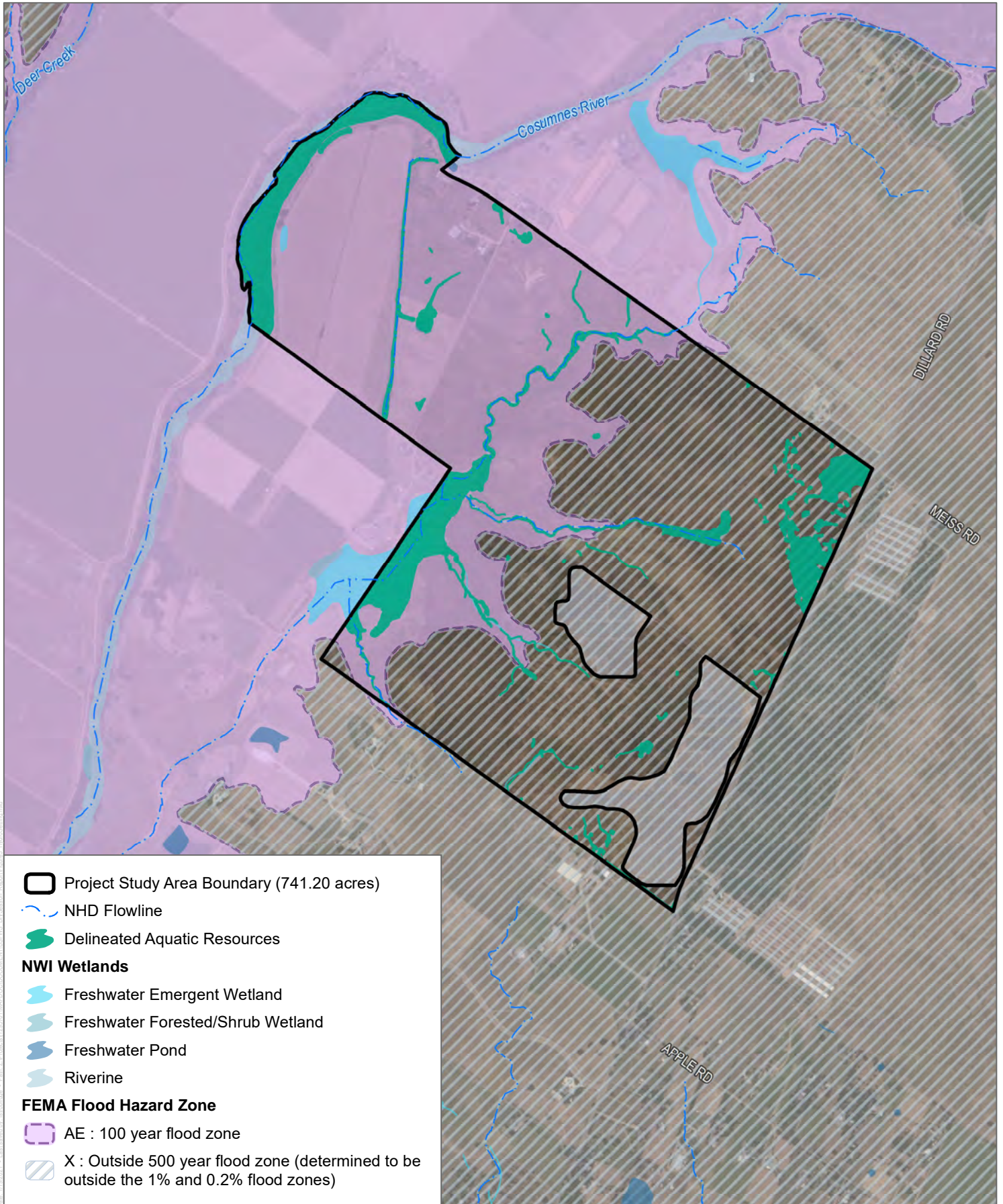
**FIGURE 2**  
Project Soils



# Attachment E

---

Figure 3- Project Hydrology



SOURCE: Bing Maps 2020, NHD 2019, Sacramento County 2019, USFWS 2020, FEMA 2019

**FIGURE 3**

**Project Hydrology**

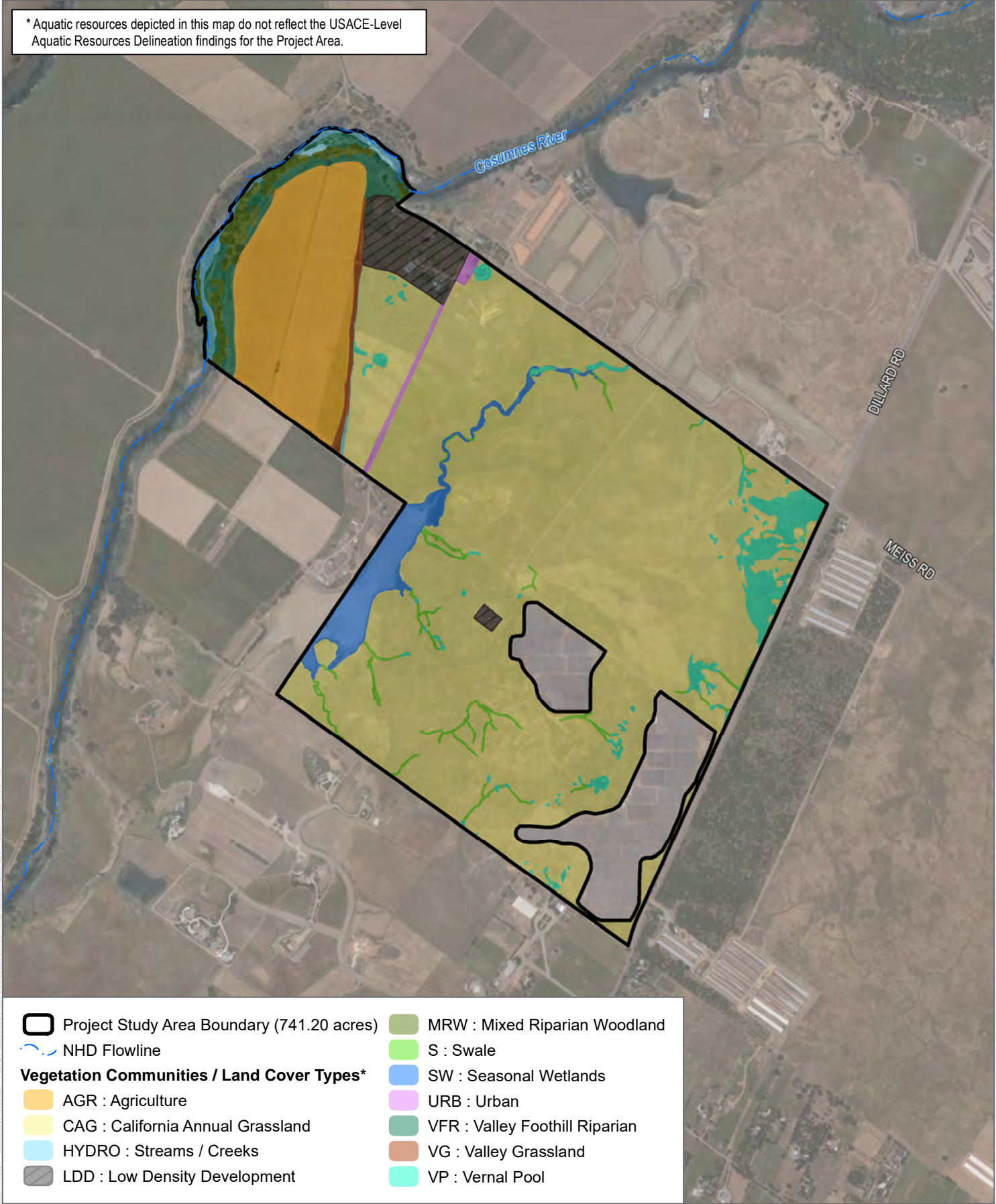


# Attachment F

---

Figure 4- Project Vegetation Communities and Land Cover

\* Aquatic resources depicted in this map do not reflect the USACE-Level Aquatic Resources Delineation findings for the Project Area.



SOURCE: Bing Maps 2020, Sacramento County 2019, SSHCP 2014



**FIGURE 4**

**Project Vegetation Communities and Land Cover**

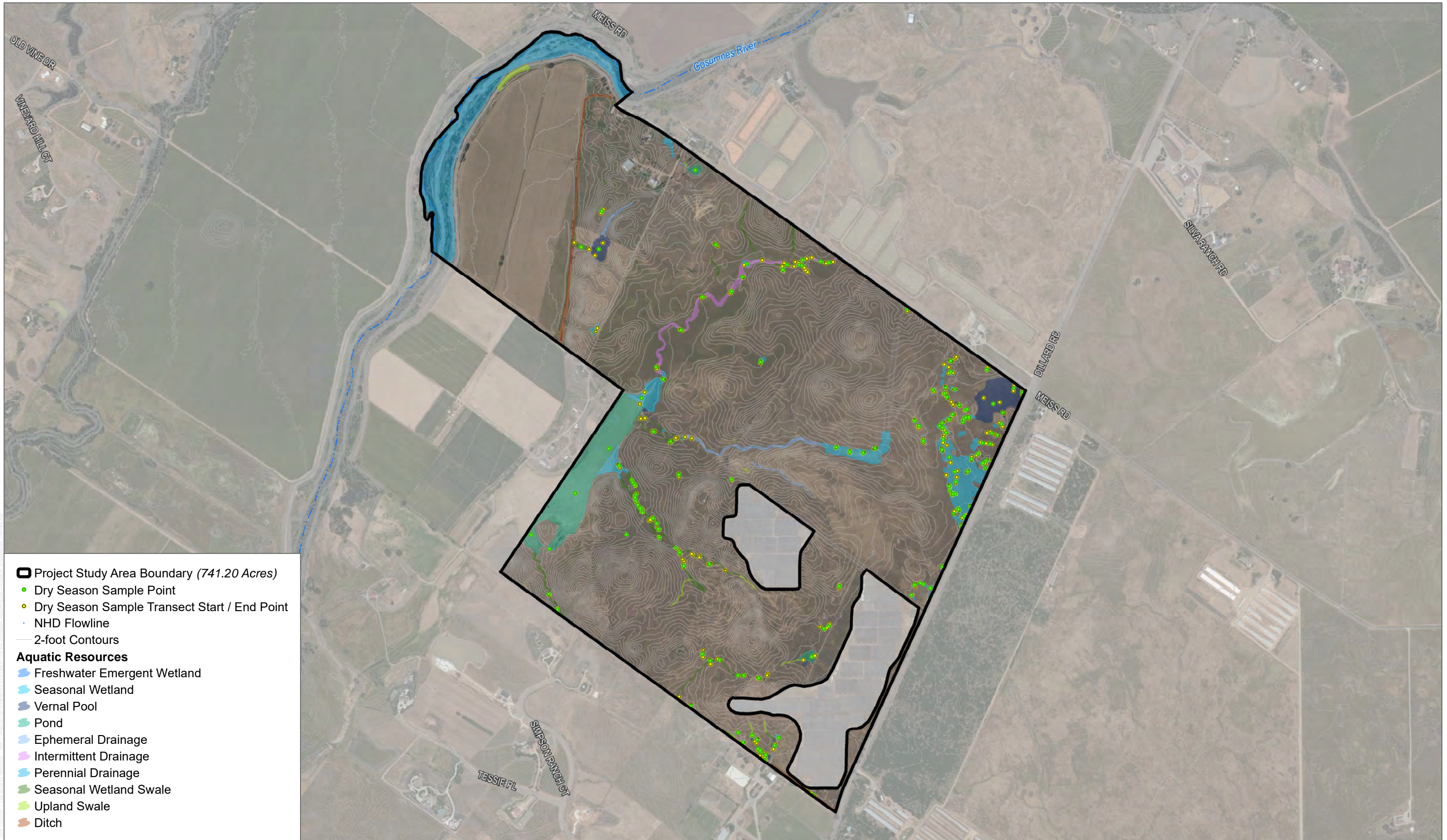
Sloughouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA



# Attachment G

---

Figure 5- USFWS Dry Season Protocol Surveys Results for Federally Listed Branchiopods



- Project Study Area Boundary (741.20 Acres)
- Dry Season Sample Point
- Dry Season Sample Transect Start / End Point
- NHD Flowline
- 2-foot Contours
- Aquatic Resources**
- Freshwater Emergent Wetland
- Seasonal Wetland
- Vernal Pool
- Pond
- Ephemeral Drainage
- Intermittent Drainage
- Perennial Drainage
- Seasonal Wetland Swale
- Upland Swale
- Ditch

SOURCE: Bing Maps 2020, Sacramento County 2019



**FIGURE 5**  
 USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods  
 Sloughhouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA



SOURCE: Bing Maps 2020, Sacramento County 2019

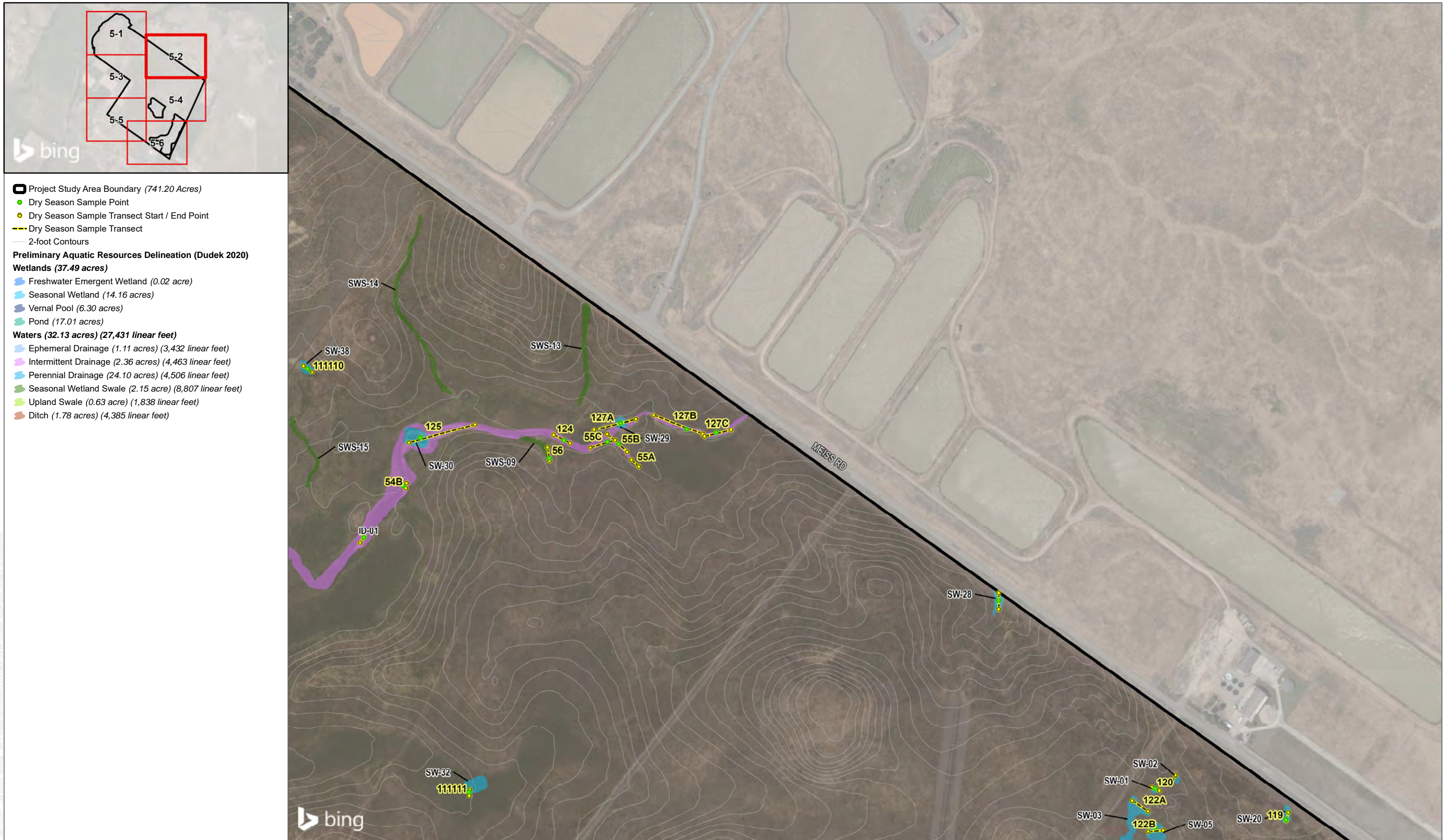


FIGURE 5-1

USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA





SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-2

USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods

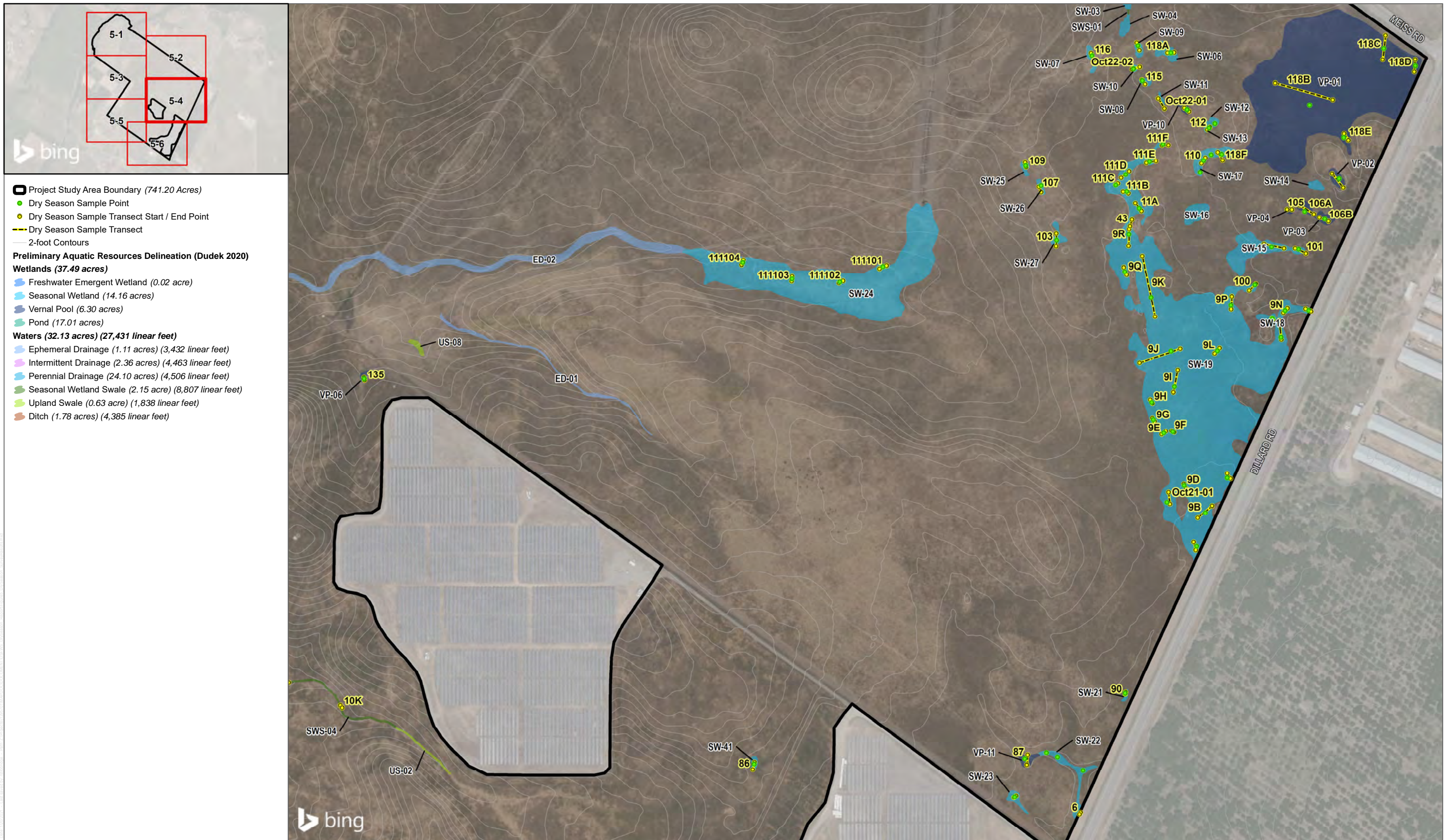
Sloughhouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA



SOURCE: Bing Maps 2020, Sacramento County 2019



**FIGURE 5-3**  
 USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods  
 Sloughhouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA



SOURCE: Bing Maps 2020, Sacramento County 2019

**FIGURE 5-4**



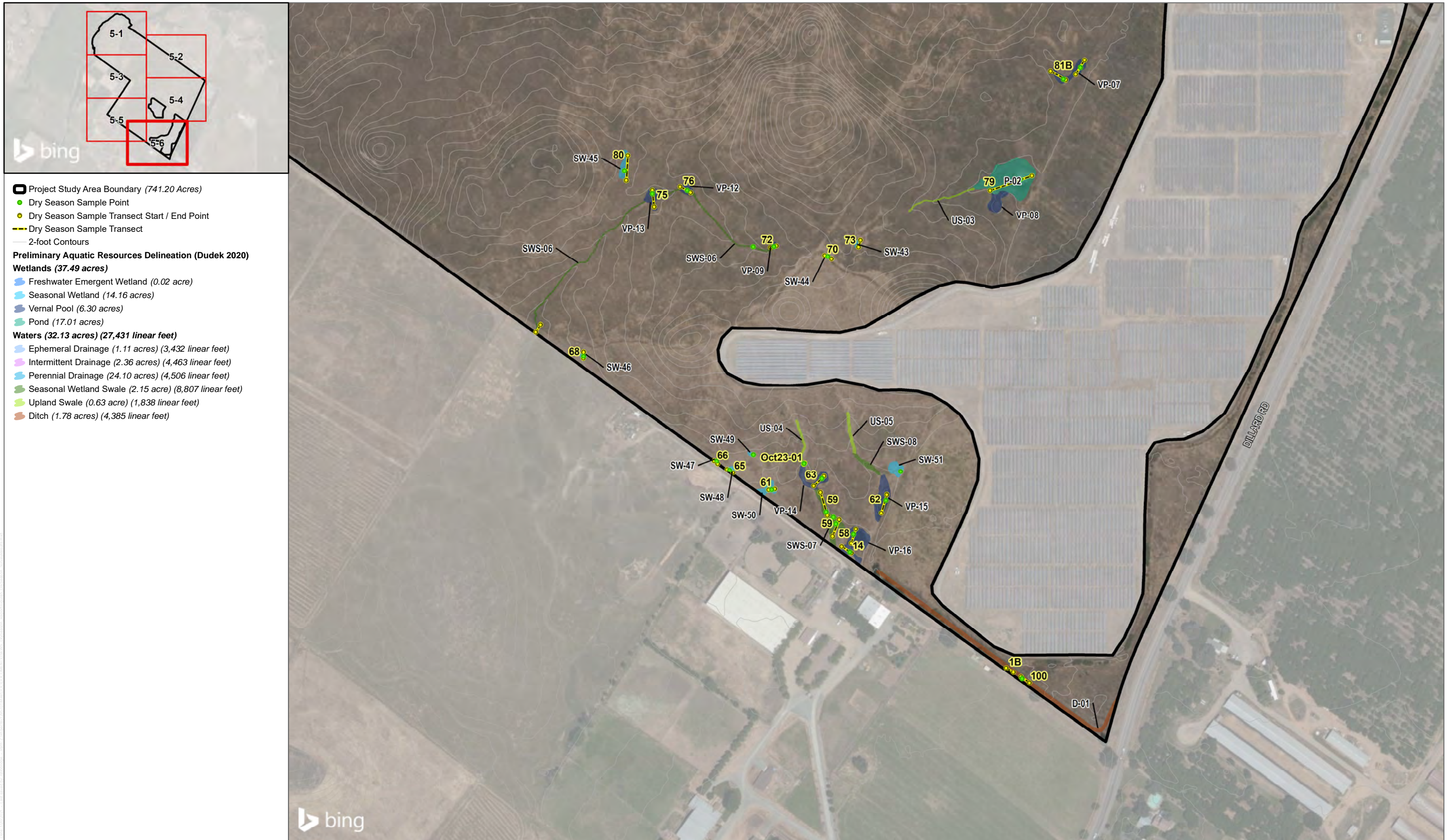
- Project Study Area Boundary (741.20 Acres)
- Dry Season Sample Point
- Dry Season Sample Transect Start / End Point
- Dry Season Sample Transect
- 2-foot Contours
- Preliminary Aquatic Resources Delineation (Dudek 2020)**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.13 acres) (27,431 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.78 acres) (4,385 linear feet)



SOURCE: Bing Maps 2020, Sacramento County 2019



**FIGURE 5-5**  
 USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods  
 Sloughhouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA



SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-6

USFWS Dry Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Project (Category: Other) - USFWS Dry Season Survey Report, Sacramento County, CA



# Attachment H

---

Photo Record

APPENDIX H  
PHOTO RECORD



Photo 1: Representative photo of freshwater emergent wetland in the Project site.



Photo 2: Representative photo of a seasonal wetland in the Project site.



Photo 3: Representative photo of dry season soil sample transect layout.



Photo 4: Representative photo of a pond in the Project site.





Photo 5: Representative photo of a linear aquatic feature soil sample transect.

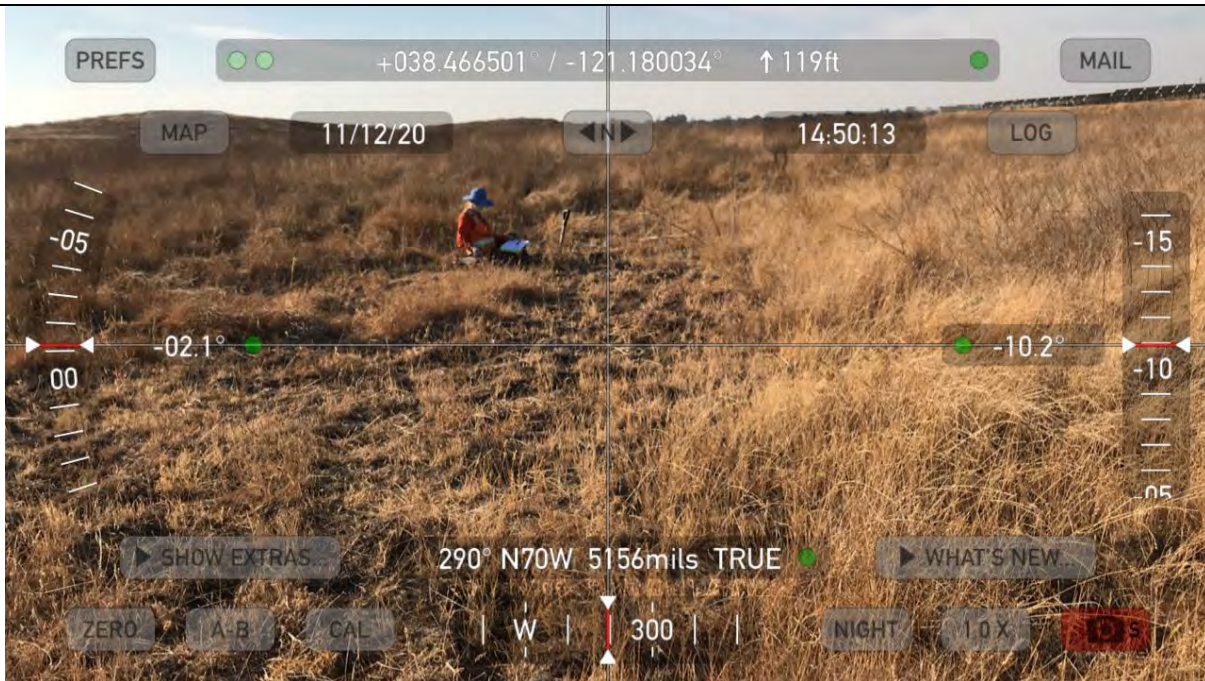


Photo 6: Representative photo of a vernal pool in the Project site.



Photo 7: Representative photo of an agricultural ditch in the Project site.



Photo 8: Representative photo of an ephemeral drainage in the Project site.

APPENDIX H  
PHOTO RECORD



**Photo 9:** Representative photo of an intermittent drainage in the Project site.



**Photo 10:** A portion of the Cosumnes River within the western boundary of the Project site.

APPENDIX H  
PHOTO RECORD



**Photo 11:** Representative photo of a seasonal wetland swale in the Project site.



**Photo 12:** Representative photo of an upland swale in the Project site.

**D-4 Wet Season Biological Survey Report**

July 28, 2021

12957

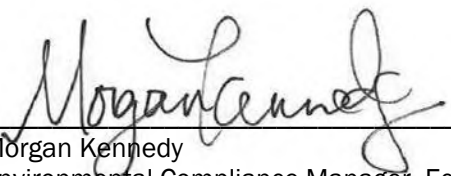
Samantha Lantz and Ian Perkins-Taylor  
USFWS, Sacramento Field Office  
Listing and Recovery Division  
2800 Cottage Way W-2605  
Sacramento, CA 95825-1888

**Subject:** *U.S. Fish and Wildlife Service Wet Season Protocol Survey Letter Report for Federally Listed Branchiopods, Sloughhouse Solar Project, Sacramento County, California (USFWS#2020-TA-3007)*

Dear Ms. Lantz and Mr. Perkins-Taylor:

This U.S. Fish and Wildlife Service (USFWS) Wet Season Protocol Survey Letter Report (Report) for federally listed branchiopods has been prepared in accordance with the USFWS *Survey Guidelines for the Listed Large Branchiopods*<sup>1</sup> and to fulfill reporting requirements in accordance with the 10(a)(1)(A) permit holder's recovery permit. This Report provides a complete overview of the wet season surveys conducted for the Sloughhouse Solar Project (Project). If you have any questions regarding this Report, or need any additional information, please feel free to call or email me at (916) 661-2498, mkennedy@dudek.com.

Sincerely,



---

Morgan Kennedy  
Environmental Compliance Manager, Ecologist

- Att.: A) USFWS Wet Season Survey Request and Authorization.  
B) Figure 1- Project Location  
C) Figure 2- Project Soils  
D) Figure 3- Project Hydrology  
E) Figure 4- Project Vegetation Communities and Land Cover  
F) Figure 5- USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods  
G) Photo Record  
H) USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods – Data Sheets

---

<sup>1</sup> USFWS (U.S. Fish and Wildlife Service). November 13, 2017. Survey Guidelines for the Large Listed Branchiopods. United State Department of the Interior. USFWS, Pacific Southwest Region. Accessed October 2020-June 2021. <https://www.fws.gov/ventura/docs/species/protocols/vpshrimp/shrimp2017.pdf>.

# 1 Introduction

This Report documents the results of the wet season surveys for vernal pool branchiopods conducted within the Project Study Area (PSA) located in south eastern Sacramento County, California. Surveys focused on the determination of presence/no presence for the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and federally endangered vernal pool tadpole shrimp (*Lepidurus packardii*). Surveys were performed in accordance with the protocols listed above. No wet season surveys have been previously conducted as part of the Project. Wet season surveys were conducted between February 3, 2021 and April 28, 2021.

The request to conduct wet season surveys was submitted to the USFWS on September 28, 2020 and approved by the USFWS on September 29, 2020 (Attachment A). Wet season surveys were conducted over 15 total days within the PSA in February, March, and April 2021. Wet season surveys were led and performed by Heather Moine, a Dudek biologist holding a Section 10(a)(1)(A) permit and a Specific Use Scientific Collecting Permit (TE-60147A-1; S-202420002-20262-001). The permitted biologist was supported by Dudek biologists with appropriate field experience including Laura Burris, Adam Crawford, Sarah Foster, Anna Godinho, Paul Keating, Morgan Kennedy, Allie Sennett, and Naomi Serratos. A summary of wet season survey dates, PSA environmental conditions, and biologists who conducted the surveys is provided in Table 1 below.

**Table 1. Wet Season Survey Dates, Site Conditions, and Biologists Present Summary**

| Date of Survey    | Site Conditions                             | Permitted Biologist        | Assisting Biologists          |
|-------------------|---------------------------------------------|----------------------------|-------------------------------|
| February 3, 2021  | 48–50 °F; 10–100% cloud cover; 0–3 mph wind | Heather Moine <sup>a</sup> | Laura Burris, Morgan Kennedy  |
| February 4, 2021  | 40–55 °F; 10–50% cloud cover; 0–3 mph wind  | Heather Moine              | Laura Burris, Morgan Kennedy  |
| February 5, 2021  | 54–63 °F; 0–10% cloud cover; 0 mph wind     | Heather Moine              | Laura Burris, Morgan Kennedy  |
| February 17, 2021 | 41–60 °F; 0–10% cloud cover; 1–15 mph wind  | Heather Moine              | Paul Keating, Adam Crawford   |
| February 18, 2021 | 39–61 °F; 30–90% cloud cover; 0–5 mph wind  | Heather Moine              | Morgan Kennedy, Adam Crawford |
| February 18, 2021 | 50–54 °F; 100% cloud cover; 0–3 mph wind    | Heather Moine              | Morgan Kennedy, Paul Keating  |
| March 3, 2021     | 46–60 °F; 100% cloud cover; 0–4 mph wind    | Heather Moine              | Anna Godinho, Paul Keating    |
| March 4, 2021     | 49–67 °F; 0% cloud cover; 0–4 mph wind      | Heather Moine              | Anna Godinho, Paul Keating    |
| March 17, 2021    | 41–58 °F; 90% cloud cover; 0–4 mph wind     | Heather Moine              | Adam Crawford, Naomi Serratos |
| March 18, 2021    | 47–59 °F; 100% cloud cover; 0–3 mph wind    | Heather Moine              | Adam Crawford, Naomi Serratos |
| March 31, 2021    | 61–81 °F; 0% cloud cover; 0–2 mph wind      | Heather Moine              | Adam Crawford                 |
| April 1, 2021     | 48–80 °F; 0–10% cloud cover; 0–3 mph wind   | Heather Moine              | Adam Crawford                 |
| April 14, 2021    | 58–71 °F; 0–10% cloud cover; 0–4 mph wind   | Heather Moine              | Adam Crawford                 |

**Table 1. Wet Season Survey Dates, Site Conditions, and Biologists Present Summary**

| Date of Survey | Site Conditions                           | Permitted Biologist | Assisting Biologists         |
|----------------|-------------------------------------------|---------------------|------------------------------|
| April 15, 2021 | 63–73 °F; 0% cloud cover;<br>0–5 mph wind | Heather Moine       | Adam Crawford, Allie Sennett |
| April 28, 2021 | 52–83 °F; 0% cloud cover;<br>0–4 mph wind | Heather Moine       | Allie Sennett, Sarah Foster  |

<sup>a</sup> Heather Moine Section 10(a)(1)(A) permitted (TE-60147A-1)

## 2 Project Setting

### 2.1 Location

The approximately 742.44-acre PSA is located at the southwest corner of the intersection of Meiss Road and Dillard Road in the unincorporated community of Sloughhouse within south eastern Sacramento County. The PSA excludes existing solar facilities within the site. The PSA is primarily used for cattle grazing or other agricultural operations, and there is an existing solar facility located in the southeast corner of the site (Attachment B). It should be noted that the PSA changed slightly from the original USFWS request authorization resulting in a change from 741.20 acres to 742.44 acres to include two roadside ditches along Dillard Road; however, these roadside ditches were not sampled during the wet season surveys. Project location details are detailed as follows:

- County: Sacramento.
- Public Land Survey System: Cosumnes Land Grant.
- U.S. Geological Survey (USGS) 7.5-Minute Quadrangle (Quad): Sloughhouse.
- Latitude, Longitude: 38.473731, -121.184568 (centroid, decimal degrees).
- Assessor Parcel Numbers (APNs): 12601100010000, 12601100030000.
- Elevation Range: 95 to 160 feet above mean sea level (amsl).
- Average Elevation: 128 feet amsl.
- PSA: 742.44 acres.

### 2.2 Soils

According to the Natural Resources Conservation Service<sup>2</sup>, 16 soil units are present within the PSA (Attachment C). Each soil unit, typical landform or geomorphic position within the landscape, drainage class (i.e., frequency and

---

<sup>2</sup> USDA (U.S. Department of Agriculture). 2021. "Web Soil Survey". USDA, Natural Resources Conservation Service, Soil Survey Staff. Accessed February 2021. <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.



duration of wet periods in conditions similar to those in which it was developed), hydric listing, and total area is detailed in Table 2 below.

**Table 2. Summary of Soil Units Within the Project Study Area (PSA)**

| Soil Map Unit Name                                  | Landform                       | Drainage Class                                | Hydric | Total Area (acres) |
|-----------------------------------------------------|--------------------------------|-----------------------------------------------|--------|--------------------|
| Bruella sandy loam, 0–2% slopes                     | Terraces                       | Well-drained                                  | No     | 3.15               |
| Bruella sandy loam, 2–5% slopes                     | Terraces                       | Well-drained                                  | No     | 58.80              |
| Columbia sandy loam, 0–2% slopes                    | Flood plains                   | Somewhat poorly drained, occasionally flooded | Yes    | 17.93              |
| Galt clay, 0–1% slopes                              | Basin floors on fan remnants   | Somewhat poorly drained                       | Yes    | 33.0               |
| Galt clay, 2-5% slopes                              | Basin floors on fan remnants   | Moderately well drained                       | Yes    | 126.62             |
| Hadselville-Pentz complex, 2–30% slopes             | Hills                          | Moderately well drained to well drained       | No     | 231.74             |
| Peters clay, 1–8% slopes                            | Hills                          | Well drained                                  | No     | 56.94              |
| Redding gravelly loam, 0–8% slopes                  | Fan remnants                   | Moderately well drained                       | No     | 15.29              |
| Reiff fine sandy loam, 0–2% slopes                  | Flood plains                   | Well drained, occasionally flooded            | No     | 96.11              |
| Sailboat silt loam, drained, 0–2% slopes            | Flood plains on natural levees | Somewhat poorly drained, occasionally flooded | Yes    | 3.50               |
| San Joaquin silt loam, 0–3% slopes                  | Terraces                       | Moderately well drained                       | No     | 14.02              |
| San Joaquin silt loam, 0–8% slopes                  | Terraces                       | Moderately well drained                       | No     | 54.45              |
| San Joaquin-Durixeralfs complex, 0–1% slopes        | Terraces                       | Moderately well drained to well drained       | No     | 0.25               |
| San Joaquin-Galt complex, leveled, 0–1% slopes      | Terraces                       | Moderately well drained                       | Yes    | 2.87               |
| San Joaquin-Galt complex, 0–3% slopes               | Terraces                       | Moderately well drained                       | Yes    | 18.55              |
| San Joaquin-Xerarents complex, leveled, 0–1% slopes | Terraces                       | Moderately well drained to well drained       | No     | 4.89               |

Source: USDA 2021

**Notes:**

The total soil cover (738.11 acres) does not account for aquatic or developed land cover, and therefore is less than the overall PSA (742.44 acres).

### 2.3 Watershed and Hydrology

The PSA is located within the Upper Cosumnes River watershed, which drains approximately 180 square miles of land in El Dorado, Amador, and Sacramento Counties (Hydrological Unit Code 1804001306)<sup>3</sup>. A complex of seasonally inundated aquatic features generally drains the Project in a southwesterly direction, and the Cosumnes River flows within the western boundary of the PSA. The western half of the PSA is located within the National Flood

<sup>3</sup> CDFW (California Department of Fish and Wildlife). 2020. *Biogeographic Information and Observation System: BIOS Viewer Version 5.94.01*. Accessed December 2020. <http://www.dfg.ca.gov/biogeodata/bios/>.

Hazard Layer 1% 100-year floodplain of the Cosumnes River<sup>4</sup>. However, the Cosumnes River within the PSA is bounded by levees intended to contain the river and protect against overtopping during a normal rain year (Attachment D).

### 2.3.1 Aquatic Resources

Dudek conducted an Aquatic Resources Delineation (ARD) within the PSA on October 27, 29, and 30, November 4 and 9 through 13, 2020, and March 3, 2021. The purpose of an ARD is to identify aquatic resources that may be potentially subject to agency jurisdiction pursuant to regulations in Section 401 and 404 of the Clean Water Act, Porter-Cologne Act, California Fish and Game Code, and California Environmental Quality Act Guidelines. Aquatic resources within the PSA were delineated based on methodology described in the *US Army Corps of Engineers Wetlands Delineation Manual* (US Army Corps of Engineers [USACE] 1987<sup>5</sup>) and the *Regional Supplement for the Arid West Region* (USACE 2008a<sup>6</sup>). Non-wetland waters of the United States and/or state were delineated based on the presence of an ordinary high water mark (OHWM), as determined using the methodology in the *OHWM Field Guide for the Arid West Region* (USACE 2008b<sup>7</sup>). Aquatic resources were recorded and mapped in the field using a Trimble R1 Global Navigation Satellite System Receiver with sub-meter accuracy and ArcGIS Collector app for iOS. On June 9, 2021 the final ARD Report with a formal request for an Approved Jurisdictional Delineation was submitted to the USACE, Sacramento District, to definitively determine and approve the extent of waters of the United States.

A total of ten aquatic resource types were documented in the proposed Project area and the potential mitigation lands of the PSA, including freshwater emergent wetland, seasonal wetland, stock pond, vernal pool, ditch, ephemeral drainage, intermittent drainage, perennial drainage, seasonal wetland swale, and upland swale, as included in Table 3.

---

<sup>4</sup> FEMA (Federal Emergency Management Agency). 2020. *National Flood Hazard Layer 1% 100-Year Floodplain*. Accessed December 2020. <https://www.fema.gov/flood-maps/products-tools/national-flood-hazard-layer>.

<sup>5</sup> USACE (United States Army Corps of Engineers). 1987. *Corps of Engineers Wetlands Delineation Manual*. Online ed. Environmental Laboratory, Wetlands Research Program Technical Report Y-87-1. Vicksburg, Mississippi: United States Army Engineer Waterways Experiment Station. January 1987.

<sup>6</sup> USACE. 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. Environmental Laboratory, ERDC/EL TR-08-28. U.S. Army Engineer Research and Development Center. Vicksburg, Mississippi. September 2008.

<sup>7</sup> USACE. 2008b. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the United States*. Cold Regions Research and Engineering Laboratory, ERDC/CRREL TR-08-12. U.S. Army Engineer Research and Development Center. Hanover, New Hampshire. August 2008.

**Table 3. Summary of Aquatic Resources Within the Project Study Area (PSA)**

| Aquatic Resource Type                      | Total Area (acres) |
|--------------------------------------------|--------------------|
| Ditch                                      | 1.93               |
| Ephemeral Drainage                         | 1.11               |
| Freshwater Emergent Wetland                | 0.02               |
| Intermittent Drainage                      | 2.36               |
| Perennial Drainage                         | 24.10              |
| Pond                                       | 17.01              |
| Seasonal Wetland                           | 14.16              |
| Seasonal Wetland Swale                     | 2.15               |
| Upland Swale                               | 0.63               |
| Vernal Pool                                | 6.30               |
| <b>Total Aquatic Resources</b>             | <b>69.77</b>       |
| Upland land covers (not aquatic resources) | 672.68             |
| <b>Grand Total</b>                         | <b>742.44</b>      |

Source: SSSLIC. 2021a. *Aquatic Resources Delineation Report for the Sloughhouse Solar Project*. Prepared by Dudek. Sacramento, California: Dudek. May 2021.

## 2.4 Vegetation Communities and Land Cover

General vegetation communities and land cover types were documented within the PSA (Attachment E) and include the following:

- California annual grassland (combines California annual grassland and valley grassland) is the dominant vegetation community present within the PSA. Dominant species in this community include soft brome (*Bromus hordeaceus*), medusa head (*Elymus caput-medusae*), and narrow tarweed (*Holocarpha virgata*). The shrub and tree layer are absent from this vegetation community. Numerous aquatic features occur throughout the grassland.
- Valley oak woodland (combines mixed riparian woodland and valley foothill riparian) comprises the riparian habitat along the Cosumnes River, a portion of which is located within the northern extent of the PSA. Valley oak (*Quercus lobata*) was the dominant overstory species, with a lesser abundance of Fremont's cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), Northern California walnut (*Juglans hindsii*), and oak species (*Quercus* spp.). Shrubs occurred intermittently and included Himalayan blackberry (*Rubus armeniacus*) and California grape (*Vitis californica*). The herbaceous layer was dominated by disturbance-tolerant upland species, including yellow star-thistle (*Centaurea solstitialis*), Italian plumeless thistle (*Carduus pycnocephalus*), and non-native grasses like those described for California annual grassland.
- Agricultural – Land cover classified as agricultural typically includes lands where farming and other agricultural practices take place, including pastures, row crops and other unidentified croplands. Production practices observed in the PSA include flood-irrigation, and cultivation; followed by harvesting and discing. After discing, some fields appear to remain fallow for short periods of time, allowing for the

establishment of annual and biennial native and non-native annual grasses and broad-leaved plants, including many non-native species.

- Developed (combines low density development and urban) – This land cover type includes areas that have been completely altered by human activities and contain little to no vegetation. Specifically, such areas include buildings, paved and gravel roadways and trails, gravel lots, and other constructed environments. Disturbed land cover in the PSA includes two residences along Meiss Road, and the existing solar facility in the southeast vicinity of the PSA along Dillard Road.

### 3 Methodology

Wet season surveys were performed in accordance with the USFWS *Survey Guidelines for the Listed Large Branchiopods*<sup>8</sup> and the 10(a)(1)(A) permit holder’s recovery permit. For the wet season surveys, site visits began after initial storm events when potential listed large branchiopod habitat had become inundated. All potential habitat was sampled at 14-day intervals after initial inundation of habitat. Sampling continued within each potential habitat until it dried. At each wet season visit, representative portions of the bottom, edges, and vertical water column of the features were adequately sampled using a seine, dip net, or aquarium net. The contents of the nets were examined and emptied frequently. Information on pool conditions and species were recorded.

### 4 Results

A total of 113 features were surveyed during the 2020/2021 wet season survey. The features consisted of freshwater emergent wetland, seasonal wetland, stock pond, vernal pool, ditch, ephemeral drainage, intermittent drainage, perennial drainage, river, seasonal wetland swale, upland swale, and ponded features. During the seven survey passes (including 15 survey days), none of the features were found occupied by federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*), federally endangered vernal pool tadpole shrimp (*Lepidurus packardi*), or any other federally listed large branchiopods. However, the non-listed California fairy shrimp (*Lindleriella occidentalis*) were observed in six features (D-02, P-02, SW-28, US-03, VP-07, and VP-16). A summary of results has been provided in Table 4. Additionally, photo plates of the PSA and various aquatic features sampled have been provided (Attachment G). Data sheets with results by feature and by date have been provided in Attachment H.

**Table 4. Results Summary of Wet Season Surveys**

| Feature ID | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae | Platyhelminths (flatworms) |
|------------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|
| D-01       |             |              |          |           |           |            |           |                   |                      |                            |

<sup>8</sup> USFWS (U.S. Fish and Wildlife Service). November 13, 2017. Survey Guidelines for the Large Listed Branchiopods. United State Department of the Interior. USFWS, Pacific Southwest Region. Accessed October-November 2020. <https://www.fws.gov/ventura/docs/species/protocols/vpshrimp/shrimp2017.pdf>.

**Table 4. Results Summary of Wet Season Surveys**

| Feature ID | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae | Platyhelminths (flatworms) |
|------------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|
| D-02       | LIOC        |              |          | x         | x         | x          | x         | x                 | x                    | x                          |
| ED-01      |             |              |          |           |           |            |           |                   |                      | x                          |
| ED-02      |             |              |          | x         | x         | x          | x         | x                 | x                    | x                          |
| ED-03      |             |              |          |           |           |            |           |                   |                      |                            |
| ED-04      |             |              |          |           |           |            |           |                   |                      |                            |
| ED-05      |             |              |          |           |           |            |           |                   |                      | x                          |
| FEW-01     |             |              |          |           |           |            |           |                   |                      |                            |
| ID-01      |             |              |          | x         | x         | x          | x         | x                 | x                    | x                          |
| P-01       |             |              |          | x         | x         | x          | x         |                   | x                    |                            |
| P-02       | LIOC        |              | x        | x         | x         | x          | x         |                   | x                    | x                          |
| P-03       |             |              | x        | x         | x         | x          | x         |                   | x                    |                            |
| PF-01      |             |              |          | x         | x         |            |           |                   |                      |                            |
| PF-02      |             |              |          |           |           |            |           |                   |                      |                            |
| PF-03      |             |              |          | x         | x         | x          |           |                   |                      |                            |
| PF-04      |             |              |          |           |           |            |           |                   |                      |                            |
| PF-05      |             |              |          |           |           |            |           |                   |                      |                            |
| PF-06      |             |              |          |           |           |            |           |                   |                      |                            |
| PF-07      |             |              |          | x         | x         |            |           |                   |                      | x                          |
| PF-08      |             |              |          |           | x         | x          |           |                   |                      | x                          |
| PF-09      |             |              |          |           |           |            |           |                   |                      |                            |
| PF-10      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-01      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-02      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-03      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-04      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-05      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-06      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-07      |             |              |          |           |           | x          |           |                   |                      |                            |
| SW-08      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-09      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-10      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-11      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-12      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-13      |             |              |          |           |           |            |           |                   |                      |                            |

**Table 4. Results Summary of Wet Season Surveys**

| Feature ID | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae | Platyhelminths (flatworms) |
|------------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|
| SW-14      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-15      |             |              |          |           | X         |            |           |                   |                      | X                          |
| SW-16      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-17      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-18      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-19      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-20      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-21      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-22      |             |              |          |           |           | X          |           |                   |                      |                            |
| SW-23      |             |              | X        | X         | X         | X          | X         | X                 | X                    | X                          |
| SW-24      |             |              |          |           | X         |            |           |                   |                      | X                          |
| SW-25      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-26      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-27      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-28      | LIOC        |              |          | X         | X         | X          |           |                   | X                    | X                          |
| SW-29      |             |              |          | X         | X         | X          | X         | X                 | X                    | X                          |
| SW-30      |             |              |          | X         | X         | X          |           |                   | X                    | X                          |
| SW-31      |             |              |          | X         |           | X          |           |                   |                      |                            |
| SW-32      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-33      |             |              |          | X         | X         | X          | X         | X                 | X                    | X                          |
| SW-34      |             |              | X        | X         | X         | X          | X         |                   |                      | X                          |
| SW-35      |             |              |          | X         |           | X          | X         |                   | X                    | X                          |
| SW-36      |             |              |          | X         |           |            |           |                   |                      | X                          |
| SW-37      |             |              |          |           |           |            |           |                   |                      | X                          |
| SW-38      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-39      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-40      |             |              |          |           |           | X          |           |                   |                      |                            |
| SW-41      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-42      |             |              |          | X         |           |            |           |                   |                      |                            |
| SW-43      |             |              |          | X         | X         | X          |           |                   |                      | X                          |
| SW-44      |             |              |          | X         | X         |            |           |                   |                      | X                          |
| SW-45      |             |              |          | X         |           | X          |           |                   |                      | X                          |
| SW-46      |             |              |          | X         |           |            |           |                   |                      | X                          |
| SW-47      |             |              |          |           |           |            |           |                   |                      | X                          |

**Table 4. Results Summary of Wet Season Surveys**

| Feature ID | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae | Platyhelminths (flatworms) |
|------------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|
| SW-48      |             |              |          | x         |           |            |           |                   |                      | x                          |
| SW-49      |             |              |          |           |           |            |           |                   |                      |                            |
| SW-50      |             |              | x        |           | x         | x          |           |                   |                      | x                          |
| SW-51      |             |              |          | x         |           |            |           |                   |                      | x                          |
| SWS-01     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-02     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-03     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-04     |             |              | x        | x         | x         | x          |           |                   | x                    | x                          |
| SWS-05     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-06     |             |              |          | x         | x         | x          |           |                   |                      | x                          |
| SWS-07     |             |              | x        | x         | x         | x          | x         | x                 | x                    | x                          |
| SWS-08     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-09     |             |              |          |           |           | x          |           |                   |                      |                            |
| SWS-10     |             |              | x        | x         | x         | x          | x         |                   | x                    | x                          |
| SWS-11     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-12     |             |              |          |           | x         | x          | x         |                   |                      | x                          |
| SWS-13     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-14     |             |              |          |           |           |            |           |                   |                      |                            |
| SWS-15     |             |              |          |           |           |            |           |                   |                      |                            |
| US-01      |             |              |          |           |           |            |           |                   |                      |                            |
| US-02      |             |              |          |           |           |            |           |                   |                      |                            |
| US-03      | LIOC        |              |          | x         | x         | x          |           |                   |                      | x                          |
| US-04      |             |              |          |           |           |            |           |                   |                      |                            |
| US-05      |             |              |          | x         | x         |            |           |                   |                      | x                          |
| US-06      |             |              |          |           |           |            |           |                   |                      |                            |
| US-07      |             |              |          |           |           |            |           |                   |                      |                            |
| US-08      |             |              |          |           |           |            |           |                   |                      |                            |
| VP-01      |             |              |          |           |           |            |           |                   |                      |                            |
| VP-02      |             |              |          |           | x         |            |           |                   |                      |                            |
| VP-03      |             |              |          |           |           | x          |           |                   |                      |                            |
| VP-04      |             |              |          |           |           |            |           |                   |                      |                            |
| VP-05      |             |              |          |           |           |            |           |                   |                      |                            |
| VP-06      |             |              |          | x         | x         |            |           |                   |                      | x                          |
| VP-07      | LIOC        |              | x        | x         | x         | x          |           |                   | x                    | x                          |

**Table 4. Results Summary of Wet Season Surveys**

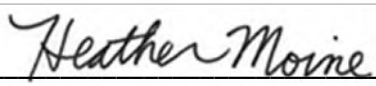
| Feature ID | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae | Platyhelminths (flatworms) |
|------------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|
| VP-08      |             |              |          | X         | X         | X          |           |                   |                      | X                          |
| VP-09      |             |              |          | X         |           | X          |           |                   |                      | X                          |
| VP-10      |             |              |          |           |           |            |           |                   |                      |                            |
| VP-11      |             |              |          | X         | X         | X          |           |                   |                      | X                          |
| VP-12      |             |              |          | X         |           | X          |           |                   |                      | X                          |
| VP-13      |             |              |          | X         |           | X          |           |                   | X                    | X                          |
| VP-14      |             |              |          | X         |           | X          |           |                   |                      | X                          |
| VP-15      |             |              | X        | X         | X         | X          |           |                   | X                    | X                          |
| VP-16      | LIOC        |              | X        | X         |           | X          |           |                   | X                    | X                          |
| VP-17      |             |              |          |           |           |            |           |                   |                      |                            |

**Notes:**

LIOC - *Lindieriella occidentalis*

## 5 Conclusion

I certify that the information in this Report for the wet season surveys conducted within the PSA and attached exhibits fully and accurately represents my work.

 7/28/2021  
 (Signature + Date)

Heather Moine (TE-60147A-1; S-202420002-20262-001)  
 Senior Biologist, Dudek





# Attachment A

---

USFWS Wet Season Survey Request and Authorization

**From:** [Lantz, Samantha M](#)  
**Sent:** Tuesday, September 29, 2020 10:23 AM  
**To:** [Morgan Kennedy](#)  
**Cc:** [David Hochart](#); [Michael Henry](#); [Perkins-Taylor, Ian E](#)  
**Subject:** Re: [EXTERNAL] FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

---

You may consider this email authorization to conduct wet season and dry season surveys for large listed branchiopods in the proposed Sloughhouse Project survey area in Sacramento County, per the conditions of the relevant recovery permits (TE-53771B; TE-031848; TE-051248; TE-60147A; TE-813545) and as specified in your email request dated September 28, 2020.

Remember to carry a copy of your permit(s) while doing the work and to follow the terms and conditions of the permit(s), including the reporting requirements. In your report(s), please include which activities were authorized, the names of all persons involved in each activity, their recovery permit numbers, if applicable, and the date of this authorization, to help ensure that we correctly record the fulfillment of the reporting requirement under this authorization. We ask that you use UTM coordinates for all spatial data. Please use **Service reference number 2020-TA-3007** and send reports to me and Ian Perkins-Taylor (biologist in our Sac Valley division) (cced here).

Best,

Sam

~~~~~

Samantha Lantz, PhD  
Fish and Wildlife Biologist  
USFWS, Sacramento Field Office  
Listing and Recovery Division  
2800 Cottage Way W-2605  
Sacramento, CA 95825-1888  
Phone: 916-414-6526  
Pronouns: she/her/hers

In an effort to slow the spread of the coronavirus (COVID-19), staff in the Sacramento Fish and Wildlife Office have implemented an aggressive telework schedule. At this time, we are responding to requests for information via email or phone as often as possible as we do not have the in-office capacity to support regular mail service. We appreciate your understanding.

---

**From:** Morgan Kennedy <mkennedy@dudek.com>  
**Sent:** Tuesday, September 29, 2020 9:41 AM  
**To:** Lantz, Samantha M <samantha\_lantz@fws.gov>  
**Cc:** David Hochart <dhochart@dudek.com>; Michael Henry <mhenry@dudek.com>; Paul Lemons <plemons@dudek.com>  
**Subject:** RE: [EXTERNAL] FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

Good Morning Samantha,

Yes, please move forward with processing the request for surveys, excluding Paul Lemons.

Thanks,



**Morgan Kennedy**  
*Environmental Compliance Manager / Ecologist*  
858 Lincoln Way, Suite 208 / Auburn, CA 95603  
O: 530.863.4276 x 3976 / C: 916.661.2498  
[www.dudek.com](http://www.dudek.com)

---

**From:** Lantz, Samantha M <[samantha\\_lantz@fws.gov](mailto:samantha_lantz@fws.gov)>  
**Sent:** Tuesday, September 29, 2020 9:39 AM  
**To:** Morgan Kennedy <[mkenedy@dudek.com](mailto:mkenedy@dudek.com)>  
**Cc:** David Hochart <[dhochart@dudek.com](mailto:dhochart@dudek.com)>; Michael Henry <[mhenry@dudek.com](mailto:mhenry@dudek.com)>; Paul Lemons <[plemons@dudek.com](mailto:plemons@dudek.com)>  
**Subject:** Re: [EXTERNAL] FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

Hi Morgan,

We're missing a 2019 annual report for Paul Lemons. Please let me know if you want me to move forward with the survey authorizaon f or Dudek except for Mr. Lemons. Alternav ely, I can wait and process the request upon receipt of the missing report. (Apologies in advance if it was sent but not filed properly.)

Thanks,

Sam

~~~~~

Samantha Lantz, PhD  
Fish and Wildlife Biologist  
USFWS, Sacramento Field Office  
Listing and Recovery Division  
2800 Cottage Way W-2605  
Sacramento, CA 95825-1888  
Phone: 916-414-6526  
Pronouns: she/her/hers

In an effort to slow the spread of the coronavirus (COVID-19), staff in the Sacramento Fish and Wildlife Office have implemented an aggressive telework schedule. At this time, we are responding to requests for information via email or phone as often as possible as we do not have the in-office capacity to support regular mail service. We appreciate your understanding.

---

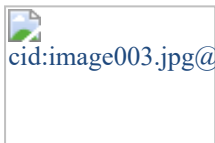
**From:** Morgan Kennedy <[mkenedy@dudek.com](mailto:mkenedy@dudek.com)>  
**Sent:** Monday, September 28, 2020 11:49 AM  
**To:** Lantz, Samantha M <[samantha\\_lantz@fws.gov](mailto:samantha_lantz@fws.gov)>; Hull, Josh <[Josh\\_Hull@fws.gov](mailto:Josh_Hull@fws.gov)>  
**Cc:** David Hochart <[dhochart@dudek.com](mailto:dhochart@dudek.com)>; Michael Henry <[mhenry@dudek.com](mailto:mhenry@dudek.com)>  
**Subject:** [EXTERNAL] FW: USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

**This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.**

Good A. ernoon,

Dudek is providing this request to the U.S. Fish and Wildlife Service (USFWS) to conduct both wet season and dry season surveys for large listed branchiopods (i.e., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) in the proposed Sloughhouse Project (Project) survey area, Sacramento County, California. Please see attached formal request.

If you have any questions regarding this request, please feel free to contact me anytime at [morgkennedy@gmail.com](mailto:morgkennedy@gmail.com), 916.661.2498. Thank you for your consideration.



**Morgan Kennedy**

*Environmental Compliance Manager / Ecologist*  
858 Lincoln Way, Suite 208 / Auburn, CA 95603  
O: 530.863.4276 x 3976 / C: 916.661.2498  
[www.dudek.com](http://www.dudek.com)

---

**From:** Markegard, Sarah I <[sarah\\_markegard@fws.gov](mailto:sarah_markegard@fws.gov)>  
**Sent:** Monday, September 28, 2020 11:39 AM  
**To:** Morgan Kennedy <[mkenedy@dudek.com](mailto:mkenedy@dudek.com)>  
**Subject:** Automatic reply: [EXTERNAL] USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

Thank you for your message. I have accepted a new position with the U.S. Fish and Wildlife Service in Anchorage, Alaska, and will be unable to respond to email messages during my transition to the new office.

Please direct all Recovery Permit correspondence for the Sacramento Fish and Wildlife Office (SFWO) to the Acting Recovery Permit Coordinator, Sam Lantz ( [samantha\\_lantz@fws.gov](mailto:samantha_lantz@fws.gov)).

For all other correspondence related to listing or recovery of federally threatened and endangered species in the SFWO jurisdiction, please contact the Listing and Recovery Division Manager, Josh Hull ([josh\\_hull@fws.gov](mailto:josh_hull@fws.gov)).

---

**From:** Morgan Kennedy  
**Sent:** Monday, September 28, 2020 11:31 AM  
**To:** [sarah\\_markegard@fws.gov](mailto:sarah_markegard@fws.gov); [jody\\_holzworth@fws.gov](mailto:jody_holzworth@fws.gov); [samuel\\_sosa@fws.gov](mailto:samuel_sosa@fws.gov)  
**Cc:** David Hochart <[dhochart@dudek.com](mailto:dhochart@dudek.com)>; Michael Henry <[mhenry@dudek.com](mailto:mhenry@dudek.com)>  
**Subject:** USFWS Survey Request For Large Listed Branchiopods (Sacramento County)

Good Afternoon,

Dudek is providing this request to the U.S. Fish and Wildlife Service (USFWS) to conduct both wet season and dry season surveys for large listed branchiopods (i.e., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) in the proposed Sloughhouse Project (Project) survey area, Sacramento County, California. Please see attached formal request.

If you have any questions regarding this request, please feel free to contact me anytime at [morgkennedy@gmail.com](mailto:morgkennedy@gmail.com), 916.661.2498. Thank you for your consideration.

**Morgan Kennedy**



*Environmental Compliance Manager / Ecologist*

858 Lincoln Way, Suite 208 / Auburn, CA 95603

O: 530.863.4276 x 3976 / C: 916.661.2498

[www.dudek.com](http://www.dudek.com)

September 25, 2020

12957

U.S. Fish and Wildlife Service  
Pacific Southwest Region (Region 8)  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825  
916.414.6600

**Subject:** *Request to the U.S. Fish and Wildlife Service to Conduct Wet and Dry Season Large Listed Branchiopod Surveys, Proposed Sloughhouse Project, Sacramento County, California*

Dear Sir or Madam:

Dudek is providing this request to the U.S. Fish and Wildlife Service (USFWS) to conduct both wet season and dry season surveys for large listed branchiopods (i.e., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) in the proposed Sloughhouse Project (Project) survey area (Attachment 1).

## Proposed Project and Survey Area

The survey area for the proposed Project could include a total of approximately 741.20 acres, pending on-going proposed Project design efforts (Attachment 2). According to the USFWS, the survey area is located in 'Survey Zone A' of California for listed large branchiopods.

## Potential Branchiopod Habitat

For the purpose of this request, Dudek evaluated potential branchiopod habitat within the survey area based on the following desktop data resources:

- California Aquatic Resources Inventory (CARI).<sup>1</sup>
- National Wetland Inventory (NWI).<sup>2</sup>
- South Sacramento Habitat Conservation Plan (SSHCP) land cover types.<sup>3</sup>
- U.S. Geological Society (USGS) National Hydrography dataset (NHD).<sup>4</sup>

The desktop evaluation of potential branchiopod habitat in the survey area found a total of 41.27 acres of potential habitat, as summarized in Table 1 below.

---

<sup>1</sup> SFEI (San Francisco Estuary Institute and the Aquatic Science Center). CARI. 2020. Accessed September 2020. <https://www.sfei.org/cari>.

<sup>2</sup> USFWS. 2020. NWI. Accessed September 2020. <https://www.fws.gov/wetlands/>.

<sup>3</sup> Sacramento County. 2019. SSHCP. Accessed September 2020. <https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/SSHCPPlan.aspx>.

<sup>4</sup> USGS. 2020. National Hydrography. Accessed September 2020. <https://www.usgs.gov/core-science-systems/ngp/national-hydrography>.

**Table 1. Summary of Potential Branchiopod Habitat Feature Types in Proposed Project Survey Area**

| Aquatic Feature Type          | Total of Individual Features in the Survey Area | Total Acreage of Features in Survey Area |
|-------------------------------|-------------------------------------------------|------------------------------------------|
| Freshwater emergent wetland   | 4                                               | 13.92                                    |
| Freshwater pond               | 3                                               | 1.32                                     |
| Depressional seasonal feature | 6                                               | 3.94                                     |
| Individual vernal pool        | 79                                              | 17.34                                    |
| Swale                         | 45                                              | 4.00                                     |
| Other- Depressional           | 1                                               | 0.75                                     |
| <b>Totals</b>                 | <b>138</b>                                      | <b>41.27</b>                             |

The survey area does not contain USFWS Designated Critical Habitat (DCH). Specifically, there are DCH occurrences of vernal pool fairy shrimp (Unit VERFS 14B), and vernal pool tadpole shrimp (Unit VERTS 9A) approximately 1.4 miles southwest of the survey area.

## Survey Request Overview

Dudek would like to initiate dry season surveys as soon as possible in the survey area pending USFWS approval. If possible, the dry season surveys would be conducted before the 2020 through 2021 wet season (i.e., prior to November 1). In the case that precipitation events occur prior to the dry season survey timing detailed above, the dry season surveys for the proposed Project will be shifted to the following dry season (i.e., beginning May 2020).

Wet season surveys would commence approximately two weeks following the first precipitation events of the wet season (i.e., mid-November 2020); specifically when aquatic features hold greater than three centimeters of water 24 hours after a rain event. Wet season surveys would then continue every 14 days until the aquatic feature dries, or a minimum of 90 consecutive days of inundation have occurred. If pools dry down during the wet season and then inundate again, surveys will be re-initiated for those pools even if the 90 days of inundation have already occurred.

## Dry Season Survey

The dry season surveys will be conducted in accordance with the USFWS *Survey Guidelines for the Listed Large Branchiopods*<sup>5</sup>. Soil samples will be collected from the top centimeter, or one to three centimeters below overburden, of the aquatic features that have the potential to be branchiopod habitat. Soil samples will be collected when they are dry to avoid damaging or destroying cysts. A hand trowel, or similar instrument, will be used to collect approximately one liter volume sample per aquatic feature. Soil samples will be collected in chunks. The soil from each sampling location will be stored in separate bags and labeled with the specific location details from within the aquatic feature from which the sample was taken. A sketch of the aquatic feature

<sup>5</sup> USFWS. May 31, 2015. Survey Guidelines for the Large Listed Branchiopods. United State Department of the Interior. USFWS, Pacific Southwest Region. Accessed September 2020. [https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/VernalPoolBranchiopodSurveyGuidelines\\_20150531.pdf](https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/VernalPoolBranchiopodSurveyGuidelines_20150531.pdf).

showing the specific location of each soil sample location will be drawn. Photographs and field notes of each survey areas physical characteristics will also be recorded.

Per the USFWS guidelines, soil samples will be collected, stored, sieved, and cysts will be identifies as genus *Branchinecta* or *Lepidurus* if possible. Soil samples containing any residual moisture initially will be adequately ventilated and allowed to air dry thoroughly before storage of the sample. The bags containing the soil samples will be kept out of direct sunlight in order to avoid excessively heating the sample.

A total of 10 soil samples of approximately 100 ml each will to be taken from each aquatic feature, for a total soil sample volume of approximately one liter per aquatic feature.

In addition to the dry season survey request, Dudek would also like to request permission to culture/hydrate cysts in the laboratory once soils have been prepared. This will allow for the identification of adult branchiopods to the species-level. Specifically, washed and sieved soil fractions from the 300 um and 150 um sieves will be examined under a dissecting microscope for fairy shrimp or tadpole shrimp cysts. The process will be repeated until all individual soil samples have been examined. All sieved material will be processed and dried as quickly as possible, preferably within one hour from the initial wetting. Cyst density information for each soil sample location will be calculated by dividing the total number of cysts recovered by the total amount of soil from the individual aliquots from that soil sample location. Total cyst density information for each soil sample location will be reported for each species in terms of the following: none; 1 to 25 cysts/100 ml soil; 26 to 50 cysts/100 ml soil; 51 to 100 cysts/100 ml soil; 101 to 199 cysts/100 ml soil; or more than 200 cysts/100 ml soil. If cysts can be identified to the species-level, then one of three methods to determine species will be applied: 1) hydrate and grow them out, though this is not always feasible due to the many factors that go into hatching and growing fairy shrimp; 2) suspend the survey and agree that they are of a listed species; or (3) complete a subsequent wet season survey according to the full protocol. Voucher specimens of adult branchiopods will be preserved, identified to the species level and transferred to an approved repository.

The results of the dry season survey will be documented within a protocol-level report. The report will include a discussion of the survey methodology and adequacy, including a description of any resource documents referenced and field survey methods used during the survey work. The report will include appropriate tables and graphics to meet the reporting requirements of the USFWS. According to USFWS requirements, the report will be submitted within 90 days of completing the survey.

## Wet Season Survey

Protocol-level wet season surveys will also be conducted in accordance with the USFWS guidelines and timing during the wet season as identified above. At each wet season visit, representative portions of the bottom, edges, and vertical water column of the aquatic feature shall be adequately sampled using a seine, dip net or aquarium net appropriate for the size of the feature. As part of the wet season surveys, Dudek will also sample water quality (i.e., pH, total dissolved solids/electro-conductivity, and temperature), and document empirical observations made at each aquatic feature surveyed. Photographs and field notes on each survey areas physical characteristics will be recorded.

The results of the wet season survey will be documented within a protocol-level report. The report will include a discussion of the survey methodology and adequacy, including a description of any resource documents referenced



and field survey methods used during the survey work. The report will include appropriate tables and graphics to meet the reporting requirements of the USFWS. According to USFWS requirements, the report will be submitted within 90 days of completing the survey.

## Survey Personnel

Dudek may employ several of our permitted biologists to conduct wet and dry season surveys in the proposed Project survey area. Each permitted biologist will be accompanied by one or more supporting biological staff that have had appropriate field experience to assist in these surveys. Table 2 below lists all Dudek biologists that hold a Recovery 10(a)(1)(a) Permit, and/or supporting biological field staff that that Dudek has is requesting to have approved to conduct large listed branchiopod surveys in the proposed Project survey area.

**Table 2. Dudek Survey Personnel Reference**

| Name (Title)    | USFWS 10(a)(1)(A) Recovery Permit | Survey Designation       |
|-----------------|-----------------------------------|--------------------------|
| Bergman, Erin   | TE53771B-2                        | Biologist- Lead          |
| Burris, Laura   | N/A                               | Field Biologist- Support |
| Godinho, Anna   | N/A                               | Field Biologist- Support |
| Henry, Ryan     | TE031848-4                        | Biologist- Lead          |
| Henry, Michael  | N/A                               | Field Biologist- Support |
| Keating, Paul   | N/A                               | Field Biologist- Support |
| Kennedy, Morgan | N/A                               | Field Biologist- Support |
| Leis, Michelle  | N/A                               | Field Biologist- Support |
| Lemons, Paul    | TE051248-6                        | Biologist- Lead          |
| Moine, Heather  | TE60147A-1                        | Biologist- Lead          |
| Ortega, Brock   | TE813545-9                        | Biologist- Lead          |
| Scricca, Emily  | N/A                               | Field Biologist- Support |
| Sennett, Allie  | N/A                               | Field Biologist- Support |

If you have any questions regarding this request, please feel free to contact me anytime at morgkennedy@gmail.com, 916.661.2498. Thank you for your consideration.

Sincerely,



Morgan Kennedy  
Environmental Compliance Manager

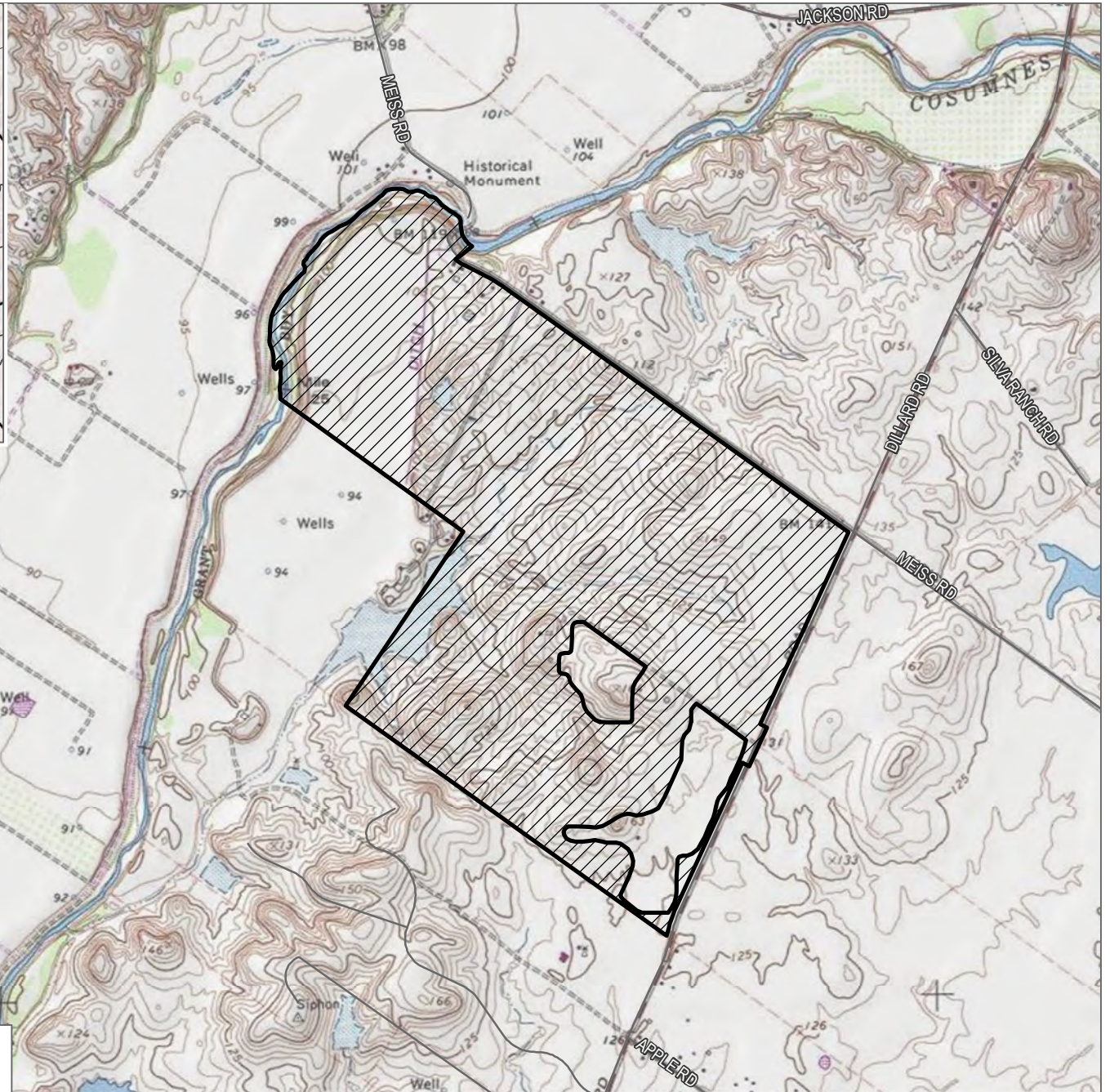
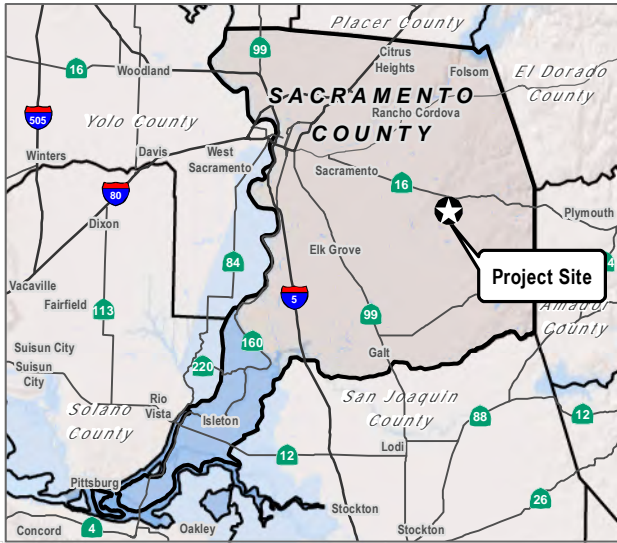
Att.: 1) Figure 1. Project Location Map  
2) Figure 2. Project Survey Area Map  
3) Figure 3. Project Area and Preliminary Survey Location Map



# Attachment 1

---

Figure 1. Project Location Map



SOURCE: USGS 7.5-Minute Series Sloughouse Quadrangle

**DUDEK**



0 1,000 2,000  
Feet  
1:24,000  
NAD1983, CA State Plane Zone II

**FIGURE 1**

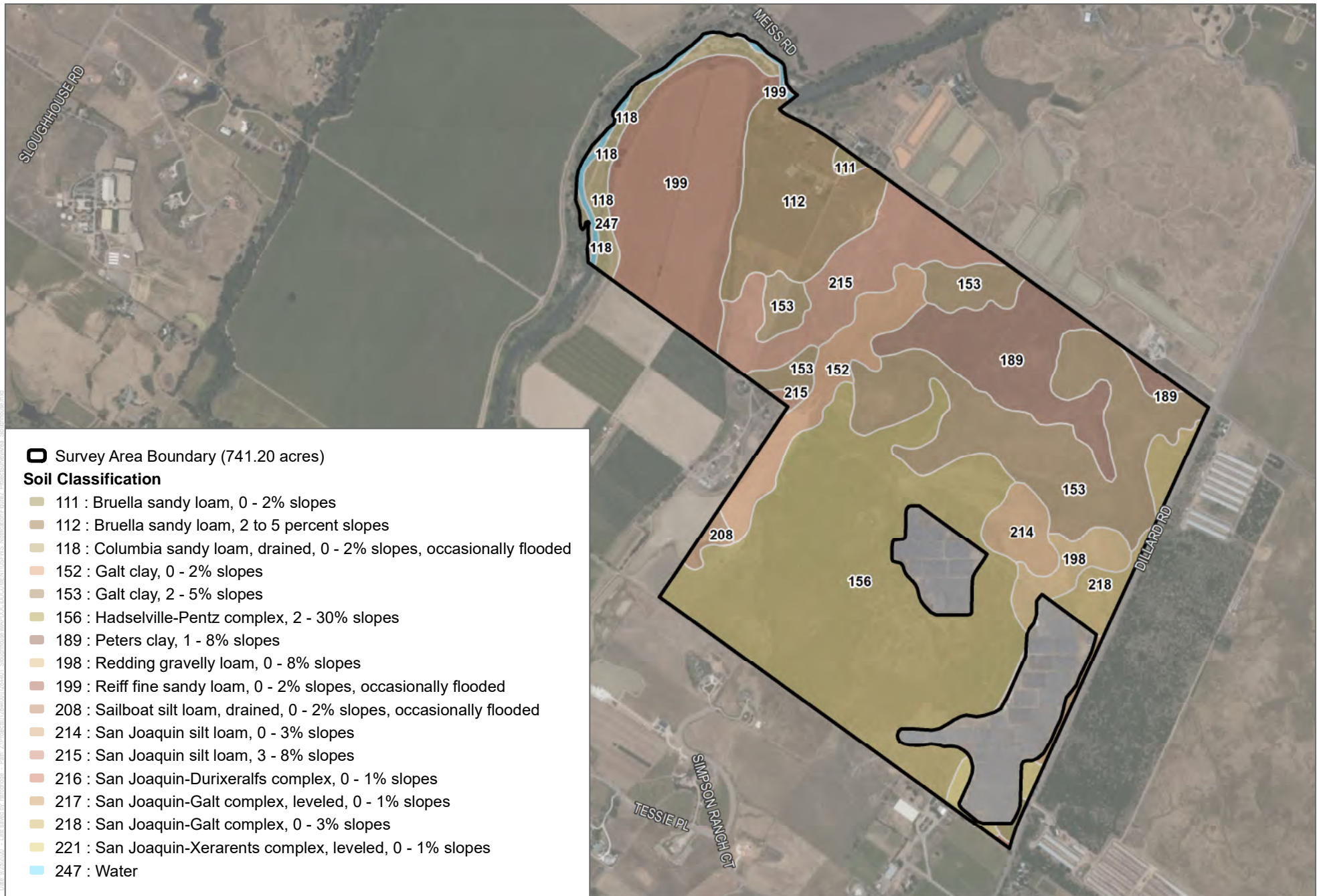
**Project Location Map**



# Attachment 2

---

Figure 2. Project Survey Area Map



SOURCE: Bing Maps 2019, USDA 2019, Sacramento County

**DUDEK**



Sloughhouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughhouse, Sacramento County

**FIGURE 2**

**Project Survey Area Map**



# Attachment 3

---

Figure 3. Project Area and Preliminary Survey Locations Map



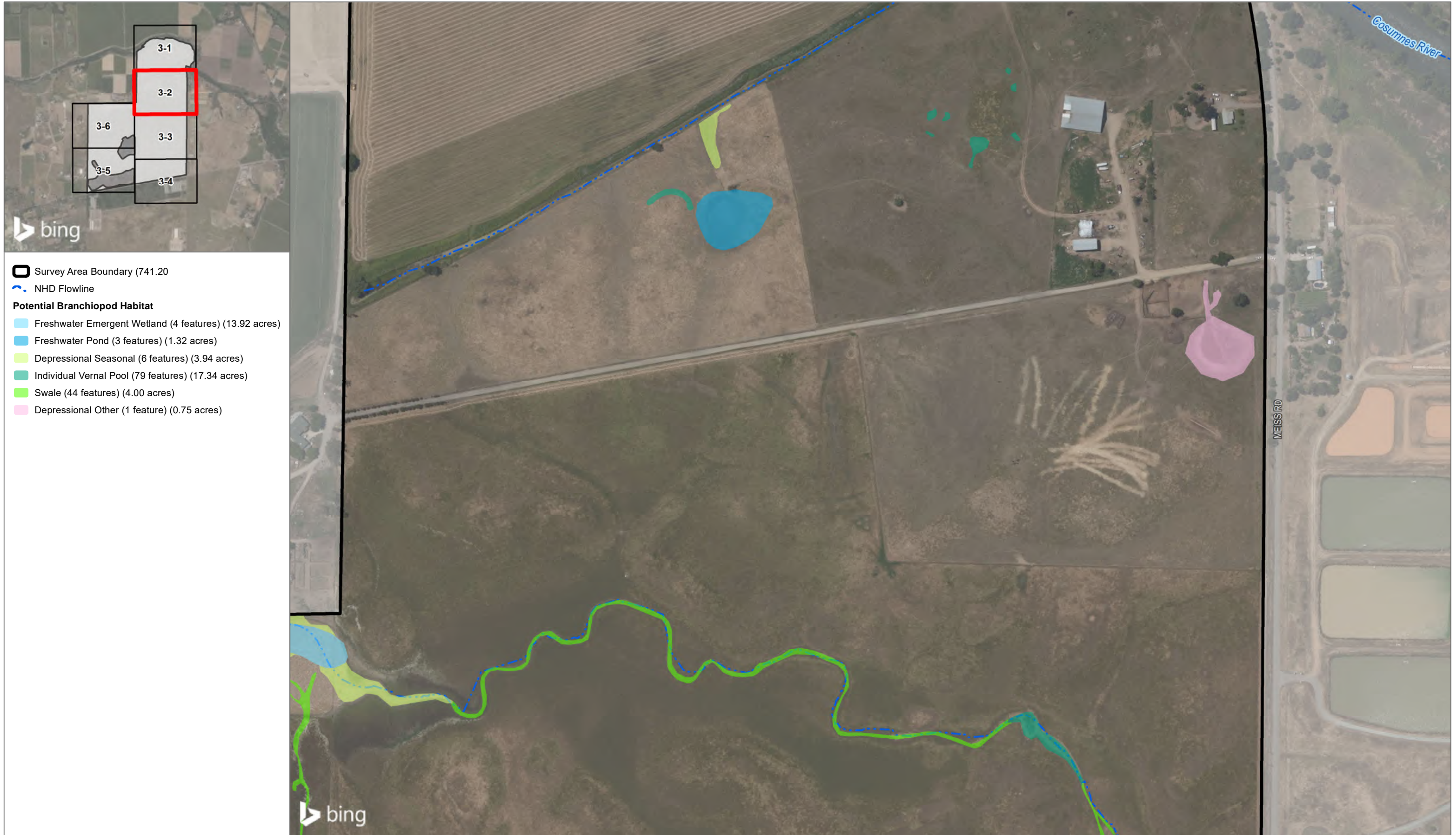
- Survey Area Boundary (741.20 acres)
- - - NHD Flowline
- Potential Branchiopod Habitat**
- Freshwater Emergent Wetland (4 features) (13.92 acres)
- Freshwater Pond (3 features) (1.32 acres)
- Depressional Seasonal (6 features) (3.94 acres)
- Individual Vernal Pool (79 features) (17.34 acres)
- Swale (44 features) (4.00 acres)
- Depressional Other (1 feature) (0.75 acres)

SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

**FIGURE 3-1**

Project Area and Preliminary Survey Locations Map

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



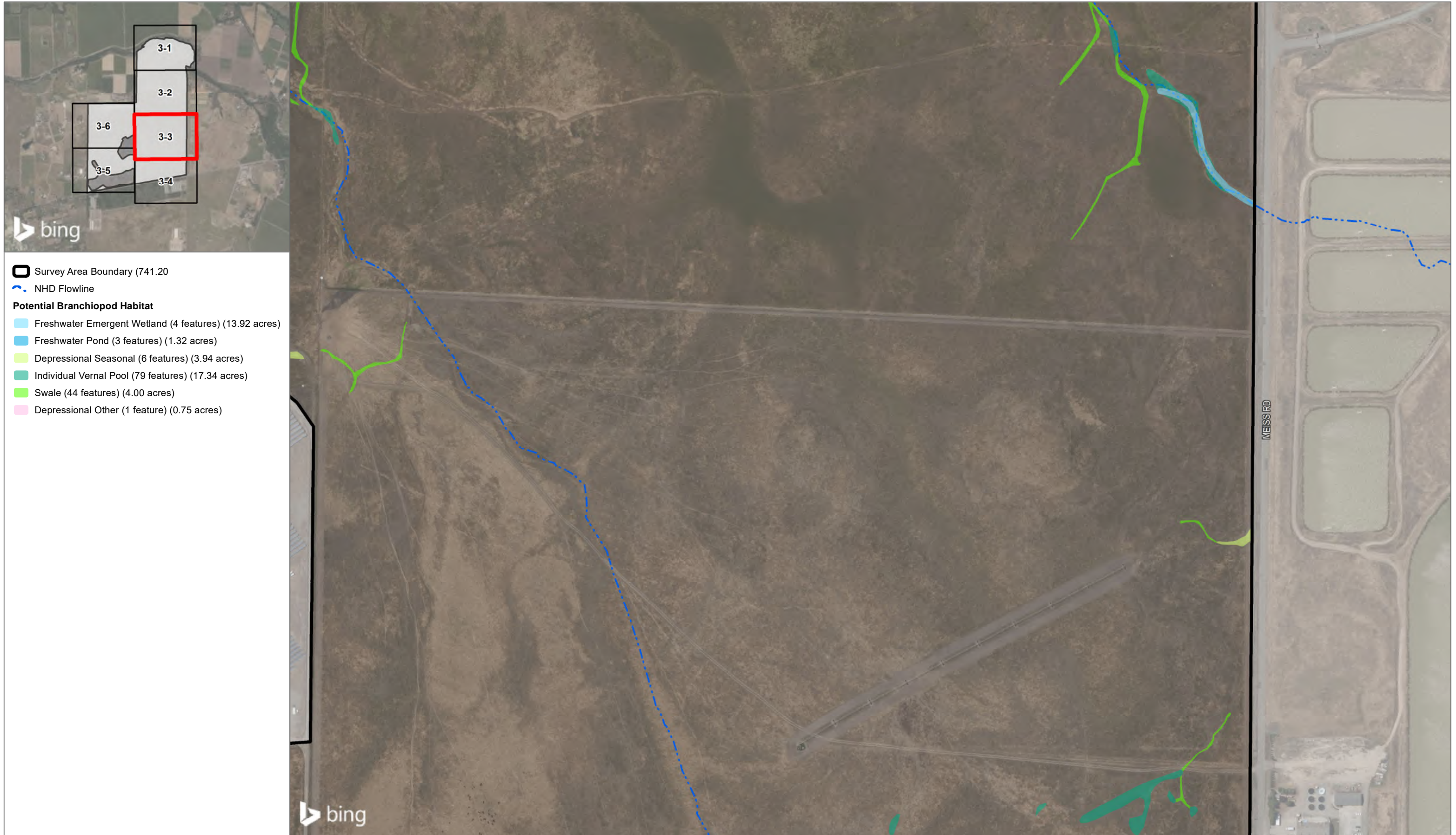
SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

**FIGURE 3-2**

**Project Area and Preliminary Survey Locations Map**

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County





- Survey Area Boundary (741.20)
- ~ NHD Flowline
- Potential Branchiopod Habitat**
- Freshwater Emergent Wetland (4 features) (13.92 acres)
- Freshwater Pond (3 features) (1.32 acres)
- Depressional Seasonal (6 features) (3.94 acres)
- Individual Vernal Pool (79 features) (17.34 acres)
- Swale (44 features) (4.00 acres)
- Depressional Other (1 feature) (0.75 acres)

SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

**FIGURE 3-3**

**Project Area and Preliminary Survey Locations Map**

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County

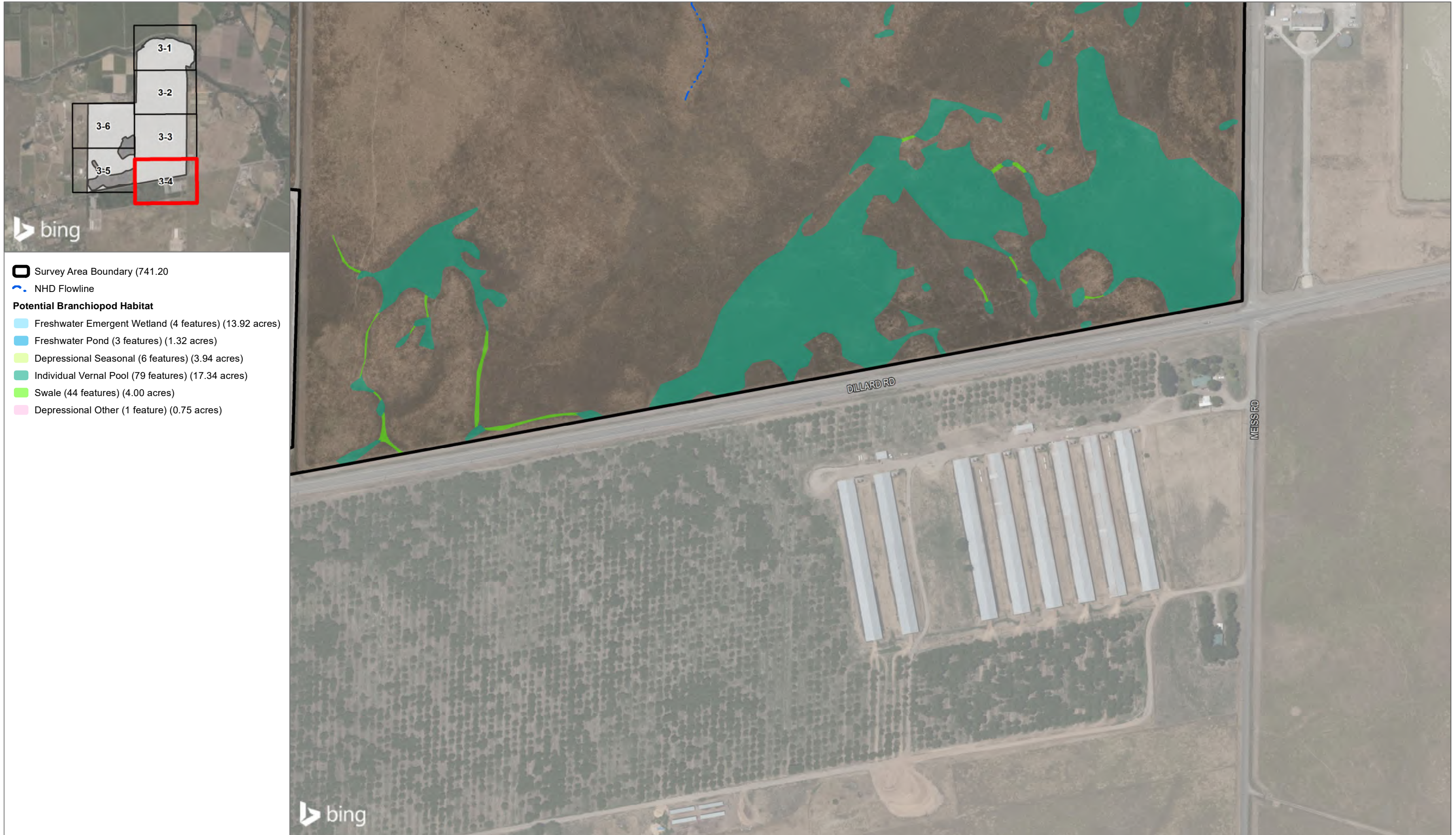
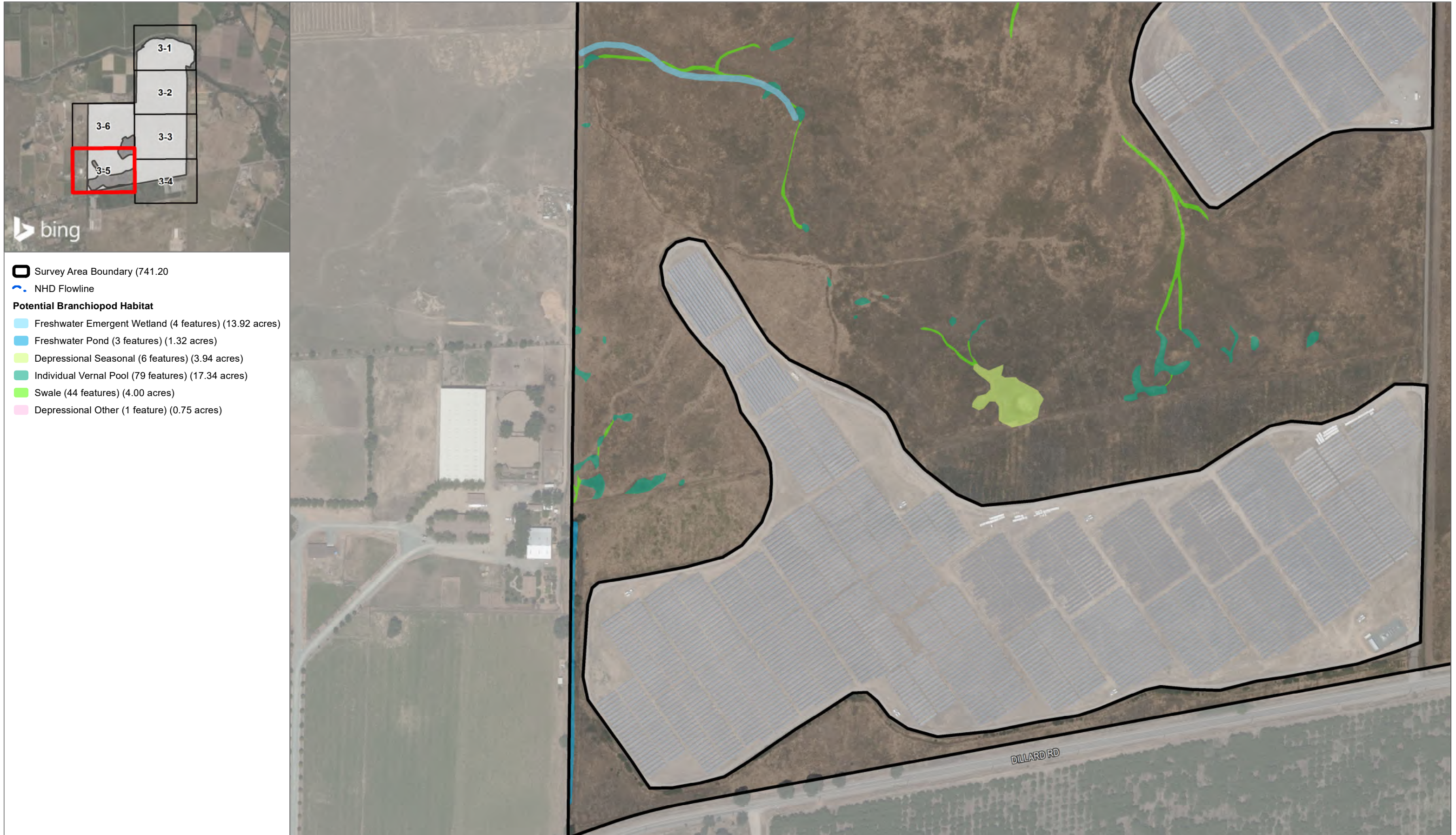


FIGURE 3-4

Project Area and Preliminary Survey Locations Map



SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

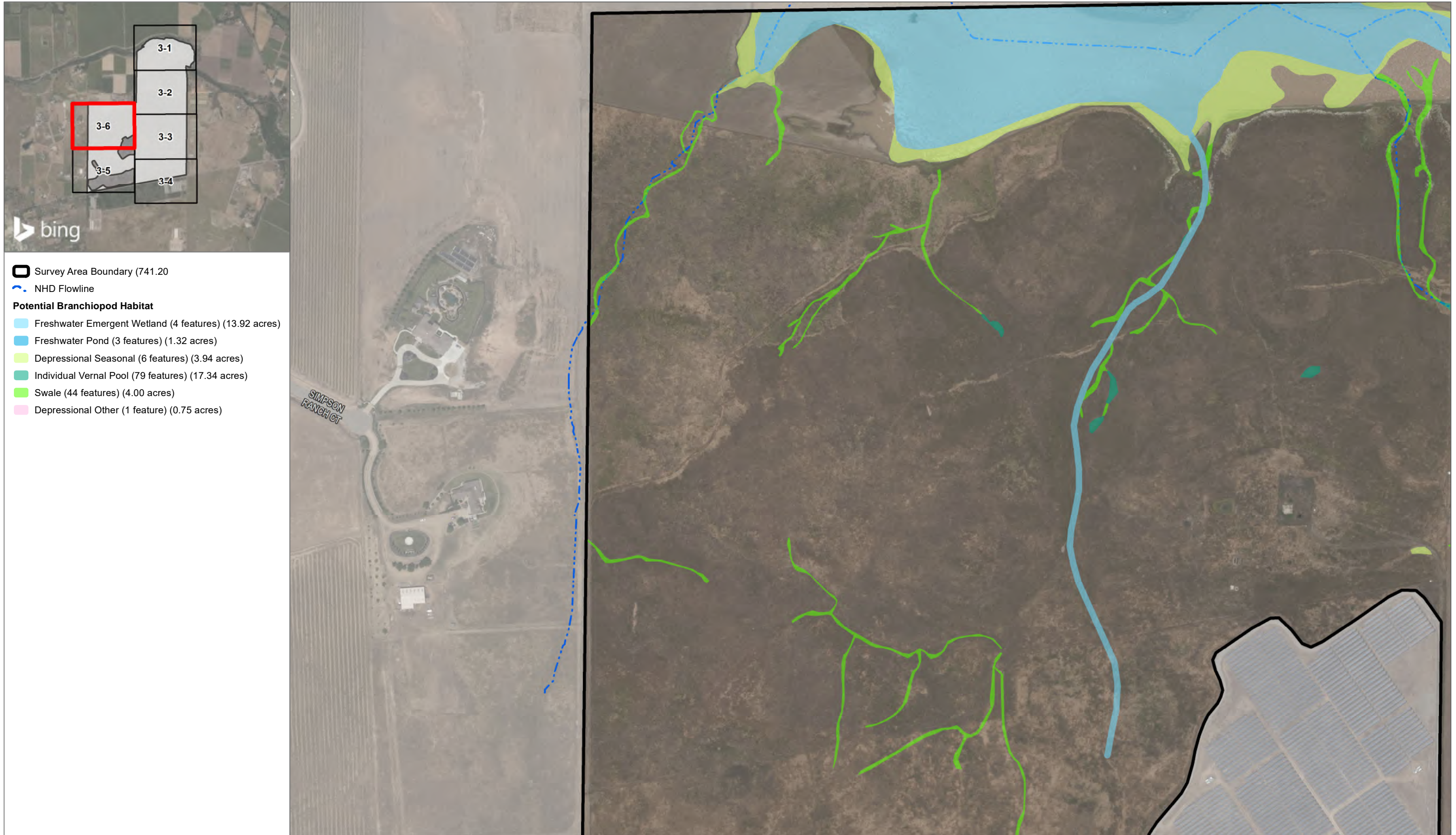
**DUDEK**

0 137.5 275 Feet  
1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-5**

Project Area and Preliminary Survey Locations Map

Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



SOURCE: Bing Maps 2019, SFEI CARI 2019, NWI 2019, Sacramento County

**DUDEK**

1:3,300  
NAD1983, CA State Plane Zone II

**FIGURE 3-6**

Project Area and Preliminary Survey Locations Map

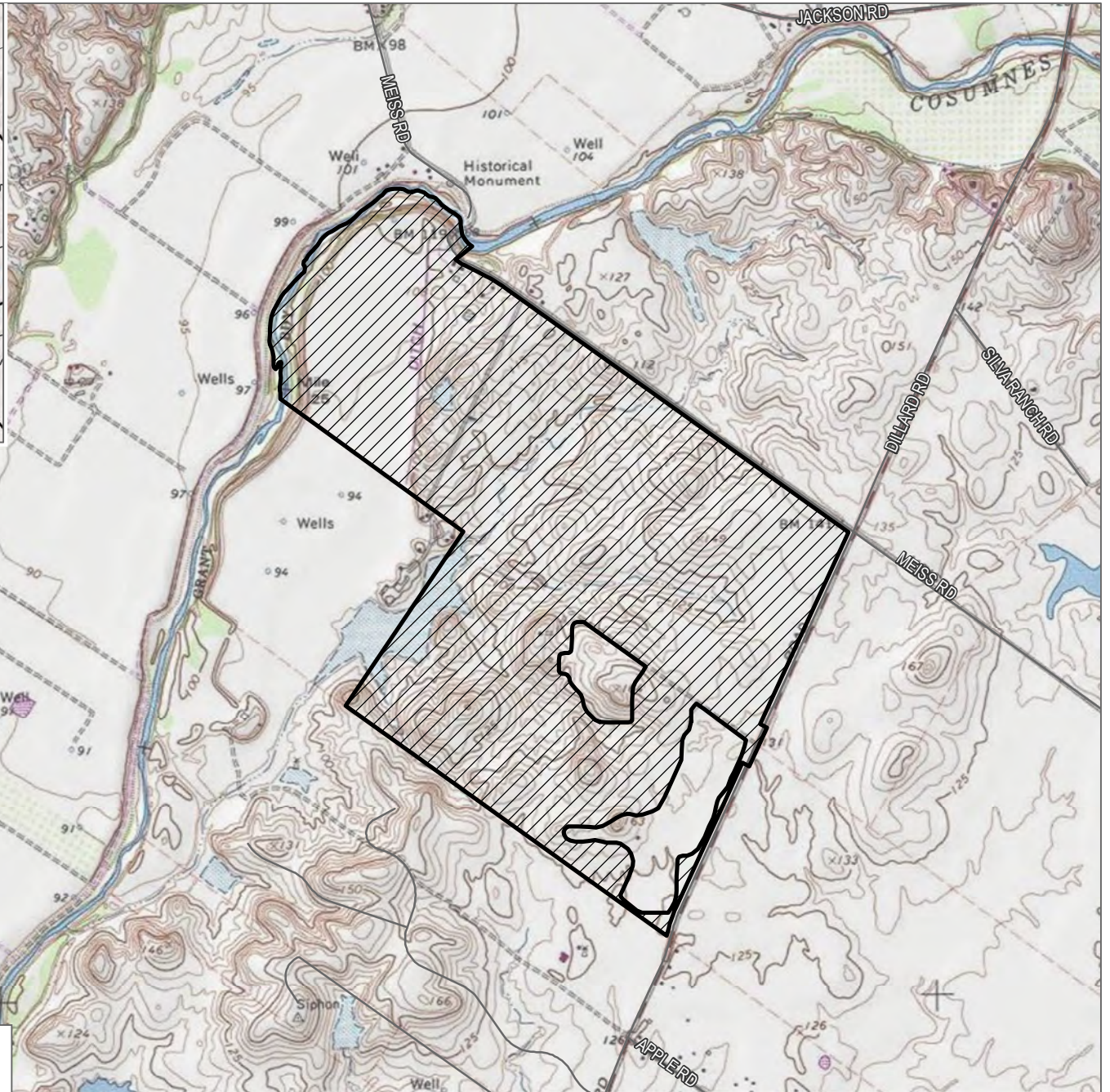
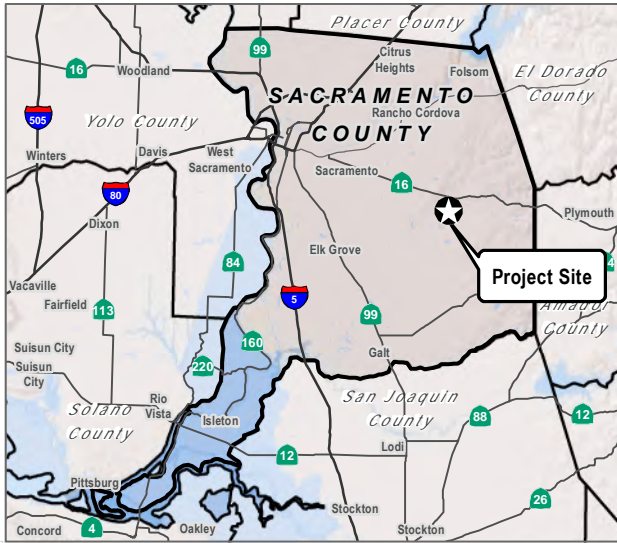
Sloughouse Project (Category: Other) - USFWS Listed Large Branchiopod Survey Notification, City of Sloughouse, Sacramento County



# Attachment B

---

Figure 1- Project Location



 Project Study Area Boundary (742.44 acres)

SOURCE: USGS 7.5-Minute Series Sloughouse Quadrangle

**DUDEK**



0 1,000 2,000  
Feet  
1:24,000  
NAD1983, CA State Plane Zone II

**FIGURE 1**

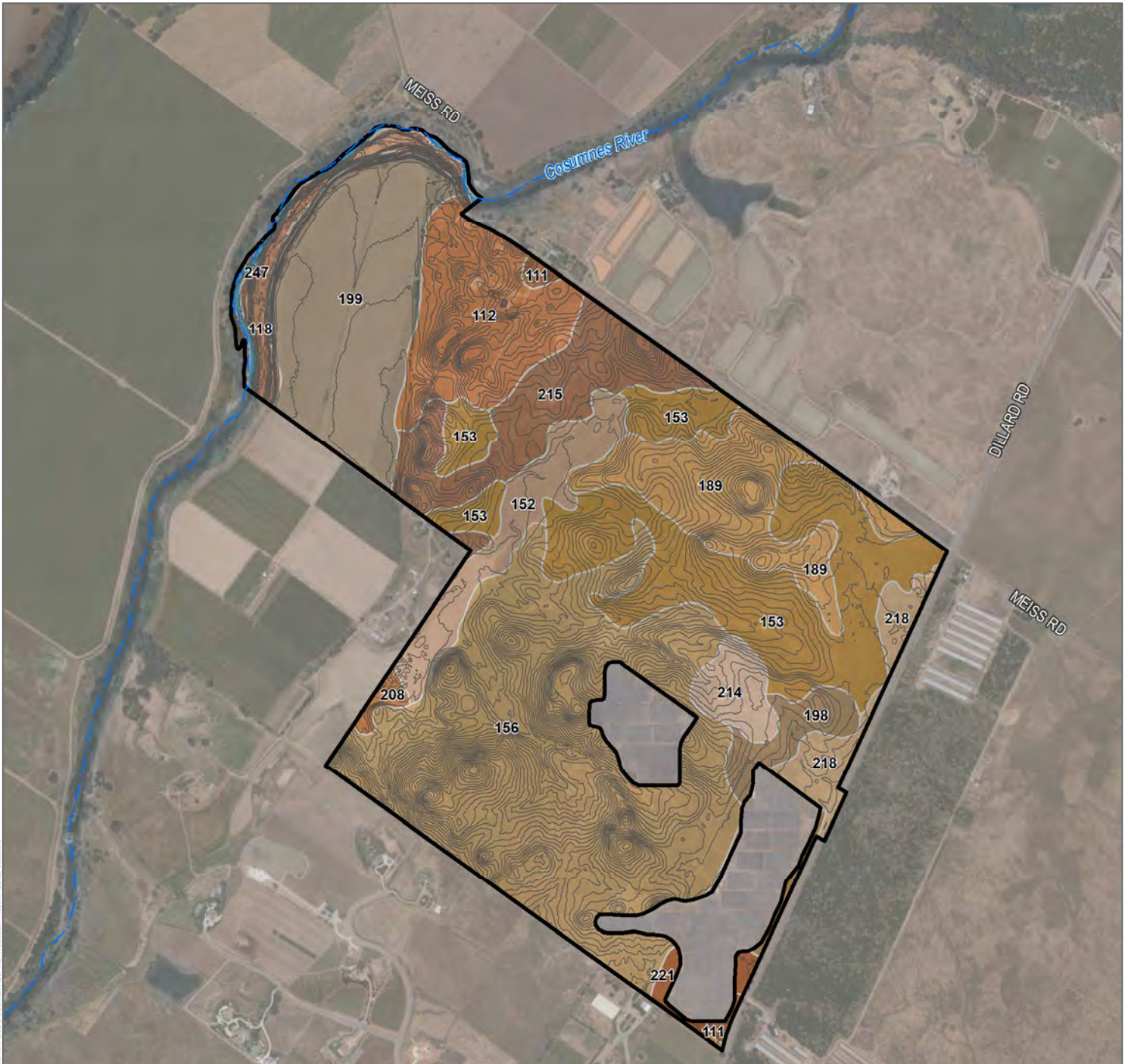
**Project Location Map**



# Attachment C

---

Figure 2- Project Soils



Project Study Area Boundary (742.44 acres)

NHD Flowline

2-foot Contours

**Soil Classification**

- 111 : Bruella sandy loam, 0-2% slopes
- 112 : Bruella sandy loam, 2-5% slopes
- 118 : Columbia sandy loam, drained, 0-2% slopes, occasionally flooded
- 152 : Galt clay, 0-2% slopes
- 153 : Galt clay, 2-5% slopes
- 156 : Hadselville-Pentz complex, 2-30% slopes
- 189 : Peters clay, 1-8% slopes

- 198 : Redding gravelly loam, 0-8% slopes
- 199 : Reiff fine sandy loam, 0-2% slopes, occasionally flooded
- 208 : Sailboat silt loam, drained, 0-2% slopes, occasionally flooded
- 214 : San Joaquin silt loam, 0-3% slopes
- 215 : San Joaquin silt loam, 0-8% slopes
- 216 : San Joaquin-Durixeralfs complex, 0-1% slopes
- 217 : San Joaquin-Galt complex, leveled, 0-1% slopes
- 218 : San Joaquin-Galt complex, 0-3% slopes
- 221 : San Joaquin-Xerarents complex, leveled, 0-1% slopes
- 247 : Water

SOURCE: Bing Maps 2020, Sacramento County 2019, USDA 2019



**FIGURE 2**  
Project Soils

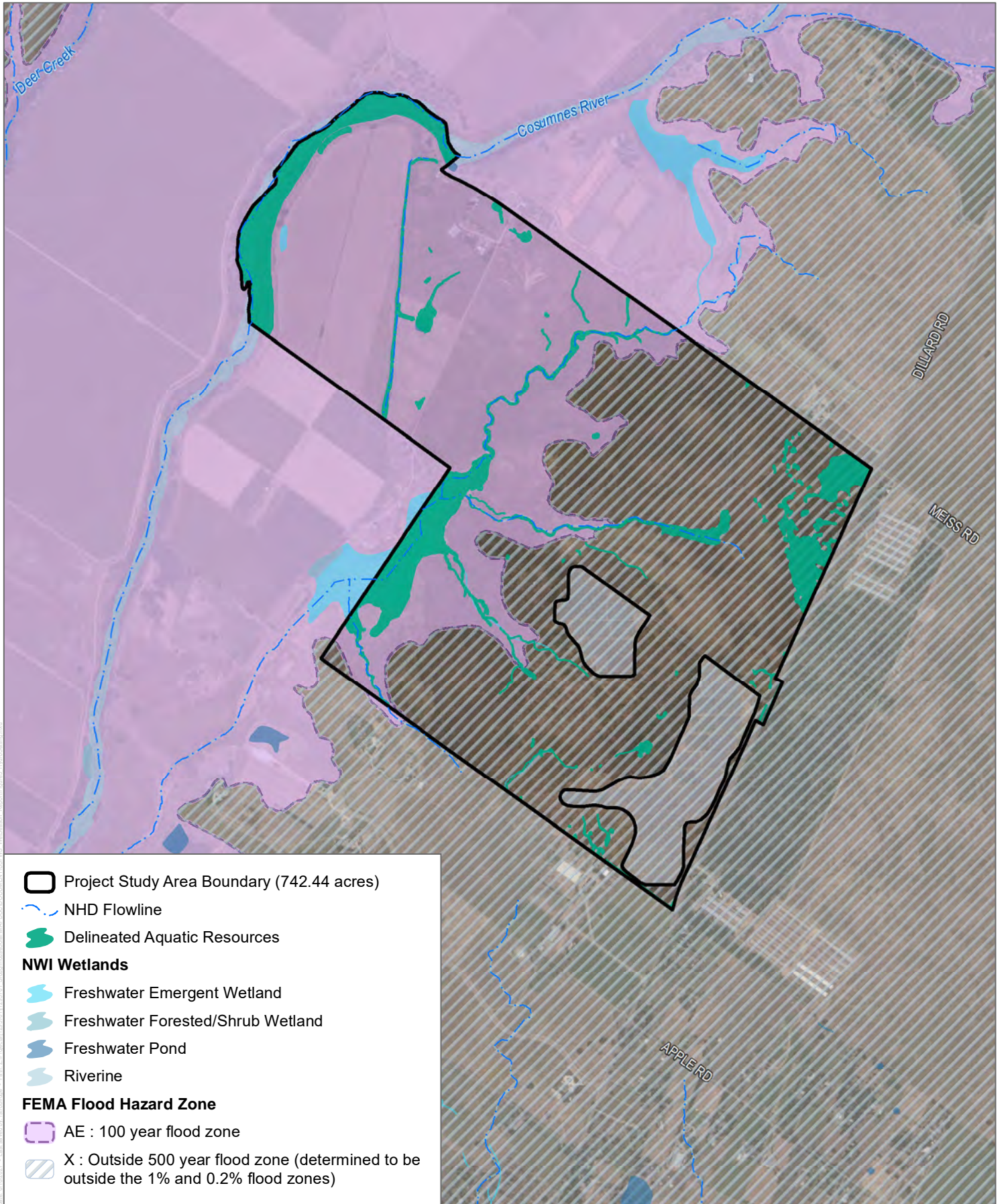




# Attachment D

---

Figure 3- Project Hydrology



SOURCE: Bing Maps 2020, NHD 2019, Sacramento County 2019, USFWS 2020, FEMA 2019

**FIGURE 3**

**Project Hydrology**

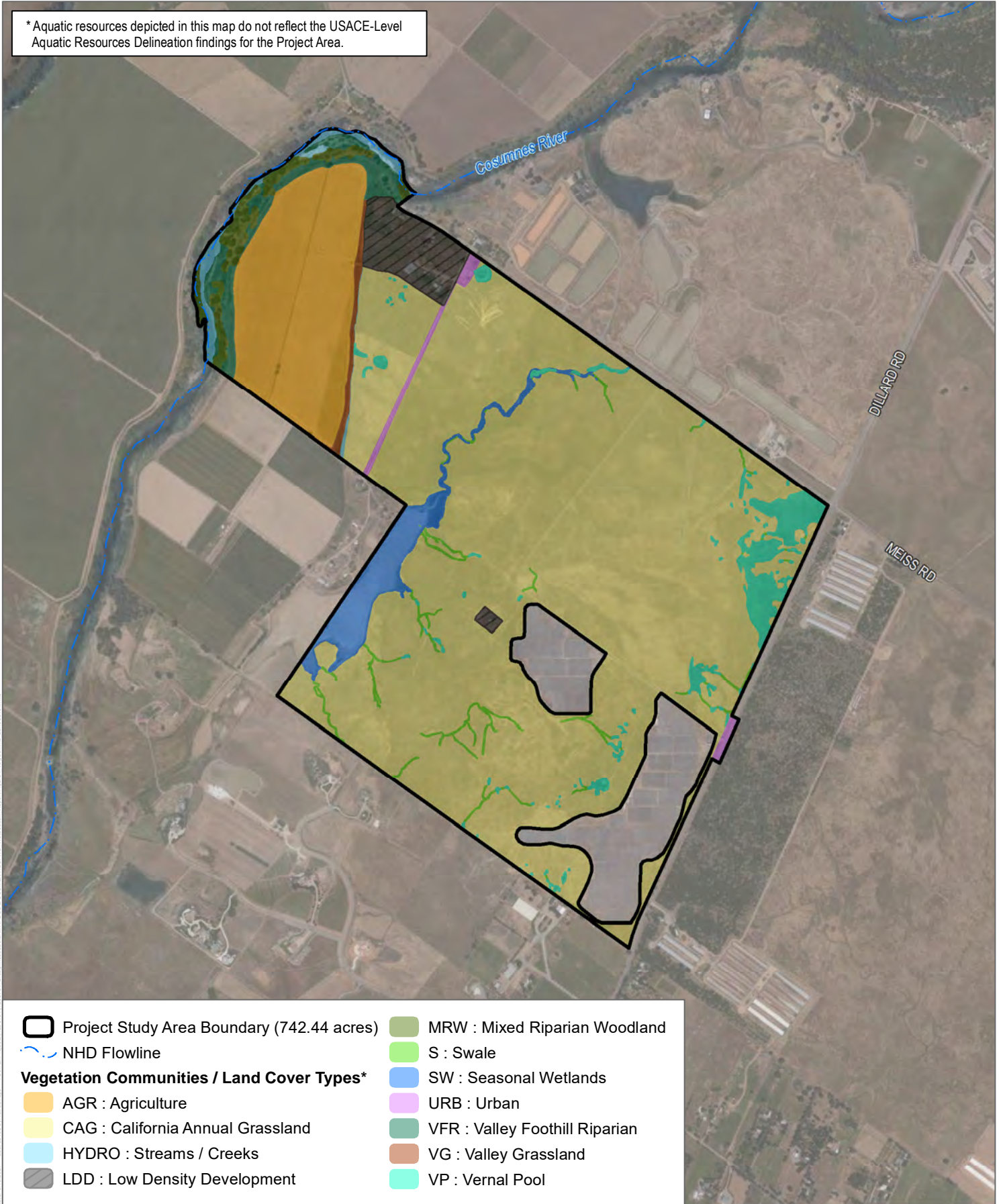


# Attachment E

---

Figure 4- Project Vegetation Communities and Land Cover

\*Aquatic resources depicted in this map do not reflect the USACE-Level Aquatic Resources Delineation findings for the Project Area.



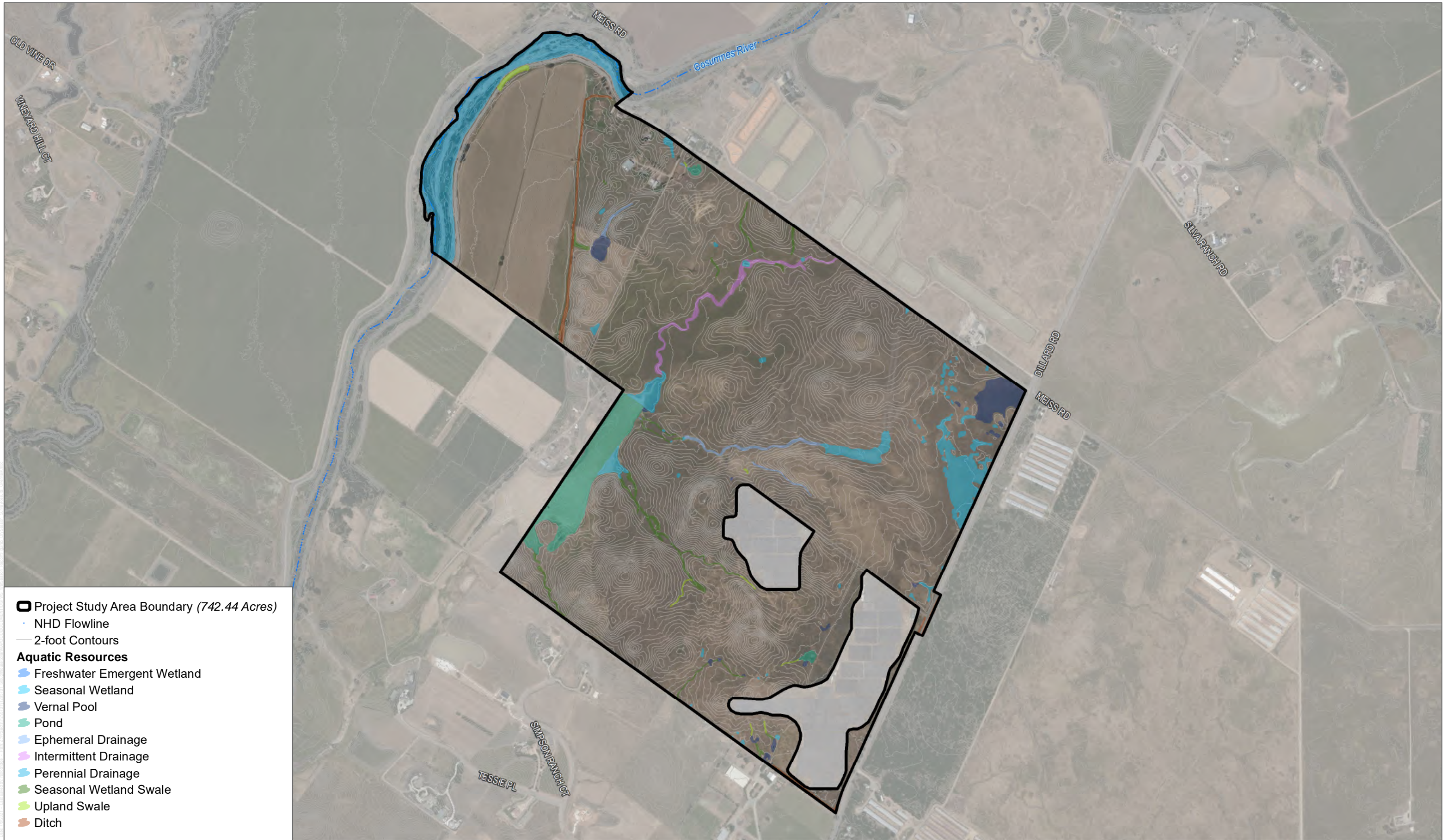
SOURCE: Bing Maps 2020, Sacramento County 2019, SSHCP 2014



# Attachment F

---

Figure 5- USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods



SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5

USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA



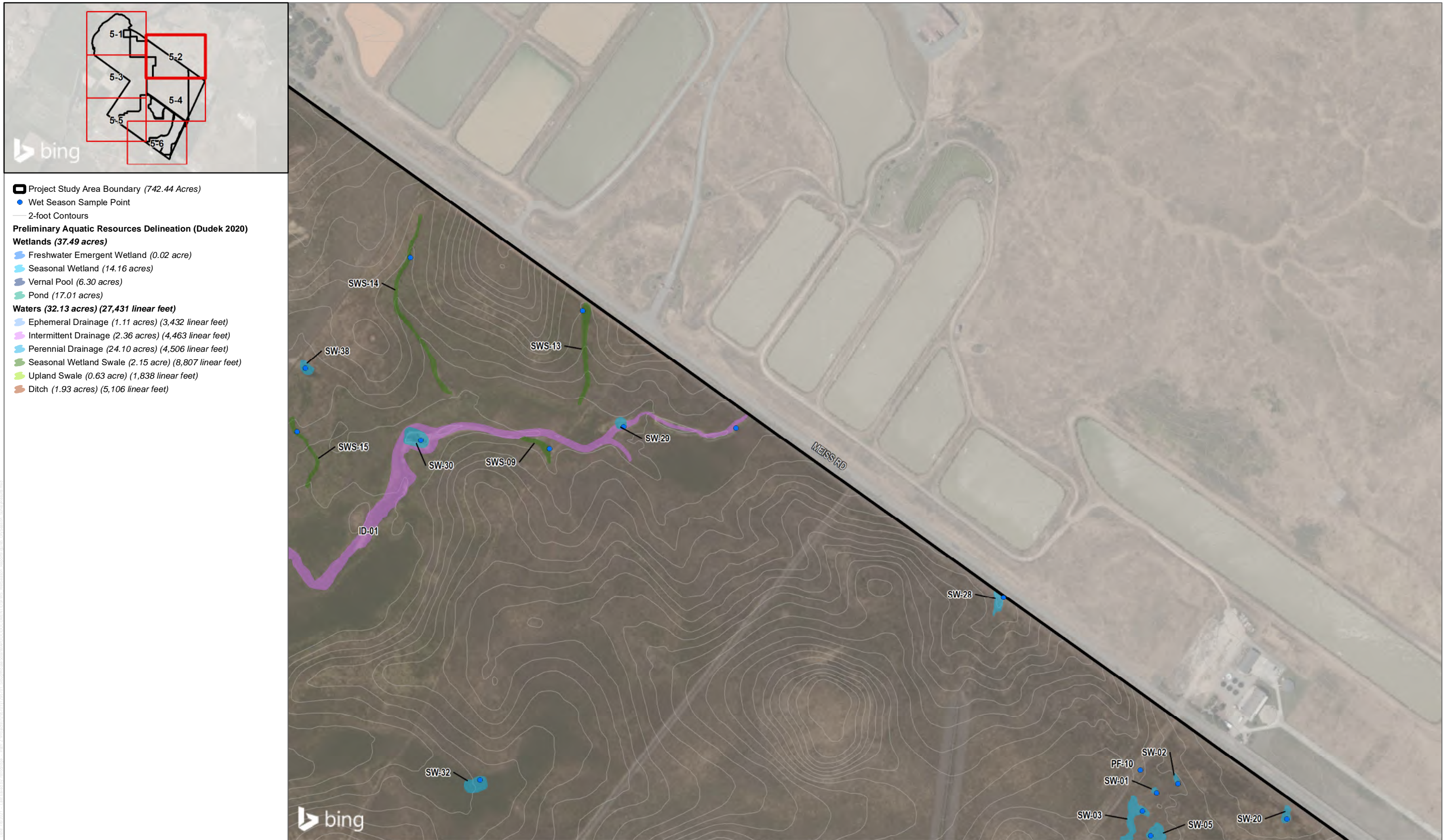
SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-1

USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA



SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-2

USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA





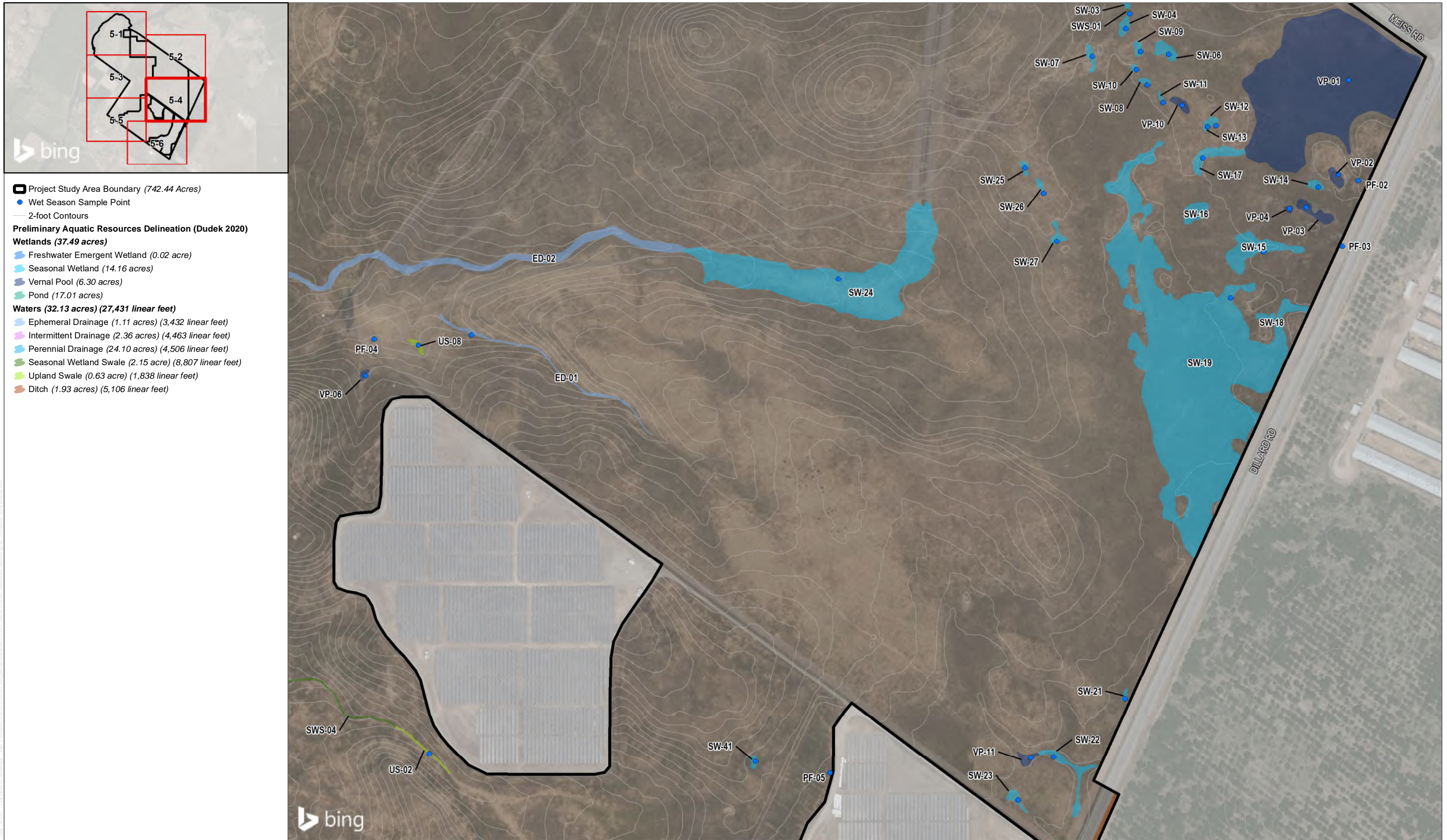
SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-3

USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA



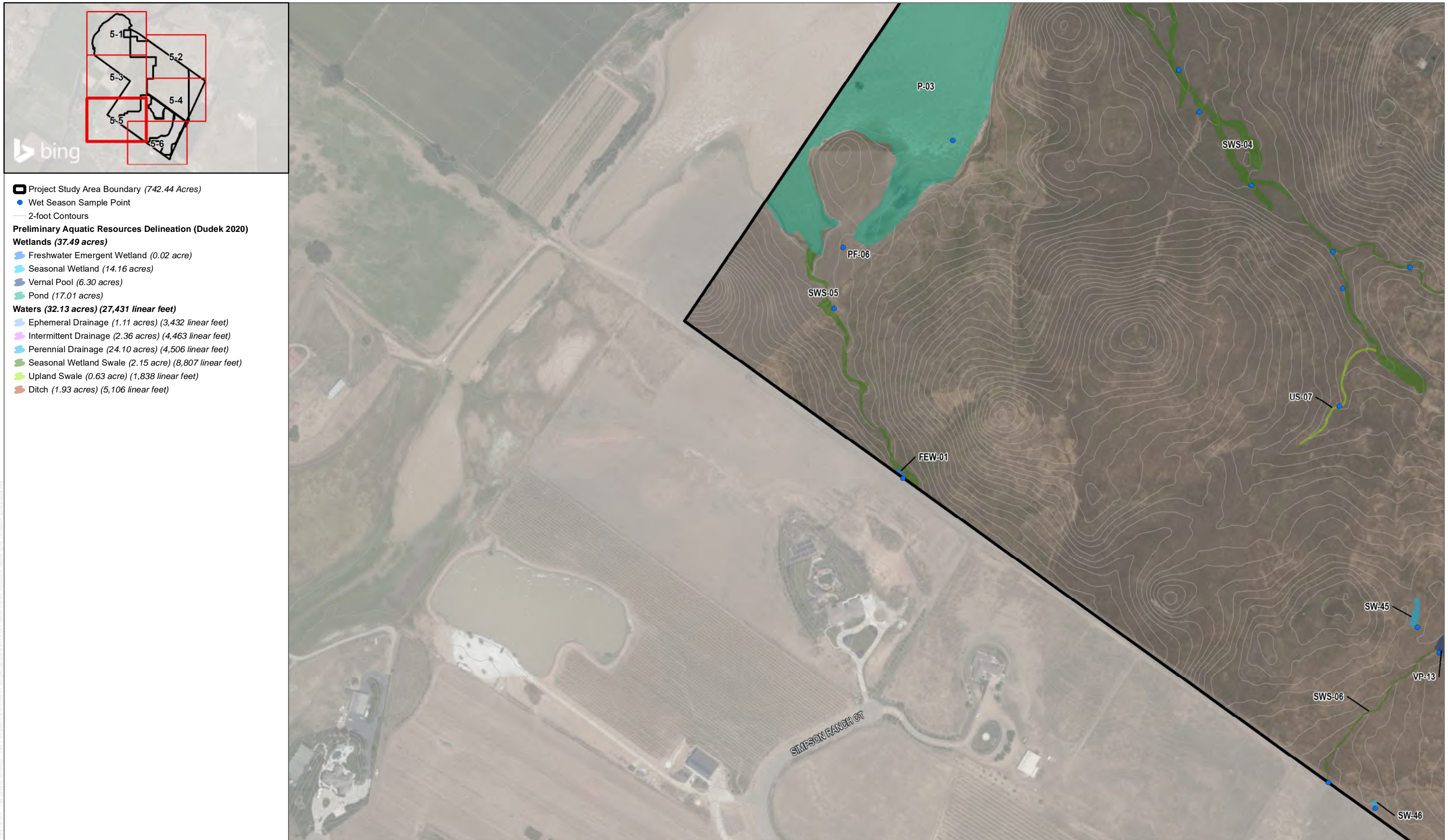
SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-4

USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods

Sloughouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA



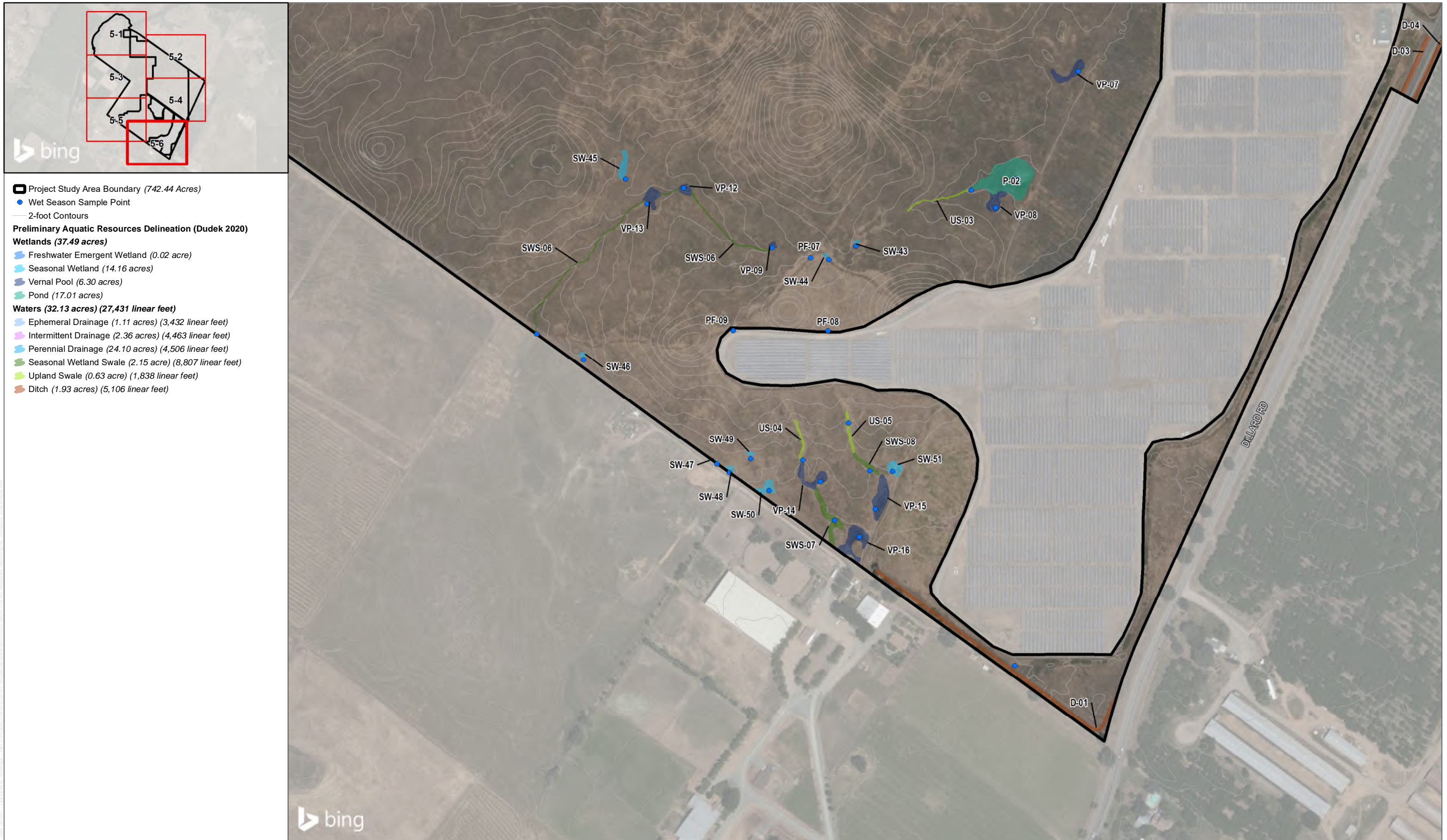
SOURCE: Bing Maps 2020, Sacramento County 2019



FIGURE 5-5

USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods

Sloughhouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA



SOURCE: Bing Maps 2020, Sacramento County 2019



**FIGURE 5-6**  
 USFWS Wet Season Protocol Survey Results for Federally Listed Branchiopods  
 Sloughhouse Solar Farm Project (Category: Other) - USFWS Wet Season Survey Report, Sacramento County, CA



# Attachment G

---

Photo Record



**Photo 1:** Representative photo of seasonal wetland in the Project study area



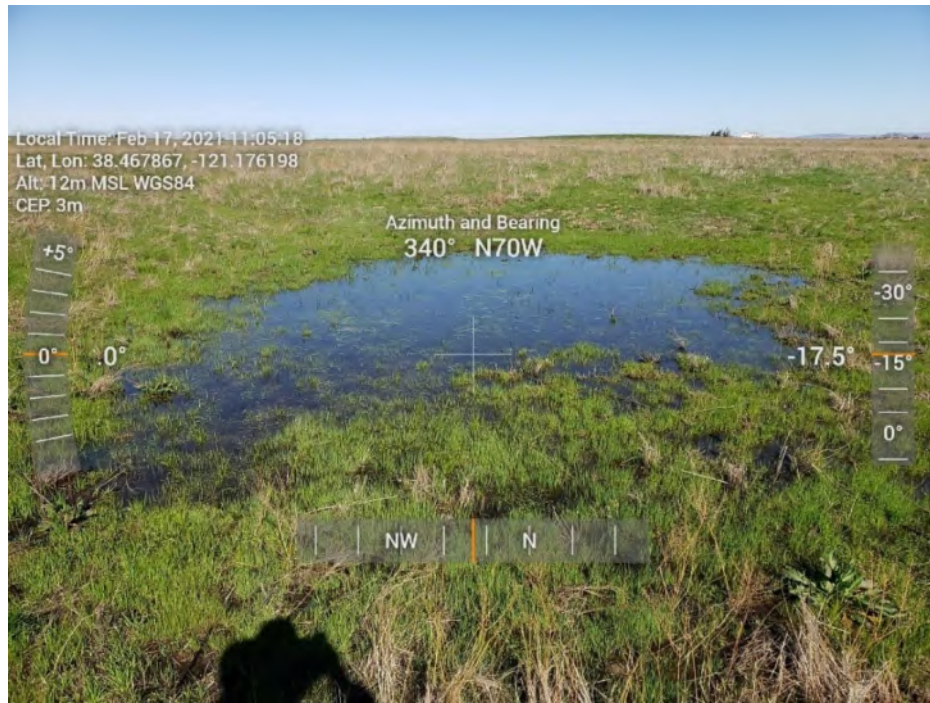
**Photo 2:** Representative photo of ephemeral drainage in the Project study area



**Photo 3:** Representative photo of seasonal wetland swale in the Project study area



**Photo 4:** Representative photo of upland swale in the Project study area



**Photo 5:** Representative photo of vernal pool in the Project study area



**Photo 6:** Representative photo of ditch in the Project study area





# Attachment H

---

USFWS Wet Season Protocol Survey Results for Federally Listed  
Branchiopods – Datasheets

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition       |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|-------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                         |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | D-01         | 4258541        | 658729        | 0           | 0          | 0.0          | 0.0           | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | D-01         | 4258541        | 658729        | 0           | 0          | 0            | 0             | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | D-01         | 4258541        | 658729        | 0           | 0          | 0            | 0             | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | D-01         | 4258541        | 658729        | 0           | 0          | 0            | 0             | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | D-01         | 4258541        | 658729        | 0           | 0          | 0            | 0             | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/15/2021 | 0800-1700 | Clear              | D-01         | 4258541        | 658729        | 0           | 0          | 0            | 0             | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/29/2021 | 0800-1700 | Clear              | D-01         | 4258541        | 658729        | 0           | 0          | 0            | 0             | 0                    | 965       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; UG      |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | D-02         | 4260535        | 657818        | 16.0        | 16.0       | 5.1          | 25.4          | 100.0                | 6,221     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: T; G: C-HG |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | D-02         | 4260535        | 657818        | 17.0        | 10.0       | 14.0         | 30.0          | 600.0                | 6,221     |             |              |          |           |           |            | x         | x                 |                      | Grassland-D: T; G: C-HG    |                         |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | D-02         | 4260535        | 657818        | 18.4        | 17.4       | 10.0         | 24.0          | 20.0                 | 6,221     |             |              |          | x         |           |            |           |                   | x                    | Grassland-D: T; G: C-HG    |                         |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | D-02         | 4260535        | 657818        | 16.4        | 15.4       | 35.0         | 60.0          | 1,000.0              | 6,221     | LIOC        |              |          | x         | x         | x          |           |                   |                      | Grassland-D: T; G: C-HG    |                         |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | D-02         | 4260535        | 657818        | 25.6        | 24.5       | 35.0         | 50.0          | 800.0                | 6,221     | LIOC        |              |          | x         | x         |            | x         |                   | x                    | Grassland-D: T; G: C-HG    |                         |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | D-02         | 4260535        | 657818        | 19.9        | 19.8       | 30.0         | 50.0          | 500.0                | 6,221     |             |              |          | x         | x         | x          | x         |                   |                      | Grassland-D: T; G: C-HG    |                         |
| D-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | D-02         | 4260535        | 657818        | 27.1        | 30.8       | 30.0         | 40.0          | 210.0                | 6,221     |             |              |          | x         | x         |            | x         |                   |                      | Grassland-D: T; G: C-HG    |                         |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |                    |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |                    |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | ED-01        | 4259744        | 658532        | 10.0        | 9.0        | 7.6          | 10.2          | 3.0                  | 286       |             |              |          |           |           |            |           |                   |                      |                            |                    | Grassland-G: C- HG |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | ED-01        | 4259744        | 658532        | 16.1        | 16.6       | 4.0          | 7.0           | 3.0                  | 286       |             |              |          |           |           |            |           |                   |                      |                            | x                  | Grassland-G: C- HG |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | ED-01        | 4259744        | 658532        | 0           | 0          | 0            | 0             | 0                    | 286       |             |              |          |           |           |            |           |                   |                      |                            |                    | Grassland-G: C- HG |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | ED-01        | 4259744        | 658532        | 0           | 0          | 0            | 0             | 0                    | 286       |             |              |          |           |           |            |           |                   |                      |                            |                    | Grassland-G: C- HG |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | ED-01        | 4259744        | 658532        | 0           | 0          | 0            | 0             | 0                    | 286       |             |              |          |           |           |            |           |                   |                      |                            |                    | Grassland-G: C- HG |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | ED-01        | 4259744        | 658532        | 0           | 0          | 0            | 0             | 0                    | 286       |             |              |          |           |           |            |           |                   |                      |                            |                    | Grassland-G: C- HG |
| ED-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | ED-01        | 4259744        | 658532        | 0           | 0          | 0            | 0             | 0                    | 286       |             |              |          |           |           |            |           |                   |                      |                            |                    | Grassland-G: C- HG |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | ED-02        | 4259832        | 658315        | 10.0        | 11.0       | 7.6          | 22.9          | 2,000.0              | 3,363     |             |              |          |           |           |            | x         |                   |                      |                            | x                  | Grassland-G: C- HG |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | ED-02        | 4259832        | 658315        | 17.4        | 16.4       | 20.0         | 40.0          | 120.0                | 3,363     |             |              |          | x         | x         | x          |           |                   | x                    | x                          | Grassland-G: C- HG |                    |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | ED-02        | 4259832        | 658315        | 17.1        | 15.7       | 8.0          | 22.0          | 26.0                 | 286       |             |              |          | x         | x         |            |           | x                 | x                    | x                          | Grassland-G: C- HG |                    |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | ED-02        | 4259832        | 658315        | 16.3        | 17.0       | 15.0         | 25.0          | 30.0                 | 3,363     |             |              |          | x         | x         | x          | x         |                   | x                    | x                          | Grassland-G: C- HG |                    |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | ED-02        | 4259832        | 658315        | 25.5        | 26.7       | 15.0         | 20.0          | 20.0                 | 3,363     |             |              |          | x         | x         |            | x         |                   | x                    |                            | Grassland-G: C- HG |                    |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | ED-02        | 4259832        | 658315        | 20.0        | 24.8       | 4.0          | 8.0           | 5.0                  | 3,363     |             |              |          |           |           | x          | x         |                   |                      |                            | Grassland-G: C- HG |                    |
| ED-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | ED-02        | 4259832        | 658315        | 24.4        | 19.8       | 20.0         | 33.0          | 29.0                 | 3,363     |             |              |          | x         |           | x          | x         |                   |                      |                            | Grassland-G: C- HG |                    |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | ED-03        | 4260675        | 657971        | 0           | 0          | 0.0          | 0.0           | 0                    | 784       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |                    |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | ED-03        | 4260675        | 657971        | 0           | 0          | 0            | 0             | 0                    | 784       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | ED-03        | 4260675        | 657971        | 0           | 0          | 0            | 0             | 0                    | 784       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | ED-03        | 4260675        | 657971        | 0           | 0          | 0            | 0             | 0                    | 784       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | ED-03        | 4260675        | 657971        | 0           | 0          | 0            | 0             | 0                    | 784       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | ED-03        | 4260675        | 657971        | 0           | 0          | 0            | 0             | 0                    | 784       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | ED-03        | 4260675        | 657971        | 0           | 0          | 0            | 0             | 0                    | 784       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | ED-04        | 4260866        | 658231        | 0           | 0          | 0.0          | 0.0           | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | ED-04        | 4260866        | 658231        | 0           | 0          | 0            | 0             | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | ED-04        | 4260866        | 658231        | 0           | 0          | 0            | 0             | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | ED-04        | 4260866        | 658231        | 0           | 0          | 0            | 0             | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | ED-04        | 4260866        | 658231        | 0           | 0          | 0            | 0             | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/15/2021 | 0800-1700 | Clear              | ED-04        | 4260866        | 658231        | 0           | 0          | 0            | 0             | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | ED-04        | 4260866        | 658231        | 0           | 0          | 0            | 0             | 0                    | 55        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | ED-05        | 4259917        | 658084        | 10.0        | 8.0        | 22.9         | 17.8          | 5.0                  | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy             | ED-05        | 4259917        | 658084        | 13.0        | 13.0       | 15.0         | 25.0          | 3.0                  | 6         |             |              |          |           |           |            |           |                   |                            | x                 | Grassland-G: C- HG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | ED-05        | 4259917        | 658084        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | ED-05        | 4259917        | 658084        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | ED-05        | 4259917        | 658084        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | ED-05        | 4259917        | 658084        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| ED-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | ED-05        | 4259917        | 658084        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | FEW-01       | 4259186        | 657792        | 0           | 0          | 0.0          | 0.0           | 0                    | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy               | FEW-01       | 4259186        | 657792        | 0           | 0          | 0            | 0             | 0                    | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | FEW-01       | 4259186        | 657792        | 0           | 0          | 0            | 0             | 0                    | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | FEW-01       | 4259186        | 657792        | 0           | 0          | 0            | 0             | 0                    | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | FEW-01       | 4259186        | 657792        | 0           | 0          | 0            | 0             | 0                    | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | FEW-01       | 4259186        | 657792        | 22.4        | 24.6       | 6.0          | 10.0          | 2.0                  | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| FEW-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 15       | Heather Moine/TE-60147A-1 | 4/29/2021 | 0800-1700 | Clear                | FEW-01       | 4259186        | 657792        | 30.2        | 25.1       | 4.0          | 8.0           | 1.0                  | 72        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Full | ID-01        | 4260515        | 658797        | 12.0        | 11.0       | 2.5          | 61.0          | 5,000.0              | 9,567     |             |              |          | x         |           | x          |           |                   | x                    | x                          | Grassland-G: C- HG |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | ID-01        | 4260515        | 658797        | 16.4        | 15.2       | 15.0         | 45.0          | 1,500.0              | 9,567     |             |              |          | x         |           | x          |           | x                 |                      | x                          | Grassland-G: C- HG |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | ID-01        | 4260515        | 658797        | 14.8        | 15.2       | 15.0         | 25.0          | 150.0                | 9,567     |             |              |          | x         |           | x          |           | x                 |                      | x                          | Grassland-G: C- HG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans                 |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-----------------------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans                 | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | ID-01        | 4260515        | 658797        | 14.5        | 18.8       | 15.0         | 35.0          | 120.0                | 9,567     |                             |              |          | x         |           | x          | x         |                   |                      | x                          | Grassland-G: C- HG |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | ID-01        | 4260515        | 658797        | 24.6        | 27.4       | 10.0         | 17.0          | 78.0                 | 9,567     |                             |              |          | x         | x         |            | x         |                   | x                    |                            | Grassland-G: C- HG |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | ID-01        | 4260515        | 658797        | 0           | 0          | 0            | 0             | 0                    | 9,567     |                             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| ID-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | ID-01        | 4260515        | 658797        | 0           | 0          | 0            | 0             | 0                    | 9,567     |                             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | P-01         | 4260846        | 658258        | 17.0        | 20.0       | 22.9         | 40.6          | 500.0                | 1,133     |                             |              |          | x         |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | P-01         | 4260846        | 658258        | 18.3        | 13.7       | 32.0         | 39.0          | 1,200.0              | 1,133     |                             |              |          | x         | x         |            |           |                   |                      |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | P-01         | 4260846        | 658258        | 17.0        | 15.5       | 20.0         | 35.0          | 75.0                 | 1,133     |                             |              |          |           | x         | x          |           |                   |                      |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | P-01         | 4260846        | 658258        | 15.7        | 18.2       | 28.0         | 42.0          | 500.0                | 1,133     |                             |              |          | x         | x         |            | x         |                   |                      |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | P-01         | 4260846        | 658258        | 16.5        | 12.9       | 20.0         | 32.0          | 350.0                | 1,133     |                             |              |          |           | x         |            | x         |                   | x                    |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/15/2021 | 0800-1700 | Clear              | P-01         | 4260846        | 658258        | 24.1        | 29.8       | 18.0         | 27.0          | 35.0                 | 1,133     |                             |              |          |           | x         |            | x         |                   |                      |                            | Grassland-G: C- HG |
| P-01                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | P-01         | 4260846        | 658258        | 28.3        | 28.6       | 15.0         | 25.0          | 335.0                | 1,133     |                             |              |          |           | x         |            | x         |                   |                      |                            | Grassland-G: C- HG |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | P-02         | 4259043        | 658725        | 12.0        | 13.0       | 35.6         | 83.8          | 160.0                | 1,498     |                             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- LG |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | P-02         | 4259043        | 658725        | 14.0        | 8.2        | 55.0         | 82.0          | 1,000.0              | 1,498     | LIOC                        |              |          | x         | x         |            |           |                   |                      | x                          | Grassland-G: C- LG |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | P-02         | 4259043        | 658725        | 11.9        | 11.6       | 30.0         | 80.0          | 150.0                | 1,498     | LIOC-male & female observed |              | x        | x         |           | x          |           |                   | x                    | x                          | Grassland-G: C- LG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                         |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|-------------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions      | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy                  | P-02         | 4259043        | 658725        | 11.5        | 12.9       | 30.0         | 55.0          | 700.0                | 1,498     | LIOC        |              | x        | x         |           |            |           |                   |                      | x                          | Grassland-G: C- LG |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                   | P-02         | 4259043        | 658725        | 19.3        | 12.9       | 40.0         | 65.0          |                      | 1,498     |             |              | x        |           | x         | x          | x         |                   |                      |                            | Grassland-G: C- HG |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/15/2021 | 0800-1700 | Clear                   | P-02         | 4259043        | 658725        | 20.9        | 18.4       | 30.0         | 50.0          | 200.0                | 1,498     |             |              | x        | x         | x         |            | x         |                   | x                    |                            | Grassland-G: C- HG |
| P-02                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                   | P-02         | 4259043        | 658725        | 29.7        | 31.4       | 40.0         | 60.0          | 120.0                | 1,498     |             |              |          |           | x         |            | x         |                   |                      |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                   | P-03         | 4259534        | 657840        | 11.0        | 12.0       | *            | *             | 10,000.0             | 66,195    |             |              |          | x         |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy                  | P-03         | 4259534        | 657840        | 12.0        | 12.1       | *            | *             | 0                    | 66,195    |             |              |          | x         | x         |            |           |                   | x                    |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                   | P-03         | 4259534        | 657840        | 18.2        | 17.5       | 100.0        | 130.0         | 66,195.0             | 66,195    |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy                  | P-03         | 4259534        | 657840        | 0           | 0          | 0            | 0             | 66,195.0             | 66,195    |             |              | x        | x         | x         |            | x         |                   | x                    |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                   | P-03         | 4259534        | 657840        | 24.7        | 24.4       | *            | *             | 66,195.0             | 66,195    |             |              |          | x         | x         | x          | x         |                   |                      |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/15/2021 | 0800-1700 | Clear                   | P-03         | 4259534        | 657840        | 21.4        | 23.5       | *            | *             | 65,000.0             | 66,195    |             |              |          |           | x         |            | x         |                   | x                    |                            | Grassland-G: C- HG |
| P-03                                                             | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/29/2021 | 0800-1700 | Clear                   | P-03         | 4259534        | 657840        | 29.3        | 29.8       | *            | *             | 43,000.0             | 66,195    |             |              |          |           | x         |            | x         |                   |                      |                            | Grassland-G: C- HG |
| PF-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Drizzle | PF-01        | 4259908        | 658234        | 12.0        | 13.0       | 12.7         | 22.9          | 20.0                 | 20        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| PF-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                   | PF-01        | 4259908        | 658234        | 17.1        | 17.5       | 10.0         | 18.0          | 10.0                 | 20        |             |              |          | x         | x         |            |           |                   |                      |                            | Grassland-G: C- MG |
| PF-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy                  | PF-01        | 4259908        | 658234        | 0           | 0          | 0            | 0             | 0                    | 20        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| PF-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                   | PF-01        | 4259908        | 658234        | 0           | 0          | 0            | 0             | 0                    | 20        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |

C cattle  
CYCA *Cyzicus californicus*  
D ditch  
D disturbed

ED ephemeral drainage  
FEW freshwater emergent wetland  
G grazed  
H horse

HG heavy grazing  
ID intermittent drainage  
LG light grazing  
LIOC *Linderiella occidentalis*

MG moderate grazing  
P pond  
P plowed  
PF ponded feature

PSRE *Pseudacris regilla*  
SW seasonal wetland  
SWS seasonal wetland swale  
T trash

TT tire tracks  
UG ungrazed  
US upland swale  
VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                              |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|------------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae         |
| PF-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-01        | 4259908        | 658234        | 0           | 0          | 0            | 0             | 0                    | 20        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG           |
| PF-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-01        | 4259908        | 658234        | 0           | 0          | 0            | 0             | 0                    | 20        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG           |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | PF-02        | 4259913        | 659444        | 13.0        | 13.0       | 5.1          | 7.6           | 5.0                  | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | PF-02        | 4259913        | 659444        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | PF-02        | 4259913        | 659444        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | PF-02        | 4259913        | 659444        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | PF-02        | 4259913        | 659444        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-02        | 4259913        | 659444        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-02        | 4259913        | 659444        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: T; G: C- LG     |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | PF-03        | 4259845        | 659428        | 11.0        | 10.0       | 5.1          | 12.7          | 25.0                 | 25        |             |              |          |           |           |            | x         |                   |                            |                   | Grassland-D: TT; G: C- LG    |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | PF-03        | 4259845        | 659428        | 12.2        | 11.4       | 6.0          | 14.0          | 9.0                  | 25        |             |              |          | x         | x         | x          |           |                   |                            |                   | Grassland-D: TT; G: C- LG    |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | PF-03        | 4259845        | 659428        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- LG    |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | PF-03        | 4259845        | 659428        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- LG    |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | PF-03        | 4259845        | 659428        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P, TT; G: C- LG |

- |      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |



ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                              |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|------------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae         |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-03        | 4259845        | 659428        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P, TT; G: C- LG |
| PF-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-03        | 4259845        | 659428        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P, TT; G: C- LG |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | PF-04        | 4259739        | 658432        | 10.0        | 8.0        | 10.2         | 12.7          | 5.0                  | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | PF-04        | 4259739        | 658432        | 16.2        | 13.7       | 6.0          | 13.0          | 6.0                  | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | PF-04        | 4259739        | 658432        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | PF-04        | 4259739        | 658432        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | PF-04        | 4259739        | 658432        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-04        | 4259739        | 658432        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-04        | 4259739        | 658432        | 0           | 0          | 0            | 0             | 0                    | 6         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG           |
| PF-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | PF-05        | 4259297        | 658907        | 12.2        | 9.6        | 3.0          | 8.0           | 5.0                  | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG           |
| PF-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | PF-05        | 4259297        | 658907        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG           |
| PF-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | PF-05        | 4259297        | 658907        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG           |
| PF-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | PF-05        | 4259297        | 658907        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG           |
| PF-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-05        | 4259297        | 658907        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG           |
| PF-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-05        | 4259297        | 658907        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG           |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | PF-06        | 4259423        | 657728        | 11.0        | 13.0       | 7.6          | 12.7          | 5.0                  | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy             | PF-06        | 4259423        | 657728        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | PF-06        | 4259423        | 657728        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | PF-06        | 4259423        | 657728        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | PF-06        | 4259423        | 657728        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-06        | 4259423        | 657728        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/29/2021 | 0800-1700 | Clear              | PF-06        | 4259423        | 657728        | 0           | 0          | *            | *             | 0                    | 5         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| PF-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | PF-07        | 4258959        | 658514        | 17.9        | 14.7       | 3.0          | 6.0           | 1.0                  | 1         |             |              |          | x         | x         |            |           |                   |                            | x                 | Grassland-G: C- LG   |
| PF-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | PF-07        | 4258959        | 658514        | 0           | 0          | 0            | 0             | 0                    | 1         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| PF-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | PF-07        | 4258959        | 658514        | 0           | 0          | 0            | 0             | 0                    | 1         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| PF-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | PF-07        | 4258959        | 658514        | 0           | 0          | 0            | 0             | 0                    | 1         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| PF-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-07        | 4258959        | 658514        | 0           | 0          | 0            | 0             | 0                    | 1         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| PF-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-07        | 4258959        | 658514        | 0           | 0          | 0            | 0             | 0                    | 1         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | PF-08        | 4258884        | 658533        | 18.0        | 19.0       | 12.7         | 17.8          | 10.0                 | 10        |             |              |          |           |           | x          |           |                   |                            |                   | Grassland-G: C- MG   |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | PF-08        | 4258884        | 658533        | 15.0        | 9.0        | 3.0          | 8.0           | 8.0                  | 10        |             |              |          |           | x         |            |           |                   |                            | x                 | Grassland-G: C- MG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | PF-08        | 4258884        | 658533        | 0           | 0          | 0            | 0             | 0                    | 10        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | PF-08        | 4258884        | 658533        | 0           | 0          | 0            | 0             | 0                    | 10        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | PF-08        | 4258884        | 658533        | 0           | 0          | 0            | 0             | 0                    | 10        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-08        | 4258884        | 658533        | 0           | 0          | 0            | 0             | 0                    | 10        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| PF-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-08        | 4258884        | 658533        | 0           | 0          | 0            | 0             | 0                    | 10        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | PF-09        | 4258883        | 658436        | 16.0        | 18.0       | 2.5          | 10.2          | 2.0                  | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | PF-09        | 4258883        | 658436        | 0           | 0          | 0            | 0             | 0                    | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | PF-09        | 4258883        | 658436        | 0           | 0          | 0            | 0             | 0                    | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | PF-09        | 4258883        | 658436        | 0           | 0          | 0            | 0             | 0                    | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | PF-09        | 4258883        | 658436        | 0           | 0          | 0            | 0             | 0                    | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-09        | 4258883        | 658436        | 0           | 0          | 0            | 0             | 0                    | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-09        | 4258883        | 658436        | 0           | 0          | 0            | 0             | 0                    | 2         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | PF-10        | 4260167        | 659217        | 10.0        | 8.0        | 5.1          | 7.6           | 3.0                  | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | PF-10        | 4260167        | 659217        | 10.1        | 8.8        | 3.0          | 5.0           | 4.0                  | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | PF-10        | 4260167        | 659217        | 0           | 0          | 0            | 0             | 0                    | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | PF-10        | 4260167        | 659217        | 0           | 0          | 0            | 0             | 0                    | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | PF-10        | 4260167        | 659217        | 0           | 0          | 0            | 0             | 0                    | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | PF-10        | 4260167        | 659217        | 0           | 0          | 0            | 0             | 0                    | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| PF-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | PF-10        | 4260167        | 659217        | 0           | 0          | 0            | 0             | 0                    | 4         |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-01        | 4260144        | 659234        | 0           | 0          | 0.0          | 0.0           | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-01        | 4260144        | 659234        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-01        | 4260144        | 659234        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-01        | 4260144        | 659234        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-01        | 4260144        | 659234        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-01        | 4260144        | 659234        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-01        | 4260144        | 659234        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-02        | 4260153        | 659255        | 0           | 0          | 0.0          | 0.0           | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-02        | 4260153        | 659255        | 0           | 0          | 0            | 0             | 0                    | 34        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-02        | 4260153        | 659255        | 0           | 0          | 0            | 0             | 0                    | 34        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-02        | 4260153        | 659255        | 0           | 0          | 0            | 0             | 0                    | 34        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-02        | 4260153        | 659255        | 0           | 0          | 0            | 0             | 0                    | 34        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-02        | 4260153        | 659255        | 0           | 0          | 0            | 0             | 0                    | 34        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-02        | 4260153        | 659255        | 0           | 0          | 0            | 0             | 0                    | 34        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-03        | 4260125        | 659219        | 0           | 0          | 0.0          | 0.0           | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-03        | 4260125        | 659219        | 0           | 0          | 0            | 0             | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-03        | 4260125        | 659219        | 0           | 0          | 0            | 0             | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-03        | 4260125        | 659219        | 0           | 0          | 0            | 0             | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-03        | 4260125        | 659219        | 0           | 0          | 0            | 0             | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-03        | 4260125        | 659219        | 0           | 0          | 0            | 0             | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-03        | 4260125        | 659219        | 0           | 0          | 0            | 0             | 0                    | 467       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-04        | 4260067        | 659203        | 0           | 0          | 0.0          | 0.0           | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-04        | 4260067        | 659203        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-04        | 4260067        | 659203        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |                    |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |                    |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-04        | 4260067        | 659203        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |                    |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-04        | 4260067        | 659203        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-04        | 4260067        | 659203        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-04        | 4260067        | 659203        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-05        | 4260100        | 659228        | 0           | 0          | 0.0          | 0.0           | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-05        | 4260100        | 659228        | 0           | 0          | 0            | 0             | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-05        | 4260100        | 659228        | 0           | 0          | 0            | 0             | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-05        | 4260100        | 659228        | 0           | 0          | 0            | 0             | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-05        | 4260100        | 659228        | 0           | 0          | 0            | 0             | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-05        | 4260100        | 659228        | 0           | 0          | 0            | 0             | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-05        | 4260100        | 659228        | 0           | 0          | 0            | 0             | 0                    | 249       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-06        | 4260041        | 659247        | 0           | 0          | 0.0          | 0.0           | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-06        | 4260041        | 659247        | 0           | 0          | 0            | 0             | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-06        | 4260041        | 659247        | 0           | 0          | 0            | 0             | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-06        | 4260041        | 659247        | 0           | 0          | 0            | 0             | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-06        | 4260041        | 659247        | 0           | 0          | 0            | 0             | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-06        | 4260041        | 659247        | 0           | 0          | 0            | 0             | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-06        | 4260041        | 659247        | 0           | 0          | 0            | 0             | 0                    | 262       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-07        | 4260037        | 659168        | 12.5        | 15.4       | 5.1          | 12.7          | 4.0                  | 135       |             |              |          |           |           | x          |           |                   |                            |                   | Grassland-D: TT; G: C- MG |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-07        | 4260037        | 659168        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-07        | 4260037        | 659168        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-07        | 4260037        | 659168        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-07        | 4260037        | 659168        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-07        | 4260037        | 659168        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-07        | 4260037        | 659168        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-08        | 4260009        | 659225        | 0           | 0          | 0.0          | 0.0           | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-08        | 4260009        | 659225        | 0           | 0          | 0            | 0             | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-08        | 4260009        | 659225        | 0           | 0          | 0            | 0             | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-08        | 4260009        | 659225        | 0           | 0          | 0            | 0             | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-08        | 4260009        | 659225        | 0           | 0          | 0            | 0             | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |                    |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |                    |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-08        | 4260009        | 659225        | 0           | 0          | 0            | 0             | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |                    |
| SW-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-08        | 4260009        | 659225        | 0           | 0          | 0            | 0             | 0                    | 59        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-09        | 4260043        | 659218        | 0           | 0          | 0.0          | 0.0           | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-09        | 4260043        | 659218        | 0           | 0          | 0            | 0             | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Clear              | SW-09        | 4260043        | 659218        | 0           | 0          | 0            | 0             | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-09        | 4260043        | 659218        | 0           | 0          | 0            | 0             | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-09        | 4260043        | 659218        | 0           | 0          | 0            | 0             | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-09        | 4260043        | 659218        | 0           | 0          | 0            | 0             | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-09        | 4260043        | 659218        | 0           | 0          | 0            | 0             | 0                    | 97        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-10        | 4260025        | 659214        | 0           | 0          | 0.0          | 0.0           | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-10        | 4260025        | 659214        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-10        | 4260025        | 659214        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-10        | 4260025        | 659214        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-10        | 4260025        | 659214        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-10        | 4260025        | 659214        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool



ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition  |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|--------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                    | Diptera Chironomidae |
| SW-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-10        | 4260025        | 659214        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            | Grassland-G: C- MG |                      |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-11        | 4259991        | 659242        | 0           | 0          | 0.0          | 0.0           | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-11        | 4259991        | 659242        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-11        | 4259991        | 659242        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-11        | 4259991        | 659242        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-11        | 4259991        | 659242        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-11        | 4259991        | 659242        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-11        | 4259991        | 659242        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-12        | 4259967        | 659297        | 0           | 0          | 0.0          | 0.0           | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-12        | 4259967        | 659297        | 0           | 0          | 0            | 0             | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-12        | 4259967        | 659297        | 0           | 0          | 0            | 0             | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-12        | 4259967        | 659297        | 0           | 0          | 0            | 0             | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-12        | 4259967        | 659297        | 0           | 0          | 0            | 0             | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-12        | 4259967        | 659297        | 0           | 0          | 0            | 0             | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-12        | 4259967        | 659297        | 0           | 0          | 0            | 0             | 0                    | 66        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |                    |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |                    |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-13        | 4259966        | 659288        | 0           | 0          | 0.0          | 0.0           | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |                    |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-13        | 4259966        | 659288        | 0           | 0          | 0            | 0             | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-13        | 4259966        | 659288        | 0           | 0          | 0            | 0             | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-13        | 4259966        | 659288        | 0           | 0          | 0            | 0             | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-13        | 4259966        | 659288        | 0           | 0          | 0            | 0             | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-13        | 4259966        | 659288        | 0           | 0          | 0            | 0             | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-13        | 4259966        | 659288        | 0           | 0          | 0            | 0             | 0                    | 45        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-14        | 4259906        | 659402        | 0           | 0          | 0.0          | 0.0           | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-14        | 4259906        | 659402        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-14        | 4259906        | 659402        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-14        | 4259906        | 659402        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-14        | 4259906        | 659402        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-14        | 4259906        | 659402        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-14        | 4259906        | 659402        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-15        | 4259838        | 659347        | 14.0        | 17.0       | 7.6          | 17.8          | 20.0                 | 1,169     |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-15        | 4259838        | 659347        | 11.8        | 10.5       | 10.0         | 16.0          | 9.0                  | 1,169     |             |              |          |           | x         |            |           |                   |                      | x                          | Grassland-G: C- MG |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-15        | 4259838        | 659347        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-15        | 4259838        | 659347        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-15        | 4259838        | 659347        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-15        | 4259838        | 659347        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-15        | 4259838        | 659347        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-16        | 4259874        | 659276        | 0           | 0          | 0.0          | 0.0           | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-16        | 4259874        | 659276        | 0           | 0          | 0            | 0             | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-16        | 4259874        | 659276        | 0           | 0          | 0            | 0             | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-16        | 4259874        | 659276        | 0           | 0          | 0            | 0             | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-16        | 4259874        | 659276        | 0           | 0          | 0            | 0             | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-16        | 4259874        | 659276        | 0           | 0          | 0            | 0             | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-16        | 4259874        | 659276        | 0           | 0          | 0            | 0             | 0                    | 367       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-17        | 4259934        | 659283        | 13.0        | 16.0       | 5.1          | 12.7          | 15.0                 | 492       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-17        | 4259934        | 659283        | 0           | 0          | 0            | 0             | 0                    | 492       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-17        | 4259934        | 659283        | 0           | 0          | 0            | 0             | 0                    | 492       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-17        | 4259934        | 659283        | 0           | 0          | 0            | 0             | 0                    | 492       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-17        | 4259934        | 659283        | 0           | 0          | 0            | 0             | 0                    | 492       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-17        | 4259934        | 659283        | 0           | 0          | 0            | 0             | 0                    | 492       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-17        | 4259934        | 659283        | 0           | 0          | 0            | 0             | 0                    | 492       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-18        | 4259767        | 659363        | 15.0        | 17.0       | 5.1          | 10.2          | 10.0                 | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-18        | 4259767        | 659363        | 0           | 0          | 0            | 0             | 0                    | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-18        | 4259767        | 659363        | 0           | 0          | 0            | 0             | 0                    | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-18        | 4259767        | 659363        | 0           | 0          | 0            | 0             | 0                    | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-18        | 4259767        | 659363        | 0           | 0          | 0            | 0             | 0                    | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-18        | 4259767        | 659363        | 0           | 0          | 0            | 0             | 0                    | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-18                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-18        | 4259767        | 659363        | 0           | 0          | 0            | 0             | 0                    | 537       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-19        | 4259790        | 659314        | 15.0        | 17.0       | 5.1          | 10.2          | 5.0                  | 27,471    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-19        | 4259790        | 659314        | 0           | 0          | 0            | 0             | 0                    | 27,471    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-19        | 4259790        | 659314        | 0           | 0          | 0            | 0             | 0                    | 27,471    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |                    |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |                    |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-19        | 4259790        | 659314        | 0           | 0          | 0            | 0             | 0                    | 27,471    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |                    |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-19        | 4259790        | 659314        | 0           | 0          | 0            | 0             | 0                    | 27,471    |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-19        | 4259790        | 659314        | 0           | 0          | 0            | 0             | 0                    | 27,471    |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-19                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-19        | 4259790        | 659314        | 0           | 0          | 0            | 0             | 0                    | 27,471    |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-20                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-20        | 4260118        | 659368        | 0           | 0          | 0            | 0             | 0                    | 110       |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- MG |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-21        | 4259376        | 659209        | 0           | 0          | 0.0          | 0.0           | 0                    | 31        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- LG |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-21        | 4259376        | 659209        | 0           | 0          | 0            | 0             | 0                    | 31        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- LG |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-21        | 4259376        | 659209        | 0           | 0          | 0            | 0             | 0                    | 31        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- LG |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-21        | 4259376        | 659209        | 0           | 0          | 0            | 0             | 0                    | 31        |             |              |          |           |           |            |           |                   |                            |                   |                      | Grassland-G: C- LG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudocris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-21        | 4259376        | 659209        | 0           | 0          | 0            | 0             | 0                    | 31        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-21        | 4259376        | 659209        | 0           | 0          | 0            | 0             | 0                    | 31        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG |
| SW-21                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-21        | 4259376        | 659209        | 0           | 0          | 0            | 0             | 0                    | 31        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-22        | 4259316        | 659136        | 11.0        | 10.0       | 5.1          | 12.7          | 3.0                  | 377       |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- MG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-22        | 4259316        | 659136        | 13.6        | 12.8       | 6.0          | 10.0          | 6.0                  | 377       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-22        | 4259316        | 659136        | 0           | 0          | 0            | 0             | 0                    | 377       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-22        | 4259316        | 659136        | 0           | 0          | 0            | 0             | 0                    | 377       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-22        | 4259316        | 659136        | 0           | 0          | 0            | 0             | 0                    | 377       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-22        | 4259316        | 659136        | 0           | 0          | 0            | 0             | 0                    | 377       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-22                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-22        | 4259316        | 659136        | 0           | 0          | 0            | 0             | 0                    | 377       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-23        | 4259271        | 659100        | 11.0        | 11.0       | 5.1          | 7.6           | 1.0                  | 133       |             |              | x        | x         | x         | x          | x         | x                 | x                    | x                          | Grassland-G: C- MG |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-23        | 4259271        | 659100        | 0           | 0          | 0            | 0             | 0                    | 133       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-23        | 4259271        | 659100        | 0           | 0          | 0            | 0             | 0                    | 133       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-23        | 4259271        | 659100        | 0           | 0          | 0            | 0             | 0                    | 133       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-23        | 4259271        | 659100        | 0           | 0          | 0            | 0             | 0                    | 133       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudocris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-23        | 4259271        | 659100        | 0           | 0          | 0            | 0             | 0                    | 133       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-23                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-23        | 4259271        | 659100        | 0           | 0          | 0            | 0             | 0                    | 133       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-24        | 4259806        | 658909        | 9.0         | 7.0        | 10.2         | 20.3          | 25.0                 | 10,099    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-24        | 4259806        | 658909        | 16.2        | 15.9       | 12.0         | 17.0          | 13.0                 | 10,099    |             |              |          |           | x         |            |           |                   |                            | x                 | Grassland-G: C- HG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-24        | 4259806        | 658909        | 0           | 0          | 0            | 0             | 0                    | 10,099    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-24        | 4259806        | 658909        | 0           | 0          | 0            | 0             | 0                    | 10,099    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-24        | 4259806        | 658909        | 0           | 0          | 0            | 0             | 0                    | 10,099    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-24        | 4259806        | 658909        | 0           | 0          | 0            | 0             | 0                    | 10,099    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-24                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-24        | 4259806        | 658909        | 0           | 0          | 0            | 0             | 0                    | 10,099    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-25        | 4259922        | 659100        | 0           | 0          | 0.0          | 0.0           | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-25        | 4259922        | 659100        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-25        | 4259922        | 659100        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-25        | 4259922        | 659100        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-25        | 4259922        | 659100        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-25        | 4259922        | 659100        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition  |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|--------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                    | Diptera Chironomidae |
| SW-25                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-25        | 4259922        | 659100        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            | Grassland-G: C- LG |                      |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-26        | 4259896        | 659120        | 0           | 0          | 0.0          | 0.0           | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-26        | 4259896        | 659120        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-26        | 4259896        | 659120        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-26        | 4259896        | 659120        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-26        | 4259896        | 659120        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-26        | 4259896        | 659120        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-26                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-26        | 4259896        | 659120        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- LG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-27        | 4259847        | 659134        | 0           | 0          | 0.0          | 0.0           | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SW-27        | 4259847        | 659134        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-27        | 4259847        | 659134        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-27        | 4259847        | 659134        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-27        | 4259847        | 659134        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-27        | 4259847        | 659134        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |
| SW-27                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-27        | 4259847        | 659134        | 0           | 0          | 0            | 0             | 0                    | 142       |             |              |          |           |           |            |           |                   |                            |                    | Grassland-G: C- MG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |



ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                          |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|--------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae     |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Full | SW-28        | 4260343        | 659074        | 11.0        | 11.0       | 17.8         | 43.2          | 100.0                | 154       |             |              |          |           |           | x          |           |                   |                            |                   | Grassland-G: C- MG       |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | SW-28        | 4260343        | 659074        | 16.1        | 15.5       | 18.0         | 38.0          | 36.0                 | 154       | LIOC        |              |          | x         | x         | x          |           |                   |                            | x                 | Grassland-G: C- MG       |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SW-28        | 4260343        | 659074        | 17.1        | 13.5       | 7.0          | 15.0          | 12.0                 | 154       |             |              |          | x         | x         | x          |           |                   | x                          | x                 | Grassland-G: C- MG       |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SW-28        | 4260343        | 659074        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG       |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SW-28        | 4260343        | 659074        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P; G: C- MG |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-28        | 4260343        | 659074        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P; G: C- MG |
| SW-28                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-28        | 4260343        | 659074        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P; G: C- MG |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Full | SW-29        | 4260515        | 658681        | 11.0        | 11.0       | 22.9         | 43.2          | 96.0                 | 96        |             |              |          | x         |           | x          |           |                   | x                          |                   | Grassland-G: C- MG       |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | SW-29        | 4260515        | 658681        | 0           | 0          | 0            | 0             | 0                    | 96        |             |              |          |           |           | x          |           | x                 |                            |                   | Grassland-G: C- MG       |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SW-29        | 4260515        | 658681        | 17.2        | 15.5       | 24.0         | 30.0          | 25.0                 | 96        |             |              |          |           |           | x          |           | x                 | x                          |                   | Grassland-G: C- MG       |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SW-29        | 4260515        | 658681        | 15.7        | 19.6       | 20.0         | 28.0          | 25.0                 | 96        |             |              |          | x         |           | x          | x         |                   |                            |                   | Grassland-G: C- MG       |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SW-29        | 4260515        | 658681        | 26.0        | 25.1       | 15.0         | 30.0          | 15.0                 | 96        |             |              |          | x         | x         |            | x         |                   |                            |                   | Grassland-G: C- MG       |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-29        | 4260515        | 658681        | 0           | 0          | 0            | 0             | 0                    | 96        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG       |
| SW-29                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-29        | 4260515        | 658681        | 0           | 0          | 0            | 0             | 0                    | 96        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG       |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Full | SW-30        | 4260499        | 658472        | 12.0        | 11.0       | 20.3         | 43.2          | 300.0                | 381       |             |              |          | x         |           | x          |           |                   |                      |                            | Grassland-G: C- MG |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | SW-30        | 4260499        | 658472        | 17.2        | 15.5       | 30.0         | 48.0          | 40.0                 | 381       |             |              |          | x         |           | x          |           |                   |                      |                            | Grassland-G: C- MG |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SW-30        | 4260499        | 658472        | 15.1        | 13.3       | 10.0         | 25.0          | 30.0                 | 381       |             |              |          | x         | x         |            |           |                   |                      | x                          | Grassland-G: C- MG |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SW-30        | 4260499        | 658472        | 13.3        | 19.7       | 20.0         | 25.0          | 20.0                 | 381       |             |              |          | x         | x         |            |           |                   |                      | x                          | Grassland-G: C- MG |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SW-30        | 4260499        | 658472        | 24.0        | 26.6       | 5.0          | 10.0          | 1.0                  | 381       |             |              |          | x         | x         | x          |           |                   | x                    | x                          | Grassland-G: C- MG |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-30        | 4260499        | 658472        | 0           | 0          | 0            | 0             | 0                    | 381       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-30                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-30        | 4260499        | 658472        | 0           | 0          | 0            | 0             | 0                    | 381       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy               | SW-31        | 4259990        | 658104        | 12.0        | 13.0       | 10.2         | 17.8          | 50.0                 | 6,852     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | SW-31        | 4259990        | 658104        | 15.8        | 14.6       | 8.0          | 15.0          | 9.0                  | 6,852     |             |              |          | x         |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SW-31        | 4259990        | 658104        | 0           | 0          | 0            | 0             | 0                    | 6,852     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SW-31        | 4259990        | 658104        | 0           | 0          | 0            | 0             | 0                    | 6,852     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SW-31        | 4259990        | 658104        | 0           | 0          | 0            | 0             | 0                    | 6,852     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-31        | 4259990        | 658104        | 0           | 0          | 0            | 0             | 0                    | 6,852     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-31                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-31        | 4259990        | 658104        | 0           | 0          | 0            | 0             | 0                    | 6,852     |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SW-32        | 4260149        | 658537        | 0           | 0          | 0.0          | 0.0           | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                         |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|-------------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions      | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                   | SW-32        | 4260149        | 658537        | 0           | 0          | 0            | 0             | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy                  | SW-32        | 4260149        | 658537        | 0           | 0          | 0            | 0             | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy                  | SW-32        | 4260149        | 658537        | 0           | 0          | 0            | 0             | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                   | SW-32        | 4260149        | 658537        | 0           | 0          | 0            | 0             | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                   | SW-32        | 4260149        | 658537        | 0           | 0          | 0            | 0             | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-32                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                   | SW-32        | 4260149        | 658537        | 0           | 0          | 0            | 0             | 0                    | 287       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Drizzle | SW-33        | 4259851        | 658249        | 12.0        | 13.0       | 20.3         | 35.6          | 101.0                | 101       |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy                  | SW-33        | 4259851        | 658249        | 12.0        | 14.0       | 12.0         | 26.0          | 30.0                 | 101       |             |              |          | x         | x         |            |           | x                 |                      |                            | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                   | SW-33        | 4259851        | 658249        | 15.8        | 18.9       | 20.0         | 30.0          | 20.0                 | 101       |             |              |          | x         | x         |            |           |                   | x                    |                            | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy                  | SW-33        | 4259851        | 658249        | 15.3        | 14.1       | 15.0         | 25.0          | 0                    | 101       |             |              |          | x         | x         |            |           |                   | x                    | x                          | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                   | SW-33        | 4259851        | 658249        | 22.6        | 21.7       | 7.0          | 13.0          | 1.0                  | 101       |             |              |          | x         | x         | x          |           |                   | x                    |                            | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                   | SW-33        | 4259851        | 658249        | 0           | 0          | 0            | 0             | 0                    | 101       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-33                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                   | SW-33        | 4259851        | 658249        | 29.9        | 30.2       | 15.0         | 25.0          | 20.0                 | 101       |             |              |          |           |           |            | x         |                   |                      |                            | Grassland-G: C- HG |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                   | SW-34        | 4259834        | 658196        | 10.0        | 8.0        | 12.7         | 25.4          | 10.0                 | 14        |             |              | x        |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy                  | SW-34        | 4259834        | 658196        | 13.0        | 0          | 15.0         | 20.0          | 15.0                 | 14        |             |              |          |           | x         | x          |           |                   |                      | x                          | Grassland-G: C- HG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudocris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-34        | 4259834        | 658196        | 14.0        | 17.5       | 5.0          | 15.0          | 5.0                  | 14        |             |              |          | x         |           | x          |           |                   |                      | x                          | Grassland-G: C- HG |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-34        | 4259834        | 658196        | 0           | 0          | 0            | 0             | 0                    | 14        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-34        | 4259834        | 658196        | 22.8        | 16.5       | 8.0          | 10.0          | 1.0                  | 14        |             |              |          | x         |           |            |           |                   |                      | x                          | Grassland-G: C- HG |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-34        | 4259834        | 658196        | 0           | 0          | 0            | 0             | 0                    | 14        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-34                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-34        | 4259834        | 658196        | 30.2        | 27.9       | 13.0         | 28.0          | 4.0                  | 14        |             |              |          |           | x         |            | x         |                   |                      |                            | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SW-35        | 4259876        | 658167        | 12.0        | 10.0       | 5.1          | 10.2          | 15.0                 | 35        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy             | SW-35        | 4259876        | 658167        | 12.4        | 13.9       | 8.0          | 14.0          | 3.0                  | 35        |             |              |          | x         |           |            |           |                   | x                    | x                          | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-35        | 4259876        | 658167        | 0           | 0          | 0            | 0             | 0                    | 35        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-35        | 4259876        | 658167        | 0           | 0          | 0            | 0             | 0                    | 35        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-35        | 4259876        | 658167        | 0           | 0          | 0            | 0             | 0                    | 35        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-35        | 4259876        | 658167        | 0           | 0          | 0            | 0             | 0                    | 35        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-35                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-35        | 4259876        | 658167        | 29.9        | 28.7       | 10.0         | 13.0          | 6.0                  | 35        |             |              |          |           |           | x          | x         |                   |                      |                            | Grassland-G: C- HG |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SW-36        | 4259713        | 658231        | 9.0         | 6.0        | 12.7         | 25.4          | 10.0                 | 104       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy             | SW-36        | 4259713        | 658231        | 14.0        | 15.0       | 7.0          | 25.0          | 5.0                  | 104       |             |              |          | x         |           |            |           |                   |                      | x                          | Grassland-G: C- HG |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-36        | 4259713        | 658231        | 0           | 0          | 0            | 0             | 0                    | 104       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SW-36        | 4259713        | 658231        | 0           | 0          | 0            | 0             | 0                    | 104       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SW-36        | 4259713        | 658231        | 0           | 0          | 0            | 0             | 0                    | 104       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-36        | 4259713        | 658231        | 0           | 0          | 0            | 0             | 0                    | 104       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-36                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-36        | 4259713        | 658231        | 0           | 0          | 0            | 0             | 0                    | 104       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SW-37        | 4259742        | 657987        | 10.9        | 12.9       | 5.1          | 22.9          | 60.0                 | 4,067     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | SW-37        | 4259742        | 657987        | 12.0        | 11.0       | 10.0         | 30.0          | 50.0                 | 4,067     |             |              |          |           |           |            |           |                   |                            | x                 | Grassland-G: C- LG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SW-37        | 4259742        | 657987        | 0           | 0          | 0            | 0             | 0                    | 4,067     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SW-37        | 4259742        | 657987        | 0           | 0          | 0            | 0             | 0                    | 4,067     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SW-37        | 4259742        | 657987        | 0           | 0          | 0            | 0             | 0                    | 4,067     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-37        | 4259742        | 657987        | 0           | 0          | 0            | 0             | 0                    | 4,067     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-37                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-37        | 4259742        | 657987        | 0           | 0          | 0            | 0             | 0                    | 4,067     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SW-38        | 4260572        | 658352        | 16.0        | 18.0       | 7.6          | 20.3          | 24.0                 | 126       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy        | SW-38        | 4260572        | 658352        | 17.6        | 17.1       | 15.0         | 28.0          | 15.0                 | 126       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SW-38        | 4260572        | 658352        | 0           | 0          | 0            | 0             | 0                    | 126       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SW-38        | 4260572        | 658352        | 0           | 0          | 0            | 0             | 0                    | 126       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-38        | 4260572        | 658352        | 0           | 0          | 0            | 0             | 0                    | 126       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-38        | 4260572        | 658352        | 0           | 0          | 0            | 0             | 0                    | 126       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-38                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-38        | 4260572        | 658352        | 0           | 0          | 0            | 0             | 0                    | 126       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SW-39        | 4260251        | 657911        | 0           | 0          | 0.0          | 0.0           | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-39        | 4260251        | 657911        | 0           | 0          | 0            | 0             | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-39        | 4260251        | 657911        | 0           | 0          | 0            | 0             | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-39        | 4260251        | 657911        | 0           | 0          | 0            | 0             | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-39        | 4260251        | 657911        | 0           | 0          | 0            | 0             | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-39        | 4260251        | 657911        | 0           | 0          | 0            | 0             | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-39                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-39        | 4260251        | 657911        | 0           | 0          | 0            | 0             | 0                    | 481       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SW-40        | 4260691        | 657933        | 16.0        | 21.0       | 12.7         | 15.2          | 10.0                 | 185       |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-40        | 4260691        | 657933        | 16.0        | 19.0       | 4.0          | 9.0           | 25.0                 | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SW-40        | 4260691        | 657933        | 16.7        | 16.9       | 2.0          | 4.0           | 2.0                  | 185       |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-40        | 4260691        | 657933        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-40        | 4260691        | 657933        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-40        | 4260691        | 657933        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SW-40                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-40        | 4260691        | 657933        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-41        | 4259308        | 658830        | 16.0        | 14.0       | 5.1          | 10.2          | 2.0                  | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-41        | 4259308        | 658830        | 0           | 0          | 0            | 0             | 0                    | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-41        | 4259308        | 658830        | 0           | 0          | 0            | 0             | 0                    | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-41        | 4259308        | 658830        | 0           | 0          | 0            | 0             | 0                    | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-41        | 4259308        | 658830        | 0           | 0          | 0            | 0             | 0                    | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-41        | 4259308        | 658830        | 0           | 0          | 0            | 0             | 0                    | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-41                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-41        | 4259308        | 658830        | 0           | 0          | 0            | 0             | 0                    | 63        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SW-42        | 4260952        | 658181        | 17.0        | 19.0       | 10.2         | 17.8          | 5.0                  | 945       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-42        | 4260952        | 658181        | 17.1        | 16.4       | 12.0         | 19.0          | 3.0                  | 945       |             |              |          | x         |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-42        | 4260952        | 658181        | 0           | 0          | 0            | 0             | 0                    | 945       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SW-42        | 4260952        | 658181        | 0           | 0          | 0            | 0             | 0                    | 945       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SW-42        | 4260952        | 658181        | 0           | 0          | 0            | 0             | 0                    | 945       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-42        | 4260952        | 658181        | 0           | 0          | 0            | 0             | 0                    | 945       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |
| SW-42                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-42        | 4260952        | 658181        | 0           | 0          | 0            | 0             | 0                    | 945       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG, H- HG |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SW-43        | 4258971        | 658561        | 14.0        | 16.0       | 7.6          | 15.2          | 5.0                  | 26        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-43        | 4258971        | 658561        | 16.3        | 11.2       | 7.0          | 10.0          | 2.0                  | 26        |             |              |          | x         | x         | x          |           |                   |                            | x                 | Grassland-G: C- LG        |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-43        | 4258971        | 658561        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-43        | 4258971        | 658561        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-43        | 4258971        | 658561        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-43        | 4258971        | 658561        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-43                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-43        | 4258971        | 658561        | 0           | 0          | 0            | 0             | 0                    | 26        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SW-44        | 4258957        | 658533        | 15.0        | 11.6       | 7.6          | 12.7          | 5.0                  | 17        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-44        | 4258957        | 658533        | 15.5        | 12.8       | 5.0          | 13.0          | 3.0                  | 17        |             |              |          | x         | x         |            |           |                   |                            | x                 | Grassland-G: C- LG        |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-44        | 4258957        | 658533        | 0           | 0          | 0            | 0             | 0                    | 17        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-44        | 4258957        | 658533        | 0           | 0          | 0            | 0             | 0                    | 17        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-44        | 4258957        | 658533        | 0           | 0          | 0            | 0             | 0                    | 17        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-44        | 4258957        | 658533        | 0           | 0          | 0            | 0             | 0                    | 17        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool



ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition         |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                           |
| SW-44                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-44        | 4258957        | 658533        | 0           | 0          | 0            | 0             | 0                    | 17        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SW-45        | 4259038        | 658323        | 11.0        | 13.0       | 7.6          | 12.7          | 2.0                  | 157       |             |              |          |           |           |            | x         |                   |                      |                            | Grassland-G: C- MG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | SW-45        | 4259038        | 658323        | 12.0        | 11.0       | 7.0          | 15.0          | 3.0                  | 157       |             |              |          | x         |           | x          |           |                   |                      | x                          | Grassland-G: C- MG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SW-45        | 4259038        | 658323        | 0           | 0          | 0            | 0             | 0                    | 157       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SW-45        | 4259038        | 658323        | 0           | 0          | 0            | 0             | 0                    | 157       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SW-45        | 4259038        | 658323        | 0           | 0          | 0            | 0             | 0                    | 157       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-45        | 4259038        | 658323        | 0           | 0          | 0            | 0             | 0                    | 157       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG        |
| SW-45                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SW-45        | 4259038        | 658323        | 0           | 0          | 0            | 0             | 0                    | 157       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG        |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SW-46        | 4258852        | 658282        | 13.0        | 16.0       | 7.6          | 12.7          | 3.0                  | 25        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy               | SW-46        | 4258852        | 658282        | 13.0        | 13.0       | 0            | 0             | 4.0                  | 25        |             |              |          | x         |           |            |           |                   |                      | x                          | Grassland-D: TT; G: C- MG |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SW-46        | 4258852        | 658282        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SW-46        | 4258852        | 658282        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SW-46        | 4258852        | 658282        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SW-46        | 4258852        | 658282        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| SW-46                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-46        | 4258852        | 658282        | 0           | 0          | 0            | 0             | 0                    | 25        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- MG |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SW-47        | 4258746        | 658420        | 16.0        | 16.0       | 7.6          | 12.7          | 3.0                  | 11        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-47        | 4258746        | 658420        | 14.0        | 11.4       | 5.0          | 9.0           | 2.0                  | 11        |             |              |          |           |           |            |           |                   |                            | x                 | Grassland-G: C- LG        |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-47        | 4258746        | 658420        | 0           | 0          | 0            | 0             | 0                    | 11        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-47        | 4258746        | 658420        | 0           | 0          | 0            | 0             | 0                    | 11        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-47        | 4258746        | 658420        | 0           | 0          | 0            | 0             | 0                    | 11        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-47        | 4258746        | 658420        | 0           | 0          | 0            | 0             | 0                    | 11        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-47                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-47        | 4258746        | 658420        | 0           | 0          | 0            | 0             | 0                    | 11        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-48        | 4258737        | 658433        | 15.0        | 19.0       | 5.1          | 10.2          | 1.0                  | 46        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-48        | 4258737        | 658433        | 14.0        | 8.9        | 3.0          | 3.0           | 1.0                  | 46        |             |              |          | x         |           |            |           |                   |                            | x                 | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-48        | 4258737        | 658433        | 0           | 0          | 0            | 0             | 0                    | 46        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-48        | 4258737        | 658433        | 0           | 0          | 0            | 0             | 0                    | 46        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-48        | 4258737        | 658433        | 0           | 0          | 0            | 0             | 0                    | 46        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-48        | 4258737        | 658433        | 0           | 0          | 0            | 0             | 0                    | 46        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| SW-48                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-48        | 4258737        | 658433        | 0           | 0          | 0            | 0             | 0                    | 46        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | SW-49        | 4258752        | 658455        | 0           | 0          | 0.0          | 0.0           | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-49        | 4258752        | 658455        | 0           | 0          | 0.0          | 0.0           | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-49        | 4258752        | 658455        | 0           | 0          | 0            | 0             | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-49        | 4258752        | 658455        | 0           | 0          | 0            | 0             | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-49        | 4258752        | 658455        | 0           | 0          | 0            | 0             | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-49        | 4258752        | 658455        | 0           | 0          | 0            | 0             | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-49                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-49        | 4258752        | 658455        | 0           | 0          | 0            | 0             | 0                    | 22        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SW-50        | 4258719        | 658474        | 16.0        | 18.0       | 10.2         | 15.2          | 3.0                  | 149       |             |              | x        |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-50        | 4258719        | 658474        | 16.6        | 10.5       | 4.0          | 13.0          | 2.0                  | 149       |             |              |          |           | x         | x          |           |                   |                            | x                 | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-50        | 4258719        | 658474        | 0           | 0          | 0            | 0             | 0                    | 149       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-50        | 4258719        | 658474        | 0           | 0          | 0            | 0             | 0                    | 149       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-50        | 4258719        | 658474        | 0           | 0          | 0            | 0             | 0                    | 149       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-50        | 4258719        | 658474        | 0           | 0          | 0            | 0             | 0                    | 149       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-50                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-50        | 4258719        | 658474        | 0           | 0          | 0            | 0             | 0                    | 149       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SW-51        | 4258740        | 658601        | 15.0        | 16.0       | 10.2         | 17.8          | 5.0                  | 153       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SW-51        | 4258740        | 658601        | 16.4        | 10.6       | 4.0          | 7.0           | 3.0                  | 153       |             |              |          | x         |           |            |           |                   |                      | x                          | Grassland-G: C- HG |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SW-51        | 4258740        | 658601        | 0           | 0          | 0            | 0             | 0                    | 153       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SW-51        | 4258740        | 658601        | 0           | 0          | 0            | 0             | 0                    | 153       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SW-51        | 4258740        | 658601        | 0           | 0          | 0            | 0             | 0                    | 153       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SW-51        | 4258740        | 658601        | 0           | 0          | 0            | 0             | 0                    | 153       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SW-51                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SW-51        | 4258740        | 658601        | 0           | 0          | 0            | 0             | 0                    | 153       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | SWS-01       | 4260082        | 659207        | 0           | 0          | 0.0          | 0.0           | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SWS-01       | 4260082        | 659207        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SWS-01       | 4260082        | 659207        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SWS-01       | 4260082        | 659207        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SWS-01       | 4260082        | 659207        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SWS-01       | 4260082        | 659207        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-01                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-01       | 4260082        | 659207        | 0           | 0          | 0            | 0             | 0                    | 5         |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SWS-02       | 4260557        | 657874        | 0           | 0          | 0.0          | 0.0           | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SWS-02       | 4260557        | 657874        | 0           | 0          | 0            | 0             | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-02       | 4260557        | 657874        | 0           | 0          | 0            | 0             | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SWS-02       | 4260557        | 657874        | 0           | 0          | 0            | 0             | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SWS-02       | 4260557        | 657874        | 0           | 0          | 0            | 0             | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-02       | 4260557        | 657874        | 0           | 0          | 0            | 0             | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-02                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-02       | 4260557        | 657874        | 0           | 0          | 0            | 0             | 0                    | 789       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-03       | 4260796        | 657938        | 0           | 0          | 0.0          | 0.0           | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy        | SWS-03       | 4260796        | 657938        | 0           | 0          | 0.0          | 0.0           | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SWS-03       | 4260796        | 657938        | 0           | 0          | 0            | 0             | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SWS-03       | 4260796        | 657938        | 0           | 0          | 0            | 0             | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SWS-03       | 4260796        | 657938        | 0           | 0          | 0            | 0             | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-03       | 4260796        | 657938        | 0           | 0          | 0            | 0             | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-03                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-03       | 4260796        | 657938        | 0           | 0          | 0            | 0             | 0                    | 39        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-04       | 4259690        | 658014        | 12.1        | 10.4       | 11.2         | 40.6          | 99.0                 | 4,524     |             |              | x        |           |           |            | x         |                   |                      |                            | Grassland-G: C- MG |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | SWS-04       | 4259690        | 658014        | 11.7        | 11.3       | 13.0         | 36.0          | 230.0                | 4,524     |             |              |          |           |           |            | x         |                   |                      | x                          | Grassland-G: C- MG |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-04       | 4259690        | 658014        | 18.2        | 20.5       | 8.5          | 30.0          | 36.0                 | 4,524     |             |              | x        | x         | x         | x          |           |                   | x                    | x                          | Grassland-G: C- MG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SWS-04       | 4259690        | 658014        | 16.7        | 15.2       | 9.0          | 15.0          | 2.0                  | 4,524     |             |              |          | x         | x         | x          |           |                   |                            |                   | Grassland-G: C- MG        |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SWS-04       | 4259690        | 658014        | 26.4        | 27.0       | 8.0          | 10.0          | 1.0                  | 4,524     |             |              |          | x         | x         | x          |           |                   |                            |                   | Grassland-G: C- MG        |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-04       | 4259690        | 658014        | 0           | 0          | 0            | 0             | 0                    | 4,524     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SWS-04                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-04       | 4259690        | 658014        | 0           | 0          | 0            | 0             | 0                    | 4,524     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-05       | 4259360        | 657720        | 11.0        | 13.0       | 5.1          | 22.9          | 20.0                 | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy               | SWS-05       | 4259360        | 657720        | 13.3        | 12.1       | 10.0         | 19.0          | 10.0                 | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-05       | 4259360        | 657720        | 18.0        | 22.2       | 2.0          | 3.0           | 1.0                  | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SWS-05       | 4259360        | 657720        | 17.1        | 16.6       | 4.0          | 6.0           | 2.0                  | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SWS-05       | 4259360        | 657720        | 0           | 0          | 0            | 0             | 0                    | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-05       | 4259360        | 657720        | 0           | 0          | 0            | 0             | 0                    | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-05                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/29/2021 | 0800-1700 | Clear                | SWS-05       | 4259360        | 657720        | 0           | 0          | 0            | 0             | 0                    | 1,076     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG        |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-06       | 4258877        | 658233        | 12.0        | 11.0       | 2.5          | 5.1           | 10.0                 | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- MG |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | SWS-06       | 4258877        | 658233        | 12.0        | 11.0       | 5.0          | 10.0          | 100.0                | 135       |             |              |          | x         |           | x          |           |                   |                            | x                 | Grassland-D: TT; G: C- MG |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-06       | 4258877        | 658233        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- MG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition         |                    |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|---------------------------|--------------------|
| Feature ID #                                                     | County     | Quad        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                           |                    |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SWS-06       | 4258877        | 658233        | 12.9        | 12.2       | 5.0          | 10.0          | 1.0                  | 135       |             |              |          | x         | x         | x          |           |                   |                      |                            | Grassland-D: TT; G: C- MG |                    |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SWS-06       | 4258877        | 658233        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |                    |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SWS-06       | 4258877        | 658233        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |                    |
| SWS-06                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-06       | 4258877        | 658233        | 0           | 0          | 0            | 0             | 0                    | 135       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-D: TT; G: C- MG |                    |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SWS-07       | 4258688        | 658542        | 17.0        | 14.0       | 10.2         | 17.8          | 12.0                 | 359       |             |              | x        | x         | x         | x          | x         | x                 | x                    | x                          | Yes                       | Grassland-G: C- HG |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SWS-07       | 4258688        | 658542        | 16.4        | 10.2       | 10.0         | 18.0          | 8.0                  | 359       |             |              |          |           |           |            | x         |                   |                      |                            | x                         | Grassland-G: C- HG |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SWS-07       | 4258688        | 658542        | 0           | 0          | 0            | 0             | 0                    | 359       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | SWS-07       | 4258688        | 658542        | 0           | 0          | 0            | 0             | 0                    | 359       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | SWS-07       | 4258688        | 658542        | 0           | 0          | 0            | 0             | 0                    | 359       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SWS-07       | 4258688        | 658542        | 0           | 0          | 0            | 0             | 0                    | 359       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-07                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-07       | 4258688        | 658542        | 0           | 0          | 0            | 0             | 0                    | 359       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | SWS-08       | 4258740        | 658578        | 0           | 0          | 0.0          | 0.0           | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SWS-08       | 4258740        | 658578        | 0           | 0          | 0            | 0             | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | SWS-08       | 4258740        | 658578        | 0           | 0          | 0            | 0             | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG        |                    |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SWS-08       | 4258740        | 658578        | 0           | 0          | 0            | 0             | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SWS-08       | 4258740        | 658578        | 0           | 0          | 0            | 0             | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-08       | 4258740        | 658578        | 0           | 0          | 0            | 0             | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-08                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-08       | 4258740        | 658578        | 0           | 0          | 0            | 0             | 0                    | 107       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Precipitation - Full | SWS-09       | 4260491        | 658605        | 11.0        | 12.0       | 12.7         | 17.8          | 70.0                 | 185       |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | SWS-09       | 4260491        | 658605        | 16.4        | 18.3       | 5.0          | 10.0          | 5.0                  | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | SWS-09       | 4260491        | 658605        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | SWS-09       | 4260491        | 658605        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | SWS-09       | 4260491        | 658605        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-09       | 4260491        | 658605        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-09                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-09       | 4260491        | 658605        | 0           | 0          | 0            | 0             | 0                    | 185       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-10                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-10       | 4259848        | 658222        | 10.0        | 8.0        | 15.2         | 25.4          | 10.0                 | 13        |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-10                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | SWS-10       | 4259848        | 658222        | 12.0        | 13.0       | 20.0         | 32.0          | 10.0                 | 13        |             |              |          |           |           | x          |           |                   | x                    | x                          | Grassland-G: C- HG |
| SWS-10                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-10       | 4259848        | 658222        | 14.9        | 18.1       | 6.0          | 15.0          | 5.0                  | 13        |             |              | x        | x         | x         |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-10                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SWS-10       | 4259848        | 658222        | 0           | 0          | 0            | 0             | 0                    | 13        |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool



ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SWS-10                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-10       | 4259848        | 658222        | 0           | 0          | 0            | 0             | 0                    | 13        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-10                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-10       | 4259848        | 658222        | 29.9        | 0          | 20.0         | 25.0          | 12.0                 | 13        |             |              |          |           | x         | x          | x         |                   |                            |                   | Grassland-G: C- HG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-11       | 4259841        | 658177        | 10.9        | 9.6        | 2.5          | 10.2          | 2.0                  | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy               | SWS-11       | 4259841        | 658177        | 0           | 0          | 0            | 0             | 0                    | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-11       | 4259841        | 658177        | 0           | 0          | 0            | 0             | 0                    | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SWS-11       | 4259841        | 658177        | 0           | 0          | 0            | 0             | 0                    | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SWS-11       | 4259841        | 658177        | 0           | 0          | 0            | 0             | 0                    | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-11       | 4259841        | 658177        | 0           | 0          | 0            | 0             | 0                    | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-11                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | SWS-11       | 4259841        | 658177        | 0           | 0          | 0            | 0             | 0                    | 68        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | SWS-12       | 4259860        | 658189        | 10.0        | 8.0        | 7.6          | 25.4          | 10.0                 | 86        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | SWS-12       | 4259860        | 658189        | 0           | 0          | 10.0         | 31.0          | 20.0                 | 86        |             |              |          |           | x         | x          |           |                   |                            | x                 | Grassland-G: C- HG   |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | SWS-12       | 4259860        | 658189        | 18.1        | 20.6       | 6.0          | 15.0          | 3.0                  | 86        |             |              |          |           | x         |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | SWS-12       | 4259860        | 658189        | 0           | 0          | 0            | 0             | 0                    | 86        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | SWS-12       | 4259860        | 658189        | 0           | 0          | 0            | 0             | 0                    | 86        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | SWS-12       | 4259860        | 658189        | 0           | 0          | 0            | 0             | 0                    | 86        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudocris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| SWS-12                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-12       | 4259860        | 658189        | 29.9        | 26.5       | 10.0         | 14.0          | 3.0                  | 86        |             |              |          |           |           | x          | x         |                   |                      |                            | Grassland-G: C- HG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SWS-13       | 4260634        | 658637        | 18.0        | 19.0       | 5.1          | 12.7          | 1.0                  | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | SWS-13       | 4260634        | 658637        | 0           | 0          | 0            | 0             | 0                    | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SWS-13       | 4260634        | 658637        | 0           | 0          | 0            | 0             | 0                    | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SWS-13       | 4260634        | 658637        | 0           | 0          | 0            | 0             | 0                    | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SWS-13       | 4260634        | 658637        | 0           | 0          | 0            | 0             | 0                    | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SWS-13       | 4260634        | 658637        | 0           | 0          | 0            | 0             | 0                    | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-13                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-13       | 4260634        | 658637        | 0           | 0          | 0            | 0             | 0                    | 487       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SWS-14       | 4260687        | 658459        | 18.0        | 16.0       | 5.1          | 7.6           | 1.0                  | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SWS-14       | 4260687        | 658459        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SWS-14       | 4260687        | 658459        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SWS-14       | 4260687        | 658459        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SWS-14       | 4260687        | 658459        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SWS-14       | 4260687        | 658459        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| SWS-14                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-14       | 4260687        | 658459        | 0           | 0          | 0            | 0             | 0                    | 108       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | SWS-15       | 4260507        | 658344        | 0           | 0          | 0.0          | 0.0           | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | SWS-15       | 4260507        | 658344        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | SWS-15       | 4260507        | 658344        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | SWS-15       | 4260507        | 658344        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | SWS-15       | 4260507        | 658344        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | SWS-15       | 4260507        | 658344        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| SWS-15                                                           | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | SWS-15       | 4260507        | 658344        | 0           | 0          | 0            | 0             | 0                    | 1,169     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | US-01        | 4261210        | 657639        | 0           | 0          | 0.0          | 0.0           | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-UG         |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | US-01        | 4261210        | 657639        | 0           | 0          | 0            | 0             | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-UG         |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | US-01        | 4261210        | 657639        | 0           | 0          | 0            | 0             | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-UG         |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | US-01        | 4261210        | 657639        | 0           | 0          | 0            | 0             | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-UG         |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | US-01        | 4261210        | 657639        | 0           | 0          | 0            | 0             | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P; UG   |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | US-01        | 4261210        | 657639        | 0           | 0          | 0            | 0             | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P; UG   |
| US-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 3        | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | US-01        | 4261210        | 657639        | 0           | 0          | 0            | 0             | 0                    | 1,993     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: P; UG   |
| US-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | US-02        | 4259312        | 658494        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| US-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | US-02        | 4259312        | 658494        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | US-02        | 4259312        | 658494        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | US-02        | 4259312        | 658494        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | US-03        | 4259031        | 658679        | 17.0        | 12.0       | 5.1          | 10.2          | 3.0                  | 49        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | US-03        | 4259031        | 658679        | 14.6        | 8.6        | 7.0          | 14.0          | 3.0                  | 49        | LIOC        |              |          | x         | x         | x          |           |                   |                            | x                 | Grassland-G: C- LG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | US-03        | 4259031        | 658679        | 0           | 0          | 0            | 0             | 0                    | 49        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | US-03        | 4259031        | 658679        | 0           | 0          | 0            | 0             | 0                    | 49        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | US-03        | 4259031        | 658679        | 0           | 0          | 0            | 0             | 0                    | 49        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | US-03        | 4259031        | 658679        | 0           | 0          | 0            | 0             | 0                    | 49        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| US-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | US-03        | 4259031        | 658679        | 0           | 0          | 0            | 0             | 0                    | 49        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | US-04        | 4258751        | 658508        | 16.0        | 15.0       | 7.6          | 12.7          | 1.0                  | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | US-04        | 4258751        | 658508        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | US-04        | 4258751        | 658508        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | US-04        | 4258751        | 658508        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | US-04        | 4258751        | 658508        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | US-04        | 4258751        | 658508        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | US-04        | 4258751        | 658508        | 0           | 0          | 0            | 0             | 0                    | 69        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | US-05        | 4258790        | 658555        | 0           | 0          | 0            | 0             | 0                    | 91        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | US-05        | 4258790        | 658555        | 16.5        | 12.4       | 2.0          | 5.0           | 1.0                  | 91        |             |              |          | x         | x         |            |           |                   |                            | x                 | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | US-05        | 4258790        | 658555        | 0           | 0          | 0            | 0             | 0                    | 91        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | US-05        | 4258790        | 658555        | 0           | 0          | 0            | 0             | 0                    | 91        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | US-05        | 4258790        | 658555        | 0           | 0          | 0            | 0             | 0                    | 91        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | US-05        | 4258790        | 658555        | 0           | 0          | 0            | 0             | 0                    | 91        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | US-05        | 4258790        | 658555        | 0           | 0          | 0            | 0             | 0                    | 91        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | US-06        | 4260865        | 658239        | 0           | 0          | 0.0          | 0.0           | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | US-06        | 4260865        | 658239        | 0           | 0          | 0            | 0             | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | US-06        | 4260865        | 658239        | 0           | 0          | 0            | 0             | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | US-06        | 4260865        | 658239        | 0           | 0          | 0            | 0             | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | US-06        | 4260865        | 658239        | 0           | 0          | 0            | 0             | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/15/2021 | 0800-1700 | Clear              | US-06        | 4260865        | 658239        | 0           | 0          | 0            | 0             | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| US-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 2        | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | US-06        | 4260865        | 658239        | 0           | 0          | 0            | 0             | 0                    | 38        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | US-07        | 4259264        | 658240        | 0           | 0          | 0.0          | 0.0           | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | US-07        | 4259264        | 658240        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | US-07        | 4259264        | 658240        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | US-07        | 4259264        | 658240        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | US-07        | 4259264        | 658240        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | US-07        | 4259264        | 658240        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/29/2021 | 0800-1700 | Clear                | US-07        | 4259264        | 658240        | 0           | 0          | 0            | 0             | 0                    | 154       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy               | US-08        | 4259733        | 658478        | 0           | 0          | 0.0          | 0.0           | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear                | US-08        | 4259733        | 658478        | 0           | 0          | 0            | 0             | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy               | US-08        | 4259733        | 658478        | 0           | 0          | 0            | 0             | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | US-08        | 4259733        | 658478        | 0           | 0          | 0            | 0             | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | US-08        | 4259733        | 658478        | 0           | 0          | 0            | 0             | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | US-08        | 4259733        | 658478        | 0           | 0          | 0            | 0             | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| US-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | US-08        | 4259733        | 658478        | 0           | 0          | 0            | 0             | 0                    | 79        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

- |      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | VP-01        | 4260016        | 659433        | 13.0        | 15.0       | 10.2         | 17.8          | 20.0                 | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | VP-01        | 4260016        | 659433        | 0           | 0          | 0            | 0             | 0                    | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-01        | 4260016        | 659433        | 0           | 0          | 0            | 0             | 0                    | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-01        | 4260016        | 659433        | 0           | 0          | 0            | 0             | 0                    | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-01        | 4260016        | 659433        | 0           | 0          | 0            | 0             | 0                    | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-01        | 4260016        | 659433        | 0           | 0          | 0            | 0             | 0                    | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-01                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-01        | 4260016        | 659433        | 0           | 0          | 0            | 0             | 0                    | 18,165    |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | VP-02        | 4259919        | 659423        | 14.0        | 15.0       | 12.7         | 22.9          | 20.0                 | 181       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | VP-02        | 4259919        | 659423        | 11.5        | 10.2       | 13.0         | 18.0          | 16.0                 | 181       |             |              |          |           | x         |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-02        | 4259919        | 659423        | 0           | 0          | 0            | 0             | 0                    | 181       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-02        | 4259919        | 659423        | 0           | 0          | 0            | 0             | 0                    | 181       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-02        | 4259919        | 659423        | 0           | 0          | 0            | 0             | 0                    | 181       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-02        | 4259919        | 659423        | 0           | 0          | 0            | 0             | 0                    | 181       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-02                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-02        | 4259919        | 659423        | 0           | 0          | 0            | 0             | 0                    | 181       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | VP-03        | 4259884        | 659391        | 15.0        | 16.0       | 7.6          | 20.3          | 120.0                | 314       |             |              |          |           |           | x          |           |                   |                            |                   | Grassland-G: C- MG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudocris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | VP-03        | 4259884        | 659391        | 0           | 0          | 0            | 0             | 0                    | 314       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-03        | 4259884        | 659391        | 0           | 0          | 0            | 0             | 0                    | 314       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-03        | 4259884        | 659391        | 0           | 0          | 0            | 0             | 0                    | 314       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-03        | 4259884        | 659391        | 0           | 0          | 0            | 0             | 0                    | 314       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-03        | 4259884        | 659391        | 0           | 0          | 0            | 0             | 0                    | 314       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-03                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-03        | 4259884        | 659391        | 0           | 0          | 0            | 0             | 0                    | 314       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | VP-04        | 4259883        | 659373        | 14.0        | 16.0       | 7.6          | 15.2          | 8.0                  | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | VP-04        | 4259883        | 659373        | 11.9        | 12.2       | 6.0          | 10.0          | 1.0                  | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-04        | 4259883        | 659373        | 0           | 0          | 0            | 0             | 0                    | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-04        | 4259883        | 659373        | 0           | 0          | 0            | 0             | 0                    | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-04        | 4259883        | 659373        | 0           | 0          | 0            | 0             | 0                    | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-04        | 4259883        | 659373        | 0           | 0          | 0            | 0             | 0                    | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-04                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-04        | 4259883        | 659373        | 0           | 0          | 0            | 0             | 0                    | 37        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | VP-05        | 4260551        | 657915        | 0           | 0          | 0.0          | 0.0           | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | VP-05        | 4260551        | 657915        | 0           | 0          | 0            | 0             | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudocris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |



ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                           |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|---------------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae      |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | VP-05        | 4260551        | 657915        | 0           | 0          | 0            | 0             | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-05        | 4260551        | 657915        | 0           | 0          | 0            | 0             | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-05        | 4260551        | 657915        | 0           | 0          | 0            | 0             | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-05        | 4260551        | 657915        | 0           | 0          | 0            | 0             | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| VP-05                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-05        | 4260551        | 657915        | 0           | 0          | 0            | 0             | 0                    | 4,299     |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG        |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear              | VP-06        | 4259701        | 658424        | 8.0         | 7.0        | 12.7         | 20.3          | 20.0                 | 58        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy             | VP-06        | 4259701        | 658424        | 13.0        | 16.0       | 10.0         | 25.0          | 25.0                 | 58        |             |              |          | x         | x         |            |           |                   |                            | x                 | Grassland-D: TT; G: C- HG |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | VP-06        | 4259701        | 658424        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | VP-06        | 4259701        | 658424        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | VP-06        | 4259701        | 658424        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-06        | 4259701        | 658424        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| VP-06                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-06        | 4259701        | 658424        | 0           | 0          | 0            | 0             | 0                    | 58        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-D: TT; G: C- HG |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | VP-07        | 4259154        | 658788        | 14.0        | 13.0       | 20.3         | 30.5          | 30.0                 | 254       |             |              |          |           |           | x          |           |                   |                            |                   | Grassland-G: C- LG        |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | VP-07        | 4259154        | 658788        | 12.6        | 9.7        | 12.0         | 16.0          | 30.0                 | 254       | LIOC        |              |          | x         | x         | x          |           |                   |                            | x                 | Grassland-G: C- LG        |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans                 |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-----------------------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Quad        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans                 | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | VP-07        | 4259154        | 658788        | 13.5        | 11.5       | 5.0          | 10.0          | 15.0                 | 254       | LIOC-male & female observed |              | x        | x         |           | x          |           | x                 | x                    | Grassland-G: C- LG         |                    |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | VP-07        | 4259154        | 658788        | 0           | 0          | 0            | 0             | 0                    | 254       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | VP-07        | 4259154        | 658788        | 0           | 0          | 0            | 0             | 0                    | 254       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | VP-07        | 4259154        | 658788        | 0           | 0          | 0            | 0             | 0                    | 254       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-07                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | VP-07        | 4259154        | 658788        | 0           | 0          | 0            | 0             | 0                    | 254       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy        | VP-08        | 4259012        | 658704        | 18.0        | 16.0       | 10.2         | 17.8          | 10.0                 | 245       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy        | VP-08        | 4259012        | 658704        | 14.0        | 8.4        | 6.0          | 15.0          | 3.0                  | 245       |                             |              |          | x         | x         | x          |           |                   |                      | x                          | Grassland-G: C- LG |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | VP-08        | 4259012        | 658704        | 0           | 0          | 0            | 0             | 0                    | 245       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | VP-08        | 4259012        | 658704        | 0           | 0          | 0            | 0             | 0                    | 245       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | VP-08        | 4259012        | 658704        | 0           | 0          | 0            | 0             | 0                    | 245       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | VP-08        | 4259012        | 658704        | 0           | 0          | 0            | 0             | 0                    | 245       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-08                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | VP-08        | 4259012        | 658704        | 0           | 0          | 0            | 0             | 0                    | 245       |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- LG         |                    |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | VP-09        | 4258969        | 658474        | 12.0        | 16.0       | 7.6          | 15.2          | *                    | 33        |                             |              |          |           |           |            |           |                   |                      | Grassland-G: C- MG         |                    |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | VP-09        | 4258969        | 658474        | 12.0        | 11.0       | 7.0          | 14.0          | 1.0                  | 33        |                             |              |          | x         |           | x          |           |                   | x                    | Grassland-G: C- MG         |                    |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | VP-09        | 4258969        | 658474        | 0           | 0          | 0            | 0             | 0                    | 33        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | VP-09        | 4258969        | 658474        | 0           | 0          | 0            | 0             | 0                    | 33        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | VP-09        | 4258969        | 658474        | 0           | 0          | 0            | 0             | 0                    | 33        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-09        | 4258969        | 658474        | 0           | 0          | 0            | 0             | 0                    | 33        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-09                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-09        | 4258969        | 658474        | 0           | 0          | 0            | 0             | 0                    | 33        |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | VP-10        | 4259988        | 659261        | 0           | 0          | 0.0          | 0.0           | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | VP-10        | 4259988        | 659261        | 0           | 0          | 0            | 0             | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-10        | 4259988        | 659261        | 0           | 0          | 0            | 0             | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-10        | 4259988        | 659261        | 0           | 0          | 0            | 0             | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-10        | 4259988        | 659261        | 0           | 0          | 0            | 0             | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-10        | 4259988        | 659261        | 0           | 0          | 0            | 0             | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-10                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-10        | 4259988        | 659261        | 0           | 0          | 0            | 0             | 0                    | 140       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Cloudy             | VP-11        | 4259315        | 659113        | 11.0        | 10.0       | 12.7         | 25.4          | 25.0                 | 146       |             |              |          |           |           |            | x         |                   |                            |                   | Grassland-G: C- MG   |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 2/17/2021 | 0800-1700 | Clear              | VP-11        | 4259315        | 659113        | 14.6        | 13.9       | 14.0         | 23.0          | 24.0                 | 146       |             |              |          | x         | x         | x          |           |                   |                            | x                 | Grassland-G: C- MG   |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-11        | 4259315        | 659113        | 0           | 0          | 0            | 0             | 0                    | 146       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- MG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                      |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|----------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions   | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy               | VP-11        | 4259315        | 659113        | 0           | 0          | 0            | 0             | 0                    | 146       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear                | VP-11        | 4259315        | 659113        | 0           | 0          | 0            | 0             | 0                    | 146       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | VP-11        | 4259315        | 659113        | 0           | 0          | 0            | 0             | 0                    | 146       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-11                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 11       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | VP-11        | 4259315        | 659113        | 0           | 0          | 0            | 0             | 0                    | 146       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | VP-12        | 4259030        | 658383        | 12.0        | 13.0       | 10.2         | 17.8          | 15.0                 | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | VP-12        | 4259030        | 658383        | 13.0        | 11.0       | 12.0         | 17.0          | 25.0                 | 100       |             |              |          | x         |           | x          |           |                   |                      | x                          | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | VP-12        | 4259030        | 658383        | 0           | 0          | 0            | 0             | 0                    | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | VP-12        | 4259030        | 658383        | 0           | 0          | 0            | 0             | 0                    | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear                | VP-12        | 4259030        | 658383        | 0           | 0          | 0            | 0             | 0                    | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear                | VP-12        | 4259030        | 658383        | 0           | 0          | 0            | 0             | 0                    | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-12                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear                | VP-12        | 4259030        | 658383        | 0           | 0          | 0            | 0             | 0                    | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/4/2021  | 0800-1700 | Clear                | VP-13        | 4259012        | 658346        | 13.0        | 13.0       | 12.7         | 22.9          | 10.0                 | 195       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Precipitation - Full | VP-13        | 4259012        | 658346        | 12.0        | 12.0       | 14.0         | 20.0          | 30.0                 | 195       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear                | VP-13        | 4259012        | 658346        | 12.6        | 11.8       | 12.0         | 20.0          | 10.0                 | 195       |             |              |          | x         |           | x          |           |                   | x                    | x                          | Grassland-G: C- MG |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy               | VP-13        | 4259012        | 658346        | 0           | 0          | 0            | 0             | 0                    | 100       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   |                      | Platyhelminths (flatworms) | Habitat Condition  |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------|----------------------------|--------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae | Diptera Chironomidae |                            |                    |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | VP-13        | 4259012        | 658346        | 0           | 0          | 0            | 0             | 0                    | 195       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-13        | 4259012        | 658346        | 0           | 0          | 0            | 0             | 0                    | 195       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-13                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-13        | 4259012        | 658346        | 0           | 0          | 0            | 0             | 0                    | 195       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- MG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | VP-14        | 4258729        | 658527        | 15.0        | 15.0       | 10.2         | 22.9          | 4.0                  | 258       |             |              |          |           |           | x          |           |                   |                      |                            | Grassland-G: C- HG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | VP-14        | 4258729        | 658527        | 15.4        | 7.3        | 10.0         | 17.0          | 8.0                  | 258       |             |              |          | x         |           | x          |           |                   |                      | x                          | Grassland-G: C- HG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | VP-14        | 4258729        | 658527        | 0           | 0          | 0            | 0             | 0                    | 258       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | VP-14        | 4258729        | 658527        | 0           | 0          | 0            | 0             | 0                    | 258       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | VP-14        | 4258729        | 658527        | 0           | 0          | 0            | 0             | 0                    | 258       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-14        | 4258729        | 658527        | 0           | 0          | 0            | 0             | 0                    | 258       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| VP-14                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-14        | 4258729        | 658527        | 0           | 0          | 0            | 0             | 0                    | 258       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- HG |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | VP-15        | 4258701        | 658584        | 15.0        | 14.0       | 25.4         | 38.1          | 425.0                | 425       |             |              | x        | x         |           | x          |           |                   |                      |                            | Grassland-G: C- LG |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | VP-15        | 4258701        | 658584        | 15.7        | 10.2       | 26.0         | 42.0          | 425.0                | 425       |             |              |          | x         |           |            |           |                   |                      | x                          | Grassland-G: C- LG |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | VP-15        | 4258701        | 658584        | 15.1        | 11.6       | 10.0         | 20.0          | 200.0                | 425       |             |              | x        | x         |           | x          |           |                   | x                    | x                          | Grassland-G: C- LG |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | VP-15        | 4258701        | 658584        | 12.7        | 12.7       | 15.0         | 22.0          | 70.0                 | 425       |             |              | x        | x         | x         | x          |           |                   | x                    | x                          | Grassland-G: C- LG |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | VP-15        | 4258701        | 658584        | 19.6        | 14.3       | 7.0          | 13.0          | 1.0                  | 425       |             |              |          |           |           |            |           |                   |                      |                            | Grassland-G: C- LG |

|      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans                  |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|------------------------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Qued        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans                  | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-15        | 4258701        | 658584        | 0           | 0          | 0            | 0             | 0                    | 425       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| VP-15                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-15        | 4258701        | 658584        | 0           | 0          | 0            | 0             | 0                    | 425       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- LG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/3/2021  | 0800-1700 | Partly Cloudy      | VP-16        | 4258672        | 658568        | 16.0        | 17.0       | 22.9         | 45.7          | 40.0                 | 440       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 2/18/2021 | 0800-1700 | Partly Cloudy      | VP-16        | 4258672        | 658568        | 10.3        | 8.6        | 29.0         | 42.0          | 250.0                | 440       |                              |              |          | x         |           |            |           |                   |                            | x                 | Grassland-G: C- HG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/4/2021  | 0800-1700 | Clear              | VP-16        | 4258672        | 658568        | 11.9        | 12.3       | 10.0         | 20.0          | 40.0                 | 440       | LIOC- male & female observed |              | x        | x         |           | x          |           |                   | x                          | x                 | Grassland-G: C- HG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 3/18/2021 | 0800-1700 | Cloudy             | VP-16        | 4258672        | 658568        | 0           | 0          | 0            | 0             | 0                    | 440       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/1/2021  | 0800-1700 | Clear              | VP-16        | 4258672        | 658568        | 0           | 0          | 0            | 0             | 0                    | 440       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-16        | 4258672        | 658568        | 0           | 0          | 0            | 0             | 0                    | 440       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-16                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 14       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-16        | 4258672        | 658568        | 0           | 0          | 0            | 0             | 0                    | 440       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/2/2021  | 0800-1700 | Cloudy             | VP-17        | 4259955        | 658099        | 12.0        | 13.0       | 2.5          | 7.6           | 5.0                  | 195       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 2/19/2021 | 0800-1700 | Cloudy             | VP-17        | 4259955        | 658099        | 0           | 0          | 0            | 0             | 0                    | 195       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/3/2021  | 0800-1700 | Cloudy             | VP-17        | 4259955        | 658099        | 0           | 0          | 0            | 0             | 0                    | 195       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/17/2021 | 0800-1700 | Cloudy             | VP-17        | 4259955        | 658099        | 0           | 0          | 0            | 0             | 0                    | 195       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 3/31/2021 | 0800-1700 | Clear              | VP-17        | 4259955        | 658099        | 0           | 0          | 0            | 0             | 0                    | 195       |                              |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

- |      |                             |     |                             |      |                                 |    |                  |      |                           |    |              |
|------|-----------------------------|-----|-----------------------------|------|---------------------------------|----|------------------|------|---------------------------|----|--------------|
| C    | cattle                      | ED  | ephemeral drainage          | HG   | heavy grazing                   | MG | moderate grazing | PSRE | <i>Pseudacris regilla</i> | TT | tire tracks  |
| CYCA | <i>Cyzicus californicus</i> | FEW | freshwater emergent wetland | ID   | intermittent drainage           | P  | pond             | SW   | seasonal wetland          | UG | ungrazed     |
| D    | ditch                       | G   | grazed                      | LG   | light grazing                   | P  | plowed           | SWS  | seasonal wetland swale    | US | upland swale |
| D    | disturbed                   | H   | horse                       | LIOC | <i>Linderiella occidentalis</i> | PF | ponded feature   | T    | trash                     | VP | vernal pool  |

ATTACHMENT H  
 USFWS WET SEASON PROTOCOL SURVEY RESULTS FOR FEDERALLY LISTED BRANCHIOPODS - DATASHEETS

| USFWS Data for West Season Surveys for Large Listed Branchiopods |            |             |                          |                           |           |           |                    |              | UTM            |               | Temperature |            | Depth        |               | Surface Area (m x m) |           | Crustaceans |              |          |           |           | Insects    |           |                   | Platyhelminths (flatworms) | Habitat Condition |                      |
|------------------------------------------------------------------|------------|-------------|--------------------------|---------------------------|-----------|-----------|--------------------|--------------|----------------|---------------|-------------|------------|--------------|---------------|----------------------|-----------|-------------|--------------|----------|-----------|-----------|------------|-----------|-------------------|----------------------------|-------------------|----------------------|
| Feature ID #                                                     | County     | Quad        | Township/ Range/ Section | Surveyor/ Permit #        | Date      | Time      | Weather Conditions | Feature ID # | Northing Datum | Easting Datum | Air (°c)    | Water (°c) | Average (cm) | Est. Max (cm) | Present              | Est. Max. | Anostracans | Notostracans | Copepods | Ostracods | Cladocera | Coleoptera | Hemiptera | Diptera Culicidae |                            |                   | Diptera Chironomidae |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/14/2021 | 0800-1700 | Clear              | VP-17        | 4259955        | 658099        | 0           | 0          | 0            | 0             | 0                    | 195       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |
| VP-17                                                            | Sacramento | Sloughhouse | T 7N / R 7E / S 10       | Heather Moine/TE-60147A-1 | 4/28/2021 | 0800-1700 | Clear              | VP-17        | 4259955        | 658099        | 0           | 0          | 0            | 0             | 0                    | 195       |             |              |          |           |           |            |           |                   |                            |                   | Grassland-G: C- HG   |

C cattle  
 CYCA *Cyzicus californicus*  
 D ditch  
 D disturbed

ED ephemeral drainage  
 FEW freshwater emergent wetland  
 G grazed  
 H horse

HG heavy grazing  
 ID intermittent drainage  
 LG light grazing  
 LIOC *Linderiella occidentalis*

MG moderate grazing  
 P pond  
 P plowed  
 PF ponded feature

PSRE *Pseudacris regilla*  
 SW seasonal wetland  
 SWS seasonal wetland swale  
 T trash

TT tire tracks  
 UG ungrazed  
 US upland swale  
 VP vernal pool

**D-5 Final Biological Technical Report**



---

Final Biological Technical Report

# Sloughhouse Solar Project

---

OCTOBER 2022

*Prepared for:*

**SLOUGHHOUSE SOLAR, LLC**

1166 Avenue of the Americas, 9th Floor  
New York, New York 10036

*Prepared by:*

**DUDEK**

1102 R. Street  
Sacramento, California 95811  
*Contact: David Hochart and Morgan Kennedy*



---

# Table of Contents

| <b>SECTION</b>                                                       | <b>PAGE NO.</b> |
|----------------------------------------------------------------------|-----------------|
| Acronyms and Abbreviations.....                                      | vi              |
| Executive Summary.....                                               | ix              |
| 1 Introduction.....                                                  | 1               |
| 1.1 Purpose.....                                                     | 1               |
| 1.2 Project Description.....                                         | 1               |
| 1.3 Project Location.....                                            | 1               |
| 2 Regulatory Setting.....                                            | 3               |
| 2.1 Federal.....                                                     | 3               |
| 2.1.1 Clean Water Act: Section 404.....                              | 3               |
| 2.1.2 Clean Water Act: Section 401.....                              | 6               |
| 2.1.3 Federal Endangered Species Act.....                            | 7               |
| 2.1.4 Migratory Bird Treaty Act.....                                 | 7               |
| 2.1.5 Bald and Gold Eagle Protection Act.....                        | 7               |
| 2.2 State of California.....                                         | 8               |
| 2.2.1 California Department of Fish and Game Code.....               | 8               |
| 2.2.2 California Environmental Quality Act.....                      | 11              |
| 2.2.3 California Department of Fish and Wildlife Special Plants..... | 11              |
| 2.2.4 Other State Tree Protection Regulations.....                   | 12              |
| 2.3 County.....                                                      | 12              |
| 2.3.1 Sacramento County General Plan.....                            | 12              |
| 2.3.2 Sacramento County Tree Preservation Ordinance.....             | 22              |
| 2.3.3 South Sacramento Habitat Conservation Plan.....                | 23              |
| 3 Methods.....                                                       | 25              |
| 3.1 Database and Literature Evaluation.....                          | 25              |
| 3.2 Field Study.....                                                 | 26              |
| 3.2.1 Aquatic Resources Delineation.....                             | 26              |
| 3.2.2 Special-Status Plant Species.....                              | 26              |
| 3.2.3 Special-Status Wildlife Species.....                           | 27              |
| 3.2.4 Reconnaissance-Level Biological Resource Surveys.....          | 31              |
| 3.2.5 Arborist Tree Survey and Inventory.....                        | 31              |
| 4 Results.....                                                       | 34              |
| 4.1 Environmental Setting.....                                       | 34              |
| 4.1.1 Regional Setting and Land Use.....                             | 34              |

4.1.2 Climate ..... 34

4.1.3 Soil and Terrain..... 34

4.2 Hydrology ..... 35

4.2.1 Aquatic Resources Delineation..... 36

4.3 Vegetation Communities and Land Cover Types..... 39

4.3.1 Vegetation Communities ..... 40

4.3.2 Land Cover Types..... 41

4.4 Other Biological and Aquatic Resources ..... 42

4.4.1 Sensitive Natural Communities ..... 42

4.4.2 Riparian Habitat..... 42

4.4.3 Swainson’s Hawk Foraging Habitat ..... 43

4.4.4 Designated Critical Habitat/Essential Fish Habitat ..... 43

4.4.5 Wildlife Corridors and Habitat Linkages ..... 44

4.4.6 Plant and Wildlife Species Observed..... 44

4.5 Special-Status Species..... 45

4.5.1 Special-Status Plants..... 45

4.5.2 Arborist Tree Survey and Inventory Results ..... 51

4.5.3 Special-Status Wildlife..... 53

5 Summary of Solar Development Area Resources ..... 72

5.1 Soil and Terrain ..... 72

5.2 Hydrology and Aquatic Resources..... 72

5.3 Vegetation Communities and Land Cover Types..... 73

5.4 Sensitive Natural Communities ..... 73

5.5 Designated Critical Habitat/Essential Fish Habitat..... 73

5.6 Special-Status Plant Species ..... 73

5.6.1 Protocol-Level Botanical Survey Summary..... 74

5.6.2 Arborist Survey and Tree Inventory..... 75

5.7 Special-Status Wildlife Species ..... 75

5.7.1 Protocol-Level and Focused Wildlife Survey Summary..... 77

6 Resources Impact Assessment of the Solar Development Area..... 79

6.1 Definition of Impact Types ..... 79

6.1.1 Direct Permanent Impacts ..... 79

6.1.2 Temporary Impacts ..... 79

6.1.3 Indirect impacts ..... 79

6.1.4 Design to Avoid Resource Impacts ..... 79

6.1.5 Avoidance, Minimization, and Mitigation ..... 80

6.2 Preliminary Analysis of Impacts..... 80

7 References ..... 107

**TABLES**

Table 1. Arborist and Sacramento County Tree Rating Scale ..... 32

Table 2. Summary of Soil Units Within the Project Study Area ..... 35

Table 3. Aquatic Resources Delineation Survey Information Summary ..... 36

Table 4. Summary of Aquatic Resources within the Project Study Area ..... 37

Table 5. Summary of Vegetation Communities and Land Cover within the Project Study Area ..... 40

Table 6. Botanical Reference Population Assessment Summary ..... 49

Table 7. Summary of Trees Inventoried within the Project Study Area ..... 51

Table 8. Summary of Tree Inventory Data ..... 51

Table 9. California Tiger Salamander Aquatic Larval Survey Results Summary ..... 54

Table 10. Protocol-Level Burrowing Owl Breeding Season Survey Results Summary ..... 59

Table 11. Protocol-Level Swainson’s Hawk Survey Results Summary ..... 61

Table 12. Focused Tricolored Blackbird Survey Results Summary ..... 62

Table 13. Focused Valley Elderberry Longhorn Beetle Survey Results Summary ..... 65

Table 14. Summary of Dry Season Survey Dates, Site Conditions, and Biologists Present ..... 68

Table 15. Summary of Wet Season Survey Dates, Site Conditions, and Biologists Present ..... 68

Table 16. Preliminary Summary of Jurisdictional Waters of the U.S. and Waters of the State with the Project Solar Development Area<sup>1</sup> ..... 73

Table 17. Preliminary Resource Impact Analysis Checklist for the Solar Development Area within the Solar Development Area ..... 80

Table 18. Summary of VELB Focused Survey Results, Impacts, and Mitigation ..... 92

Table 19. Summary of Aquatic Resources Impacts by Jurisdiction within the Solar Development Area ..... 99

Table 20. South Sacramento Habitat Conservation Plan Modeled Special-Status Wildlife Species Habitat and Land Cover within Undeveloped Lands in Plan Area and the Solar Development Area ..... 102

**FIGURES**

Figure 1 Project Location ..... 116

Figure 2 Project Setting ..... 118

Figure 3 Soil and Terrain Setting ..... 120

Figure 4 Hydrologic Setting ..... 122

Figure 5 Aquatic Resources Delineation ..... 124

Figure 6 Vegetation and Land Cover ..... 126

Figure 7 Known Special-Status Species Occurrences, Critical Habitat, and Sensitive Communities ..... 128

Figure 8 California Tiger Salamander Habitat Assessment ..... 130

Figure 9 Valley Elderberry Longhorn Beetle Results ..... 132

Figure 10 Dry and Wet Season Large Listed Branchiopod Results ..... 134

Figure 11 Burrowing Owl, Swainson’s Hawk, and Tricolored Blackbird Survey Results ..... 136

**APPENDICES**

- A Swainson’s Hawk and Other Raptor Foraging Use of Solar Array Fields within an Agricultural Landscape in Sacramento County, Year 2
- B Observed Species Compendium
- C Special-Status Plants with Potential to Occur
- E Special-Status Wildlife with Potential to Occur
- F Photo Record

INTENTIONALLY LEFT BLANK

# Acronyms and Abbreviations

| Acronym/Abbreviation | Definition                                 |
|----------------------|--------------------------------------------|
| AOL                  | Adjacent Other Lands                       |
| AMM                  | avoidance and minimization measure         |
| amsl                 | above mean sea level                       |
| ARD                  | Aquatic Resource Delineation               |
| BAGEPA               | Bald and Golden Eagle Protection Act       |
| BCC                  | Bird of Conservation Concern               |
| BTR                  | Biological Technical Report                |
| BUOW                 | burrowing owl                              |
| CDFW                 | California Department of Fish and Wildlife |
| CESA                 | California Endangered Species Act          |
| CEQA                 | California Environmental Quality Act       |
| CFGC                 | California Fish and Game Code              |
| CFR                  | Code of Federal Regulations                |
| CNDDB                | California Natural Diversity Database      |
| CNPS                 | California Native Plant Society            |
| CRPR                 | California Rare Plant Rank                 |
| CTS                  | California tiger salamander                |
| CWA                  | Clean Water Act                            |
| DBH                  | diameter at breast height                  |
| DCH                  | Designated Critical Habitat                |
| DPS                  | distinct population segment                |
| EFH                  | Essential Fish Habitat                     |
| EPA                  | U.S. Environmental Protection Agency       |
| FESA                 | Federal Endangered Species Act             |
| FRAP                 | Fire Resource Assessment Program           |
| MBTA                 | Migratory Bird Treaty Act                  |
| MM                   | mitigation measure                         |
| NOP                  | Notice of Preparation                      |
| NWW                  | Non-Wetland Waters                         |
| OHWM                 | ordinary high water mark                   |
| OWCA                 | Oak Woodlands Conservation Act             |
| Porter-Cologne Act   | Porter-Cologne Water Quality Control Act   |
| Project              | Sloughhouse Solar Project                  |
| PSA                  | Project Study Area                         |
| PRC                  | California Public Resources Code           |
| Quad                 | Quadrangle                                 |
| RWQCB                | Regional Water Quality Control Board       |
| SDA                  | Solar Development Area                     |
| SSC                  | species of special concern                 |



| Acronym/Abbreviation | Definition                                 |
|----------------------|--------------------------------------------|
| SSHCP                | South Sacramento Habitat Conservation Plan |
| SWHA                 | Swainson's hawk                            |
| SWRCB                | State Water Resources Control Board        |
| TRBL                 | tricolored blackbird                       |
| USACE                | U.S. Army Corps of Engineers               |
| USFWS                | U.S. Fish and Wildlife Service             |
| USGS                 | U.S. Geological Survey                     |
| VELB                 | valley elderberry longhorn beetle          |
| WEAP                 | Worker Environmental Awareness Program     |
| WST                  | western spadefoot toad                     |

INTENTIONALLY LEFT BLANK

---

# Executive Summary

Sloughhouse Solar, LLC is proposing construction and operation of the Sloughhouse Solar Project (Project), a solar photovoltaic energy-generating facility adjacent to an existing solar energy facility located in the Sloughhouse community of Sacramento County, California. A Project Study Area (PSA) of 732.26 acres was evaluated for this final Biological Technical Report (BTR). The PSA includes the Project solar development area (371.72 acres), plus the remaining areas outside of the solar development area, which will be referred to herein as “adjacent other lands” (360.54 acres). The purpose of evaluating resources within the PSA was to site an area for proposed solar development that would avoid biological and aquatic resources to the maximum extent feasible. This BTR uses the final preferred environmental alternative site plan dated June 2022 to assess location and potential impacts to biological and aquatic within the solar development area (DESRI 2022).

Sloughhouse Solar, LLC has contracted Dudek to prepare this final BTR to provide an overview of biological and aquatic resources within the PSA and to identify any regulatory constraints and applicable avoidance and minimization measures and mitigation related to these resources. This final BTR provides support for lead and responsible agency analyses, determinations, and findings pursuant to the California Environmental Quality Act, and preliminary impact evaluation and mitigation planning for state and federal permitting, as needed. This final BTR includes a description of the Project; methods used to assess biological and aquatic resources, including analysis of a literature and database review; compiled field surveys; results of the assessment of biological and aquatic resources; resource impact assessments; and recommended avoidance and minimization measures and/or mitigation to reduce potential impacts. The resource evaluations presented herein refer to all resources occurring or with the potential to occur in the PSA and vicinity (i.e., up to 5 miles from the PSA), apart from Section 5, Summary of Solar Development Area Resources, and Section 6, Resources Impact Assessment of the Solar Development Area, which are explicit to only resources within the solar development area of the PSA (i.e., excludes adjacent other lands).

INTENTIONALLY LEFT BLANK

---

# 1 Introduction

## 1.1 Purpose

Dudek has prepared this final Biological Resources Report (BTR) for the Sloughhouse Solar Project (Project). The purpose of this final BTR is to provide a complete overview of biological and aquatic resources within the Project Study Area (PSA) and to identify any regulatory constraints in relation to these resources. In addition, this final BTR provides support for lead and responsible agency analyses, determinations, and findings pursuant to the California Environmental Quality Act (CEQA) and supports impact determination and mitigation planning for state and federal permitting, as needed. This final BTR includes a description of the Project; methods used to assess biological and aquatic resources, including analysis of a literature and database review; compiled field surveys; results of the assessment of biological and aquatic resources; resource impact assessments; and recommended avoidance and minimization measures (AMMs) and/or mitigation to reduce potential impacts.

## 1.2 Project Description

The Project is a solar photovoltaic energy-generating facility located on the southwest corner of Meiss Road and Dillard Road, adjacent to an existing solar energy facility (i.e., Dillard Road Solar Power Facility) located at 7794 Dillard Road, Sacramento County, California. The Project is proposed to be developed by Sloughhouse Solar, LLC to sell its electricity and all renewable and environmental attributes to the Sacramento Municipal Utility District under long-term contracts to help meet California's Renewables Portfolio Standard goals. The Project would construct, operate, and decommission a solar generation and energy storage facility within a solar development area of approximately 371.72 acres (the solar development area, or the limits of disturbance, is inclusive of solar fields, energy storage, substation[s], roads, retention basins, etc.). The Project may also include additional auxiliary facilities such as raw water/fire water storage, treated water storage, stormwater retention basins, water filtration buildings and equipment, equipment control buildings, septic system(s), and parking within the solar development area. The design and construction of the buildings, solar arrays (panels, etc.), energy storage facilities, and auxiliary facilities will be consistent with Sacramento County building standards.

## 1.3 Project Location

The approximately 732.26-acre PSA is located at the southwest corner of the intersection of Meiss Road and Dillard Road in Sloughhouse, an unincorporated area in eastern Sacramento County (Figure 1, Project Location). The southeast portion of the PSA is comprised of an existing solar facility (Dillard Road Solar Power Facility). The remainder of the PSA is comprised of a ponded area in the southwest corner and vacant lands used for cattle ranching. The PSA is surrounded by rural residences, specifically Simpson Ranch to the south, a caviar aquaculture farm to the north, orchards and a turkey farm to the east, and the Consumes River to the west. The PSA can be accessed from gates off both Dillard Road and Meiss Road (Figure 2, Project Setting).

- County - Sacramento
- Public Land Survey System - Cosumnes Land Grant
- U.S. Geological Survey (USGS) 7.5-Minute Quadrangle (Quad) - Sloughhouse
- Latitude, Longitude (decimal degrees) - 38.473731, -121.184568 (Centroid)
- Assessor Parcel Numbers - 12601100010000, 12601100030000
- Elevation Range/Average - 95 to 160 feet above mean sea level (amsl)/128 feet amsl
- PSA - 732.26 acres

---

## 2 Regulatory Setting

### 2.1 Federal

#### 2.1.1 Clean Water Act: Section 404

Pursuant to Section 404 of the Clean Water Act (CWA), the U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged and/or fill material into waters of the United States (U.S). Activities in wetlands or waters for which a USACE permit may be required include the placement of fill material due to development, land clearing involving relocation of soil, road construction, erosion control, mining, stockpiling excavation spoils, and utility line or pipeline construction. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid an impact) can include, to an extent, certain drainage channel maintenance activities involving the use of hand tools only or by positioning construction equipment outside of USACE jurisdiction and excavating without stockpiling in jurisdictional areas. Any person or public agency proposing to discharge dredged or fill material into waters of the U.S., including jurisdictional wetlands, must obtain a Section 404 permit from USACE.

The wetlands determination process is initiated by submitting either an Approved Jurisdictional Determination or a Preliminary Jurisdiction Determination request along with an Aquatic Resources Delineation (ARD) Report to determine if USACE-jurisdictional wetlands or other waters are present on the subject property. The wetland determination process is complete with the issuance of a written geographic jurisdictional determination verification from USACE. Compliance is required with Section 404 of the CWA if a project activity will affect verified waters of the U.S., including wetlands. The most common permits issued by the USACE Regulatory Program are Nationwide Permits, intended for those projects with minimal environmental impacts, and Individual Permits, intended for those projects that are more impactful to environmental resources.

The definition of waters of the U.S. establishes the geographic scope for jurisdiction under Section 404 of the CWA; however, the CWA does not specifically define waters of the U.S., leaving the definition open to statutory interpretation and agency rulemaking. On November 18, 2021, the U.S. Environmental Protection Agency (EPA) and USACE announced the signing of a proposed rule revising the current definition of waters of the U.S. This proposed rule obviates much of the 2020 Navigable Waters Protection Rule implemented during the Trump administration and restores the regulations in effect prior to the Obama Administration's 2015 Clean Water Rule. Moving forward, USACE and EPA propose to reinstate the pre-2015 definition of waters of the U.S. along with updates to reflect consideration of two notable Supreme Court decisions described in more detail below.

#### ***Rapanos v. United States and Carabell v. United States***

In 2007 and again in 2008, USACE and EPA developed guidance for implementing the definition of waters of the U.S. under the CWA following the *Rapanos v. United States* and *Carabell v. United States* Supreme Court decision (EPA 2008). In accordance with both the original and revised guidance, jurisdiction over these waters are as follows:

- Traditional navigable waters
- Wetlands adjacent to traditional navigable waters

- Non-navigable tributaries of traditional navigable waters that are relatively permanent (i.e., the tributaries typically flow year-round or have continuous flow at least seasonally)
- Wetlands that directly abut such tributaries

USACE and EPA decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally (i.e., ephemeral stream channels)
- Wetlands adjacent to such tributaries
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary

USACE and EPA apply a significant nexus evaluation to potential waters of the U.S. as follows:

- A significant nexus analysis assesses the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if in combination they significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters
- Significant nexus includes consideration of hydrologic and ecologic factors including, but not limited to, volume, duration, and the frequency of surface water flow in the resource and its proximity to a traditional navigable water, and the functions performed by the resource on adjacent wetlands.

### *Solid Waste Agency of Northern Cook County v. USACE*

In 2001 and again in 2003, the agencies developed guidance to address the above definition of waters of the U.S. under the CWA following the *Solid Waste Agency of Northern Cook County v. USACE* U.S. Supreme Court decision that “isolated, non-navigable, intrastate” waters could not be claimed as jurisdictional by USACE based on their use by migratory birds (EPA 2000). Although the Supreme Court did not specifically address the meaning of the word “isolated,” it upheld the above definition of “adjacent” wetlands (and other waters), which are by definition wetlands that are “bordering, contiguous, or neighboring” other jurisdictional waters. Therefore, the term “isolated wetland” has implicitly been defined as wetlands that are not bordering, contiguous, or neighboring other waters. The 2001 decision did not, however, define the term “adjacent,” nor did it state whether the basis for adjacency is geographic proximity or hydrology. As established by the Supreme Court in *United States v. Riverside Bayview Homes Inc.* in 1985, “wetlands separated from other waters by man-made dikes or barriers, natural river berms, beach dunes, and the like are ‘adjacent wetlands.’”

### Current (Proposed) Definition of Waters of the U.S., Including Wetlands

As currently proposed by USACE and EPA, the term waters of the U.S. include the following (86 Code of Federal Regulations [CFR] 69372-69450):



1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. "Other Waters" that meet either the "Relatively Permanent Standard" or the "Significant Nexus Standard." All Other Waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:
  - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
  - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments, and wetlands adjacent to impoundments, that meet either the Relatively Permanent Standard or the Significant Nexus Standard;
5. Tributaries of waters;
6. The territorial seas; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands), and waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the U.S.

The Relatively Permanent Standard refers to waters that are relatively permanent, standing, or continuously flowing, and waters with a continuous surface connection to such waters. The Significant Nexus Standard refers to waters that either alone, or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable waters, interstate waters, or the territorial seas (86 CFR 69372-69450).

Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). USACE predominantly relies on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region – Version 2.0* (USACE 2008a) methodology to determine the presence of jurisdictional wetlands in California. USACE relies on the presence of three criteria to determine if an area is a wetland: hydrophytic vegetation, hydric soils, and hydrology. Hydrophytic vegetation refers to a

predominance of plant life that is adapted to life in wet conditions. Hydric soils refer to soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part. Hydrology refers to the presence of water, either above the soil surface or within the upper 12 to 18 inches of the soil profile just below the soil surface (USACE 1987).

For linear, non-wetland waters of the U.S. (e.g., perennial, intermittent, or ephemeral drainages), the lateral limits of USACE jurisdiction extend to the reliable ordinary high water mark (OHWM). As defined in the CFR Title 33, Section 328.3(e), the OHWM is “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.” If wetlands are present adjacent to such resources and they meet the Relatively Permanent Standard or the Significant Nexus Standard, then jurisdiction would likely extend to the limit of these wetlands (86 CFR 69372-69450). Further guidance for determining jurisdictional limits in Washington is detailed in USACE’s *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b).

## 2.1.2 Clean Water Act: Section 401

Section 401 of the CWA provides states and authorized tribes with a valuable tool to help protect the water quality of federally regulated waters within their borders (i.e., waters of the state), in collaboration with federal agencies.

On June 1, 2020, the EPA finalized the 2020 CWA Section 401 Certification Rule (i.e., the 2020 Rule). The 2020 rule became effective on September 11, 2020. The 2020 Rule was vacated on October 21, 2021, and the vacatur was stayed on April 6, 2022, so the 2020 Rule is currently in effect (EPA 2022).

As such, the EPA’s regulations at 40 CFR 121 address CWA Section 401 certification generally. Under Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the U.S. unless a CWA Section 401 water quality certification is issued, or certification is waived. States and authorized tribes where the discharge would originate are generally responsible for issuing water quality certifications. In cases where a state or tribe does not have authority, EPA is responsible for issuing certification. In making decisions to grant, grant with conditions, or deny certification requests, certifying authorities consider whether the federally licensed or permitted activity will comply with applicable water quality standards, effluent limitations, new source performance standards, toxic pollutants restrictions, and other appropriate water quality requirements of state or tribal law. A federal agency may not issue a license or permit for an activity that may result in a discharge into waters of the U.S. without a water quality certification or waiver (EPA 2022).

### Implementation in California

The California State Water Resources Control Board (SWRCB) has authority over waters of the state, including wetlands, through Section 401 of the CWA, the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), California Code of Regulations Section 3831(k), and the California Wetlands Conservation Policy. The CWA requires that an applicant for a Section 404 permit (to discharge dredge or fill material into waters of the U.S.) first obtain certification from the appropriate state agency stating that the fill is consistent with the state’s water quality standards and criteria. In California, the authority to either grant certification or waive the requirement for permits is delegated by the SWRCB to the nine regional boards. The Central Valley Regional Water Quality Control Board

(RWQCB) has authority for Section 401 compliance in the Project region. A request for Water Quality Certification is submitted to the RWQCB while an application is filed with USACE (EPA 2022).

### 2.1.3 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973, as amended (16 USC 1531 et seq.), serves as the enacting legislation to list, conserve, and protect threatened and endangered species, and the ecosystems on which they depend, from extinction. In addition, for those wildlife species listed as federally endangered, FESA provides for the ability to designate critical habitat, defined as that habitat considered “essential to the conservation of the species” and that “may require special management considerations or protection.”

Under FESA Section 7, if a project that would potentially result in adverse impacts to threatened or endangered species includes any action that is authorized, funded, or carried out by a federal agency, that agency must consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any such action is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat for that species. FESA Section 9(a)(1)(B) prohibits the taking, possession, sale, or transport of any endangered fish or wildlife species. “Take” is defined to mean “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 USC 1532[19]). With respect to any endangered species of plant, Sections 9(a)(2)(A) and 9(a)(2)(B) prohibit the possession, sale, and import or export, of any such species, and prohibits any action that would “remove and reduce to possession any such species from areas under federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.” Pursuant to FESA Section 10(a)(1)(B), USFWS may issue a permit for the take of threatened or endangered species if such taking is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity” (USFWS 2022).

### 2.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50, Section 10.13 of the CFR. The MBTA is an international treaty for the conservation and management of bird species that migrate through more than one country and is enforced in the United States by USFWS. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50, Section 20 of the CFR. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors) (USFWS 2021a).

### 2.1.5 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BAGEPA) (16 USC 668 et seq.) provides for the protection of both bald and golden eagles. Specifically, BAGEPA prohibits take of eagles, which is defined as any action that would “pursue, destroy, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb” bald and golden eagles, including parts, nests, or eggs. The term “disturb” is further defined by regulation as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, injury to an eagle, a decrease in productivity, or nest abandonment” (50 CFR 22.3). Under BAGEPA, it is also illegal to “sell, purchase, barter, trade, import, or export, or offer for sale, purchase, barter, or trade, at any time or in any manner, any bald eagle or any golden eagle, or the parts, nests, or eggs” of these birds. Pursuant to 50 CFR 22.26, and as of the latest amendment to BAGEPA in

December 2016, a permit may be obtained that authorizes take of bald eagles and golden eagles where the take is “compatible with the preservation of the bald eagle and the golden eagle; is necessary to protect an interest in a particular locality; is associated with, but not the purpose of, the activity; and cannot practicably be avoided” (USFWS 2021b).

## 2.2 State of California

### 2.2.1 California Department of Fish and Game Code

Divisions of the California Fish and Game Code (CFGC) establish the basis of fish, wildlife, and native plant protections and management in the state.

#### 2.2.1.1 California Endangered Species Act

Under the California Endangered Species Act (CESA), the California Department of Fish and Wildlife (CDFW) has the responsibility of maintaining a list of threatened and endangered species. CESA prohibits the take of state-listed threatened or endangered animals and plants unless otherwise permitted pursuant to CESA. “Take” under CESA is defined as any of the following: “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (CFGC Section 86). Species determined by the state to be candidates for listing as threatened or endangered are treated as if listed as threatened or endangered and are, therefore, protected from take. Pursuant to CESA, a state agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species, or candidate species, could be potentially impacted by that project (CDFW 2021a).

#### 2.2.1.2 California Oak Woodlands Conservation Act and Oak Protection

The 2005 CFGC Sections 1360–1372 outline the terms and conditions comprising the California Oak Woodlands Conservation Act (OWCA) (CLI 2016). An oak woodland is defined as an oak stand with greater than 10% canopy cover, or that may have historically supported greater than 10% canopy cover. The overall purpose of the OWCA is to provide funding for the conservation and protection of California’s oak woodlands. In addition, the OWCA is designed to support and encourage voluntary, long-term private stewardship and conservation of California’s oak woodlands by offering landowners financial incentives to protect and promote biologically functional oak woodlands over time, as mandated by the Wildlife Conservation Board. The Wildlife Conservation Board has established programs, including the California Oak Woodlands Conservation Program, to protect and restore oak woodlands. The OWCA encourages and defers to local jurisdictions to develop and implement oak conservation plans developed under the OWCA (WCB 2021).

Furthermore, the California Public Resources Code (PRC) Section 21083.4 defines an oak as a native tree species in the genus *Quercus*, not designated as commercial species (i.e., Groups A and B) pursuant to regulations adopted by the State of California Board of Forestry and Fire Protection (i.e., Section 4526), that is 5 inches or more in diameter at breast height (DBH) (i.e., diameter of a tree measured 4.5 feet above natural grade). In addition, the PRC defines a 10% canopy cover stipulation that pertains to an individual stand of vegetation, and not all oaks within an entire project site. PRC 21083.4 does not apply to oak woodlands dominated by black oak (*Quercus kelloggii*). As part of the determination made pursuant to PRC Section 21080.1, it is the responsibility of a county to determine if a project under its jurisdiction would result in a significant effect on the environment resulting from

a conversion of an oak woodland. When a county determines that a project could result in significant impacts to oak woodlands, mitigation measures (MMS) are required and may be selected from several mitigation alternatives set forth in PRC Section 21083.4(b).

### 2.2.1.3 Lake and Streambed Alteration Program

Under Sections 1600–1616 of the CFGC, CDFW regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFW’s jurisdiction are defined in the code as the “bed, channel or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit.” In practice, CDFW usually marks its jurisdictional limit at the top of the stream or bank, or at the outer edge of the riparian vegetation, whichever is wider (CDFW 2021b).

### 2.2.1.4 Native Plant Protection Act

The Native Plant Protection Act was enacted in 1977 and is administered by CDFW, per CFGC Section 1900 et seq. The Native Plant Protection Act prohibits take of endangered, threatened, or rare plant species native to California, apart from special criteria identified in the CFGC. A “native plant” means a plant growing in a wild uncultivated state that is normally found native to the plant life of the state. A “rare” species can be defined as species that are broadly distributed but never abundant where found, narrowly distributed, or clumped yet abundant where found, and/or narrowly distributed or clumped and not abundant where found. If potential impacts are identified for a project activity, then consultation with CDFW, permitting, and/or other mitigation may be required (CLI 2021).

### 2.2.1.5 Nesting Migratory Birds and Raptors

Section 3503 of the CFGC states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 protects all birds of prey (raptors) and their eggs and nests. Section 3511 states that fully protected birds or parts thereof may not be taken or possessed at any time. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA.

### 2.2.1.6 California Fish and Game Code Section 4150

CFGC Section 4150 states a mammal occurring naturally in California that is not a game mammal, fully protected mammal, or fur-bearing mammal is a non-game mammal. A non-game mammal may not be taken or possessed under this code. All bat species occurring naturally in California are considered non-game mammals and are therefore prohibited from take as stated in CFGC Section 4150.

### 2.2.1.7 California Fish and Game Code Section 1940

Section 1940 of the CFGC requires CDFW to develop and maintain a vegetation mapping standard for the state. More than half of the vegetation communities in the state have been mapped through the Vegetation Classification and Mapping Program.

Natural vegetation communities are evaluated by CDFW and are assigned global (G), and state (S) ranks based on rarity of and threats to these vegetation communities in California. Sensitive natural communities are defined by

CDFW as vegetation alliances with state ranks of S1–S3 (S1: critically imperiled, S2: imperiled, S3: vulnerable), as identified in the 2010 List of Vegetation Alliances and Associations and subsequent updates. Natural communities with ranks of S1–S3 are considered sensitive natural communities to be addressed in the environmental review processes of CEQA and its equivalents. Additionally, all vegetation associations within the alliances with ranks of S1–S3 are considered sensitive habitats. CEQA requires that impacts to sensitive natural communities be evaluated and mitigated to the extent feasible.

Sensitive natural communities are communities that have a limited distribution and are often vulnerable to the environmental effects of projects. These communities may or may not contain special-status species or their habitats. For purposes of this assessment, sensitive natural communities are considered to include vegetation communities listed in CDFW’s California Natural Diversity Database (CNDDDB) and communities listed in the Natural Communities List with a rarity rank of S1- S3 (CDFW 2021c).

### 2.2.1.8 Porter-Cologne Water Quality Control Act

As detailed above in Section 2.1.2, Clean Water Act: Section 401, The Porter-Cologne Act, CFGC Sections 1601–1607, delegates responsibility to the SWRCB for water rights and water quality protection and directs the nine statewide RWQCBs to develop and enforce water quality standards within their jurisdiction. The Porter-Cologne Act requires any entity discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state to file a “report of waste discharge” with the appropriate RWQCB. The appropriate RWQCB then must issue a permit, referred to as a Waste Discharge Requirement. Waste Discharge Requirements implement water quality control plans and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisances (SWRCB 2019).

The SWRCB defines a water of the state as “any surface water or groundwater, including saline waters, within the boundaries of the state” (California Water Code Section 13050[e]). As of April 2019, the SWRCB has defined “wetland” to include the following (SWRCB 2019):

1. Natural wetlands,
2. Wetlands created by modification of a surface water of the state,
3. Artificial wetlands that meet any of the following criteria:
  - a. Approved by an agency as compensatory mitigation for impacts to other Waters of the State, except where the approving agency explicitly identifies the mitigation as being of limited duration;
  - b. Specifically identified in a Water Quality Control Plan as a wetland or other water of the state;
  - c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or
  - d. Greater than or equal to one acre in size unless the artificial wetland was constructed and is currently used and maintained, primarily for one or more of the following purposes: industrial or municipal wastewater treatment or disposal; settling of sediment; detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial permitting program; treatment of surface waters; agricultural crop irrigation

or stock watering; fire suppression; industrial processing or cooling water; active surface mining – even if the site is managed for interim wetlands functions and values; log storage; treatment, storage, or distribution of recycled water; maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or fields flooded for rice growing.

All waters of the U.S. are waters of the state. Wetlands, such as isolated seasonal wetlands, that are not generally considered waters of the U.S. are considered waters of the state 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” (SWRCB 2019).

## 2.2.2 California Environmental Quality Act

CEQA, PRC Section 21000 et seq., requires public agencies undertaking discretionary actions to approve a project to first determine whether a project may have a significant effect on the environment, and then to prepare an environmental impact report if there is substantial evidence that the project may have a significant effect on the environment. Where an environmental impact report has been prepared, CEQA further requires public agencies to adopt findings with respect to each significant effect that “changes or alterations have been required in, or incorporated, into the project which mitigate or avoid the significant effects on the environment; that those changes are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency; or that specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report” (PRC Section 21081[a]).

The California Natural Resources Agency has adopted regulations (i.e., guidelines) to implement CEQA. Pursuant to CEQA Guidelines Section 15380, protection is provided for federal and/or state-listed species, as well as species not listed federally or by the state that may be considered rare, threatened, or endangered. Species that meet these criteria can include candidate species, species proposed for listing, and species of special concern. Plants listed in the California Native Plant Society (CNPS) Rare Plant Program are considered to meet CEQA’s Section 15380 criteria as well. Section 15380 also addresses a potential situation in which a public agency is to review a project that may have a significant effect on, for example a candidate species, which has not yet been listed by USFWS or CDFW. Therefore, CEQA enables an agency to protect a species from significant project impacts until the respective government agencies have had an opportunity to list the species as protected, if warranted. Impacts to these species would therefore be considered significant, requiring mitigation (CDFW 2021d).

## 2.2.3 California Department of Fish and Wildlife Special Plants

For the purposes of this analysis, special plant species are defined as plants that are legally protected or that are otherwise considered sensitive by federal, state, or local resource conservation agencies. These species fall into one or more of the following categories:

- Listed by the federal government under the FESA of 1973 or the State of California under the CESA of 1970 as endangered, threatened, or rare
- A candidate for federal or state listing as endangered or threatened

- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range but not currently threatened with extirpation
- Population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California
- Taxa strongly associated with a habitat that is declining in California at a significant rate (e.g., wetlands, riparian, vernal pools, old growth forests, desert aquatic systems, native grasslands, valley shrubland habitats)

Taxa considered to be “rare, threatened, or endangered in California” as defined by CDFW are assigned a California Rare Plant Rank (CRPR). The CDFW system includes six rarity and endangerment ranks for categorizing plant species of concern, as follows:

- CRPR 1A – Plants presumed to be extinct in California
- CRPR 1B – Plants that are rare, threatened, or endangered in California and elsewhere
- CRPR 2A – Plants presumed to be extinct in California, but more common elsewhere
- CRPR 2B – Plants that are rare, threatened, or endangered in California, but more common elsewhere
- CRPR 3 – Plants about which more information is needed (a review list)
- CRPR 4 – Plants of limited distribution (a watch list)

Plants ranked as CRPR 1A, 1B, 2A, or 2B may qualify as endangered, rare, or threatened species within the definition of CEQA Guidelines Section 15380. CDFW recommends that potential impacts to CRPR 1 and 2 species be evaluated in CEQA review documents. In general, CRPR 3 and 4 species do not meet the definition of endangered, rare, or threatened pursuant to CEQA Guidelines Section 15380, but these species may be evaluated on a case-by-case basis (CNPS 2021a).

## 2.2.4 Other State Tree Protection Regulations

Additional state laws that regulate and/or protect oaks and oak woodlands include the Professional Foresters Law, CEQA, and the Board of Forestry and Fire Protection. The Professional Foresters Law addresses oak habitat evaluations. Both the Professional Foresters Law and CEQA apply to all local jurisdictions. Since it is a state agency, the Board of Forestry and Fire Protection has regulatory authority over all of California's forested landscapes, including the authority to regulate oak woodlands at the state or local level.

## 2.3 County

### 2.3.1 Sacramento County General Plan

The Sacramento County General Plan addresses policies to help preserve and restore vegetation, wildlife, biological habitat, and aquatic resources throughout Sacramento County, including ways to ensure that these important



natural resources are given adequate attention in development projects and master planning efforts. Additionally, the Open Space Element of the General Plan describes protection measures and provides a management/acquisition for continued preservation and protection of Sacramento County's natural resource habitats. The sections below provide an overview of General Plan Conservation Elements pertaining to biological and aquatic resources in Sacramento County (Sacramento County 2017).

### 2.3.1.1 Vegetation and Wildlife Conservation Element

#### Habitat Protection and Management

Goal: Preserve and manage natural habitats and their ecological functions throughout Sacramento County.

#### Habitat Mitigation

Objective: Mitigate and restore for natural habitat and special-status species loss.

##### Policies:

- CO-58. Ensure no net loss of wetlands, riparian woodlands, and oak woodlands.
- CO-59. Ensure mitigation occurs for any loss of or modification to the following types of acreage and habitat function: (1) vernal pools, (2) wetlands, (3) riparian, (4) native vegetative habitat, and (5) special-status species habitat.
- CO-60. Mitigation should be directed to lands identified on the Open Space Vision Diagram and associated component maps.
- CO-61. Mitigation should be consistent with Sacramento County-adopted habitat conservation plans.
- CO-62. Permanently protect land required as mitigation.

#### Habitat Preserve and Management

Objective: Establish and manage a preserve system with large core and landscape level preserves connected by wildlife corridors throughout Sacramento County to protect ecological functions and species populations.

##### Policies:

- CO-64. Consistent with overall land use policies, the County shall support and facilitate the creation and biological enhancement of large natural preserves or wildlife refuges by other government entities or by private individuals or organizations.
- CO-65. Create a network of preserves linked by wildlife corridors of sufficient size to facilitate the movement of species.
- CO-66. Mitigation sites shall have a monitoring and management program including an adaptive management component including an established funding mechanism. The

programs shall be consistent with Habitat Conservation Plans that have been adopted or are in draft format.

- CO-67. Preserves and conservation areas should have an established funding mechanism, and where needed, an acquisition strategy for its operation and management in perpetuity. This includes existing preserves such as the American River Parkway, Dry Creek Parkway, Cosumnes River Preserve and other plans in progress for riparian areas like Laguna Creek.
- CO-68. Preserves shall be planned and managed to the extent feasible to avoid conflicts with adjacent agricultural activities.
- CO-69. Avoid, to the extent possible, the placement of new major infrastructure through preserves unless located along disturbed areas, such as existing roadways.

## Habitat Protection and Project Review

**Objective:** Review development plans and projects to ensure a balance between essential growth needs and the protection and preservation of natural habitats and special-status species.

**Policies:**

- CO-70. Community Plans, Specific Plans, Master Plans and development projects shall: 1- include the location, extent, proximity and diversity of existing natural habitats and special-status species in order to determine potential impacts, necessary mitigation and opportunities for preservation and restoration; 2- be reviewed for the potential to identify nondevelopment areas and establish preserves, mitigation banks and restore natural habitats, including those for special-status species, considering effects on vernal pools, groundwater, flooding, and proposed fill or removal of wetland habitat; and 3- be reviewed for applicability of protection zones identified in this Element, including the Floodplain Protection Zone, Stream Corridor Ordinance, Cosumnes River Protection Combining Zone and the Laguna Creek Combining Zone.
- CO-71. Development design shall help protect natural resources by: (1) Minimizing total built development in the floodplain, while designing areas of less frequent use that can support inundation to be permitted in the floodplain; (2) Ensuring development adjacent to stream corridors and vernal pools provide, where physically reasonable, a public street paralleling at least one side of the corridor with vertical curbs, gutters, foot path, street lighting, and post and cable barriers to prevent vehicular entry; (3) Projects adjacent to rivers and streams shall integrate amenities, such as trail connectivity, that will serve as benefits to the community and ecological function; (4) Siting of wetlands near residential and commercial areas should consider appropriate measures to minimize potential for mosquito habitation; and (5) Development adjacent to stream corridors and vernal pools shall be designed in such a manner as to prevent unauthorized vehicular entry into protected areas.
- CO-72. If land within river and stream watersheds in existing agricultural areas is developed for non-agricultural purposes, the County should actively pursue easement dedication for recreation trails within such development as a condition of approval.

- CO-73. Secure easement or fee title to open space lands within stream corridors as a condition of development approval.
- CO-74. Evaluate feasible on-site alternatives early in the planning process and prior to the environmental review process that reduce impacts on wetland and riparian habitat and provide effective on-site preservation in terms of minimum management requirements, effective size, and evaluation criteria.

### Special-Status Species and Their Respective Habitats

Goal: Preserve, enhance, and restore special-status species habitat in Sacramento County to aid in the recovery of these species.

#### Protection of Special-Status Species

Objective: Protect and maintain habitat for special-status species.

Policies:

- CO-75. Maintain viable populations of special-status species through the protection of habitat in preserves and linked with natural wildlife corridors.
- CO-77. Development of open space acquisition programs within natural areas shall consider whether the area is occupied by special-status species.

#### Manage Lands for Special-Status Species

Objective: Manage and maintain special-status species and their respective habitat in a manner that resolves conflicts with adjacent privately owned-land and agricultural operations.

Policies:

- CO-80. Control human access to sensitive habitat areas on public lands to minimize impact upon and disturbance of special-status species.
- CO-82. Ensure that mosquito control measures have the least effect on non-target species.

## 2.3.1.2 Aquatic Resources Conservation Element

### Vernal Pools

Goal: Preserve and enhance self-sustaining vernal pool habitats.

#### Vernal Pools Preserves

Objective: Establish vernal pool preserves that enhance and protect the ecological integrity of vernal pool resources.

Policies:

- CO-83. Preserve a representative portion of vernal pool resources across their range by protecting vernal pools on various geologic landforms, vernal pools that vary in depth and size, and vernal pool complexes of varying densities; to maintain the ecological integrity of a vernal pool ecosystem.
- CO-84. Ensure that vernal pool preserves are large enough to protect vernal pool ecosystems that provide intact watersheds and an adequate buffer, have sufficient number and extent of pools to support adequate species populations and a range of vernal pool types.
- CO-85. Utilize proper vernal pool restoration techniques as approved by the USFWS, the CDFW, and the USACE.
- CO-86. Limit land uses within established preserves to activities deemed compatible with maintenance of the vernal pool resource, which may include ranching, grazing, scientific study, and education.

## Rivers and Streams

Goal: Preserve, protect, and enhance natural open space functions of riparian, stream, and river corridors.

### Riparian Habitat

Objective: Manage riparian corridors to protect natural, recreational, economic, agricultural, and cultural resources as well as water quality, supply, and conveyance.

Policies:

- CO-87. Encourage private landowners to protect, enhance and restore riparian habitat.
- CO-88. Where removal of riparian habitat is necessary for channel maintenance, it will be planned and mitigated to minimize unavoidable impacts upon biological resources.
- CO-89. Protect, enhance, and maintain riparian habitat in Sacramento County.
- CO-90. Increase riparian woodland, valley oak riparian woodland and riparian scrub habitat along select waterways within Sacramento County.
- CO-91. Discourage introductions of invasive non-native aquatic plants and animals.
- CO-92. Enhance and protect shaded riverine aquatic habitat along rivers and streams.

### Limitation of Fill in Floodplains

Objective: Maintain the natural character of the 100-year floodplain by limiting fill and excavation.

Policies:

- CO-93. Discourage fill in the 100-year floodplain.

- CO-94. Development within the 100-year floodplain and designated floodway of Sacramento streams, sloughs, creeks, or rivers shall be: 1- Consistent with policies to protect wetlands and riparian areas; and 2- Limited to land uses that can support seasonal inundation.
- CO-95. Development within the 100-year floodplain should occur in concert with the development of the Floodplain Protection Zone.

## Bank Stabilization

**Objectives:** Maintain levee protection, riparian vegetation, function and topographic diversity by stream channel and bank stabilization projects. Stabilize riverbanks to protect levees, water conveyance and riparian functions.

**Policies:**

- CO-96. Reduce dependence on traditional levee protection methods where those methods conflict with habitat preservation efforts and where alternate methods exist which are compatible with preservation efforts and offer an acceptable level of bank stabilization.
- CO-97. Work with appropriate regulatory agencies to reduce bank and levee erosion by minimizing erosive wake activity generated by recreational and commercial boating.
- CO-98. Coordinate with federal, state, and local agencies overseeing levee and bank stabilization to investigate and, whenever possible, utilize biotechnical or nonstructural alternatives to other conventional stabilization methods.
- CO-99. Encourage habitat restoration and recreational opportunities as an integral part of bank and levee stabilization efforts.
- CO-100. Encourage construction of structures for flood control and stormwater quality purposes using currently approved scientific methods to prevent erosion and stabilize the banks.
- CO-101. Stabilize the banks of rivers and streams in a manner that increases flood protection and increases riparian habitat functions.

## Protection of Rivers

**Objective:** Conserve and protect the Sacramento, Cosumnes, Mokelumne and American Rivers to preserve natural habitat and recreational opportunities.

**Policies:**

- CO-102. Promote and encourage habitat restoration efforts on and adjacent to our river floodways.
- CO-103. Protect the Cosumnes River Corridor by promoting the preservation of agriculture, natural habitat, and limited recreational uses adjacent to the river channel, and when feasible by acquiring appropriate lands or easements adjacent to the river.

## Channel Modifications

Objective: Protect and restore natural stream functions.

Policies:

- CO-105. Channel modification projects shall be considered for approval by the Board of Supervisors only after conducting a noticed public hearing examining the full range of alternatives, relative costs and benefits, and environmental, economic, and social benefits.
- CO-105a. Encourage flood management designs that respect the natural topography and vegetation of waterways while retaining flow and functional integrity.
- CO-106. Realigned or modified channels should retain topographic diversity including maintaining meandering characteristics, varied berm width, naturalized side slope, and varied channel bottom elevation.
- CO-107. Maintain and protect natural function of channels in developed newly developing, and rural areas.
- CO-108. Channel lowering should occur after consideration of alternatives and only when it is necessary to accommodate the gravity drainage of storm runoff and/or accommodate flood flows under existing bridge structures.
- CO-109. Channel modifications should not prevent minimum water flows necessary to protect and enhance fish habitats, native riparian vegetation, water quality, or ground water recharge.
- CO-110. Improvements in watercourses will be designed for low maintenance. Appropriate Manning's "n" 13 values will be used in design of the watercourses to reflect future vegetative growth (including mitigation plantings) associated with the low maintenance concept.
- CO-111. Channel modifications shall retain wetland and riparian vegetation whenever possible or otherwise recreate the natural channel consistent with the historical ecological integrity of the stream or river.
- CO-112. The use of concrete and impervious materials is discouraged where it is inconsistent with the existing adjacent watercourse and overall ecological function of the stream.
- CO-113. Encourage revegetation of native plant species appropriate to natural substrate conditions and avoid introduction of nonindigenous species.

## Land Use Adjacent to Rivers and Streams

Objective: Land uses within and development adjacent to stream corridors are to be consistent with natural values.

Policies:

- CO-114. Protect stream corridors to enhance water quality, provide public amenities, maintain flood control objectives, preserve, and enhance habitat, and offer recreational and educational opportunities.

- CO-115. Provide setbacks along stream corridors and stream channels to protect riparian habitat functions. (1) A functional setback of at least 100 feet and measured from the outside edge of the stream bank should be retained on each side of a stream corridor that prohibits development or agricultural activity. This buffer is necessary to protect riparian functions by allowing for the filtering of sediment, pesticides, phosphorus and nitrogen, organic matter and other contaminants that are known to degrade water quality. This buffer also provides for the protection of vegetation along the stream bank which provides bank stability, erosion control and flood attenuation; (2) A transitional setback of at least 50 feet in width beyond the functional buffer should be retained along all stream corridors. This buffer is necessary to protect hydrogeomorphic functions that regulate water temperature, regulate microclimate, maintain channel complexity, and retain hydrologic flow regimes. This buffer also provides corridors to facilitate the movement of wildlife; (3) An extended setback of at least 50 feet in width beyond the transitional setback should be retained along all stream corridors. This setback will allow for recreational uses such as bike, pedestrian and/or equestrian trails and will allow for the placement of infrastructure such as water and sewer lines; (4) Stormwater discharge ponds or other features used for improving stormwater quality may be located within the extended or transitional setback area. However, to protect stream habitat and floodplain value, the width of the setback shall not be based upon the width of the pollutant discharge pond. The ponds shall be landscaped and maintained with vegetation native to the surrounding area. Detention ponds or other features implementing pollutant discharge requirements, other than approved regional stormwater quality practices that are designed and operated to complement the corridor functionally and aesthetically, are prohibited; (5) Setback averaging within individual development projects or as otherwise specified in a Sacramento County-adopted master plan will be permitted except when riparian woodland will be lost. The minimum width of setbacks cannot fall below 50 feet; and (6) Master drainage plans may provide for other standards that meet the intent of this policy.
- CO-116. Encourage filter strips using appropriate native vegetation and substrate along riparian streambanks adjacent to irrigated croplands.
- CO-117. Public roads, parking, and associated fill slopes shall be located outside of the stream corridor, except at stream crossings and for purposes of extending or setting back levees. The construction of public roads and parking should utilize structural materials to facilitate permeability. Crossings shall be minimized and be aesthetically compatible with naturalistic values of the stream channel.
- CO-118. Development adjacent to waterways should protect the water conveyance of the system, while preserving and enhancing the riparian habitat and its function.

## Maintenance of Rivers and Streams

Objective: Properly manage and fund the maintenance of rivers and streams to protect and enhance natural functions.

Policies:

- CO-120. Development projects adjacent to rivers and streams shall provide unencumbered maintenance access.
- CO-121. No grading, clearing, tree cutting, debris disposal or any other despoiling action shall be allowed in rivers and streams except for normal channel maintenance, restoration activities, and road crossings.
- CO-122. River and stream maintenance should allow natural vegetation in and along the channel to assist in removal of nutrients, pollutants, and sediment and to increase bank stabilization, while minimizing impacts on conveyance.
- CO-123. The use of native plant species shall be encouraged on revegetation plans.
- CO-124. Maintain and manage rivers and streams to encourage special-status species.

### Restoration of Rivers and Streams

Objective: Restore concrete sections of rivers and streams to increase natural functions

Policies:

- CO-125. Restore concrete sections of rivers and streams to natural or naturalized channels, where feasible for increased flood or conveyance capacity and groundwater recharge.

### Fisheries

Goal: Preserve and protect fisheries in the Sacramento County waterways and water bodies.

### In-Stream Functions

Objective: Provide and protect high quality in-stream habitat, water quality and water flow to support fisheries propagation, development, and migration.

Policies:

- CO-126. Prohibit obstruction or underground diversion of natural waterways.
- CO-127. Protect, preserve, and restore migratory routes for anadromous species.
- CO-128. Require screens on diversion pumps or similar bypass apparatus to reduce fish mortality. CO-129. Require screening on all public water diversion facilities.
- CO-130. Protect, enhance, and restore riparian, in-channel, and shaded riverine aquatic habitat for: (1) spawning and rearing of fish species, including native and recreational non-native, non-invasive species, where they currently spawn; (2) potential areas where natural spawning could be sustainable; and (3) supporting other aquatic species.



### 2.3.1.3 Terrestrial Resources Conservation Element

#### Native Vegetation Protection, Restoration and Enhancement

Objective: Tree and native vegetation management practices to promote regeneration in designated resource conservation areas.

Policies:

- CO-132. Protect native vegetative habitats from improper grazing regimes on public lands and inform private land operators of how they may minimize impacts to these habitats.
- CO-133. Prohibit native vegetative habitat mitigation and/or other public plantings onto incompatible substrates i.e., tree planting in vernal pool hardpan.
- CO-134. Maintain and establish a diversity of native vegetative species in Sacramento County.
- CO-135. Protect the ecological integrity of California Prairie habitat.
- CO-136. Prohibit the loss of mitigated resource areas.
- CO-137. Mitigate for the loss of native trees for road expansion and development consistent with General Plan policies and/or the Sacramento County Tree Preservation Ordinance.

#### Landmark and Heritage Tree Protection

Objective: Heritage and landmark tree resources preserved and protected for their historic, economic, and environmental functions.

Policies:

- CO-138. Protect and preserve non-oak native trees along riparian areas if used by Swainson's Hawk (SWHA), as well as landmark and native oak trees measuring a minimum of 6 inches in diameter or 10 inches aggregate for multi-trunk trees at 4.5 feet above ground.
- CO-139. Native trees other than oaks, which cannot be protected through development, shall be replaced with in-kind species in accordance with established tree planting specifications, the combined diameter of which shall equal the combined diameter of the trees removed.
- CO-140. For projects involving native oak woodlands, oak savannah, or mixed riparian areas, ensure mitigation through either of the following methods: (1) An adopted habitat conservation plan; (2) Ensure no net loss of canopy area through a combination of the following: A- preserving the main, central portions of consolidated and isolated groves constituting the existing canopy and B- provide an area on site to mitigate any canopy lost. Native oak mitigation area must be a contiguous area on site which is equal to the size of canopy area lost and shall be adjacent to existing oak canopy to ensure opportunities for regeneration; (3) Removal of native oaks shall be compensated with native oak species with a minimum of a one to one DBH replacement; (4) A provision for a comparable on-site area for the propagation of oak trees may substitute for replacement tree planting

requirements at the discretion of the Sacramento County Tree Coordinator when removal of a mature oak tree is necessary; (5) If the project site is not capable of supporting all the required replacement trees, a sum equivalent to the replacement cost of the number of trees that cannot be accommodated may be paid to Sacramento County's Tree Preservation Fund or another appropriate tree preservation fund; and (6) If on-site mitigation is not possible given site limitation, off-site mitigation may be considered. Such a mitigation area must meet all the following criteria to preserve, enhance, and maintain a natural woodland habitat in perpetuity, preferably by transfer of title to an appropriate public entity. Protected woodland habitat could be used as a suitable site for replacement tree plantings required by ordinances or other mitigations. (a) Equal or greater in area to the total area that is included within a radius of 30 feet of the dripline of all trees to be removed; (b) Adjacent to protected stream corridor or other preserved natural areas; (c) Supports a significant number of native broadleaf trees; and (d) Offers good potential for continued regeneration of an integrated woodland community.

- CO-141. In 15 years, the native oak canopy within on-site mitigation areas shall be 50% canopy coverage for valley oak and 30% canopy coverage for blue oak and other native oaks.

## 2.3.2 Sacramento County Tree Preservation Ordinance

Sacramento County regulates tree impacts and preservation through the Tree Preservation Ordinance (Sacramento County Code 480 Section 1, 1981). The Sacramento County Tree Preservation Ordination specifically applies to the following: (1) the planting, maintenance, protection, and preservation of public trees and landscaping; (2) helping to eliminate dangerous conditions caused by trees and shrubs that may result in injuries to persons or property; (3) the protection of all trees within Sacramento County against the spread of disease or pests; and (4) the provision for the special protection of heritage and landmark trees within the unincorporated area of Sacramento County. Chapter 19.12 of the Sacramento County Code requires a Sacramento County Tree Permit before any party shall plant, transplant, move, separate, trim, prune, cut above or below the ground, disrupt, alter, or do surgery upon any public tree located on an easement, planting easement, street, or public premises, irrespective of whether the tree is alive or dead. In addition, without a tree permit or discretionary approval by the Board of Supervisors, Sacramento County Planning Commission, Zoning Board of Appeals, the Zoning Administrator, or the Subdivision Review Committee, no person shall trench, grade, or fill within the dripline of any tree or destroy, kill, or remove any tree as defined, in the designated urban area of the unincorporated area of Sacramento County, on any property, public or private (Sacramento County 2021). Protected trees under this ordinance include the following: valley oak (*Quercus lobata*), interior live oak (*Quercus wislizenii*), blue oak (*Quercus douglasii*), or oracle oak (*Quercus morehus*). Additionally, per Sacramento County, a "tree" shall mean any living native oak tree having at least one trunk of 6 inches or more in diameter measured at 4.5 feet above the ground, or a multi-trunked native oak tree having an aggregate diameter of 10 inches or more, measured 4.5 feet above the ground (Sacramento County 2021).

### 2.3.3 South Sacramento Habitat Conservation Plan

The *South Sacramento Habitat Conservation Plan* (SSHCP) streamlines federal and state permitting processes for SSHCP-covered development and infrastructure projects, while protecting habitat, open space, and agricultural lands (SSHCP 2021). The SSHCP is led by a multi-jurisdiction collaborative that includes Sacramento County, the Cities of Rancho Cordova and Galt, the Sacramento County Water Agency, the Sacramento Regional County Sanitation District, and the Capital Southeast Connector Joint Powers Authority (SSHCP 2021). The SSHCP does not expressly include utility-scale solar as a potential covered activity.

INTENTIONALLY LEFT BLANK

---

# 3 Methods

## 3.1 Database and Literature Evaluation

Dudek completed a database and literature evaluation of special-status biological and aquatic resources present or potentially present within the PSA. The database and literature evaluation assessed the PSA vicinity, which specifically includes the general and nearby areas adjacent to the PSA, not to exceed 5 miles. Resources and search parameters used during the desktop-level review include the following:

- California Aquatic Resource Inventory dataset via ArcGIS for surface waters and their riparian areas in the PSA (CARI 2016).
- CDFW CNDDDB nine USGS 7.5-minute quad search (Carmichael, Buffalo Creek, Folsom SE, Elk Grove, Sloughhouse, Carbondale, Galt, Clay, and Goose Creek) and within a 5-mile buffer search for special-status species (CDFW 2021a).
- CNPS Online Inventory of Rare and Endangered Plants nine USGS 7.5-minute quad search (Carmichael, Buffalo Creek, Folsom SE, Elk Grove, Sloughhouse, Carbondale, Galt, Clay, and Goose Creek) (CNPS 2022)
- California Tree and Landscape Consulting Updated Arborist Report and Tree Inventory for Sloughhouse Solar LLC (SLLC 2020).
- Federal Emergency Management Agency National Flood Hazard Layer geospatial database (FEMA 2021).
- Fire and Resource Assessment Program (FRAP) vegetation and land cover data (FRAP 2019).
- National Oceanic and Atmospheric Administration Essential Fish Habitat (EFH) West Coast Data Inventory via ArcGIS (NOAA 2022).
- Natural Resources Conservation Service Web Soil Survey (USDA 2022).
- SSHCP (Sacramento County 2018).
- USFWS Environmental Conservation Online System Threatened and Endangered Species Active Critical Habitat Report data via ArcGIS (USFWS 2020a).
- USFWS Information for Planning and Consultation Trust Resource Report for the PSA (USFWS 2022).
- USFWS National Wetlands Inventory Mapper of historical wetland data (USFWS 2020b).
- USGS National Hydrography Dataset to assess potential surface water features occurring in the PSA vicinity (USGS 2021).

In Addition, Dudek reviewed secondary resources such as the Calflora database and the Jepson Herbarium online for vegetation and specialty soil resources occurring in Sacramento County, the CNPS Manual of California Vegetation Online for vegetation community descriptions and classification attributes (CNPS 2021b), current and historical Google Earth aerial photography to identify any potential jurisdictional aquatic resources based on aerial signatures, and climate information for the region using the Western Regional Climate Center (Calflora 2021; Google Earth 2021; Jepson eFlora 2021; WRCC 2020).

## 3.2 Field Study

Dudek completed various reconnaissance, focused, and protocol-level technical field studies for aquatic resources and special-status plant and wildlife species that have the potential to occur in the PSA; see Section 4.5, Special-Status Species, for a full discussion on occurrence potentials. The methodology for the field studies conducted are detailed in the sections below.

### 3.2.1 Aquatic Resources Delineation

Dudek conducted an ARD within the PSA on October 27, 29, and 30, 2020; November 4 and 9 through 13, 2020; and March 3, 2021. The purpose of an ARD is to identify aquatic resources that may be potentially subject to agency jurisdiction pursuant to regulations in Section 401 and 404 of the CWA, Porter-Cologne Act, CFGC, and CEQA Guidelines. Aquatic resources within the PSA were delineated based on methodology described in USACE's *Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement for the Arid West Region* (USACE 2008a). Non-wetland waters of the U.S. and/or state were delineated based on the presence of an OHWM, as determined using the methodology in the *OHWM Field Guide for the Arid West Region* (USACE 2008b). Aquatic resources were recorded and mapped in the field using a Trimble R1 GNSS Receiver with sub-meter accuracy and ArcGIS Collector app for iOS. On June 9, 2021, the final ARD Report with a formal request for an Approved Jurisdictional Delineation was submitted to USACE, Sacramento District, to definitively determine and approve the extent of waters of the U.S. The ARD results are summarized in Section 4.2.1 of this final BTR and can be reviewed further in the final ARD Report (SSLLC 2022).

### 3.2.2 Special-Status Plant Species

#### 3.2.2.1 Protocol-Level Botanical Surveys

Dudek conducted reference population checks for special-status plant species on April 22, 2021 and conducted protocol-level botanical field surveys within the PSA on May 4, 2021. The purpose of protocol-level botanical surveys is to identify special-status plant resources that may be potentially subject to agency jurisdiction pursuant to regulations under FESA, CESA, CFGC, CEQA Guidelines, and the Sacramento County General Plan. The botanical field surveys were performed in accordance with the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000), the *Protocol for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018), and the *Botanical Survey Guidelines* (CNPS 2001). The protocol-level botanical field surveys were conducted during the appropriate floristic bloom period for special-status plant species known to occur within the Project region (i.e., late spring to early summer months). Surveys were completed using a systematic transect approach within suitable habitats for special-status species that have the potential to occur. All plant species encountered were identified to the taxonomic level appropriate to determine species and regulatory status, if needed. Botanical resources were recorded and mapped in the field using a Trimble R1 GNSS Receiver with sub-meter accuracy and ArcGIS Collector app for iOS. Complete special-status plant species profiles and botanical survey results have been included in Section 4.5 of this final BTR.

### 3.2.3 Special-Status Wildlife Species

#### 3.2.3.1 Valley Elderberry Longhorn Beetle Focused Surveys

Dudek conducted focused surveys for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*; VELB) within the PSA on February 19 and 25, 2021, and January 12, 2022. The purpose of focused VELB surveys is to identify habitat and species presence that may be potentially subject to agency jurisdiction pursuant to regulations under FESA, CESA, CFGC, and CEQA Guidelines. The focused VELB surveys were performed using the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (USFWS 2017b), and the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). The surveys focused on the assessment of black elderberry shrubs (*Sambucus nigra*), the host plant to VELB, to evaluate for ancillary evidence of VELB presence including eggs and/or larval galleries, bore holes, and frass. Only elderberry shrubs stem greater than 1 inch DBH were evaluated. Elderberry shrub health, total number of stems, and proximity to riparian habitat were also recorded during the focused surveys for VELB. Elderberry shrub locations were recorded and mapped in the field using ArcGIS Collector app for iOS. A complete VELB species profile and survey results have been included in Section 4.5.3.14 of this final BTR.

#### 3.2.3.2 California Tiger Salamander Preliminary Habitat Assessment and Aquatic Larval Surveys

Prior to conducting the California tiger salamander (*Ambystoma californiense*; CTS) aquatic larval surveys, a CTS preliminary habitat assessment was conducted to evaluate for the potential of CTS to occur within 2 kilometers of the solar development area within the PSA. This assessment was completed by compiling geographic information system aquatic resource data within 2 kilometers of the solar development area. Aquatic resources north of the Consumes River were not assessed, as CTS are not known to occur across the river boundary. Identified aquatic resource were further evaluated by assessing historic aerial imagery, hydrology sources, and other land use conditions to determine the likelihood for CTS to occur within the aquatic resources within 2 kilometers of the solar development area.

Dudek conducted CTS aquatic larval surveys within potential suitable habitat within the PSA in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or Negative Findings of California Tiger Salamander* (USFWS 2003). Aquatic larval surveys were conducted by a Dudek biologist holding a valid USFWS 10(a)(1)(A) Recovery Permit for the species. The CTS surveys included three separate site visits spaced a minimum of 10 days apart, on March 16, April 15, and April 28, 2021. The purpose of CTS aquatic larval surveys is to assess suitable upland and aquatic breeding habitat and determine species presence. Suitable sites were sampled using dipnets covering representative portions of the ponds with a maximum of 50 dipnet sweeps. Resources were recorded and mapped in the field using ArcGIS Collector app for iOS. A complete CTS species profile and survey results have been included in Section 4.5.3.1 of this final BTR.

#### 3.2.3.3 Western Spadefoot Toad Focused Surveys

Dudek conducted focused surveys for western spadefoot toad (*Spea hammondi*; WST) within potential suitable habitat for this species. The purpose of focused WST surveys is to assess suitable habitat and aquatic breeding habitat and determine species presence. The WST focused surveys were completed in conjunction with both the

CTS aquatic larval surveys (see Section 3.2.3.2) and the protocol-level large listed branchiopod wet season surveys (see Sections 3.2.3.4 and 3.2.3.5). Since there are no published protocols specific to WST surveys, WST surveys were performed in accordance with the most recent published literature and recommendations from CDFW and under the guidance of Dudek species experts. WST resources were recorded and mapped in the field using ArcGIS Collector app for iOS. A complete WST species profile and survey results have been included in Section 4.5.3.2 of this final BTR.

### 3.2.3.4 Protocol-Level Large Listed Branchiopod Dry Season Surveys

Dudek conducted protocol-level dry season surveys for large-listed branchiopods (i.e., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) within the PSA. The purpose of protocol-level large listed branchiopod dry season surveys is to identify if listed branchiopods are present within aquatic habitat soils that may potentially be subject to agency jurisdiction pursuant to regulations under FESA, CESA, CFGC, and CEQA Guidelines. Surveys were conducted on October 13 through 16, October 19 through 22, and November 11, 2020, by Dudek biologists holding valid USFWS 10(a)(1)(A) Recovery Permits for the listed species. Surveys were conducted in accordance with the *Survey Guidelines for Large Listed Branchiopods* (USFWS 2015) and were approved by USFWS prior to surveying.

For the dry season surveys, soil samples were collected from the bottom of each known aquatic resource when the soil was very dry, and a small 6-inch hand trowel was used to excavate between 10 and 100 samples of soil (approximately 100 milliliters each), depending on the size of the aquatic resource. The locations of the aquatic resources and sampling transects were recorded and mapped in the field using ArcGIS Collector app for iOS. Samples were collected equidistantly along two generally perpendicular transects. Soil samples were submitted in November 2020 for processing by Helm Biological Consulting to assess for cysts in the soil samples. On February 11, 2021, the final 90-Day Dry Season Protocol Survey Letter Report for Federally Listed Branchiopods was submitted to the Sacramento Office of the USFWS. On March 4, 2021, the USFWS provided a formal receipt of all report submittals. Complete species profiles for large-listed branchiopods and survey results have been included in Section 4.5.3.15-4.5.3.16 of this final BTR.

### 3.2.3.5 Protocol-Level Large Listed Branchiopod Wet Season Surveys

Dudek conducted protocol-level wet season surveys for large-listed branchiopods (i.e., vernal pool fairy shrimp and vernal pool tadpole shrimp) within the PSA. The purpose of protocol-level large listed branchiopod wet season surveys is to identify if live listed branchiopods are present within inundated aquatic resources that may be subject to jurisdiction pursuant to regulations under FESA, CESA, CFGC, and CEQA Guidelines. Surveys were conducted on February 3–5, February 17–18, March 3–4, March 17–18, March 31, April 14–15, and April 28, 2021, by a Dudek biologist holding a valid USFWS 10(a)(1)(A) Recovery Permit for the species. Surveys were conducted in accordance with the *Survey Guidelines for Large Listed Branchiopods* (USFWS 2015) and were approved by USFWS prior to surveying.

For the wet season surveys, site visits began after initial storm events when potential listed large branchiopod habitat had become inundated. All potential habitat was sampled at 14-day intervals after the initial inundation of habitat. Sampling continued within each potential habitat until it dried. At each wet season visit, representative portions of the bottom, edges, and vertical water column of the features were adequately sampled using a dip net or aquarium net. The contents of the nets were examined and emptied frequently. Information on pool conditions



and species was recorded and mapped in the field using ArcGIS Collector app for iOS. The final 90-Day Wet Season Protocol Survey Letter Report for Federally Listed Branchiopods was submitted to the USFWS in July 2021. Complete species profiles for large-listed branchiopods and survey results have been included in Section 4.5.3.15-4.5.3.16 of this final BTR.

### 3.2.3.6 Protocol-Level Burrowing Owl Breeding Season Surveys

Dudek conducted protocol-level burrowing owl (*Athene cunicularia*; BUOW) breeding season surveys within the PSA. The purpose of protocol-level BUOW surveys is to assess for burrows, suitability of habitat, and foraging or other activity within the PSA and up to 500 feet from the solar development area that may be potentially subject to agency jurisdiction pursuant to regulations in MBTA, CFGC, and CEQA Guidelines. Surveys were focused on the BUOW breeding season and conducted on February 18 and 25, 2021 (Pass 1); March 4 and 16, 2021 (Pass 2); April 9 and 15, 2021 (Pass 3); and May 3, 2021 (Pass 4). Due to the early dry season in the 2021 rain year, Pass 4 was conducted earlier than is typical to account for early nesting and fledging. In addition, in accordance with recommendations from CDFW, two additional breeding season surveys were conducted in 2022: June 2 and 3, 2022 (Pass 5), and July 7 and 9, 2022 (Pass 6). Surveys were completed in the PSA in accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012), and the *Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium 1993). Survey areas were focused on suitable habitat within the PSA, such as California annual grasslands, managed agricultural fields, roadside areas, and the margins of agricultural fields. Survey transect centerlines were marked at 30 feet and walked linearly. During the second, third, and fourth passes only those areas that were determined to support suitably sized burrows during the first survey pass were resurveyed. Surveys were conducted between civil twilight and 10:00 a.m. and 2 hours before sunset until civil twilight and were limited to periods when wind speed was less than 12 miles per hour and there was no precipitation or dense fog. Resources were recorded and mapped in the field using an ArcGIS Collector app for iOS. A complete BUOW species profile and survey results have been included in Section 4.5.3.8 of this final BTR.

### 3.2.3.7 Protocol-Level Swainson's Hawk Surveys

Dudek conducted protocol-level Swainson's hawk (*Buteo swainsoni*; SWHA) surveys within the PSA including visual and aural detection and visual surveys within 0.5 miles of the solar development area. The purpose of protocol-level surveys is to assess for SWHA nesting, foraging, suitability of habitat, and other activity within the PSA and vicinity that may be subject to agency jurisdiction pursuant to regulations under MBTA, CESA, CFGC, and CEQA Guidelines. Surveys were focused on the SWHA breeding season and conducted on February 18 and 25, 2021 (Pass 1); March 4 and March 16, 2021 (Pass 2); April 9 and 15, 2021 (Pass 3), May 3, 2021 (Pass 4); and June 4, 2021 (Pass 5). Due to the early dry season in the 2021 rain year, Passes 4 and 5 were conducted earlier than is typical to account for early nesting and fledging. In addition, in accordance with recommendations from CDFW, two additional SWHA breeding season surveys were conducted in 2022: June 2 and 3, 2022 (Pass 6), and July 7 and 9, 2022 (Pass 7). The protocol-level SWHA surveys were conducted in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC 2000). Initial surveys focused on inspection of individual and cluster trees and riparian areas for nests within the PSA. During subsequent surveys, nests and potential nest sites that were identified during the initial surveys were inspected for nesting activity, including territorial or courtship displays, brooding on the nest, presence of young on the nest, and frequent trips to the nest by adults. Survey transect centerlines were marked at 30 feet and walked linearly. Resources were recorded and mapped in the field using a Trimble R1 GNSS Receiver with sub-meter accuracy and ArcGIS Collector

app for iOS. A complete SWHA species profile and protocol survey results have been included in Section 4.5.3.11 of this final BTR.

### 3.2.3.8 Swainson's Hawk and Other Raptor Foraging and Land Use Study

In 2013, Estep Environmental Consulting conducted a 1-year study to assess raptor use of solar array fields at three newly developed photovoltaic solar facilities in Sacramento County (Estep Environmental Consulting 2013). The purpose of the study was to provide supplemental research that would inform impact assessment and mitigation requirements related to the loss of SWHA foraging habitat as provided under the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley* (CDFG 1994) by (1) determining the potential for solar facilities to maintain foraging habitat for SWHA and (2) evaluating and comparing the retained on-site foraging value to other known foraging habitats. The results of this study indicated that SWHAs and other raptors can use appropriately designed and managed solar array fields. Specifically, arrays should provide adequate spacing to allow foraging between arrays, and the grassland substrate should be managed to promote visibility and access to prey. The 2013 study found that foraging habitat within the solar arrays was being used by SWHAs at a greater frequency than would be expected based on habitat availability, suggesting that SWHAs were selecting the solar array habitat. Potential explanations for this included in the 2013 report included the ability of the hawks to perch on edges of solar arrays, and the management of grasslands in such a way to benefit prey detectability as compared to other local habitat types. However, CDFW determined that a 1-year study was insufficient to draw conclusions that would support the modification of standard mitigation requirement for solar projects.

The solar development area within the PSA is to be constructed on suitable SWHA foraging habitat. As such, Sloughhouse Solar, LLC engaged Estep Environmental Consulting to conduct an additional year (i.e., year two) of SWHA and other raptor foraging and land use studies. These studies were initiated on April 12, 2021 and concluded in September 2021. Both the 2013 and 2021 studies include the review of route and land cover to establish walking transects and survey points, and visual surveys of predetermined road routes in the vicinity of the Project. Surveys were conducted twice weekly during the breeding season for a total of 20 weeks, or 40 total surveys. Following surveys, all data was compiled and analyzed, including a Chi-square analysis to assess the relationship of available habitat, and observed use of habitat to determine the relative use of different land cover, including solar array fields. Results were compiled into *Swainson's Hawk and Other Raptor Foraging Use of Solar Array Fields within an Agricultural Landscape in Sacramento County, Year 2*, by Estep Environmental Consulting (Appendix A).

### 3.2.3.9 Tricolored Blackbird Focused Surveys

Dudek conducted tricolored blackbird (*Agelaius tricolor*; TRBL) focused surveys within the PSA. The purpose of focused TRBL surveys is to assess for colonial breeding sites/nesting, foraging, suitable habitat, and other activity within the PSA that may be potentially subject to agency jurisdiction pursuant to regulations in MBTA, CESA, CFGC, and CEQA Guidelines. Surveys for TRBL were conducted in accordance with *the Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields* (CDFW 2015) and modified for the more natural and naturalized habitat present within the PSA. Surveys were focused on the TRBL breeding season and conducted in conjunction with the protocol-level BUOW and SWHA surveys in 2021. Survey transect centerlines were marked at 30 feet and walked linearly. Resources were recorded and mapped in the field using ArcGIS Collector app for iOS. A complete TRBL species profile and survey results have been included in Section 4.5.3.12 of this final BTR.

### 3.2.4 Reconnaissance-Level Biological Resource Surveys

Reconnaissance-level biological field surveys in the PSA were conducted in conjunction with all the species-specific technical studies listed in the sections above. Reconnaissance-level biological observations focused on assessing and identifying common plant species to the lowest taxonomic group possible, all wildlife observations, the presence of or potential for other special-status plant and wildlife species, and vegetation communities and land cover types. Field notes, an aerial photograph with an overlay of the property boundary, Collector for ArcGIS on an iPad/mobile device, a Trimble R1 GNSS Receiver with sub-meter accuracy, and ArcGIS Collector app for iOS were used interchangeably to map biological resources while in the field. Species survey results and inventory have been included in Sections 4.4.5 and 4.5 of this final BTR.

### 3.2.5 Arborist Tree Survey and Inventory

International Society of Arboriculture Certified Arborists with California Tree and Landscaping Consulting Inc. conducted a tree survey and inventory in February and December 2020, to evaluate the trees on the site for purposes of providing updated tree information for Project planning (Cal TLC 2020). The GPS location of each tree was collected using ArcGIS Collector app for iOS. The data detailed below were collected in the field. Survey and inventory results and inventory have been included in Section 4.5.2 of this final BTR.

- Field Tag Number - The pre-stamped tree number on the tag which is installed at approximately 6 feet above ground level on the north side of the tree.
- Species - The species of a tree is listed by local and correct common name and botanical name by genus and species.
- DBH - DBH is normally measured at 4 feet 6 inches, but if that varies then the location where it is measured is noted.
- Measured At - Height above average ground level where the measurement of DBH was taken.
- Canopy Radius and Protection Area - The farthest extent of the crown composed of leaves and small twigs. This measurement represents the longest extension from the trunk to the outer canopy, known as the “dripline.” This measurement further defines the protection zone and can indicate if pruning may be required for development. Sacramento County specifies this measurement as the required “Protected Root Zone.”
- Critical Root Zone - The radius of the critical root zone is a circle equal to the trunk diameter inches converted to feet and factored by tree age, condition, and health pursuant to the industry standard.
- Arborist Rating - This rating is subjective to condition and is based on both the health and structure of the tree. All the trees were rated for condition, per the recognized national standard as set up by the Council of Tree and Landscape Appraisers and the International Society of Arboriculture on a numeric scale of 5 (being the highest) to 0 (the worst condition, dead) as depicted in Table 1. The rating was done in the field at the time of the measuring and inspection.

**Table 1. Arborist and Sacramento County Tree Rating Scale**

| Rating Score     | Arborist Tree Rating | Sacramento County Tree Rating |
|------------------|----------------------|-------------------------------|
| 5 - Excellent    | No problems          | Excellent                     |
| 4 - Good         | No apparent problems | Good                          |
| 3 - Fair         | Minor problems       | Fair                          |
| 2 - Fair to Poor | Major problems       | Declining                     |
| 1 - Poor         | Extreme problems     | Severe decline                |
| 0 - Dead         | Dead                 | Dead                          |

Source: CalTLC 2020.

INTENTIONALLY LEFT BLANK

---

## 4 Results

### 4.1 Environmental Setting

#### 4.1.1 Regional Setting and Land Use

The PSA is located within eastern Sacramento County at the eastern edge of the Central Valley, less than 15 miles from the western foothills of the Sierra Nevada Mountains (Figure 1). The PSA is less than 1 mile south of State Route 16, and approximately 18 miles southeast of the City of Sacramento. The PSA is surrounded by rural residential, commercial development, and open space generally composed of annual grassland and agricultural fields. The PSA is primarily used for cattle grazing or other agricultural operations. There is an existing solar facility located in the southeast corner of the PSA (Figure 2).

#### 4.1.2 Climate

The PSA is in a semi-arid climate where average annual temperatures range from approximately 53 °F to 91 °F, and the average annual precipitation is 20.06 inches. On average, the months with the highest rainfall are December and January, and July has the least precipitation (WRCC 2020). According to data from the Sacramento WB City weather station, the total precipitation recorded from October 1, 2019, through September 30, 2021, was 17.92 inches, approximately 61% of normal. Therefore, the PSA region had below normal hydrological conditions in the year preceding the biological resource surveys. The Sacramento WB City weather station is located approximately 18 miles west of the PSA at an elevation of approximately 25 feet amsl (CDEC 2020).

#### 4.1.3 Soil and Terrain

The PSA is in an area of relatively flat topographic relief with scattered rolling hills. Elevations within the PSA range from approximately 95 feet amsl in the western portion of the PSA to 160 feet amsl in the southeastern portion of the PSA.

According to the Natural Resources Conservation Service, there are 16 soil units mapped within the PSA. Each soil unit, hydric and drainage class (i.e., frequency and duration of wet periods in conditions like those in which it was developed), and typical landform or geomorphic position within the landscape is detailed in Table 2. Figure 3, Soil and Terrain Setting, provides the geographic extent of each soil unit in the PSA region (USDA 2022).

Of the 16 soil units identified within the PSA, six are listed as hydric soils. Hydric soils are defined by the National Technical Committee for Hydric Soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA 2021). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. Refer to Section 4.2.1 for description of wetlands and other waters recorded in the PSA. Soils encountered during the field surveys were generally classified as clay to clay loam soils.

**Table 2. Summary of Soil Units Within the Project Study Area**

| Soil Map Unit Name                                   | Landform                       | Drainage Class                                | Hydric <sup>1</sup> | Project Study Area Total Area (acres) |
|------------------------------------------------------|--------------------------------|-----------------------------------------------|---------------------|---------------------------------------|
| Bruella sandy loam, 0%–2% slopes                     | Terraces                       | Well-drained                                  | No                  | 2.44                                  |
| Bruella sandy loam, 2%–5% slopes                     | Terraces                       | Well-drained                                  | No                  | 58.80                                 |
| Columbia sandy loam, 0%–2% slopes                    | Flood plains                   | Somewhat poorly drained, occasionally flooded | Yes                 | 17.93                                 |
| Galt clay, 0%–1% slopes                              | Basin floors on fan remnants   | Somewhat poorly drained                       | Yes                 | 33.0                                  |
| Galt clay, 2%–5% slopes                              | Basin floors on fan remnants   | Moderately well drained                       | Yes                 | 126.62                                |
| Hadselville-Pentz complex, 2%–30% slopes             | Hills                          | Moderately well drained to well drained       | No                  | 226.32                                |
| Peters clay, 1%–8% slopes                            | Hills                          | Well drained                                  | No                  | 56.94                                 |
| Redding gravelly loam, 0%–8% slopes                  | Fan remnants                   | Moderately well drained                       | No                  | 14.93                                 |
| Reiff fine sandy loam, 0%–2% slopes                  | Flood plains                   | Well drained, occasionally flooded            | No                  | 96.11                                 |
| Sailboat silt loam, drained, 0%–2% slopes            | Flood plains on natural levees | Somewhat poorly drained, occasionally flooded | Yes                 | 3.50                                  |
| San Joaquin silt loam, 0%–3% slopes                  | Terraces                       | Moderately well drained                       | No                  | 14.02                                 |
| San Joaquin silt loam, 0%–8% slopes                  | Terraces                       | Moderately well drained                       | No                  | 52.45                                 |
| San Joaquin-Durixeralfs complex, 0%–1% slopes        | Terraces                       | Moderately well drained to well drained       | No                  | 0.25                                  |
| San Joaquin-Galt complex, leveled, 0%–1% slopes      | Terraces                       | Moderately well drained                       | Yes                 | 0.52                                  |
| San Joaquin-Galt complex, 0%–3% slopes               | Terraces                       | Moderately well drained                       | Yes                 | 18.59                                 |
| San Joaquin-Xerarents complex, leveled, 0%–1% slopes | Terraces                       | Moderately well drained to well drained       | No                  | 3.52                                  |

Source: USDA 2022.

<sup>1</sup> Hydric soil- defined by the USADA (i.e., formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part); if hydric conditions are present within the soil unit.

## 4.2 Hydrology

The PSA occurs within the Upper Cosumnes River watershed, which drains approximately 180 square miles of land in El Dorado, Amador, and Sacramento Counties (Hydrological Unit Code 1804001306) (USGS 2021). A complex of

seasonally inundated aquatic features generally drains the PSA in a southwesterly direction, and the Cosumnes River flows within the western boundary of the PSA (Figure 4, Hydrologic Setting). The western half of the PSA is located within the Federal Emergency Management Agency National Flood Hazard Layer 1% 100-year floodplain of the Cosumnes River (FEMA 2021), which flows immediately west of the PSA. However, the portion of the Cosumnes River within the PSA is bounded by levees intended to contain the river and protect against overtopping during varied annual precipitation events. The National Wetlands Inventory maps numerous aquatic resources in the PSA, including Freshwater Emergent Wetland, Freshwater Forested/Shrub Wetland, Freshwater Pond, and Riverine (USFWS 2020b). The National Wetlands Inventory dataset is based on coarse aerial mapping (Figure 4). Results are provided in Section 4.2.1.

## 4.2.1 Aquatic Resources Delineation

Dudek conducted an ARD within the PSA on October 27, 29, and 30, 2020; November 4 and 9 through 13, 2020; and March 3, 2021. Survey information and conditions is summarized below in Table 3.

**Table 3. Aquatic Resources Delineation Survey Information Summary**

| Survey Date | Hours                | Dudek Personnel                           | Conditions                                 |
|-------------|----------------------|-------------------------------------------|--------------------------------------------|
| 10/27/2020  | 8:00 a.m.– 4:00 p.m. | Laura Burris, Allie Sennett, Anna Godinho | 43°F–73°F; 0% cloud cover; 0–5 mph wind    |
| 10/28/2020  | 7:45 a.m.– 4:45 p.m. | Laura Burris, Allie Sennett, Anna Godinho | 40°F–85°F; 0% cloud cover; 0–3 mph wind    |
| 10/30/2020  | 7:30 a.m.–2:30 p.m.  | Laura Burris, Anna Godinho                | 41°F–77°F; 0% cloud cover; 0–3 mph wind    |
| 11/04/2020  | 8:30 a.m.–3:30 p.m.  | Anna Godinho, Paul Keating                | 64°F–78°F; 0% cloud cover; 0–3 mph wind    |
| 11/09/2020  | 8:00 a.m.– 4:00 p.m. | Allie Sennett, Adam Crawford              | 33°F–50°F; 0% cloud cover; 0–3 mph wind    |
| 11/10/2020  | 8:00 a.m.–4:00 p.m.  | Anna Godinho, Adam Crawford               | 48°F–55°F; 0% cloud cover; 0 mph wind      |
| 11/11/2020  | 7:30 a.m.–4:45 p.m.  | Laura Burris, Allie Sennett               | 36°F–70°F; 0–20% cloud cover; 0–5 mph wind |
| 11/12/2020  | 7:30 a.m.–4:00 p.m.  | Allie Sennett, Anna Godinho               | 33°F–74°F; 0% cloud cover; 0–3 mph wind    |
| 11/13/2020  | 7:30 a.m.–1:30 p.m.  | Laura Burris, Anna Godinho                | 41°F–57°F; 100% cloud cover; 0–3 mph wind  |
| 3/3/2021    | 2:00 p.m.–3:30 p.m.  | Anna Godinho                              | 60°F; 30% cloud cover; 0-3 mph wind        |

Source: SSSLIC 2022.

Ten aquatic resource types were documented in the solar development area and the adjacent other lands comprising the PSA, including freshwater emergent wetland, seasonal wetland, stock pond, vernal pool, ditch, ephemeral drainage, intermittent drainage, river, seasonal wetland swale, and upland swale (Figure 5, Aquatic Resources Delineation) (SSLLC 2022). Aquatic resources delineated within the PSA are summarized in Table 4.



**Table 4. Summary of Aquatic Resources within the Project Study Area**

| Aquatic Resource Feature      | Aquatic Resource Type | Total Acreage |
|-------------------------------|-----------------------|---------------|
| <b>Solar Development Area</b> |                       |               |
| Ditch                         | NWW                   | 0.15          |
| Ephemeral Drainage            | NWW                   | 0.74          |
| Intermittent Drainage         | NWW                   | 0.46          |
| Seasonal Wetland Swale        | NWW                   | 0.70          |
| Upland Swale                  | NWW                   | 0.08          |
| Pond                          | Wetlands              | 0.37          |
| Seasonal Wetland              | Wetlands              | 3.10          |
| Vernal Pool                   | Wetlands              | 0.25          |
|                               | <i>Sub-Total</i>      | 5.85          |
| <b>Adjacent Other Lands</b>   |                       |               |
| Ditch                         | NWW                   | 1.78          |
| Ephemeral Drainage            | NWW                   | 0.37          |
| Intermittent Drainage         | NWW                   | 1.91          |
| Perennial Drainage            | NWW                   | 24.10         |
| Seasonal Wetland Swale        | NWW                   | 1.45          |
| Upland Swale                  | NWW                   | 0.54          |
| Freshwater Emergent Wetland   | Wetlands              | 0.02          |
| Pond                          | Wetlands              | 16.64         |
| Seasonal Wetland              | Wetlands              | 11.06         |
| Vernal Pool                   | Wetlands              | 6.04          |
|                               | <i>Sub-Total</i>      | 63.90         |
|                               | <b>Total</b>          | <b>69.75</b>  |

**Source:** SLLC 2022.

**Note:** Applicable regulatory jurisdictions to aquatic resources as defined in this table are further provided in Table 16. Summary of the Preliminary Jurisdictions of Aquatic Resources within the Solar Development Area.

#### 4.2.1.1 Wetlands

##### Freshwater Emergent Wetland

One freshwater emergent wetland comprising approximately 0.02 acres occurs in the southwest corner of the PSA. This feature entirely occurs within the adjacent other lands within the PSA. This feature has developed because of artificial irrigation and would likely convert to upland vegetation if the leakage were repaired (SLLC 2022).

##### Pond

There are three ponds comprising approximately 17.01 acres within the PSA, of which 0.37 acres occur in the solar development area and 16.64 acres occur in the adjacent other lands. These features are natural closed depressions that have been artificially augmented by perennial water sources, for the purpose of supporting livestock (SLLC 2022).

## Seasonal Wetland

There are 51 seasonal wetlands comprising approximately 14.16 acres throughout the PSA, of which 3.10 acres occur in the solar development area and 11.06 acres occur in the adjacent other lands. These features only appear to be inundated seasonally, and some are connected via seasonal wetland swales, ephemeral drainages, and/or intermittent drainages. Seasonal wetlands were characterized by a distinct change in vegetation type and cover from the surrounding grassland. Small mammal burrows were observed within several of the features, indicating that these features remained dry for a long enough period for subterranean animals to inhabit them (SLLC 2022).

## Vernal Pool

There are 17 vernal pools comprising approximately 6.30 acres throughout the PSA, of which 0.25 acres occur in the solar development area and 6.04 acres occur in the adjacent other lands. These features were characterized as three-parameter wetlands with an impermeable layer such as a hard pan that may fill and empty several times during the rainy season. These features may be isolated or connected to larger vernal complexes via swales or subsurface flows. The vernal pools on site exhibited concentric rings of distinctly different vegetation cover and species composition (SLLC 2022).

### 4.2.1.2 Non-Wetland Waters

#### Ditch

There are four ditches comprising approximately 1.93 acres (5,105.55 linear feet) throughout the PSA, of which 0.15 acre (720.26 linear feet) is within the solar development area, and 1.78 acres (4,385.29 linear feet) are within the adjacent other lands of the PSA. The earthen ditches are human-made features with intermittent hydrology intended for runoff from stormwater, agricultural uses, irrigation, or similar purposes. There is no continuous riparian corridor associated with the ditch features in the PSA (SLLC 2022).

#### Ephemeral Drainage

There are four ephemeral drainages comprising approximately 1.11 acres (3,431.84 linear feet) within the PSA, of which 0.74 acres (2,439.08 linear feet) occur in the solar development area and 0.37 acres (992.76 linear feet) occur in the adjacent other lands. Ephemeral drainages on site consist of stream channels that are naturally occurring rather than human created and contain flowing water during and briefly after precipitation events. Hydrology of the ephemeral drainages depends on inputs during rain events and runoff from the surrounding uplands. There are no continuous riparian corridors associated with these features in the PSA (SLLC 2022).

#### Intermittent Drainage

There is one intermittent drainage comprising approximately 2.36 acres (4,462.81 linear feet) within the PSA, of which 0.46 acres (1,303.60 linear feet) occur in the solar development area and 1.91 acres (3,159.21 linear feet) occur in the adjacent other lands. Intermittent drainages generally have flowing water during certain times of the year, when groundwater provides water for stream flow, and receive supplemental water from rainfall runoff. The intermittent drainage on site appears to receive water via a culvert from a basin complex located north of the PSA. The drainage receives water from two adjacent seasonal wetland swales, contains three seasonal wetlands within low points or widenings, and terminates into Pond 3 (SLLC 2022).

## Perennial Drainage (Cosumnes River)

The northwestern portion of the PSA contains 24.10 acres (4,506.29 linear feet) of the Cosumnes River and its associated riparian corridor. This feature entirely occurs within the adjacent other lands within the PSA. The Cosumnes River is a known jurisdictional water with perennial flows that originates in the Sierra Nevada mountains and flows approximately 50 miles into the Central Valley, emptying into the Mokelumne River in the Sacramento San Joaquin Delta (SLLC 2022).

## Seasonal Wetland Swale

There are 15 seasonal wetland swales comprising approximately 2.15 acres (8,807.17 linear feet) within the PSA, of which 0.70 acres (3,874.33 linear feet) occur in the solar development area, and 1.45 acres (4,932.85 linear feet) occur in the adjacent other lands. Seasonal wetland swales on site consist of topographic depressions that would be expected to convey water when inundated, but where a defined bed and bank and typical fluvial indicators are lacking (SLLC 2022).

## Upland Swale

There are seven upland swales comprising approximately 0.62 acres (1,837.54 linear feet) within the PSA, of which 0.08 acres (923.59 linear feet) occur in the solar development area and 816 linear feet 0.54 acres (811.44 linear feet) occur in the adjacent other lands. Upland swales on site consisted of linear topographic depressions that lack a distinct OHWM (SLLC 2022).

# 4.3 Vegetation Communities and Land Cover Types

Vegetation communities and land cover types within the PSA consist of a combination of terrestrial non-vegetative land covers and natural vegetation communities. The vegetation communities and land covers within the PSA were mapped using the FRAP land cover data (FRAP 2019). FRAP vegetation communities and land cover types occurring within the PSA include agricultural, California annual grassland, low density development, mixed riparian forest, urban, valley foothill riparian, and valley grassland. The FRAP has also mapped aquatic resource land covers with the PSA including hydrologic streams and creeks, swales, seasonal wetlands, and vernal pools (Figure 6, Vegetation and Land Cover). The FRAP aquatic resources within the PSA have been replaced with the more detailed mapping of aquatic resources as defined in Section 4.2.1. A complete summary of vegetation communities and land cover types is summarized in Table 5. Special-status species and/or SSCHP Covered Species with the potential to occur and/or that are known to occur in the PSA and associated suitable habitat (i.e., vegetation community or land cover type) are discussed below.

**Table 5. Summary of Vegetation Communities and Land Cover within the Project Study Area**

| Vegetation Community/Land Cover Type | Total Acreage |
|--------------------------------------|---------------|
| <b>Solar Development Area</b>        |               |
| California Annual Grassland          | 357.61        |
| Low Density Development              | 6.84          |
| Urban                                | 1.96          |
| <i>Sub-Total</i>                     | <i>366.41</i> |
| <b>Adjacent Other Lands</b>          |               |
| Agricultural                         | 85.33         |
| California Annual Grassland          | 180.48        |
| Low Density Development              | 14.93         |
| Mixed Riparian Woodland              | 10.42         |
| Urban                                | 2.32          |
| Valley Foothill Riparian             | 17.38         |
| Valley Grassland                     | 2.86          |
| <i>Sub-Total</i>                     | <i>313.71</i> |
| <b>Total</b>                         | <b>680.12</b> |

Source: FRAP 2019.

Note: The total acreage of vegetation communities land cover types omits overlapping aquatic resources occurring in the PSA.

## 4.3.1 Vegetation Communities

### 4.3.1.1 California Annual Grassland

California annual grassland is the dominant vegetation community present through all portions of the PSA. Dominant species in this community include soft brome (*Bromus hordeaceus*), medusa head (*Elymus caput-medusae*), and narrow tarweed (*Holocarpha virgata*). The shrub and tree layer are absent from this vegetation community. There are numerous aquatic features that occur throughout the California annual grassland (discussed in Section 4.2.1). California annual grassland supports wildlife species such as herbivores, deer, rabbits, gophers, and mice, and provides suitable nesting and foraging bird habitat. California annual grassland comprises a total of 357.61 acres in the solar development area and a total of 180.48 acres in the adjacent other lands of the PSA.

### 4.3.1.2 Mixed Riparian Woodland

Mixed riparian woodland is a vegetation community that is present along the Consumes River corridor, on the east side of the PSA, outside of the solar development area. Mixed riparian woodland intergrades with the valley grassland wooded borders along streams and agricultural fields (Sacramento County 2018). Vegetation associated with this vegetation community includes various oak species (*Quercus* spp.) and elderberry shrubs, as well as other herbaceous species that occur in the sparse to densely vegetated ground cover. There is no mixed riparian woodland within the solar development area. Mixed riparian woodland comprises a total of 10.42 acres with the adjacent other lands of the PSA.

### 4.3.1.3 Valley Foothill Riparian

Valley foothill riparian is a vegetation community that is also present along the Cosumnes River corridor. Valley foothill riparian is like the mixed riparian woodland vegetation community described in Section 4.3.1.2. There is no valley foothill riparian within the solar development area. Valley foothill riparian comprises a total of 17.38 acres with the adjacent other lands of the PSA.

### 4.3.1.4 Valley Grassland

Valley grassland is present within a ditch adjacent to the agricultural areas in the eastern vicinity of the PSA. Valley grassland is a vegetation community that is like the California annual grassland vegetation community described in Section 4.3.1.1. Additionally, valley grassland is one of the most dominant vegetation types in the PSA and in the PSA region (Sacramento County 2018). This vegetation community is characterized mostly by naturalized annual grasses and herbaceous annual forbs and includes patches with relatively high proportions of native grasses and forbs. There is no valley grassland within the solar development area. Valley grassland comprises a total of 2.86 acres with the adjacent other lands of the PSA.

## 4.3.2 Land Cover Types

### 4.3.2.1 Agricultural

Agricultural land cover comprises a large field to the east of the Cosumnes River riparian corridor and levee. Land cover classified as agricultural typically includes lands where farming and other agricultural practices take place, including pastures (hay and alfalfa), row crops and other unidentified croplands. Production practices observed in the PSA include flood-irrigation and cultivation followed by harvesting and discing. After discing, some fields remain fallow for short periods of time, allowing for the establishment of annual and biennial native and non-native annual grasses and broad-leaved plants, including many non-native species. In 2018, approximately 500 acres were burned in a fire and no irrigation was initiated. No agricultural land cover was identified in the solar development area of the PSA. Agricultural land cover comprises a total of 85.33 acres in the adjacent other lands of the PSA.

### 4.3.2.2 Low Density Development

The low-density development land cover type consists of relatively sparse constructed environments such as residences and other structures, including farm buildings, and small rural neighborhoods with large individual property sizes per house (Sacramento County 2018). These areas are primarily concentrated in the northeastern vicinity of the PSA, adjacent to agricultural lands. Low density development land cover comprises a total of 6.84 acres in the solar development area and a total of 14.93 acres in the adjacent other lands of the PSA.

### 4.3.2.3 Urban

The urban land cover type consists of developed areas, including roadways and other general infrastructure systems. Most urban areas, if planted, are planted with non-native grasses, shrubs, and trees. Species composition in urban habitats varies with planting design and climate. Monoculture is commonly observed in tree groves and street tree strips. Some urban land covers are regularly maintained by irrigation, mowing, pruning, or other

management techniques (Sacramento County 2018). Urban land cover in the PSA consists of county roads. Urban land cover comprises a total of 1.96 acres in the solar development area and a total of 2.32 acres in the adjacent other lands of the PSA.

## 4.4 Other Biological and Aquatic Resources

### 4.4.1 Sensitive Natural Communities

Sensitive natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status species. Specifically, sensitive natural communities are those that are listed in the CDFW CNDDDB due to the rarity of the community in the state or throughout its entire range (i.e., globally). For rarity, the ranking involves the knowledge of range and distribution of a given type of vegetation, and the proportion of occurrences that are of good ecological integrity. The conservation of sensitive natural communities is integral to maintaining biological diversity (CDFW 2021b).

#### 4.4.1.1 Northern Hardpan Vernal Pool

Northern hardpan vernal pool has been identified within 5 miles of the PSA, with the closest known occurrence located approximately 0.90 miles east of the PSA, specifically in the Meiss Road vicinity, 1 mile south of the Cosumnes River and east of Dillard Road (Figure 7, Known Special-Status Species Occurrences, Critical Habitat, and Sensitive Communities) (CDFW 2022). Northern hardpan vernal pools are not decidedly present within the PSA, however there is vernal pool habitat, a sensitive community, present within the PSA, as discussed in Section 4.2.1 above.

Northern hardpan vernal pools are seasonally flooded or saturated with fresh water. Many species of plants and wildlife depend on these unique communities and are often classified special-status, including CTS and WST, which have a potential to occur in the PSA and are further discussed in Section 4.5.3. Vegetative species composition varies from pool to pool and from year to year. Herbs and grasses typically grow less than 1 foot high with intermediate to open cover. These pools form over areas with hardpan soils and generally have more topographic relief associated with them. CDFW tracks this rare habitat (Tulare Basin Wildlife Partners 2021). The vernal pools in the PSA are considered a sensitive natural community.

### 4.4.2 Riparian Habitat

A stream or other watercourse is a body of water that flows year-round or intermittently, and as such has surface and subsurface flow that supports or has supported riparian vegetation/habitat. Riparian habitat acts as a buffer between aquatic resources and uplands. Healthy riparian habitat is essential in supporting both plant and wildlife species, as well as supporting watercourse integrity. As such, riparian habitat is considered a sensitive habitat within California pursuant to CFGC 1600-1616 and regulated through the CDFW Lake and Streambed Alteration Program. The goal of conserving riparian habitat as a sensitive natural community is to preserve these systems to maintain species and watercourse health and function. Within the PSA, riparian habitat was identified along the Consumes River in the adjacent other lands of the PSA and classified as mixed riparian woodland and valley foothill riparian vegetation communities; riparian habitat is discussed in Section 4.3.1. above.

### 4.4.3 Swainson's Hawk Foraging Habitat

SWHA nesting and foraging habitat is present within the PSA. Specifically, SWHA foraging habitat is identified as the California annual grassland and valley grassland vegetation communities in the PSA, as described in Section 4.3.1.

### 4.4.4 Designated Critical Habitat/Essential Fish Habitat

Critical habitat is designated by USFWS and is specifically defined as a geographic area that contains features essential to the conservation of species listed as threatened or endangered under FESA. The purpose of Designated Critical Habitat (DCH) is to identify areas that are essential to the species' conservation and recovery and what management requirements may be necessary to conserve the species. EFH is designated by the National Oceanic and Atmospheric Administration and is specific to aquatic habitat where federally managed fish species and invertebrates live and reproduce. Discussed below are the five types of DCH and EFH occurring within the PSA and/or within 5 miles of the PSA (Figure 7).

#### 4.4.4.1 Chinook Salmon Essential Fish Habitat

National Oceanic and Atmospheric Administration Fisheries has delineated eight recovery domains, or geographic recovery planning areas, for the FESA-listed salmon and steelhead species populations on the western coast of California, and this includes Chinook salmon (*Oncorhynchus tshawytscha*). The *2014 Recovery Plan for Sacramento River Winter-run Chinook, Central Valley Spring-run Chinook, and Central Valley Steelhead* domain extends from the upper Sacramento River Valley to the northern portion of the San Joaquin River Valley (NOAA 2014). This domain includes the Cosumnes River.

The Cosumnes River flows along the western boundary of the PSA, within the adjacent other lands of the PSA, where EFH for Chinook salmon has been identified (NOAA 2022).

#### 4.4.4.2 Sacramento Orcutt Grass and Slender Orcutt Grass Designated Critical Habitat

USFWS has designated habitat for special-status annual grass species Sacramento Orcutt grass (*Orcuttia viscidia*) and slender Orcutt grass (*Orcuttia tenuis*). Protection and recovery requisites for these species are detailed in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005). The known range and habitat for these species includes swales, wetlands, and vernal pools within the Sacramento Valley. These species are distributed in a narrow zone of remnant depositional stream terraces at the base of the Sierra foothills in northern hardpan vernal pool and northern volcanic mudflow vernal pools. Most, if not all occurrences for these species are in eastern Sacramento County in the general vicinity of the PSA. Although several occurrences are now protected under land conversion easements, impacts from surrounding land use, adjacent road widening, and other human activities continue to threaten the species (USFWS 2009).

DCH for Sacramento Orcutt grass has been identified within 5 miles of the PSA, with the closest located approximately 3.70 miles southeast of the PSA (USFWS 2020c). DCH for slender Orcutt grass has also been identified within 5 miles of the PSA, with the closest located approximately 4.20 miles northwest of the PSA (USFWS

2020d). Sacramento Orcutt grass and slender Orcutt grass are discussed in detail in Section 4.5.1, Special-Status Plants.

#### 4.4.4.3 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Designated Critical Habitat

USFWS has designated habitat for special-status invertebrate species vernal pool fairy shrimp and vernal pool tadpole shrimp. Protection and recovery requisites for these species are detailed in the 2005 Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005). These species have an ephemeral life cycle and exist only in vernal pools or vernal pool-like habitats, such as those occurring within the PSA. The overarching recovery strategy for these species is habitat protection and management (USFWS 2005).

DCH for vernal pool fairy shrimp and vernal pool tadpole shrimp have both been identified within 5 miles of the PSA, with the closest located approximately 1.30 miles southeast of the PSA (USFWS 2020c). Vernal pool fairy shrimp and vernal pool tadpole shrimp are discussed in detail in Section 4.5.3.

#### 4.4.5 Wildlife Corridors and Habitat Linkages

Wildlife movement corridors have been recognized by federal and state agencies as important habitats worthy of conservation. Wildlife corridors provide migration channels seasonally (i.e., between winter and summer habitats) and provide non-migrant wildlife the opportunity to move within their home range for food, cover, reproduction, and refuge.

The existing network of fencing throughout the PSA is wildlife-friendly and does not preclude overland movement. Therefore, agricultural areas and undeveloped grassland in the PSA provide open space with some habitat value. However, proposed fencing around the solar development area of the Project may limit wildlife permeability for certain species. Species such as birds, small to medium sized mammals (i.e., coyote, racoon, etc.) and reptiles (i.e., snakes, lizards, etc.) will be able to pass through or over the proposed fencing and will not impede their movement through the solar development area.

According to the California Essential Habitat Connectivity Project, the Cosumnes River corridor in the western vicinity of the PSA is considered a potential riparian connection, providing native habitat for resident wildlife and linkages to additional native habitat in the surrounding area (Spencer et al. 2010). The California Essential Habitat Connectivity Project also identifies much of the grasslands within the PSA as “Natural Areas Small,” which are areas important to maintaining ecological integrity, but not specifically identified in the Essential Connectivity Network as Essential Connectivity Areas or Natural Landscape Blocks. As discussed in Section 4.3, the agricultural areas and grasslands on site provide nursery and migratory habitat for common wildlife species. Furthermore, the SSCHP recognized the Cosumnes River Corridor in the vicinity as part of SSHCP Preserve Planning Unit 5 (i.e., a linkage to targeted preserve areas within the region). A complete discussion of habitat and wildlife linkages is provided in Section 6.2 of the final BTR.

#### 4.4.6 Plant and Wildlife Species Observed

During field studies conducted in the PSA, a total of 75 species of native or naturalized plants, 34 native (45%) and 41 non-native (55%), were recorded on the PSA. A total of 40 wildlife species were observed in the PSA, 38 native



(95%) and two introduced species (5%). Wildlife species observed primarily consisted of common bird species, some of which are considered special status. A compendium of observed plant and wildlife species identified during the field surveys is included as Appendix B.

## 4.5 Special-Status Species

For this final BTR, special-status plant and wildlife species are defined as those that are (1) listed, proposed for listing, or candidates for listing as threatened or endangered under the FESA; (2) listed or candidates for listing as threatened or endangered under the CESA; (3) a federal Bird of Conservation Concern (BSS); (4) a CDFW Species Of Special Concern (SSC); (5) a plant species with a CRPR or 1 or 2; (6) a Covered Species under the SSHCP; and/or (7) a special-status species that may otherwise meet the definition of rare or endangered under CEQA Section 15380. Appendices C and D summarize the potential for the occurrence of special-status species identified during the literature and desktop review. Figure 7 provides known occurrence locations of special-status species based on database search results. This section further summarizes the results of special-status species with the potential to occur within the PSA based on the database and literature evaluation and species-specific technical survey results.

### 4.5.1 Special-Status Plants

Results of the database searches of the USFWS Information for Planning and Consultation, CDFW CNDDDB, the CNPS Inventory of Rare and Endangered Plants, and the SSHCP revealed a total of 19 special-status plant species that have known occurrences within the nine USGS 7.5-Minute Quads and/or within 5 miles of the PSA (CDFW 2022; CNPS 2022). Of these special-status plant species, 12 species have a low to moderate potential to occur in the PSA, and of these, nine are Covered Species under the SSHCP. Species with the potential to occur in the PSA are discussed in further detail below. The remaining seven special-status plant species were removed from further consideration due to lack of suitable habitat within or adjacent to the PSA, no known occurrences within 5 miles of the PSA, and/or because the PSA is outside of the species' known geographic or elevation range. The plant species with no potential to occur in the PSA can be referenced in Appendix C. Results of the protocol-level botanical survey are summarized in Section 4.5.1.11.

#### 4.5.1.1 Ahart's Dwarf Rush (*Juncus leiospermus* var. *ahartii*)

Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) is a CRPR 1B.2 species (i.e., moderately threatened in California) and SSHCP Covered Species with a low potential to occur in the PSA. Ahart's dwarf rush is an annual herb that is native to California. The common blooming period for this species is March through May. This species can be found in mesic valley and foothill grassland habitat from approximately 98 to 750 feet amsl. This species has not been documented in the vicinity of the PSA, but the PSA is within the known range of the species. Habitat for the species is minimal and of low quality in the PSA, though the PSA does include SSHCP modeled habitat (Sacramento County 2018). Suitable habitat for this species in the PSA includes vernal pools, wetland swales and seasonal wetlands throughout both the solar development area and adjacent other lands. The nearest known occurrence for this species is within 5 miles of the PSA, located at the southeast corner of Keifer Boulevard and Sunrise Boulevard (CDFW 2022; Sacramento County 2018).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.2 Boggs Lake Hedge-Hyssop (*Gratiola heterosepala*)

Boggs Lake hedge-hyssop (*Gratiola heterosepala*) is a state endangered, CRPR 1B.2 species (i.e., moderately threatened in California) and SSHCP Covered Species with a moderate potential to occur in the PSA. Boggs Lake hedge-hyssop is an annual herb that is native to California. The common blooming period for this species is April through August. This species can be found in clay soils in marshes, swamps, lake margins, and vernal pools from approximately 33 to 7,790 feet amsl. The PSA is within the known range of the species, and low-quality suitable habitat for the species is present throughout the PSA within the vernal pools, wetland swales, and seasonal wetlands of both the solar development area and adjacent other lands. The nearest known occurrence for this species is within 5 miles of the PSA, located approximately 0.85 miles southwest of the junction at Sloughhouse Road and Jackson Road (Highway 16) (CDFW 2022; Sacramento County 2018).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.3 Dwarf Downingia (*Downingia pusilla*)

Dwarf downingia (*Downingia pusilla*) is a CRPR 2B.2 species (i.e., moderately threatened in California) and SSHCP Covered Species with a moderate potential to occur in the PSA. Dwarf downingia is an annual herb that is native to California. The common blooming period for this species is March through May. This species can be found in mesic valley and foothill grassland and vernal pool habitat from approximately 3 to 1,455 feet amsl. The PSA is within the known range of the species, and suitable habitat for this species is located throughout the PSA within the vernal pools, wetland swales, and seasonal wetlands of the solar development area and adjacent other lands. The nearest known occurrences for this species are located west of the PSA in the Elk Grove USGS 7.5-Minute Quad and south to southwest in the Clay and Galt USGS 7.5-Minute Quads (CNPS 2022; Sacramento County 2018).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.4 Hoary Navarretia (*Navarretia eriocephala*)

Hoary navarretia (*Navarretia eriocephala*) is a CRPR 4.3 species (i.e., limited distribution in California yet not very threatened). Hoary navarretia is an annual herb that is native to California. The common blooming period for this species is May through June. This species can be found in cismontane woodlands, valley and foothill grasslands, and vernal mesic aquatic areas. The PSA is within the known range for this species and there is suitable habitat present throughout the PSA. The nearest known occurrences for this species are located west of the PSA in the Elk Grove USGS Quad (CNPS 2022).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.5 Hogwallow Starfish (*Hesperervax caulescens*)

Hogwallow starfish (*Hesperervax caulescens*) is a CRPR 4.2 species (i.e., limited distribution in California and moderately threatened). Hogwallow starfish is an annual herb that is native to California. The common blooming period for this species March through June. This species can be found in valley and foothill grasslands, and vernal pool aquatic features. This PSA is within the known range for this species and there is minimal suitable habitat

present. The nearest known occurrences for this species are located west of the PSA in the Buffalo Creek USGS Quad (CNPS 2022).

#### 4.5.1.6 *Legenere (Legenere limosa)*

*Legenere (Legenere limosa)* is a CRPR 1B.1 species (i.e., seriously threatened in California) and SSHCP Covered Species with a moderate potential to occur in the PSA. *Legenere* is an annual herb that is native to California. The common blooming period for this species is April through June. This species can be found in vernal pools from approximately 2 to 2,885 feet amsl. The PSA is within the known range of the species, and habitat for the species is present. There is also SSHCP modeled habitat in the PSA (Sacramento County 2018). Suitable habitat for this species is located throughout the PSA within the vernal pools, wetlands swales, and seasonal wetlands of the solar development area and adjacent other lands. The nearest known occurrences for this species are within 5 miles of the PSA, located approximately 2 miles northeast of the Nimbus Fish Hatchery and 1.8 miles east of the junction of Apple Road and Dillard Road (CDFW 2022; Sacramento County 2018).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.7 *Pincushion Navarretia (Navarretia myersii ssp. myersii)*

*Pincushion navarretia (Navarretia myersii ssp. myersii)* is a CRPR 1B.1 species (i.e., seriously threatened in California) and SSHCP Covered Species with a moderate potential to occur in the PSA. *Pincushion navarretia* is an annual herb that is native to California. The common blooming period for this species is April through May. This species can be found in often acidic vernal pools from approximately 66 to 1,080 feet amsl. The PSA is within the known range of the species, and habitat for the species is present. The PSA is also mapped as SSHCP modeled habitat for the species (Sacramento County 2018). Specifically, the Hadselville-Pentz and Redding Gravelly Loam soil complexes within the PSA are slightly acidic, and vernal pools located in these soils provide potential suitable habitat. The nearest known occurrence for this species is within 5 miles of the PSA, located approximately 6 miles east of Highway 16, south of the Schneider Ranch property near Meiss Road (CDFW 2022; Sacramento County 2018; USDA 2022).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.8 *Sacramento Orcutt Grass (Orcuttia viscida)*

*Sacramento Orcutt (Orcuttia viscida)* grass is a federally and state endangered, CRPR 1B.1 species (i.e., seriously threatened in California) and SSHCP Covered Species with a moderate potential to occur in the PSA. *Sacramento Orcutt grass* is an annual herb that is native to California. The common blooming period for this species is April through July. This species can be found in vernal pools from approximately 98 to 330 feet amsl. The PSA is within the known range of the species, and habitat for the species is present. Suitable habitat for this species is located throughout the PSA within the vernal pools, wetland swales, and seasonal wetlands of both the solar development area and adjacent other lands. DCH is located approximately 4 miles northwest of the PSA and discussed further in Section 4.4. There are also several known occurrences for this species within 5 miles of the PSA, including numerous locations off Kiefer Boulevard near the intersection with Grant Line Road (CDFW 2022; USFWS 2020d).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.9 Sanford's Arrowhead (*Sagittaria sanfordii*)

Sanford's arrowhead (*Sagittaria sanfordii*) is a CRPR 1B.2 species (i.e., moderately threatened in California) and SSHCP Covered Species with a low potential to occur in the PSA. Sanford's arrowhead is a perennial rhizomatous emergent herb that is native to California. The common blooming period for this species is April through October (or sometimes November). This species can be found in assorted, shallow freshwater marshes and swamps from approximately sea level to 2,130 feet amsl. The PSA is within the known range of the species and perennially inundated habitat for the species is present but is minimal and of low quality. The PSA also includes SSHCP modeled habitat for the species (Sacramento County 2018). The nearest known occurrence for this species is within 5 miles of the PSA, located approximately 0.60 miles south of Meiss Road and southeast of Sloughhouse (CDFW 2022; Sacramento County 2018).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.10 Slender Orcutt Grass (*Orcuttia tenuis*)

Slender Orcutt grass (*Orcuttia tenuis*) is a federally threatened, state endangered, CRPR 1B.1 species (i.e., seriously threatened in California) and SSHCP Covered Species with a moderate potential to occur in the PSA. Slender Orcutt grass is an annual herb that is native to California. The common blooming period for this species is May through September. This species can be found in often gravelly vernal pools from approximately 115 to 5,770 feet amsl. The PSA is within the known range of the species, and suitable habitat for this species is located throughout the PSA within the vernal pools, wetland swales, and seasonal wetlands of both the solar development area and adjacent other lands. DCH is located approximately 4 miles northwest of the PSA. A known occurrence is also recorded for this species to the west of the PSA in the Elk Grove USGS 7.5-Minute Quad (CNPS 2022; USFWS 2020c).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.11 Tuolumne Button-Celery (*Eryngium pinnatisectum*)

Tuolumne button-celery (*Eryngium pinnatisectum*) is a CRPR 1B.2 species (i.e., moderately threatened in California) with a low potential to occur in the PSA. Tuolumne button-celery is an annual or perennial herb that is native to California. The common blooming period for this species is May through August. This species can be found in mesic cismontane woodland, lower montane coniferous forest, and vernal pools from approximately 230 to 3,000 feet amsl. This species has not been documented in the vicinity of the PSA, but the PSA is within the known range of the species. Habitat for the species in the PSA is minimal and of low quality and is in the vernal pools, wetland swales, and seasonal wetlands of the solar development area and adjacent other lands. The nearest known occurrences for this species are located to the east and northeast of the PSA in the Carbondale and Folsom SE USGS 7.5-Minute Quads (CNPS 2022).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.12 Valley Brodiaea (*Brodiaea rosea* ssp. *vallicola*)

Valley brodiaea (*Brodiaea rosea* ssp. *vallicola*) is a CRPR 4.2 species (i.e., limited distribution and is moderately threatened in California) with a moderate potential to occur in the PSA. Valley brodiaea is perennial herb (bulb) that is native to California. The common blooming period for this species is April through May. This species can be found in valley and foothill grasslands, alluvial terraces that are silty, sandy, and/or loamy, and in vernal pools and swale aquatic features. The PSA is within the known range for this species and contains suitable habitat. This species has been documented four miles northwest of the PSA (CDFW 2022).

This species was not observed during protocol-level botanical surveys, as discussed below in Section 4.5.1.11.

#### 4.5.1.11 Protocol-Level Botanical Survey Results

Dudek conducted protocol-level botanical surveys in April and May 2021 in accordance with *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000), the *Protocol for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018), and the *Botanical Survey Guidelines* (CNPS 2001).

As part of the protocol-level botanical surveys, Dudek first conducted reference population checks at known locations for species that were found to have a potential to occur within the PSA during the database and literature evaluation (Figure 7). On April 22, 2021, Dudek conducted reference population checks for mid to early late bloom species. Reference population checks yielded positive identification of Tuolumne button-celery, which typically blooms May through August, and was in early phenological stage at the time of observation. All other reference population checks for known special-status plant species yielded no observations, as well as abnormally dry conditions in suitable habitat features (Table 6).

**Table 6. Botanical Reference Population Assessment Summary**

| Species                                                              | Location of Reference Population                                             | Occurrence ID   | Typical Bloom Period | Assessment Summary                                                                                                                                                                  |
|----------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ahart's dwarf rush ( <i>Juncus leiospermus</i> var. <i>ahartii</i> ) | Illa Collin Preserve at Mather Field; off Zinfandel Drive, west side of road | 8 <sup>1</sup>  | March–May            | No special-status plant observed. Vernal pools very dry.                                                                                                                            |
| Boggs Lake hedge-hyssop ( <i>Gratiola heterosepala</i> )             | Illa Collin Preserve at Mather Field; off Zinfandel Drive, west side of road | 84 <sup>1</sup> | April–August         | No special-status plant observed. Common hedge hyssop ( <i>Gratiola ebracteata</i> ) observed in drainage across from Zinfandel Drive. Vernal pools very dry and in poor condition. |
| Boggs Lake hedge-hyssop                                              | Illa Collin Preserve at Mather field; on                                     | 57 <sup>1</sup> | April–August         | No special-status plant observed. Active construction surrounding preserve, no                                                                                                      |

**Table 6. Botanical Reference Population Assessment Summary**

| Species                                                                     | Location of Reference Population                                    | Occurrence ID                                     | Typical Bloom Period | Assessment Summary                                                                                                                   |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <i>(Gratiola heterosepala)</i>                                              | Cobble Brook Road off Jaeger Road                                   |                                                   |                      | access. Visual observations indicate dry conditions.                                                                                 |
| Dwarf downingia<br><i>(Downingia pusilla)</i>                               | Phoenix Park, Fair Oaks                                             | 129 <sup>1</sup>                                  | March–May            | No special-status plant observed. Vernal pools very dry and in poor condition.                                                       |
| Legenere<br><i>(Legenere limosa)</i>                                        | Arno Road and Frontage Road                                         | 21 <sup>1</sup>                                   | April–June           | No special-status plant observed. Vernal pools very dry and in poor condition.                                                       |
| Legenere<br><i>(Legenere limosa)</i>                                        | Riley Road, Galt.                                                   | 21 <sup>1</sup>                                   | April–June           | No special-status plant observed. Vernal pools very dry and in poor condition.                                                       |
| Pincushion navarretia<br><i>(Navarretia myersii</i><br>ssp. <i>myersii)</i> | Twin Cities Road (38.388417°, -121.039917°)                         | 77f0dd52-d335-427b-ac8e-8a292559491d <sup>2</sup> | April–May            | No special-status plant observed. Private land with no access. Visual observations indicate dry conditions.                          |
| Sacramento Orcutt grass<br><i>(Orcuttia viscida)</i>                        | Southeast of Grantline Road, Rancho Cordova (38.58008, -121.196666) | b413c094-cc5f-4ddf-8239-9027599ed5c1 <sup>2</sup> | April–               | No special-status plant observed. Private land with no access. Visual observations indicate dry conditions.                          |
| Sanford's arrowhead<br><i>(Sagittaria sanfordii)</i>                        | Deer Creek Preserve (38.535833, -121.098889)                        | 1f49032a-eb6d-4298-a5af-b74d3a2bbc5c <sup>2</sup> | May–October          | No special-status plant observed. Plants observed were still in vegetative cycle.                                                    |
| Slender Orcutt grass<br><i>(Orcuttia tenuis)</i>                            | —                                                                   | —                                                 | May–September        | No special-status plant observed. No suitable reference population locations due to old occurrences that may be extirpated.          |
| Tuolumne button-celery<br><i>(Eryngium pinnatisectum)</i>                   | 1 mile north of Carbondale Road on Lambert Road                     | 20 <sup>1</sup>                                   | May–August           | Approximately 20 individuals observed, in bud and vegetative; however, identifiable due to bracts. Located on the west side of road. |

Sources: CDFW 2022; CNPS 2022.

**Notes:**

<sup>1</sup> California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB) occurrence ID.

<sup>2</sup> University of California Davis Herbarium occurrence ID.

Due to the abnormally dry conditions from the lack of annual precipitation events in the 2020 through 2021 water year, species phenology for the region was observed to be atypical, with some species blooming earlier than typical and/or not at all. As such, only one mid to late early bloom protocol-level botanical survey was conducted on May

4, 2021, within the PSA, with focus on suitable habitat features for special-status species known to occur in the Project vicinity. No special-status species were observed during the protocol-level surveys conducted within the PSA.

## 4.5.2 Arborist Tree Survey and Inventory Results

International Society of Arboriculture Certified Arborists with California Tree and Landscaping Consulting Inc. conducted tree surveys and inventory on February 6, 2020, and December 2, 2020, and a total of 22 trees were inventoried within the PSA. Table 7 and Table 8 summarize all California Tree and Landscaping Consulting Inc. survey results within the PSA, as well as the trees' provided protection assignments according to the Sacramento County Tree Preservation Ordinance.

**Table 7. Summary of Trees Inventoried within the Project Study Area**

| Tree Species                                  | Total Trees Inventoried | Protected by Sacramento County Tree Preservation Ordinance | Total Trees Proposed for Removal |
|-----------------------------------------------|-------------------------|------------------------------------------------------------|----------------------------------|
| <b>Protected Species</b>                      |                         |                                                            |                                  |
| Valley Oak ( <i>Quercus lobata</i> )          | 3                       | 1                                                          | 0                                |
| <b>Non-Protected Species</b>                  |                         |                                                            |                                  |
| Incense cedar ( <i>Calocedrus decurrens</i> ) | 1                       | 0                                                          | 1                                |
| Tree of heaven ( <i>Ailanthus altissima</i> ) | 17                      | 0                                                          | 17                               |
| Unknown species                               | 1                       | 0                                                          | 1                                |
| <b>Total</b>                                  | <b>22</b>               | <b>1</b>                                                   | <b>19</b>                        |

Source: CalTLC 2020.

Note: This summary does not include inventoried elderberry shrubs (*Sambucus* sp).

**Table 8. Summary of Tree Inventory Data**

| Field Tag         | Protected | Common Name    | Scientific Name             | Multi-Stems | DBH | Measured At | Canopy Radius | Arborist Rating <sup>a</sup> | Tree Location in PSA |
|-------------------|-----------|----------------|-----------------------------|-------------|-----|-------------|---------------|------------------------------|----------------------|
| 4001 <sup>b</sup> | No        | Incense cedar  | <i>Calocedrus decurrens</i> | —           | 12  | 54          | 8             | 1                            | SDA                  |
| 4002 <sup>b</sup> | No        | Unknown        | <i>Unknown</i>              | —           | 26  | 54          | 0             | 0                            | SDA                  |
| 4403              | No        | Tree of heaven | <i>Ailanthus altissima</i>  | —           | 7   | 36          | 12            | 3                            | SDA                  |
| 4404              | No        | Tree of heaven | <i>Ailanthus altissima</i>  | —           | 9   | 54          | 15            | 3                            | SDA                  |
| 4405              | No        | Tree of heaven | <i>Ailanthus altissima</i>  | —           | 4   | 54          | 5             | 3                            | SDA                  |
| 4406              | No        | Tree of heaven | <i>Ailanthus altissima</i>  | —           | 5   | 54          | 5             | 3                            | SDA                  |

**Table 8. Summary of Tree Inventory Data**

| Field Tag         | Protected | Common Name    | Scientific Name            | Multi-Stems | DBH | Measured At | Canopy Radius | Arborist Rating <sup>a</sup> | Tree Location in PSA |
|-------------------|-----------|----------------|----------------------------|-------------|-----|-------------|---------------|------------------------------|----------------------|
| 4407              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 10  | 36          | 10            | 3                            | SDA                  |
| 4408              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 12  | 36          | 15            | 3                            | SDA                  |
| 4409              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 12  | 24          | 15            | 3                            | SDA                  |
| 4410              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 8   | 24          | 10            | 3                            | SDA                  |
| 4411              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 5   | 54          | 8             | 3                            | SDA                  |
| 4412              | No        | Oak            | <i>Quercus sp.</i>         | —           | 0   | 54          | 0             | 0                            | SDA                  |
| 4413              | No        | Tree of heaven | <i>Ailanthus altissima</i> | 2,3,4,5     | 7   | 54          | 6             | 3                            | SDA                  |
| 4414              | No        | Tree of heaven | <i>Ailanthus altissima</i> | 8,8         | 11  | 54          | 15            | 3                            | SDA                  |
| 4415              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 18  | 36          | 20            | 3                            | SDA                  |
| 4416              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 20  | 54          | 18            | 3                            | AOL                  |
| 4417              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 19  | 24          | 8             | 3                            | AOL                  |
| 4418              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 13  | 54          | 15            | 3                            | AOL                  |
| 4419              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 36  | 54          | 20            | 3                            | AOL                  |
| 4420              | No        | Tree of heaven | <i>Ailanthus altissima</i> | —           | 9   | 54          | 8             | 3                            | AOL                  |
| 4421              | Yes       | Valley oak     | <i>Quercus lobata</i>      | —           | 32  | 54          | 28            | 3                            | AOL                  |
| 4422 <sup>b</sup> | No        | Valley oak     | <i>Quercus lobata</i>      | —           | 0   | 54          | —             | 0                            | AOL                  |

Source: CalTLC 2020.

Notes: DBH = diameter at breast height; PSA = Project Study Area; SDA = Solar Development Area; AOL = Adjacent Other Lands

<sup>a</sup> 0=Dead; 3= Fair.

<sup>b</sup> Recommendations – Remove due to defects.

Based on the tree inventory results captured in Table 7 and Table 8, one tree (i.e., tree number 4421, valley oak) is protected by Sacramento County Tree Preservation Ordinance; however, this tree will not be impacted by Project activities as it resides within the adjacent other lands of the PSA. The remaining trees within the PSA will be removed including 4001 through 4420 and 4422. Tree numbers 4001, 4002, and 4422 are recommended to be removed (per Arborist Report), as they are either dead or have extreme problems and are in severe decline. Tree numbers



4412 and 4422 are native oak trees; however, they are not protected as they are dead (CalTLC 2020). In total, 18 trees within the solar development area and adjacent other lands of the PSA will be directly impacted.

### 4.5.3 Special-Status Wildlife

Results of the database searches of the USFWS Information for Planning and Consultation, the CDFW CNDDDB, and the SSHCP revealed 37 special-status wildlife species that have known occurrences either within the nine USGS 7.5-Minute Quads or within 5 miles of the PSA. Of these 37 special-status wildlife species, 28 have a low to high potential to occur in the PSA or are known to occur in the PSA, and of these, 14 are Covered Species under the SSHCP. In addition, the PSA provides habitat for nesting birds protected by the federal MBTA and CFGC and native bats protected by the CFGC. The remaining nine special-status wildlife species were removed from further consideration due to lack of suitable habitat within or adjacent to the PSA, no known occurrences within 5 miles of the PSA, and/or the PSA being outside of the species' known geographic range. The special-status wildlife species with no potential to occur in the PSA can be referenced in Appendix D. Results of the various wildlife technical studies are summarized in Sections 4.5.3.1 through 4.5.3.18.

#### 4.5.3.1 California Tiger Salamander (*Ambystoma californiense*)

CTS is a federally and state threatened species with a moderate potential to occur in the PSA. CTS is most associated with annual grassland habitats but may also occur within open woodland areas of low hills and valleys. Necessary habitat components for CTS include suitable underground retreats and breeding ponds. CTS spend most of their adult life within suitable underground refugia, such as the burrows of California ground squirrel (*Spermophilus beecheyi*) and pocket gopher (*Thomomys* sp.) or other small mammal burrows; occasionally CTS will occupy human-made structures. Suitable underground refugia for CTS provides cover from predators, protection from desiccation during the dry season, and foraging habitat (Stebbins and McGinnis 2012; USFWS 2005). Suitable breeding sites include vernal pools, seasonal wetlands, stock ponds, or slow-moving streams that do not support fish, although streams are rarely used for reproduction. This species may use permanent human-made ponds if predatory species (e.g., fish, crayfish) are absent (Fisher and Shaffer 1996).

CTS have been reported to migrate up to 1.3 miles between breeding ponds and upland habitat (Orloff 2007); however, only a small number of individuals likely travel this distance (Orloff 2011). The estimated average migration distance is estimated to be 1,844 feet (Searcy and Shaffer 2011). Several studies have indicated that, depending on habitat and life stage, the majority of CTS (between 50% and 95% of adults) travel between 0.09 and 0.5 miles and adult captures declined with increased distance from the breeding pond (Trenham and Shaffer 2005; Orloff 2011),

Although CTS has not been documented in the PSA, this species is known to occur in the vicinity of the PSA. CTS is an SSHCP Covered Species and suitable habitat, as well as SSHCP-modeled aquatic and upland habitat, is present within the PSA (Sacramento County 2018). Specifically, there are known occurrences for CTS 5 miles southeast of the PSA, southeast of Laguna Creek, approximately 0.25 miles southeast of Katena Lane at Clay Station Road (CDFW 2022; USFWS 2022). The site is at the extreme northern extent of the presumed species range (Sacramento County 2018), as the Cosumnes River provides a barrier to movement. A summary of the CTS aquatic larval survey results is provided below.

## California Tiger Salamander Preliminary Habitat Assessment and Aquatic Larval Survey Results

Prior to conducting the CTS aquatic larval surveys, a CTS preliminary habitat assessment of aquatic features was conducted to evaluate for the potential for CTS to occur within 2 kilometers of the solar development area, south of the Cosumnes River. Dudek identified a total of 34 aquatic resources within 2 kilometers of the solar development area. Of these 34 identified resources, a total of 13 could not be excluded as having potential for CTS to occur and 21 were determined to have little to no likelihood for CTS to occur based on ponding duration (either too brief or perennial) and known or suspected presence of predatory fish or bullfrogs (Figure 8, California Tiger Salamander Habitat Assessment). Generally, the features that could not be eliminated as potential CTS aquatic habitat were toward the edge or the 2 kilometer buffer or had significant barriers to movement toward the solar development area such as orchards or concentrations of residential development. The potential upland habitat within the PSA is also not unique or especially high quality, based on the generally low density of small mammal burrows that would be used by CTS.

Dudek conducted CTS aquatic larval surveys on March 16, April 15, and April 28, 2021, within the PSA in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or Negative Findings of California Tiger Salamander* (USFWS 2003). Surveys were conducted by Allie Sennett, a Dudek biologist holding a valid USFWS 10(a)(1)(A) Recovery Permit for the species (Permit No. TE55068D-0). Surveys were specifically conducted within all suitable breeding habitat (i.e., seasonal bodies of standing water) for CTS located in the PSA, which included pond 1 (0.28 acres), pond 2 (0.37 acres), and pond 3 (16.36 acres). Pond 1 and pond 3 are located within adjacent other lands, and pond 2 is located within the solar development area of the PSA (Figure 5). Pond 1 and pond 3 were highly disturbed due to cattle activity and dredging by the landowner. Soils in these ponds were unconsolidated and no emergent vegetation or other structure was present for deposition of eggs. The recent dredging of pond 3 had increased pond depth such that surveyors could only access the pond edges; however, CTS larvae do not typically use such deeper waters. Pond 2 adjoins and overflows into an adjacent vernal pool (VP-08), which was also surveyed for presence of larval CTS; therefore, only the edges of pond could be sampled due to depth and unconsolidated earth.

There were no observations of CTS during the aquatic larval surveys conducted within the PSA (Table 9). There were no incidental observations of CTS within the aquatic features in the PSA during wet season large-listed branchiopod surveys or during focused CTS surveys. Lastly, no incidental observations of CTS or suitable burrows were made in the uplands within the PSA during the additional field studies.

**Table 9. California Tiger Salamander Aquatic Larval Survey Results Summary**

| Survey Pass <sup>1</sup> | Survey Time | Weather Conditions ( °C) | Average Pond Depth (inches) | Pond Inundation (%) | Water Temperature | Turbidity <sup>2</sup> | Aquatic Vegetation Present | Dip Net Area (Square Feet) | Invertebrates Observed | Vertebrate Observed | Larval Length (mm) |
|--------------------------|-------------|--------------------------|-----------------------------|---------------------|-------------------|------------------------|----------------------------|----------------------------|------------------------|---------------------|--------------------|
| <b>Pond 1</b>            |             |                          |                             |                     |                   |                        |                            |                            |                        |                     |                    |
| 1                        | 1125        | 9, clear, windy          | 9                           | 70                  | 14                | H                      | No                         | 5,000                      | Yes                    | No                  | —                  |
| 2                        | 0940        | 9, clear, windy          | 2                           | 60                  | 23                | H                      | Yes                        | 7,300                      | Yes                    | Yes                 | —                  |

**Table 9. California Tiger Salamander Aquatic Larval Survey Results Summary**

| Survey Pass <sup>1</sup> | Survey Time | Weather Conditions ( °C) | Average Pond Depth (inches) | Pond Inundation (%) | Water Temperature | Turbidity <sup>2</sup> | Aquatic Vegetation Present | Dip Net Area (Square Feet)  | Invertebrates Observed | Vertebrate Observed | Larval Length (mm) |
|--------------------------|-------------|--------------------------|-----------------------------|---------------------|-------------------|------------------------|----------------------------|-----------------------------|------------------------|---------------------|--------------------|
| 3                        | 1125        | 9, clear, windy          | ≥10                         | 90                  | 13                | L                      | No                         | Access only at edge of pond | Yes                    | No                  | —                  |
| <b>Pond 2</b>            |             |                          |                             |                     |                   |                        |                            |                             |                        |                     |                    |
| 1                        | 1340        | 22, clear                | 0.80                        | 10                  | 29.8              | H                      | No                         | 1,400                       | Yes                    | No                  | —                  |
| 2                        | 1150        | 22, clear                | 1                           | 40                  | 18.4              | H                      | Yes                        | 4,300                       | Yes                    | Yes                 | —                  |
| 3                        | 1230        | 22, clear                | ≥5                          | 60                  | 23.5              | H                      | No                         | Access only at edge of pond | Yes                    | No                  | —                  |
| <b>Pond 3</b>            |             |                          |                             |                     |                   |                        |                            |                             |                        |                     |                    |
| 1                        | 1228        | 28, clear                | 5.9                         | 60                  | 28.6              | H                      | No                         | 1,000                       | Yes                    | No                  | —                  |
| 2                        | 1540        | 28, clear                | 15.7                        | 20                  | 31.4              | H                      | No                         | 1,300                       | Yes                    | No                  | —                  |
| 3                        | 1728        | 28, clear                | 15                          | 70                  | 29.8              | H                      | No                         | Access only at edge of pond | Yes                    | No                  | —                  |

**Notes:**

<sup>1</sup> Survey Pass 1 – March 16, 2021; Survey Pass 2 – April 15, 2021, Survey Pass 3 – April 28, 2021.

<sup>2</sup> Turbidity – H = High; M= Moderate; L= Low

Pond 1 – Poor quality breeding habitat, highly denuded due to dredging and cattle activity.

Pond 2 – Adjoins/overflows into adjacent vernal pool (i.e., VP-08), which was also surveyed.

Pond 3 – Poor quality breeding habitat, highly denuded due to dredging and cattle activity; highly disturbed with unconsolidated soil; emergent vegetation present; poor quality and highly turbid water; recently dredged by landowner; therefore, only the edges of pond could be sampled due to depth and unconsolidated earth.

#### 4.5.3.2 Western Spadefoot Toad (*Spea hammondi*)

WST is a state SSC with a moderate potential to occur in the PSA. WST is almost completely terrestrial, entering temporal pools and drainages only to breed. The species aestivates within rodent burrows in upland habitats near aquatic breeding sites (Stebbins 1972). The species prefers open areas with sandy or gravelly soils in a variety of habitats, including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, river floodplains, alluvial fans, playas, and alkali flats (Stebbins 2003; Holland and Goodman 1998). However, the species is most common in grasslands with vernal pools or mixed grassland/coastal sage scrub areas and is most active during periods of rain (Holland and Goodman 1998).

Although WST has not been documented in the PSA, this species is known to occur in the PSA vicinity. WST is an SSHCP Covered Species and suitable habitat, as well as SSHCP modeled aquatic and upland habitat, is present within the PSA (Sacramento County 2018). In addition, there are known occurrences for WST within 4.8 miles of the PSA, located on the west side of Sloughhouse Road, approximately 0.90 miles south of Highway 16 (CDFW 2022; USFWS 2022).

## Focused Western Spadefoot Toad Survey Results

Dudek conducted focused surveys for WST within the PSA in conjunction with both the CTS aquatic larval surveys and the protocol-level large listed branchiopod wet season surveys (see Section 4.5.3.15-4.5.3.16) in accordance with the most recent published literature and recommendations from CDFW and under the guidance of Dudek species experts. Both the solar development area and the adjacent other lands within the PSA provide suitable aquatic and upland aestivation sites for WST. No WST or their larval masses were observed during focused surveys.

### 4.5.3.3 Central Valley Steelhead Distinct Population Segment (*Oncorhynchus mykiss irideus*)

The Central Valley steelhead distinct population segment (DPS) is a federally threatened fish species that is known to occur within 5 miles of the PSA along the Cosumnes River. Adult steelhead spawn in relatively high-gradient reaches of tributary rivers and require streams with cool, clean, well-oxygenated water and suitably sized spawning gravel that is generally free of fine sediments (i.e., sand, silt, and clay) (Moyle 2002). Spawning water depth ranges from 15 to 60 centimeters (preferred depth of 35 centimeters) typically in gravel-sized substrate, but also in a mixture of sand-gravel and gravel-cobble (McEwan and Jackson 1996). Juvenile steelhead require year-round flows, suitable water temperatures, adequate cover, and abundant food to support growth and survival to the smolt stage. Summer rearing habitat consisting of pools, cool, well-oxygenated water, and sufficient cover are often cited as major limiting factors for juvenile steelhead in California streams when one or more of these habitat conditions are absent (Moyle 2002).

The Central Valley steelhead DPS species has been documented in the Cosumnes River in the PSA (CDFW 2022). Based on field observations, the Cosumnes River within the PSA is deep, lacks riffle habitat, and contains a bedrock bottom that is absent of sand, gravel, or cobble that is suitable substrate for spawning steelhead. In addition, the river contains limited shaded areas or overhanging banks and in-stream structures, such as downed trees, that normally provide cover and foraging opportunities for rearing juvenile steelhead. For these reasons, habitat for steelhead in the Cosumnes River within the PSA only provides habitat for migrating steelhead and generally lacks spawning and rearing habitat for this DPS. No Central Valley steelhead were observed during reconnaissance-level field surveys.

### 4.5.3.4 Giant Garter Snake (*Thamnophis gigas*)

Giant garter snake (*Thamnophis gigas*) is a federally and state threatened species with a low potential to occur in the PSA. Giant garter snake is primarily aquatic and prefers marshes, sloughs, wetlands, agricultural ditches, rice fields, and other slow moving or still waters with emergent vegetation that is necessary for cover and foraging, and upland habitat consisting of grassy banks and openings for basking and aestivation in the summer and torpor in the winter (Hansen 1988). Suitable habitat components consist of (1) adequate water during the snake's active period (i.e., early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) high-elevation uplands for cover and refuge from flood waters. Giant garter snake is typically absent from larger rivers and other water bodies that support introduced populations of large, predatory fish, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands do not provide habitat because of excessive shade, lack of basking sites, and absence of prey populations (USFWS 2017a).

Giant garter snake has not been documented in the vicinity of the PSA and the habitat in the PSA is of low quality. There are no known occurrences within 5 miles of the PSA (CDFW 2022; USFWS 2022). No giant garter snakes were observed during reconnaissance-level field surveys. Giant garter snake is an SSHCP Covered Species; however, modeled aquatic and upland habitat is not present within the PSA (Sacramento County 2018).

#### 4.5.3.5 Northwestern Pond Turtle (*Actinemys marmorata*)

Northwestern pond turtle (*Actinemys marmorata*) is a state SSC with a moderate potential to occur in the adjacent other lands of the PSA. This species is found in rivers, lakes, streams, ponds, wetlands, ephemeral creeks, reservoirs, agricultural ditches, estuaries, and brackish waters. Northwestern pond turtles prefer areas that provide cover from predators, such as vegetation and algae, as well as basking sites for thermoregulation. Adults tend to favor deeper, slow moving water, whereas hatchlings search for slow and shallow water that is slightly warmer. Terrestrial habitats are used for wintering and usually consist of burrows in leaves and soil. Northwestern pond turtles also lay their eggs in terrestrial habitats normally near water. Although nesting sites should contain deep soils (at least 4 inches deep), the type of soil can vary from sandy to very hard.

Although northwestern pond turtle has not been documented in the PSA, this species is known to occur in the PSA vicinity and marginal suitable habitat is present in the PSA, specifically in the other lands adjacent to the Cosumnes River. Northwestern pond turtle is an SSHCP Covered Species and modeled aquatic and upland habitat is also present within the PSA (Sacramento County 2018). There are known occurrences for northwestern pond turtle within 5 miles of the PSA, located at Laguna Creek approximately 2.70 miles northeast of Clay Station Road (CDFW 2022). No northwestern pond turtles were observed during reconnaissance-level field surveys.

#### 4.5.3.6 Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagle (*Haliaeetus leucocephalus*) is a federally delisted bird species and state endangered and fully protected species that is known to occur within the PSA. In California, most nesting bald eagles are found in the northern part of the state, but pairs nest locally south through the Sierra Nevada, coastal counties in Central and Southern California, and on the Channel Islands. Bald eagles typically nest in large conifers or on rock outcrops near aquatic features, but also occasionally in large hardwoods, such as sycamores and oaks (Anthony et al. 1982; USFWS 1986). They usually nest in one of the largest trees available in proximity of water and generally situated with a prominent overview of the surrounding area (Buehler 2000). Bald eagles preferentially forage on fish and waterfowl, but their diet varies regionally and seasonally in response to locally available resources, and often includes a variety of mammals, as well as carrion, especially in winter (Todd et al. 1982; Stalmaster 1987; Ewins and Andress 1995; Buehler 2000).

Although nesting habitat throughout the PSA is generally absent to limited, bald eagles were observed in both the PSA and the surrounding vicinity during field studies conducted by Dudek in 2020–2021. Specifically, one eagle was observed perched on a wooden fence post in the vicinity of an anchovy production facility (i.e., north of Meiss Road), and another was observed up to three separate times perched on a tree snag on an island in the middle of pond 3 in the southeast corner of the PSA in the adjacent other lands. These eagles were likely winter migrants to the area and/or foraging along the Cosumnes River corridor.

#### 4.5.3.7 Bank Swallow (*Riparia riparia*)

Bank swallow (*Riparia riparia*) is a state threatened bird species with a moderate potential to occur in the PSA. In California, this species is found primarily west of deserts in riparian and other lowland habitats during the spring–fall period. In summer, bank swallows are restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine textured sandy soils, into which they dig nesting holes. Approximately 75% of the breeding population in California occurs along banks of the Sacramento and Feather Rivers in the northern Central Valley. Breeding colonies can have between 10 and 1,500 nesting pairs, but typically have between 100 and 200 nesting pairs (CDFW 2022).

The PSA provides suitable migratory habitat for bank swallow but is located outside the breeding range for this species. There are known occurrences of bank swallow within 5 miles of the PSA, located on the Cosumnes River approximately 0.25 miles downstream of Bridge House (CDFW 2022; Cornell Lab 2021; USFWS 2022). No bank swallows were observed during reconnaissance-level field surveys.

#### 4.5.3.8 Burrowing Owl (*Athene cunicularia*)

BUOW is a state SSC known to occur in the PSA. In California, BUOWs are yearlong residents of open, dry grassland and desert habitats and grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats (CDFW 2022). Preferred habitat is typified by short, sparse vegetation with few shrubs, level to gentle topography, and well-drained soils. The presence of burrows is the most essential component of BUOW habitat, as they are required for nesting, roosting, cover, and caching prey (Poulin et al. 2011). In California, BUOWs most commonly live in burrows created by California ground squirrels. BUOWs may also occur in human-altered landscapes such as agricultural areas, ruderal grassy fields, vacant lots, and pastures if the vegetation structure is suitable (i.e., open, and sparse), usable burrows are available, and foraging habitat occurs in proximity (Gervais et al. 2008). Debris piles, riprap, culverts, and pipes can also be used for nesting, shelter, and roosting.

There is suitable habitat for BUOW in the PSA, as well as recorded presence. BUOW is an SSHCP Covered Species and modeled wintering habitat is present within the PSA (Sacramento County 2018). A summary of the protocol-level BUOW surveys results is provided below.

#### Protocol-Level Burrowing Owl Breeding Season Survey Results

Dudek conducted protocol-level BUOW surveys within the PSA and visual surveys within the surrounding vicinity (i.e., up to 500 feet) on February 18 and 25, 2021 (Pass 1); March 4 and 16, 2021 (Pass 2); April 9 and 15, 2021 (Pass 3), and May 3, 2021 (Pass 4). In addition, in accordance with recommendations from CDFW, two additional breeding season surveys were conducted in 2022: June 2 and 3, 2022 (Pass 5), and July 7 and 9, 2022 (Pass 6). Surveys were conducted in accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012), and the *Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium 1993). A total of 22 BUOW observations, mostly of suitable burrows but including two visual observations of BUOW, were made during the four survey passes conducted in 2021. Specifically, the two visual observations were of individual BUOWs and not ancillary observations such as burrows, whitewash, etc. Observations were made within areas that provided suitable burrowing and foraging habitat, including both the solar development area and the adjacent other lands within the PSA (Figure 11, Burrowing Owl, Swainson's Hawk, and Tricolored Blackbird Survey Results; Table 10).

**Table 10. Protocol-Level Burrowing Owl Breeding Season Survey Results Summary**

| Date                 | Observation Summary           | Observation Location (decimal degrees) |               |
|----------------------|-------------------------------|----------------------------------------|---------------|
|                      |                               | Latitude                               | Longitude     |
| <b>Survey Pass 1</b> |                               |                                        |               |
| 2/18/2021            | Burrow - potential, single    | 38.46777976°                           | -121.1795649° |
| 2/18/2021            | Burrow - potential, single    | 38.47138943°                           | -121.1811695° |
| 2/18/2021            | Burrow - potential, single    | 38.48260533°                           | -121.1887913° |
| 2/25/2021            | Burrow - potential, single    | 38.48344044°                           | -121.1933353° |
| 2/25/2021            | Visual - flushed              | 38.47075249°                           | -121.1851769° |
| 2/25/2021            | Burrow - potential, single    | 38.46530577°                           | -121.1830474° |
| 2/25/2021            | Burrow - potential, single    | 38.46525486°                           | -121.1830911° |
| 2/25/2021            | Burrow - potential, single    | 38.46460451°                           | -121.1851927° |
| 2/25/2021            | Burrow - potential, single    | 38.46465651°                           | -121.1849397° |
| 2/25/2021            | Burrow - potential, single    | 38.46552494°                           | -121.1860965° |
| 2/25/2021            | Burrow - potential, single    | 38.46707128°                           | -121.1830843° |
| <b>Survey Pass 2</b> |                               |                                        |               |
| 3/4/2021             | Burrow - potential, single    | 38.46957097°                           | -121.1886550° |
| 3/4/2021             | Burrow - potential, single    | 38.47086409°                           | -121.1883382° |
| 3/4/2021             | Burrows - potential, multiple | 38.46942884°                           | -121.1895094° |
| 3/16/2021            | Burrow - potential, single    | 38.46668135°                           | -121.1792350° |
| <b>Survey Pass 3</b> |                               |                                        |               |
| 4/9/2021             | Burrow - potential, single    | 38.48130423°                           | -121.1872571° |
| 4/9/2021             | Burrows - potential, multiple | 38.48023688°                           | -121.1880083° |
| 4/15/2021            | Burrows - potential, multiple | 38.46501097°                           | -121.1844780° |
| 4/15/2021            | Burrow - potential, single    | 38.46952106°                           | -121.1840387° |
| 4/15/2021            | Burrow - potential, single    | 38.46487298°                           | -121.1859698° |
| 4/15/2021            | Burrow - potential, single    | 38.46586949°                           | -121.1846340° |
| <b>Survey Pass 4</b> |                               |                                        |               |
| 5/4/2021             | Visual - flushed              | 38.47255171°                           | -121.1794499° |
| <b>Survey Pass 5</b> |                               |                                        |               |
| 6/3/2022             | No observations               | —                                      | —             |
| <b>Survey Pass 6</b> |                               |                                        |               |
| 7/9/2022             | No observations               | —                                      | —             |

#### 4.5.3.9 Common Yellowthroat (*Geothlypis trichas sinuosa*)

Common yellowthroat (*Geothlypis trichas sinuosa*) is a state SSC with a low potential to nest in the PSA. This species nests and forages in emergent wetlands including woody swamp, brackish marsh, and freshwater marsh. Common yellowthroat also breeds in valley foothill riparian, and occasionally in desert riparian, annual grassland, and perennial grassland habitats. During migration, they are found in other moist habitats with low dense vegetation (CDFW 2022).

Although the PSA provides suitable foraging habitat for common yellowthroat, this species is not common in inland habitats during the breeding season, especially in the Central Valley. In addition, there are no known occurrences of this species within 5 miles of the PSA (CDFW 2022; USFWS 2022). No common yellowthroats were observed during reconnaissance-level field surveys.

#### 4.5.3.10 Golden Eagle (*Aquila chrysaetos*)

Golden eagle (*Aquila chrysaetos*) is a federally fully protected species and a state watchlist species with a low potential to nest in the PSA. Golden eagle is a year-round, diurnally active species that is a permanent resident and migrant throughout California where it tends to occupy mountain, foothill, and desert areas. Foraging habitat for this species includes open habitats with scrub, grasslands, desert communities, and agricultural areas. This species typically nests on cliffs within canyons and escarpments and in large trees (generally in open habitats) primarily within rugged, hilly, or mountainous terrain (Garrett and Dunn 1981; Johnsgard 1990). Most nests are located on cliffs or trees near forest edges or in small stands near open fields, but golden eagle is also known to utilize electrical transmission towers and similarly sized structures as nest sites (Garrett and Dunn 1981; Johnsgard 1990; Kochert et al. 2002; Scott 1985). Golden eagles commonly build, maintain, and variably use multiple alternative nest sites in their breeding territories, routinely refurbishing and reusing individual nests over many years.

The PSA lacks cliff and canyon nesting habitat and only provides foraging habitat for golden eagle. There are no known occurrences of golden eagle within 5 miles of the PSA (CDFW 2022; USFWS 2022). No golden eagles were observed during reconnaissance-level field surveys.

#### 4.5.3.11 Swainson's Hawk (*Buteo swainsoni*)

SWHA is a state threatened species known to occur in the PSA. In California, this species nests in the Central Valley and smaller adjacent valleys, the Klamath Basin, the Northeastern Plateau, Lassen County, and the Mojave Desert. It breeds in riparian areas, stands of trees in agricultural environments, oak savannah, Joshua trees (*Yucca brevifolia*) in the Mojave Desert, and juniper-sage flats. In the San Joaquin Valley, it nests in riparian areas and in isolated tree clusters, often near rural residences or other areas with some human disturbance. Alfalfa fields are the favored foraging areas of SWHA in the Central Valley, but the species also forages in undisturbed grasslands, fallow agricultural fields, and some row crops.

There are known occurrences of SWHA within the PSA. SWHA is an SSHCP Covered Species and modeled foraging and nesting habitat is located within and immediately adjacent to the PSA (Sacramento County 2018). A summary of the protocol-level SWHA survey results is provided below.

#### Protocol-Level Swainson's Hawk Survey Results

Dudek conducted protocol-level SWHA surveys within the PSA and visual surveys up to 0.5 miles from the solar development area on February 18 and 25, 2021 (Pass 1); March 4 and March 16, 2021 (Pass 2); April 9 and 15, 2021 (Pass 3); May 3, 2021 (Pass 4); and June 4, 2021 (Pass 5). In addition, in accordance with recommendations from CDFW, two additional SWHA breeding season surveys were conducted in 2022: June 2 and 3, 2022 (Pass 6), and July 7 and 9, 2022 (Pass 7). Surveys were conducted in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC 2000). A total of nine SWHA observations, including foraging and courting, were made during the five survey passes conducted in 2021. No



nesting observations were made. Observations were made within areas that primarily provided suitable foraging habitat, as well as some nesting habitat, including both the solar development area and the adjacent other lands within the PSA (Figure 11; Table 11).

**Table 11. Protocol-Level Swainson’s Hawk Survey Results Summary**

| Date                 | Observation Summary                   | Observation Location (decimal degrees) |               |
|----------------------|---------------------------------------|----------------------------------------|---------------|
|                      |                                       | Latitude                               | Longitude     |
| <b>Survey Pass 1</b> |                                       |                                        |               |
| 2/25/2021            | Raptor nest - unoccupied              | 38.47971791°                           | -121.1895586° |
| <b>Survey Pass 2</b> |                                       |                                        |               |
| 3/16/2021            | Foraging - juvenile                   | 38.48067111°                           | -121.1836011° |
| <b>Survey Pass 3</b> |                                       |                                        |               |
| 4/9/2021             | Visual flight                         | 38.47189084°                           | -121.1801946° |
| 4/9/2021             | Visual flight                         | 38.47821603°                           | -121.1885398° |
| 4/9/2021             | Perched                               | 38.48351407°                           | -121.1889381° |
| 4/14/2021            | Visual flight- pair                   | 38.48424802°                           | -121.1885927° |
| 4/15/2021            | Foraging                              | 38.46309840°                           | -121.1824983° |
| 4/15/2021            | Courting pair                         | 38.46538260°                           | -121.1829533° |
| <b>Survey Pass 4</b> |                                       |                                        |               |
| 5/4/2021             | No observations                       | —                                      | —             |
| <b>Survey Pass 5</b> |                                       |                                        |               |
| 6/8/2021             | No observations                       | —                                      | —             |
| <b>Survey Pass 6</b> |                                       |                                        |               |
| 6/2/2022             | Visual flight, potential nesting site | 38.483694°                             | -121.186524°  |
| <b>Survey Pass 7</b> |                                       |                                        |               |
| 7/7/2022             | Visual flight, potential nesting site | 38.483694°                             | -121.186524°  |

### Swainson’s Hawk and Other Raptor Foraging and Land Use Study Results

As noted in Section 3.2.3.8, Estep Environmental Consulting conducted two 1-year studies in 2013 and 2021 to assess raptor use of solar array fields in Sacramento County, including the Dillard Road solar array that is immediately adjacent to the Project (Estep Environmental Consulting 2013, 2021). Refer to Section 3.2.3.8 for details on the findings of the 2013 study and Appendix A for the report synthesizing findings of the 2013 and 2021 studies. The studies indicate that raptors including SWHA continued to use moderately sized solar array fields following conversion from cultivated uses. Results of the strip transect road survey indicate raptor use in general, and specifically SWHA and American kestrel use, of solar array fields exceeds expected use based on their availability within the agricultural landscape. This suggests that solar array fields are not avoided by these species and may be selected at a greater frequency than many cultivated land cover types. The stationary observation point surveys confirmed use within solar array fields, including foraging or potential foraging use by all species. The study suggested that management of a grassland substrate to promote rodent populations and maintaining this substrate at a height that promotes visibility and access to prey is favorable to continued raptor usage. Unlike most crop

types, these grassland conditions are available in solar fields throughout the spring and summer breeding season, and thus can provide a consistent and available source of prey.

#### 4.5.3.12 Tricolored Blackbird (*Agelaius tricolor*)

TRBL is a state threatened species with known occurrences within the PSA. This species typically nests in freshwater marshes with dense growths of emergent vegetation dominated by cattails or bulrushes, but has also established colonies in willows, blackberries (*Rubus* spp.), and a variety of other types of dense, herbaceous vegetation, such as thistles (*Cirsium* and *Centaurea* spp.) and nettles (*Urtica* spp.). TRBLs forage in a variety of habitats, such as grasslands and croplands, where high densities of suitable insect prey are found.

SSHCP has modeled nesting and foraging TRBL habitat located within the solar development area (Sacramento County 2018). In addition, there are several known occurrences of TRBL within 5 miles of the PSA, with the nearest approximately 0.40 miles south of Dillard Road (which runs adjacent to the PSA) at its intersection with Highway 16 (CDFW 2022; USFWS 2022).

There are known occurrences of TRBL within the PSA. A summary of the TRBL focused survey results is provided below. TRBL is an SSHCP Covered Species and modeled nesting, and foraging habitat is located within the PSA (Sacramento County 2018).

#### Tricolored Blackbird Focused Survey Results

Dudek conducted focused TRBL surveys within the PSA on February 18 and 25, 2021 (pass 1); March 16 and 17, 2021 (Pass 2); April 9 and 15, 2021 (Pass 3); and May 3, 2021 (Pass 4). Surveys were conducted in accordance with the *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields* (CDFW 2015). A total of six TRBL species observations, including foraging, were observed during the four total survey passes conducted in 2021. No nesting colonies were observed. The PSA, both within the solar development area and the adjacent other lands, provides suitable foraging habitat for TRBL. Nesting habitat is generally absent from the PSA; however, sites exist just outside the western PSA near the Cosumnes River (Table 12; Figure 11).

**Table 12. Focused Tricolored Blackbird Survey Results Summary**

| Date                 | Observation Summary                         | Observation Location (decimal degrees) |               |
|----------------------|---------------------------------------------|----------------------------------------|---------------|
|                      |                                             | Latitude                               | Longitude     |
| <b>Survey Pass 1</b> |                                             |                                        |               |
| 2/18/2021            | No observations                             | —                                      | —             |
| 2/25/2021            | No observations                             | —                                      | —             |
| <b>Survey Pass 2</b> |                                             |                                        |               |
| 3/17/2021            | Perched - mixed flock                       | 38.48186885°                           | -121.1855454° |
| 3/17/2021            | Perched - mixed flock                       | 38.48186885°                           | -121.1855454° |
| <b>Survey Pass 3</b> |                                             |                                        |               |
| 4/9/2021             | Vocalizing                                  | 38.47405814°                           | -121.1875744° |
| 4/9/2021             | Foraging, perched, vocalizing - mixed flock | 38.48160789°                           | -121.1859765° |

**Table 12. Focused Tricolored Blackbird Survey Results Summary**

| Date                 | Observation Summary           | Observation Location (decimal degrees) |               |
|----------------------|-------------------------------|----------------------------------------|---------------|
|                      |                               | Latitude                               | Longitude     |
| 4/9/2021             | Perched, vocalizing - various | 38.48044310°                           | -121.1824292° |
| 4/15/2021            | Perched, vocalizing - various | 38.47428959°                           | -121.1891113° |
| <b>Survey Pass 4</b> |                               |                                        |               |
| 5/3/2021             | No observations               | —                                      | —             |

#### 4.5.3.13 White-Tailed Kite (*Elanus leucurus*)

White-tailed kite (*Elanus leucurus*) is a state fully protected species known to occur in the PSA. White-tailed kites occur in grasslands, marshes, and lowland scrub habitats, and nest in dense foliage in taller- to medium-size trees near foraging habitat. This species may also forage in meadows, agricultural fields, other types of emergent wetlands, and disturbed lands. White-tailed kites feed principally on rodents, especially voles (CDFW 2022).

There are several known occurrences for white-tailed kite in or adjacent to the PSA (CDFW 2022). The SSHCP shows one white-tailed kite occurrence and modeled nesting habitat along the riparian habitat adjacent to the Cosumnes River at the northern edge of Assessor's Parcel No. 126-0110-001. There is also SSHCP modeled foraging habitat within the PSA (Sacramento County 2018). During the reconnaissance-level biological surveys conducted by Dudek in 2021, various observations of white-tailed kite were made in both the solar development area and adjacent other lands of the PSA. Observations specifically included foraging, hovering, perching, and flight.

#### 4.5.3.14 Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)

VELB is a federally threatened species known to occur in the PSA. VELB is completely dependent on its host plant, elderberry (*Sambucus* spp.), which occurs in riparian and other woodland communities in California's Central Valley and the associated foothills. Female beetles lay their eggs in crevices on the stems or on the leaves of living elderberry plants. When the eggs hatch, larvae bore into the stems. The larval stages last for 1 to 2 years. The fifth instar larvae create emergence holes in the stems and then plug the holes and remain in the stems through pupation. Adults emerge through the emergence holes from late March through June. The short-lived adult beetles forage on leaves and flowers of elderberry shrubs.

There are several known occurrences of this species documented in the western part of the PSA (CDFW 2022; USFWS 2007a; USFWS 2022). VELB is an SSHCP Covered Species and modeled habitat is present within the PSA (Sacramento County 2018). A summary of the VELB focused survey results is provided below.

#### Valley Elderberry Longhorn Beetle Focused Survey Results

Dudek conducted focused surveys for VELB within the PSA on February 19 and 25, 2021, and January 12, 2022; see Table 13 and Figure 9, Valley Elderberry Longhorn Beetle Results. Surveys were conducted in accordance with the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999) and specifically focused on

the assessment of known locations of elderberry shrubs to evaluate for evidence of VELB. Surveys were conducted prior to the onset of the typical known emergence period for adult VELB (i.e., March through June).

A total of 13 elderberry shrubs, all identified as *Sambucus nigra*, were assessed. Of these 13 shrubs, 4 occur within the solar development area and/or within 165 feet (i.e., typical avoidance buffer area) of the solar development area of the PSA. No VELB, egg/larval galleries, or frass were observed on any of the shrubs. Bore and/or exit holes were observed on four of the 13 shrubs, specifically on shrub ID 2, ID 6, ID 8, and ID 12. Shrub ID 2 is in fair condition and located approximately 385 feet from the Cosumnes River riparian habitat. Shrub ID 6 is in poor condition and located in an upland area approximately 1,650 feet from the riparian habitat. Shrub ID 6 is located within the adjacent other lands directly adjacent to the solar development area. Shrub IDs 8 and 12 are both in good condition and are located within 130 and 335 feet of riparian habitat, respectively. The condition of the bore holes observed reflect potential past use of boring insects and are not conclusive to VELB occupancy. No other elderberry shrub observations relevant to VELB were made during focused surveys.

**Table 13. Focused Valley Elderberry Longhorn Beetle Survey Results Summary**

| Shrub ID (Shrub-Stem) | Dead/Alive <sup>1</sup> | General Condition <sup>2</sup> | Approx. no. of Stems | Approx. no. of Stems ≥1 in. DBH | Beetle Observed <sup>3</sup> | Eggs/Larval Gallery <sup>3</sup> | Bore Holes <sup>3</sup> | Frass <sup>3</sup> | Other | Location (decimal degrees) | Habitat             | Land Use                          | PSA Location <sup>4</sup> | Approx. Distance from Riparian Habitat (Ft) | Approx. Distance from Work Limits (Ft) | Notes                                                                                                                                                              |
|-----------------------|-------------------------|--------------------------------|----------------------|---------------------------------|------------------------------|----------------------------------|-------------------------|--------------------|-------|----------------------------|---------------------|-----------------------------------|---------------------------|---------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-A                   | A                       | G                              | 30                   | 10                              | N                            | N                                | N                       | N                  | —     | 38.458791°, -121.191745°   | Riparian            | Adjacent agriculture              | AOL                       | 0, Within                                   | 1,545                                  | Two shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 1-B                   | A                       | G                              | 25                   | 7                               | N                            | N                                | N                       | N                  | —     | 38.458791°, -121.191745°   | Riparian            | Adjacent agriculture              | AOL                       | 0, Within                                   | 1,545                                  | Two shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 2-A                   | A                       | F                              | 75                   | 25                              | N                            | N                                | N                       | N                  | —     | 38.484704°, -121.189644°   | Converted grassland | Agricultural                      | AOL                       | 275                                         | 850                                    | Three shrubs present at this location.                                                                                                                             |
| 2-B                   | A                       | F                              | 150                  | 45                              | N                            | N                                | N                       | N                  | —     | 38.484704°, -121.189645°   | Converted grassland | Agricultural                      | AOL                       | 275                                         | 850                                    | Three shrubs present at this location.                                                                                                                             |
| 2-C                   | A                       | F                              | 300                  | 95                              | N                            | N                                | Y                       | N                  | —     | 38.484704°, -121.189646°   | Converted grassland | Agricultural                      | AOL                       | 275                                         | 850                                    | Three shrubs present at this location. Bore holes only present on old bark (not new growth), in areas where outer bark has begun to sluff of exposing the cambium. |
| 3-A                   | A                       | G                              | 20                   | 3                               | N                            | N                                | N                       | N                  | —     | 38.485637°, -121.192488°   | Riparian            | Adjacent agriculture              | AOL                       | 0, Within                                   | 1,640                                  | Six shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 3-B                   | A                       | G                              | 25                   | 5                               | N                            | N                                | N                       | N                  | —     | 38.485637°, -121.192488°   | Riparian            | Adjacent agriculture              | AOL                       | 0, Within                                   | 1,640                                  | Six shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 3-C                   | A                       | G                              | 25                   | 5                               | N                            | N                                | N                       | N                  | —     | 38.485637°, -121.192488°   | Riparian            | Adjacent agriculture              | AOL                       | 0, Within                                   | 1,640                                  | Six shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 3-D                   | A                       | G                              | 30                   | 5                               | N                            | N                                | N                       | N                  | —     | 38.485637°, -121.192488°   | Riparian            | Adjacent agriculture              | AOL                       | 0                                           | 1,640                                  | Six shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 3-E                   | A                       | G                              | 45                   | 7                               | N                            | N                                | N                       | N                  | —     | 38.485637°, -121.192488°   | Riparian            | Adjacent agriculture              | AOL                       | 0                                           | 1,640                                  | Six shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 3-F                   | A                       | G                              | 55                   | 10                              | N                            | N                                | N                       | N                  | —     | 38.485637°, -121.192488°   | Riparian            | Adjacent agriculture              | AOL                       | 0                                           | 1,640                                  | Six shrubs present at this location on Cosumnes River levee slope.                                                                                                 |
| 4-A                   | A                       | P                              | 15                   | 4                               | N                            | N                                | N                       | N                  | —     | 38.470930°, -121.185041°   | Converted grassland | Agricultural                      | SDA                       | 4,200                                       | 0                                      | Two shrubs present at this location. Isolated pasture near fence line.                                                                                             |
| 4-B                   | A                       | F                              | 35                   | 6                               | N                            | N                                | N                       | N                  | —     | 38.470930°, -121.185041°   | Converted grassland | Agricultural                      | SDA                       | 4,200                                       | 0                                      | Two shrubs present at this location. Isolated pasture near fence line.                                                                                             |
| 5                     | A                       | F                              | 8                    | 3                               | N                            | N                                | N                       | N                  | —     | 38.479077°, -121.190647°   | Converted grassland | Agricultural, Irrigation Drainage | AOL                       | 1,550                                       | 590                                    | On irrigation drainage at fence line.                                                                                                                              |
| 6                     | A                       | P                              | 400                  | 85                              | N                            | N                                | Y                       | N                  | —     | 38.480429°, -121.188664°   | Converted grassland | Agricultural                      | AOL                       | 1,650                                       | 0                                      | Highly degraded due to cattle use. Dead valley oak tree                                                                                                            |

**Table 13. Focused Valley Elderberry Longhorn Beetle Survey Results Summary**

| Shrub ID (Shrub-Stem) | Dead/Alive <sup>1</sup> | General Condition <sup>2</sup> | Approx. no. of Stems | Approx. no. of Stems ≥1 in. DBH | Beetle Observed <sup>3</sup> | Eggs/Larval Gallery <sup>3</sup> | Bore Holes <sup>3</sup> | Frass <sup>3</sup> | Other | Location (decimal degrees) | Habitat               | Land Use             | PSA Location <sup>4</sup> | Approx. Distance from Riparian Habitat (Ft) | Approx. Distance from Work Limits (Ft) | Notes                                                                                                                                                                                                                                          |
|-----------------------|-------------------------|--------------------------------|----------------------|---------------------------------|------------------------------|----------------------------------|-------------------------|--------------------|-------|----------------------------|-----------------------|----------------------|---------------------------|---------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                         |                                |                      |                                 |                              |                                  |                         |                    |       |                            |                       |                      |                           |                                             |                                        | growing within and through shrub. Bore holes not observed on new growth. Majority of new growth is less than 1 inch DBH. Only stems at base where dead valley oak tree is present are greater than 1 inch DBH. Cambium and heartwood exposure. |
| 7                     | A                       | G                              | 70                   | 15                              | N                            | N                                | N                       | N                  | —     | 38.480377°, -121.195489°   | Converted grassland   | Adjacent agriculture | AOL                       | 145                                         | 1,970                                  | On adjacent Cosumnes River Levee.                                                                                                                                                                                                              |
| 8                     | A                       | G                              | 45                   | 30                              | N                            | N                                | Y                       | N                  | —     | 38.484131°, -121.188719°   | Converted agriculture | Adjacent agriculture | AOL                       | 130                                         | 535                                    | Elderberry shrub was obstructed by blackberry shrubs; located adjacent to barn.                                                                                                                                                                |
| 9                     | A                       | G                              | 45                   | 12                              | N                            | N                                | N                       | N                  | —     | 38.483398°, -121.189090°   | Converted agriculture | Adjacent agriculture | AOL                       | 200                                         | 535                                    | Located adjacent to barn.                                                                                                                                                                                                                      |
| 10                    | A                       | G                              | 80                   | 20                              | N                            | N                                | N                       | N                  | —     | 38.484051°, -121.88989°    | Converted agriculture | Adjacent agriculture | AOL                       | 185                                         | 535                                    | Located adjacent to barn.                                                                                                                                                                                                                      |
| 11                    | A                       | G                              | 70                   | 30                              | N                            | N                                | N                       | N                  | —     | 38.483701°, -121.18893°    | Converted agriculture | Adjacent agriculture | AOL                       | 150                                         | 535                                    | Elderberry shrub was obstructed by blackberry shrubs; located adjacent to barn.                                                                                                                                                                |
| 12                    | A                       | G                              | 90                   | 50                              | N                            | N                                | Y                       | N                  | —     | 38.483701°, -121.189249°   | Converted agriculture | Adjacent agriculture | AOL                       | 335                                         | 485                                    | Located adjacent to barn.                                                                                                                                                                                                                      |
| 13                    | A                       | G                              | 30                   | 5                               | N                            | N                                | N                       | N                  | —     | 38.470444°, -121.184741°   | Converted grassland   | Adjacent agriculture | SDA                       | 4,300                                       | 0                                      | Base of elderberry shrub was wrapped in barbed wire; located adjacent to barn.                                                                                                                                                                 |

**Notes:**

<sup>1</sup> A = Alive; D = Dead

<sup>2</sup> G = Good; F = Fair; P = Poor

<sup>3</sup> N = No, Y = Yes

<sup>4</sup> Project Study Area (PSA) Locations: AOL = Adjacent Other Lands; SDA = Solar Development Area.

#### 4.5.3.15 Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

Vernal pool fairy shrimp is a federally threatened species with a low potential to occur in the PSA. This species is known to occupy vernal pools or other areas of similar hydrology that pool continuously for enough time to support its average reproductive period of 43 days (Helm 1998). Vernal pool fairy shrimp does not occupy perennial waters or creeks. They are most frequently found in small vernal pools (less than 0.05 acres), especially pool and swale complexes where they can move between individual pools (USFWS 2005).

Vernal pool fairy shrimp is known to occur in the vicinity of the PSA, but this species was not observed during protocol-level dry and wet season surveys. Suitable habitat and SSHCP modeled habitat are present in the PSA, which include vernal pools (Sacramento County 2018). There are various DCH units for vernal pool fairy shrimp within 5 miles of the PSA, with the nearest 1.3 miles southeast of the PSA (USFWS 2022). In addition, there are several known occurrences for this species within 5 miles of the PSA, with the nearest being located within 0.25 miles of the PSA on the south side of Meiss Road, approximately 0.75 miles southeast of the intersection at Dillard Road (CDFW 2022).

A summary of the protocol-level large listed branchiopod dry and wet season survey results is provided below in Section 4.5.3.15-4.5.3.16.

#### 4.5.3.16 Vernal Pool Tadpole Shrimp (*Lepidurus packardii*)

Vernal pool tadpole shrimp is a federally endangered and SSHCP Covered Species known to occur in the PSA. This species occupies vernal pools and seasonally ponded areas within vernal swales. Aquatic habitat for vernal pool tadpole shrimp is typically mud or grass-bottomed with clear to tea-colored or highly turbid water. These species are typically found in depressional pools within grassland habitat (Sacramento County 2018).

Vernal pool tadpole shrimp has been documented in the PSA (Sacramento County 2018) but was not observed during protocol-level dry and wet season surveys of the PSA during 2020–2021. Suitable habitat and SSHCP modeled habitat are present within the solar development area, including vernal pools (CDFW 2022; Sacramento County 2018). In addition, there are various DCH units for vernal pool tadpole shrimp within 5 miles of the PSA, with the nearest 1.3 miles southeast of the PSA (USFWS 2022).

A summary of the protocol-level large listed branchiopod dry and wet season survey results is provided below.

#### Protocol-Level Large Listed Branchiopod Dry Season Survey Results

Dry season branchiopod surveys were conducted in October and November 2020; see Table 14. Soil samples were submitted to Dr. Brent Helm at Helm Biological Consulting to process the dry soil samples for the presence of cysts from fairy shrimp and tadpole shrimp. Dry season surveys were negative for federally listed large branchiopods (Figure 10, Dry and Wet Season Large Listed Branchiopod Results). However, six features contained cysts belonging to the non-listed California fairy shrimp (*Lindleriella occidentalis*) (SLLC 2021a).

**Table 14. Summary of Dry Season Survey Dates, Site Conditions, and Biologists Present**

| Date of Survey    | Site Conditions                              | Permitted Biologist                     | Assisting Biologists                                         |
|-------------------|----------------------------------------------|-----------------------------------------|--------------------------------------------------------------|
| October 13, 2020  | 66°F–90°F; 0%–10% cloud cover; 0–6 mph wind  | Heather Moine <sup>1</sup>              | Allie Sennett                                                |
| October 14, 2020  | 62°F–91°F; 0% cloud cover; 1–7 mph wind      | Heather Moine                           | Allie Sennett                                                |
| October 15, 2020  | 57°F–90°F; 0% cloud cover; 0–5 mph wind      | Heather Moine                           | Emily Scricca                                                |
| October 19, 2020  | 55°F–89°F; 0% cloud cover; 0–4 mph wind      | Heather Moine                           | Laura Burris                                                 |
| October 20, 2020  | 54°F–88°F; 0% cloud cover; 0–4 mph wind      | Heather Moine, Paul Lemons <sup>2</sup> | Laura Burris, Anna Godinho, Emily Scricca, and Allie Sennett |
| October 21, 2020  | 54°F–88°F; 0% cloud cover; 0–4 mph wind      | Heather Moine, Paul Lemons              | Laura Burris, Anna Godinho, Emily Scricca, and Allie Sennett |
| October 22, 2020  | 56°F–78°F; 0% cloud cover; 0–6 mph wind      | Heather Moine                           | Anna Godinho, Allie Sennett                                  |
| October 23, 2020  | 45°F–59°F; 0% cloud cover; 0–3 mph wind      | Heather Moine                           | Anna Godinho                                                 |
| November 11, 2020 | 42°F–58°F; 80%–90% cloud cover; 0–4 mph wind | Heather Moine                           | Anna Godinho, Allie Sennett                                  |

**Notes:**<sup>1</sup> Heather Moine (TE-60147A-1).<sup>2</sup> Paul Lemons (TE-051248-6).**Protocol-Level Large Listed Branchiopod Wet Season Survey Results**

Wet season branchiopod surveys were conducted February through April 2021, with surveys occurring every 14 days; see Table 15. Wet season surveys were negative for federally listed large branchiopods (Figure 10) (SSLLC 2021b).

**Table 15. Summary of Wet Season Survey Dates, Site Conditions, and Biologists Present**

| Date of Survey    | Site Conditions                               | Permitted Biologist        | Assisting Biologists          |
|-------------------|-----------------------------------------------|----------------------------|-------------------------------|
| February 3, 2021  | 48°F–50°F; 10%–100% cloud cover; 0–3 mph wind | Heather Moine <sup>1</sup> | Laura Burris, Morgan Kennedy  |
| February 4, 2021  | 40°F–55°F; 10%–50% cloud cover; 0–3 mph wind  | Heather Moine              | Laura Burris, Morgan Kennedy  |
| February 5, 2021  | 54°F–63°F; 0%–10% cloud cover; 0 mph wind     | Heather Moine              | Laura Burris, Morgan Kennedy  |
| February 17, 2021 | 41°F–60°F; 0%–10% cloud cover; 1–15 mph wind  | Heather Moine              | Paul Keating, Adam Crawford   |
| February 18, 2021 | 39°F–61°F; 30%–90% cloud cover; 0–5 mph wind  | Heather Moine              | Morgan Kennedy, Adam Crawford |



**Table 15. Summary of Wet Season Survey Dates, Site Conditions, and Biologists Present**

| Date of Survey    | Site Conditions                             | Permitted Biologist | Assisting Biologists          |
|-------------------|---------------------------------------------|---------------------|-------------------------------|
| February 18, 2021 | 50°F–54°F; 100% cloud cover; 0–3 mph wind   | Heather Moine       | Morgan Kennedy, Paul Keating  |
| March 3, 2021     | 46°F–60°F; 100% cloud cover; 0–4 mph wind   | Heather Moine       | Anna Godinho, Paul Keating    |
| March 4, 2021     | 49°F–67°F; 0% cloud cover; 0–4 mph wind     | Heather Moine       | Anna Godinho, Paul Keating    |
| March 17, 2021    | 41°F–58°F; 90% cloud cover; 0–4 mph wind    | Heather Moine       | Adam Crawford, Naomi Serratos |
| March 18, 2021    | 47°F–59°F; 100% cloud cover; 0–3 mph wind   | Heather Moine       | Adam Crawford, Naomi Serratos |
| March 31, 2021    | 61°F–81°F; 0% cloud cover; 0–2 mph wind     | Heather Moine       | Adam Crawford                 |
| April 1, 2021     | 48°F–80°F; 0%–10% cloud cover; 0–3 mph wind | Heather Moine       | None                          |
| April 14, 2021    | 58°F–71°F; 0%–10% cloud cover; 0–4 mph wind | Heather Moine       | Adam Crawford                 |
| April 15, 2021    | 63°F–73°F; 0% cloud cover; 0–5 mph wind     | Heather Moine       | Adam Crawford, Allie Sennett  |
| April 28, 2021    | 52°F–83°F; 0% cloud cover; 0–4 mph wind     | Heather Moine       | Allie Sennett, Sarah Foster   |

**Note:**

<sup>1</sup> Heather Moine (TE-60147A-1).

#### 4.5.3.17 American Badger (*Taxidea taxus*)

American badger (*Taxidea taxus*) is a state SSC and SSHCP Covered Species with a high potential to occur on the solar development area. This species is most abundant in drier open stages of most shrub and forest habitat, as well as open herbaceous habitats, including grasslands, meadows, and savannahs. Suitable habitat for American badger typically contains loose soils for denning and hunting, ample prey, and uncultivated land. American badgers are elusive, nocturnal mammals with expansive home ranges (CDFW 2022).

Although American badger has not been documented in the PSA, a collapsed burrow with badger sign (i.e., claw marks along both sides of entrance) was documented in the northern portion of the PSA. In addition, this species is known to occur in the vicinity and suitable habitat, as well as SSHCP modeled habitat, is present (Sacramento County 2018). There are known occurrences for American badger within 5 miles of the PSA, with one located 0.40 miles east of Sunrise Boulevard in southeast Rancho Cordova (CDFW 2022; USFWS 2022).

### 4.5.3.18 Other Special-Status Wildlife

#### Insects

In addition to the insects detailed above, the aquatic resource features within the PSA provide marginal suitable habitat for aquatic insects including hairy water flea (*Dumontia oregonensis*) and Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*). Hairy water flea, a special-status insect species within a low potential to occur in the PSA, and Ricksecker's water scavenger beetle, a special-status and SSHCP Covered Species with a moderate potential to occur in the PSA, are exclusively associated with vernal pools and seasonal wetlands that contain water in winter and early spring and are dry in summer. These species do not discriminate between small or large vernal pools, vernal swales, or constructed vernal pools, but appears to favor aquatic habitat that is neutral to slightly alkaline, clear, and low in dissolved salts. In addition, they prefer habitat dominated by hydrophytic plants (Sacramento County 2018). Hairy water flea and Ricksecker's water scavenger beetle and their potential to occur in the PSA can also be referenced in Appendix D

#### Invertebrates

In addition to the invertebrate detailed above, the aquatic resource features in the PSA provide low quality to suitable habitat for invertebrate species including California Linderiella (*Linderiella occidentalis*) and mid-valley Fairy Shrimp (*Branchinecta mesoamericana*). California linderiella is special-status species with known occurrences within the PSA, and Mid-valley fairy shrimp is a special-status and SSHCP Covered species within a high potential to occur within the PSA. These species are known to occupy primarily in vernal pools and seasonally ponded areas within vernal swales. Aquatic habitat is typically mud or grass-bottomed with clear or tea-colored water (Sacramento County 2018). California linderiella and mid-valley fairy shrimp and their potential to occur in the PSA can also be referenced in Appendix D

#### Native Bats

Trees and structures in or adjacent to the PSA provide roosting habitat for native bats protected by the CFGC. Specifically, trees with exfoliating bark, crevices, and/or sufficient foliage and barns (or similar structures) in the PSA provide potential bat roosting habitat. Roosting habitat in the PSA is limited to trees along the Cosumnes River and isolated trees near seasonal ponds or other aquatic habitat that provide nearby foraging opportunities. No active bat roosts or signs of occupation, such as guano or staining, were detected during the reconnaissance-level field surveys.

#### Nesting Raptors and Migratory Birds

In addition to the special-status birds discussed above, the PSA provides nesting habitat for several other special-status local nesting and migratory bird species including black Tern (*Chelidonias niger*), great blue heron (*Ardea Herodias*), great egret (*Ardea alba*), Lawrence's Goldfinch (*Spinus lawrencei*), long-eared owl (*Asio otus*), Nuttall's Woodpecker (*Picoides nuttallii*), and yellow-billed magpie (*Pica nuttallii*). Native birds of prey are protected by CFGC Section 3503.5 and migratory bird species are protected by the federal MBTA. Although no active nests were detected during the field surveys, many common migratory birds and raptors were recorded (Appendix B). The nesting raptor and migratory bird species and their potential to occur in the PSA can also be referenced in Appendix D.

INTENTIONALLY LEFT BLANK

---

# 5 Summary of Solar Development Area Resources

In the summary of findings section below, the results provided in Section 4 have been further summarized to be explicit to the solar development area of the PSA (i.e., excluding the other adjacent lands within the PSA).

Representative photographs of resource findings can be referenced in Appendix E, Photo Record.

## 5.1 Soil and Terrain

A total of 11 soil units were mapped in the solar development area, of which seven are listed as partially hydric soils. Hydric soils are defined by the National Technical Committee for Hydric Soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA 2021). Soils encountered during the field surveys were generally classified as clay to clay loam soils (Table 2; Figure 3).

## 5.2 Hydrology and Aquatic Resources

The solar development area occurs within the Upper Cosumnes River watershed. The western half of the solar development area is located within the Federal Emergency Management Agency National Flood Hazard Layer 1% 100-year floodplain of the Cosumnes River (FEMA 2021).

During the ARD conducted for the Project, eight aquatic resource types were documented within the solar development area including ditch, ephemeral drainage, intermittent drainage, seasonal wetland, seasonal wetland swale, pond, upland swale, and vernal pool (Figure 4 and Figure 5) (SLLC 2022).

Aquatic resources delineated within the solar development area have the potential to be waters of the U.S. and/or waters of the state based on an analysis of the three parameters (i.e., soils, hydrology, and vegetation) and if they have a significant nexus to known waters of the U.S. and waters of the state and/or exhibit relative permanence. A preliminary jurisdictional assessment of aquatic resources known to occur in the solar development area was completed to evaluate total acreages and linear feet of resources for each known regulatory authority that may require compliance (i.e., permitting). The preliminary jurisdictional assessment identifies all 5.85 acres (9,260.86 linear feet) of aquatic resources within the solar development area of the PSA as Waters of the U.S. and waters of the state, meeting the criteria of waters of the United States pursuant to regulations in Section 404 of the CWA and waters of the state pursuant to Sections 1600 through 1603 of the California FGC, and the RWQCB, pursuant to CWA Section 401 and the Porter-Cologne Act (Table 16, Preliminary Summary of Jurisdictional Waters of the U.S. and Waters of the State within the Project Solar Development Area) (SLLC 2022).

**Table 16. Preliminary Summary of Jurisdictional Waters of the U.S. and Waters of the State with the Project Solar Development Area<sup>1</sup>**

| Feature Type                      | Total Acreage | Total Linear Feet |
|-----------------------------------|---------------|-------------------|
| <b>Wetlands</b>                   |               |                   |
| Pond                              | 0.37          | —                 |
| Seasonal Wetland                  | 3.10          | —                 |
| Vernal Pool                       | 0.25          | —                 |
| <i>Total Wetlands</i>             | 3.72          | —                 |
| <b>Non-Wetlands Waters (NWWs)</b> |               |                   |
| Ditch                             | 0.15          | 720.26            |
| Ephemeral Drainage                | 0.74          | 2,439.08          |
| Intermittent Drainage             | 0.46          | 1,303.60          |
| Seasonal Wetland Swale            | 0.70          | 3,874.33          |
| Upland Swale                      | 0.08          | 923.59            |
| <i>Total NWWs</i>                 | 2.13          | 9,260.86          |
| <b>Total</b>                      | <b>5.85</b>   | <b>9,260.86</b>   |

Source: SSSLC 2022.

## 5.3 Vegetation Communities and Land Cover Types

Vegetation communities and land cover types were documented within the solar development area and mapped using the vegetation community and land cover data in the FRAP dataset (Table 5; Figure 6) (FRAP 2019). Vegetation and land cover within the solar development area includes California annual grassland (357.61 acres), low density development (6.84 acres), and urban (1.96 acres).

## 5.4 Sensitive Natural Communities

No CDFW sensitive natural communities were identified within the solar development area (Figure 7).

Vernal pool habitat is present within the solar development area (Figure 5).

## 5.5 Designated Critical Habitat/Essential Fish Habitat

No USFWS DCH or National Oceanic and Atmospheric Administration EFH was identified within the solar development area (Figure 7) (USFWS 2022).

## 5.6 Special-Status Plant Species

A total of 19 special-status plant species that have known occurrences either within the nine USGS 7.5-Minute Quads and/or within 5 miles of the PSA were identified (CDFW 2022; CNPS 2022). Of these 16, 12 species have a low to moderate potential to occur in the PSA, and of these, nine are Covered Species under the SSHCP. The

remaining seven special-status plant species were removed from further consideration due to lack of suitable habitat within the solar development area, no known occurrences within 5 miles of the PSA, and/or because the PSA is outside of the species' known geographic or elevation range. No special-status plant species were observed during protocol-level botanical field surveys. Species with the potential to occur within the solar development area of the PSA are summarized below.

### Moderate potential for occurrence within the PSA

- Boggs Lake hedge-hyssop—No federal status, moderately threatened in California, SSHCP Covered Species
- Dwarf downingia—No federal status, moderately threatened in California, more common elsewhere, SSHCP Covered Species
- Legenere—No federal status, seriously threatened in California, more common elsewhere, SSHCP Covered Species
- Pincushion navarretia—No federal status, seriously threatened in California, more common elsewhere
- Sacramento Orcutt grass—Federally endangered, state endangered, seriously threatened in California, SSHCP Covered Species
- Slender Orcutt grass—Federally endangered, state endangered, seriously threatened in California, SSHCP Covered Species
- Valley brodiaea—No federal status, moderately threatened in California, not covered under SSHCP
- Hoary navarretia—No federal status, not very threatened in California, SSHCP Covered Species

### Low Potential for Occurrence within the PSA

- Ahart's dwarf rush—No federal status, moderately threatened in California, SSHCP Covered Species
- Hogwallow starfish—No federal status, limited distribution in California, not covered under SSHCP
- Sanford's arrowhead—No federal status, moderately threatened in California, SSHCP Covered Species
- Tuolumne button-celery—No federal status, moderately threatened in California, not covered under SSHCP

## 5.6.1 Protocol-Level Botanical Survey Summary

Dudek conducted protocol-level botanical surveys in May 2021 within the solar development area. No special-status plant species were observed in the solar development area during the protocol-level surveys conducted.

## 5.6.2 Arborist Survey and Tree Inventory

International Society of Arboriculture Certified arborists with California Tree and Landscaping Consulting Inc. conducted an arborist survey and tree inventory of trees that could potentially be protected by the Sacramento County Tree Preservation Ordinance. Twenty-two trees were inventoried and 19 could be directly impacted by Project activities, as they reside within the solar development area. Since none of the 19 trees are protected, no trees need a permit for removal within the solar development area. The remaining three trees are not expected to be impacted by Project activities.

## 5.7 Special-Status Wildlife Species

A total of 37 special-status wildlife species have known occurrences either within the nine USGS 7.5-Minute Quads or within 5 miles of the PSA. Of these 37 special-status wildlife species, 28 have a low to high potential to occur in the solar development area and/or are known to occur in the solar development area, and of these, 14 are Covered Species under the SSHCP (Sacramento County 2018). In addition, the solar development area provides suitable habitat for nesting birds protected by the federal MBTA and CFGC and native bats protected by the CFGC. The remaining three special-status wildlife species were removed from further consideration due to lack of suitable habitat within or adjacent to the PSA, no known occurrences within 5 miles of the PSA, and/or because the PSA is outside of the species' known geographic range. Special-status wildlife species including bald eagle, BUOW, SWHA, TRBL, white-tailed kite, great egret, great blue heron, yellow-billed magpie, and California linderiella were observed during field studies. Species with the potential to occur within the solar development area of the PSA are summarized below.

### Known to Occur within the PSA

- Bald eagle—Federal BCC, state endangered, not covered under the SSHCP
- BUOW—Federal BCC, no state status, not covered under the SSHCP
- California linderiella—No federal status, state SSC, not covered under the SSHCP
- Central Valley steelhead—Federally threatened, no state status, not covered under the SSHCP
- Great blue heron—Federal and state special-status species, not covered under the SSHCP
- Great egret—federal and state special-status species, not covered under the SSHCP
- SWHA—Federal BCC, state threatened, SSHCP Covered Species
- TRBL—Federal BCC, state threatened and SSC, SSHCP Covered Species
- VELB—Federally threatened, no state status, SSHCP Covered Species
- Vernal pool tadpole shrimp—Federally endangered, no state status, SSHCP Covered Species

- White-tailed kite—No federal status, state fully protected, SSHCP Covered Species
- Yellow-billed magpie—Federal BCC, no state status, not covered under the SSHCP

#### High Potential for Occurrence within the PSA

- American badger—No federal status, state SSC, not covered under the SSHCP
- Mid-valley fairy shrimp—No federal status, no state status, SSHCP Covered Species

#### Moderate Potential for Occurrence within the PSA

- Bank swallow—No federal status, state threatened, not covered under the SSHCP
- Long-eared owl—federal and state special-status species, not covered under the SSHCP
- Northwestern pond turtle—No federal status, State SSC, SSHCP Covered Species
- Ricksecker’s water scavenger beetle—No federal status, no state status, SSHCP Cover Species
- WST—No federal status, state SSC, SSHCP Covered Species

#### Low Potential for Occurrence within the PSA

- Black tern—Federal BCC, state SSC, not covered under the SSHCP
- CTS—Federally threatened, state threatened and on state watchlist, SSHCP Covered Species
- Common yellowthroat—Federal BCC, state SSC, not covered under the SSHCP
- Golden eagle—Federally protected and BCC, state watchlist, not covered under the SSHCP
- Giant garter snake—Federally threatened, state threatened, SSHCP Covered Species
- Hairy water flea—Federal and state special-status species, not covered under the SSHCP
- Lawrence’s goldfinch—Federal BCC, no state status, not covered under the SSHCP
- Nuttall’s woodpecker—Federal BCC, no state status, not covered under the SSHCP
- Vernal pool fairy shrimp—Federally threatened, no state status, SSHCP Covered Species



## 5.7.1 Protocol-Level and Focused Wildlife Survey Summary

### 5.7.1.1 California Tiger Salamander

During the database and literature evaluation, the nearest CTS occurrences was determined to be approximately 5 miles from the solar development area, beyond the dispersal distance known for the species. Evaluation of potential aquatic habitat within the vicinity of the solar development area identified some features that could potentially provide aquatic habitat for the species, but they were generally toward the edges of the dispersal distance or blocked by partial or complete barriers to movement. During the aquatic larval surveys, no CTS or their larvae were observed within the solar development area, and a low number of burrows suitable for CTS were identified within the upland areas of the solar development area.

### 5.7.1.2 Western Spadefoot Toad

There is suitable habitat for WST within the solar development area. During database and literature evaluation, WST were identified within 5 miles of the PSA. During CTS aquatic larval surveys and wet season large listed branchiopod surveys, WST were not identified within the solar development area.

### 5.7.1.3 Burrowing Owl

There is suitable habitat for BUOW in the solar development area, as well as recorded known occurrences. Protocol-level BUOW surveys were conducted from February through May 2021, and June through July 2022, within the solar development area. These surveys identified two visual detections of BUOW individuals, and several potential burrow locations based on presence of sign such as pellets, whitewash, etc.

### 5.7.1.4 Swainson's Hawk

There is suitable habitat for foraging for SWHA within the solar development area. There are known occurrences of SWHA within the PSA. conducted protocol-level SWHA surveys within the PSA, and visual surveys up to 0.5 miles outside of the solar development area, from February through June 2021, and June through July 2022. These surveys identified multiple SWHA individuals foraging, perching, and displaying courtship behavior within and/or adjacent to the solar development area.

### 5.7.1.5 Tricolored Blackbird

There is suitable habitat for foraging for TRBL within the solar development area. Nesting habitat is generally absent from the solar development area; however, potential nesting habitat is present just outside the solar development area within the western PSA near the Cosumnes River. There are several known occurrences of TRBL within 5 miles of the PSA and record known occurrences within the PSA in the adjacent other lands. Dudek conducted focused TRBL surveys within the PSA from February through May 2021. A total of six TRBL species observations, including foraging, were observed during the four survey passes conducted in 2021. No nesting colonies were observed.

### 5.7.1.6 Valley Elderberry Longhorn Beetle

Habitat suitable for VELB has been identified within 165 feet of the solar development area, specifically within upland areas. The black elderberries within the 165 feet of the solar development area were surveyed in February 2021 for signs of VELB. One surveyed location of elderberry shrubs identified relict bore holes present on older branches, but none present on new growth.

### 5.7.1.7 Large-Listed Branchiopods

During the database and literature evaluation, vernal pool fairy shrimp were identified within 5 miles of the solar development area and vernal pool tadpole shrimp were identified as having known recorded occurrences within the solar development area (Sacramento County 2018). Vernal pool fairy shrimp and vernal pool tadpole shrimp were not observed in the Project during protocol-level dry season and wet season surveys, and there are no recorded occurrences of these species on the site in agency databases. Suitable habitat is present in the solar development area for both branchiopod species.

---

# 6 Resources Impact Assessment of the Solar Development Area

This section addresses impacts to biological and aquatic resources that have the potential to be affected by the implementation of the Project and provides preliminary analysis of impacts, as well as recommendations to avoid and minimize potential impacts. For this final BTR, this assessment explicitly addresses only the impacts to resources occurring within the solar development area (371.72 acres) of the PSA (i.e., not the adjacent other lands).

## 6.1 Definition of Impact Types

### 6.1.1 Direct Permanent Impacts

Direct permanent impacts refer to the permanent physical loss of a biological and aquatic resource typically due to clearing and grading associated with implementation of a project. Direct permanent impacts are analyzed in four ways: (1) permanent loss of vegetation communities and natural land cover types (excluding anthropogenic/disturbed land covers), as well as general wildlife and their habitat; (2) permanent loss of or harm to individuals of special-status plant and wildlife species; (3) permanent loss of suitable and/or occupied habitat for special-status species; and/or (4) permanent loss of wildlife movement and habitat connectivity in the Project vicinity.

### 6.1.2 Temporary Impacts

Temporary impacts refer to a temporary loss of biological and aquatic resources typically due to clearing and grading associated with implementation of the Project. Temporary impacts generally occur for a brief period (e.g., up to approximately 1 year) and would normally be reversible (e.g., temporary removal of vegetation after which no permanent impacts would occur).

### 6.1.3 Indirect impacts

Indirect impacts are reasonably foreseeable effects of Project implementation on remaining or adjacent biological and aquatic resources outside the direct disturbance zone that may occur during typical grading or maintenance activities (i.e., short-term construction-related indirect impacts) or later in time as a result of the Project (i.e., long-term, or operational, indirect impacts). Short-term indirect impacts can include dust, human activity, pollutants (e.g., potential erosion), and noise that extend beyond the identified construction area. Long-term indirect impacts can include changes to hydrology, introduction of invasive species, dust, and noise that are operations related or persist after construction is complete.

### 6.1.4 Design to Avoid Resource Impacts

The Project has the potential to influence both biological and aquatic resources. The Project assessed a PSA of 732.26 acres to allow for flexibility in the solar development design to avoid biological and aquatic resources to the

maximum extent possible. As such, the Project is designed in such a manner that impacts to resources will be avoided and reduced to the extent feasible.

### 6.1.5 Avoidance, Minimization, and Mitigation

The significance criteria used to evaluate impacts to biological and aquatic resources is based on CEQA Guidelines, as well as federal, state, and local regulatory guidance pertaining to potential jurisdictional resources and features occurring only within the solar development area of the PSA. Suggested AMMs and MMs include those measures that would avoid, minimize, or otherwise mitigate potential impacts to biological and aquatic resources. Based on the results in this final BTR, preliminary AMMs and MMs have been provided where applicable in the resource impact assessment sections below.

## 6.2 Preliminary Analysis of Impacts

A preliminary analysis of impacts to biological (and aquatic) resources, consistent with the Sacramento County thresholds of significance and those included in CEQA Appendix G (14 CCR 15000 et seq.), has been provided below (Table 17).

**Table 17. Preliminary Resource Impact Analysis Checklist for the Solar Development Area within the Solar Development Area**

|                                                                                                                                                                                                                                                                                                                  | Potentially Significant Impact | Less Than Significant Impact with Mitigation Incorporated | Less Than Significant Impact | No Impact                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------|------------------------------|--------------------------|
| <b>BIOLOGICAL RESOURCES – Would the Project:</b>                                                                                                                                                                                                                                                                 |                                |                                                           |                              |                          |
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | <input type="checkbox"/>       | <input checked="" type="checkbox"/>                       | <input type="checkbox"/>     | <input type="checkbox"/> |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?                                                              | <input type="checkbox"/>       | <input checked="" type="checkbox"/>                       | <input type="checkbox"/>     | <input type="checkbox"/> |
| c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?                                                                                     | <input type="checkbox"/>       | <input checked="" type="checkbox"/>                       | <input type="checkbox"/>     | <input type="checkbox"/> |

**Table 17. Preliminary Resource Impact Analysis Checklist for the Solar Development Area within the Solar Development Area**

|                                                                                                                                                                                                                                    | Potentially Significant Impact | Less Than Significant Impact with Mitigation Incorporated | Less Than Significant Impact        | No Impact                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------|-------------------------------------|-------------------------------------|
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | <input type="checkbox"/>       | <input type="checkbox"/>                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?                                                                                                | <input type="checkbox"/>       | <input type="checkbox"/>                                  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?                                               | <input type="checkbox"/>       | <input type="checkbox"/>                                  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Source: 14 CCR 15000 et seq.

a) ***The Project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW and or USFWS.***

A total of 12 special-status plant species and 28 special-status wildlife species are known to occur in the PSA or have a low, moderate, or high potential to occur in the PSA and could therefore be impacted by eventual Project implementation. Species-specific impacts and recommended avoidance measures for species with known occurrences or a high to moderate potential to occur as well as federal and state status are included below.

a.1 Special-Status Plant Species

There are eight special-status plant species have a moderate potential to occur within the PSA, including Boggs Lake hedge-hyssop, dwarf downingia, hoary navarretia, legenera, pincushion navarretia, Sacramento Orcutt grass, slender Orcutt grass, and valley brodiaea. Suitable habitat for these species includes valley grasslands and several types of aquatic resources (e.g., vernal pools, pond and lake margins, mesic areas), like those identified within the solar development area.

Of these eight special-status species with a moderate potential to occur in the PSA, only Sacramento Orcutt grass and slender Orcutt are federally, and state listed. Of the remaining six special-status plant species with a moderate potential to occur, only four are state listed and/or have a CNPS CRPR rank of 1 or 2, including Boggs Lake hedge hyssop, Dwarf downingia, legenera, and pincushion navarretia. Special-status

plant resources may be subject to agency jurisdiction pursuant to regulations under FESA, CESA, CFGC, CEQA Guidelines, and the Sacramento County General Plan.

To assist the Project design in understanding areas to avoid, specifically in regard to botanical resources, Dudek conducted reference population checks for special-status plant species on April 22, 2021, and conducted protocol-level botanical field surveys within the PSA, including the solar development area, during the appropriate floristic period, on May 4, 2021, in accordance with the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000), the *Protocol for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018), and the *Botanical Survey Guidelines* (CNPS 2001). Due to the early dry season in the 2021 rain year, many species did not bloom due to inadequate inundation in suitable habitat resources (e.g., wetlands, vernal pools, etc.). No special-status plant species were observed. Note that negative survey results during one field season does not constitute evidence that a plant occurrence is absent from a location (CDFW 2018).

If eventual Project implementation were to cause reduction and/or damage to special-status plant species and/or existing habitat that supports special-status plant species, then it would be considered a significant impact under CEQA.

To reduce impacts to special-status plant species and habitat to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance and Minimization Measures.** The following measures are recommended to avoid, minimize, and mitigate direct or indirect impacts to special-status plant species:

- A Worker Environmental Awareness Program (WEAP) should be prepared that will educate staff on the presence of all special-status plant species, sensitive natural communities, and protected wetlands with potential to occur, or that are known to occur, within the solar development area. The program should describe their identification, habitat requirements, and penalties for species impacts, as well as immediate steps to take should special-status plant species be observed by staff on site. This WEAP should include biological resource AMMs from the Project's CEQA Mitigation Monitoring and Reporting Program, resource permits or agreements, and any species-specific plans. The WEAP can be provided in the form of a handout and/or video presentation. Staff that attend the training should fill out a sign-in sheet indicating that they completed the training.
- Protocol-level botanical surveys shall be conducted by a qualified botanist a maximum of 2 weeks prior to Project activity initiation, in accordance with CDFW and CNPS guidelines.
- If no special-status species are observed, then no further AMMs or mitigation is required.
- If special-status plant species are observed, then the following measures are additionally recommended to avoid the species:
  - Special-status plant species should be mapped and flagged within the solar development area.

- Project activities should be modified to avoid impact.
- Environmentally sensitive area fencing, and appropriate signage should be installed at a minimum of 20 feet from the edge of special-status plant populations. The Project should avoid performing any construction related activities within the environmentally sensitive area.
- If full avoidance is not feasible, the applicant should prepare and implement a Botanical Mitigation Plan. The plan will include specifications for transplantation, including requirements for transplant destinations, methods to minimize damage of plants during transplantation, and irrigation or other treatments required to improve chance of transplantation success. The plan would also include monitoring requirements to demonstrate transplantation success and no net loss of special-status plant species. If monitoring demonstrates transplantation is not fully successful in achieving no net loss, compensatory mitigation would be required. The mitigation ratios would vary depending on the level of transplantation success but would ensure no net loss of special-status plant species from direct permanent, indirect, and/or temporary Project impacts.

#### a.2 California Tiger Salamander

CTS is a federally and state threatened species and an SSHCP Covered Species. CTS has not been documented in the solar development area. The nearest known occurrence of the species is approximately 5 miles south of the solar development area (CDFW 2022; USFWS 2021a). CTS are subject to agency jurisdiction pursuant to regulations under FESA, CESA, CFGC, and CEQA Guidelines.

Dudek conducted CTS aquatic larval surveys within potential suitable aquatic habitat within the solar development area and other areas of the PSA in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or Negative Findings of California Tiger Salamander* (USFWS 2003). Aquatic larval surveys were conducted on March 16, April 15, and April 28, 2021, and no CTS larvae were observed. Aquatic resources within the solar development area were found to lack required habitat characteristics for CTS. Note that negative survey findings (i.e., no presence), especially from a single season of larval surveys, does not demonstrate species absence. However, assessment of aquatic resources within 2 kilometers of the solar development area (i.e., the maximum reasonable dispersal distance for CTS) indicated that most aquatic features in the vicinity lack the appropriate hydro-period or show evidence of occupancy by game fish (e.g., fishing docks). The ponds within the 2 kilometer buffer that could not be eliminated as potential CTS aquatic habitat were generally blocked from dispersal to and from the solar development area by partial or complete barriers to movement. The potential upland habitat within the PSA, specifically the solar development area, does contain small mammal burrows in some areas, but substantial portions of the solar development area lack burrows entirely or have low burrow densities. This potential upland CTS habitat is not unique or high quality as compared to similar resources in the vicinity.

To reduce impacts to CTS and habitat to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance, and Minimization Measures.** The following measures are recommended to avoid and minimize direct or indirect impacts to this species:

- Project ground-disturbing activities within CTS suitable habitat will occur outside of the breeding and dispersal season (after July 31 and before October 15), to the extent feasible. If Project activities must be implemented during the breeding and dispersal season, they will not start until 30 minutes after sunrise and must be completed 30 minutes prior to sunset.
- A biologist with CTS knowledge and experience will conduct a pre-construction survey and monitor Project activities within CTS suitable habitat.
- If a CTS is encountered during Project activities, the approved biologist will notify CDFW and USFWS immediately. Project activities will cease within a 100-foot radius of the animal until the animal is relocated by an approved biologist with appropriate handling permits. Prior to relocation, the approved biologist will notify CDFW and USFWS to determine the appropriate procedures related to relocation. If the animal is handled, a report will be submitted within 1 business day to CDFW and USFWS.
- The Project will prepare a CTS Relocation Plan for Project activities occurring in CTS suitable habitat. The CTS Relocation Plan will achieve no net reduction in CTS or CTS suitable habitat within the PSA. The CTS Relocation Plan will include the name(s) of the approved biologist(s) who will relocate CTS; pre-construction habitat assessment methodology; measures to minimize temporary impacts to CTS suitable habitat; capture, handling, and relocation methods; a map and description of the relocation area(s) for captured CTS, including relative location, quality of habitat, non-native species or the potential for CTS-barred tiger salamander hybrids to be present, identified upland burrows determined to be suitable for CTS placement, distance to aquatic habitat, and potential barriers for movement; written permission from the landowner to use their land as a relocation site; and identification of a wildlife rehabilitation center or veterinary facility that routinely evaluates or treats amphibians. The Project permittee will submit the CTS Relocation Plan to CDFW for written approval at least 15 days prior to the beginning of any Project activities, including pre-construction surveys.

### a.3 Western Spadefoot Toad

WST is a state SSC and SSHCP Covered Species with a moderate potential to occur in the solar development area. Vernal pools, seasonal wetlands swales, and other aquatic resources in the solar development area provide habitat for WST. Development could impact WST if this species is present within the solar development area prior to ground-disturbing activities. To assist the Project design in understanding areas to avoid, Dudek conducted focused WST surveys within potential suitable habitat for this species. The surveys were completed in conjunction with the CTS and large listed branchiopod surveys between February and April 2021. No WST or their larval masses were observed during focused surveys. Although WST has not been documented in the solar development area, there are known occurrences of the species within 5 miles. Direct or indirect impacts to this species would likely be considered a potentially significant impact under CEQA. To reduce impacts to WST and habitat to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance, and Minimization Measures.** The following measures are recommended to avoid and minimize direct or indirect impacts to this species:



- Project ground-disturbing activities within western spadefoot suitable habitat should occur outside the breeding and dispersal season (after May 15 and before October 15). If it is determined necessary for ground-disturbing activities that occur within the breeding season. The Project shall enlist biologists with valid collecting permits to perform a pre-construction survey for WST within suitable habitat, including breeding habitat. If WST are encountered during the survey, individuals will be safely relocated to suitable habitat outside of the solar development area. The survey should include searches for small mammal burrows, crevices, and other potential refugia, as well as dip-netting or seining suitable breeding habitat. Additionally, if WST is observed within the solar development area, adult and larval WST and egg masses should be collected and relocated to suitable habitat (i.e., to be preserved in perpetuity).
- WST should be hand-captured and relocated outside the construction area to suitable habitat by a biologist with a valid collecting permit or with proper agency authorization as determined during coordination with CDFW. All relocation areas should be identified and approved by CDFW prior to the pre-construction survey. Relocated WST should be monitored until they have escaped into upland refugia or aquatic habitat with sufficient water. Project construction activities will be suspended in a 100-foot radius of the WST until the WST leaves the solar development area on its own or is relocated by a CDFW approved biologist.
- If Project ground-disturbing activities must commence in suitable WST habitat during the breeding and dispersal season, exclusion fencing will be installed around the Project footprint and must be monitored by an approved biologist following rain events. Temporary high-visibility construction fencing will be installed along the edge of work areas, and silt fencing will be installed immediately behind the temporary high-visibility construction fencing to exclude WST from entering the construction area. Fencing will remain in place until all construction activities within the construction area are completed.
- At the end of each working day, open trenches and holes must be covered or installed with wildlife ramps to avoid wildlife entrapment overnight.
- If WST are determined to be present within the solar development area, then ongoing monitoring by a qualified biologist is required to ensure there are no impacts to this species and its habitat during construction and operation and maintenance activities for the Project.
- This species should be included in the WEAP described above for special-status plant species and should also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

#### a.4 Central Valley Steelhead Distinct Population Segment

Central Valley steelhead DPS is a federally threatened species. The Cosumnes River in the western portion of the PSA is known to support the Central Valley steelhead DPS and is designated as EFH for this species. No EFH is present in the solar development area of the PSA. As a federally listed species, impacts to this steelhead DPS would be considered take under FESA and a significant impact under CEQA.

Direct and indirect impacts to the Cosumnes River would be avoided and there would be **no impact** to Central Valley Steelhead DPS.

#### a.5 Northwestern Pond Turtle

Northwestern pond turtle is a state SSC and SSHCP Covered Species with a moderate potential to occur in upland habitat within the solar development area. The Cosumnes River in the northern portion of the PSA provides aquatic habitat for northwestern pond turtle. Development in the solar development area of the PSA could impact this species if upland nesting or aestivation sites or individual turtles are present within the construction footprint during ground disturbance. Although no northwestern pond turtles have been documented in the solar development area, this species is known to occur within 5 miles. Direct or indirect impacts to this species would likely be considered a potentially significant impact under CEQA.

To reduce impacts to northwestern pond turtle and habitat to **less than significant with mitigation incorporated**, the measures below are recommended.

**Recommended Avoidance and Minimization Measures.** The following measures are recommended to avoid and minimize direct or indirect impacts to this species:

- Project ground-disturbing activities will be conducted outside of northwestern pond turtle's active season (after May 1 and before September 15), to the extent feasible. If Project activities must be implemented during the breeding and dispersal season, they will not start until 30 minutes after sunrise and must be completed 30 minutes prior to sunset.
- A qualified biologist should conduct a pre-construction survey for northwestern pond turtle within 48 hours prior to the start of construction activities within 300 feet of suitable habitat (e.g., any adjacent riparian woodland). Concurrently with the pre-construction survey, searches for nesting sites should be conducted and any identified sites should be delineated with high-visibility flagging or fencing and avoided during construction activities. If avoidance is not possible, the nest and/or turtle should be removed by a qualified biologist and relocated to an appropriate location.
- If turtles and/or nests are encountered during the pre-construction survey, a qualified biologist should be present during grubbing and clearing activities in suitable habitat (aquatic) to monitor for northwestern pond turtle. If a turtle is observed in the active construction zone, construction should cease within a 100-foot buffer, and a qualified biologist will be notified. Construction may resume when the biologist has either hand-captured and relocated the turtle to nearby suitable habitat outside the construction zone, or, after thorough inspection, determined that the turtle has moved away from the construction zone.
- On-site personnel will observe a 20-mile-per-hour speed limit within northwestern pond turtle suitable habitat.
- This species should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

### a.6 Burrowing Owl

BUOW is an SSC and an SSHCP Covered Species. There is suitable habitat for BUOW in the PSA, as well as recorded presence. Protocol-level and visual BUOW surveys were conducted from February through May 2021, and June and July 2022, within the PSA. The surveys covered the entirety of the PSA, including the solar development area, as well as suitable nesting habitat within 500 feet. Within the solar development area, these surveys identified two visual detections of BUOW individuals, and 16 potential burrow locations (i.e., of single and/or multiple burrows) based on presence of signs such as pellets, whitewash, etc. BUOW is a federal BCC and a state SSC. Open areas in the solar development area (i.e., grassland and cultivated land) provide foraging and nesting habitat for BUOW. Impacts to this species would likely be considered a potentially significant impact under CEQA and may be considered take under the MBTA.

To reduce impacts to BUOW and habitat to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance, and Minimization Measures.** The following measures are recommended to avoid, minimize, and mitigate direct or indirect impacts to this species:

- A qualified biologist should conduct surveys for BUOW within 30 days prior to ground-disturbing activities within suitable habitat for the species. The survey should cover the limits of ground disturbance and potentially suitable nesting habitat within 500 feet. If ground-disturbing activities are delayed, then additional surveys should be conducted such that no more than 7 days elapse between the survey and ground-disturbing activities.
- If BUOW is encountered during the pre-construction survey, the approved biologist should prepare a Special-Status Species Avoidance, Minimization, and Relocation Plan for special-status species occurring in the solar development area, including BUOW. The Avoidance, Minimization, and Relocation Plan shall include a performance standard of no net loss of BUOW within the PSA.
- If non-nesting BUOWs are observed in or adjacent to the construction footprint during the survey, construction should be postponed until the qualified biologist can fully implement a Burrowing Owl Passive Relocation and Exclusion Plan (to be prepared by the qualified biologist). The plan should be prepared in accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). Once owls have been successfully excluded and unoccupied burrows evacuated, construction in the area may proceed.
- If nesting BUOWs are observed during the survey, construction activities within 300 feet of occupied burrows should be delayed until young owls have fledged and are independent of the burrow, as determined by a qualified biologist. The qualified biologist may reduce the 300-foot buffer based on the type, timing, extent, and intensity of the construction activity and other factors such as site topography and vegetation cover between the construction activity and the burrow. Once all young have fledged and are no longer dependent upon the nest burrow, the same burrow exclusion (i.e., environmentally sensitive area) procedure described above should be implemented prior to resuming construction activities in the area.

- If BUOW is determined present within the solar development area, then on-going monitoring by a qualified biologist may be required to ensure there are no impacts to this species and its habitat during construction and operation and maintenance activities for the Project.
- This species should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.
- Compensatory mitigation shall be provided for impacts to BUOW nesting, wintering, and/or foraging habitat by Project infrastructure to achieve a performance standard of no net loss of habitat value to the BUOW. The methods and implementation measures to achieve this performance standard shall be described in a mitigation plan to be submitted to the County of Sacramento for review prior to the start of construction.

#### a.7 Swainson's Hawk

SWHA is a federal BCC, a state threatened species, and an SSHCP Covered Species. No SWHA nests were observed in the solar development area or within the PSA. One potential nest was identified within just north, outside of the PSA, within 0.5 miles. Large trees in the riparian corridor of the PSA north of the solar development area and outside the PSA within 0.5 miles provide potential nesting habitat for SWHA, and open areas in the solar development area provide foraging habitat for this species.

Construction activities, including grading and grubbing, near suitable nesting habitat (e.g., individual trees or riparian woodland habitats) within the solar development area or within 0.5 miles of the PSA could disturb an active SWHA nest. SWHA were not observed nesting within the solar development area during protocol-level surveys conducted on February 18 and 25, 2021; March 4 and March 16, 2021; April 9 and 15, 2021; May 3, 2021; June 4, 2021, June 2 and 3, 2022, and July 7 and 9, 2022; however, a pair was observed over the solar development area exhibiting courting behavior, and a pair was observed outside the PSA (i.e., outside the solar development area) going to and from a potential nest site. It is expected that a few trees would be removed during Project construction, but these trees have not been found to support nesting SWHA. If trees within 0.5 miles of the solar development area become occupied by nesting SWHA prior to construction, then activities could result in the incidental loss of adults, juveniles, nestlings, or fertile eggs. In addition to the potential to remove a tree with an active nest, construction-generated disturbances also have the potential to indirectly affect SWHAs if the species is nesting within 0.5 miles of Project activities. Increased levels of noise and human activity within 0.5 miles of an active nest could result in nest abandonment or forced fledging and subsequent loss of fertile eggs, nestlings, or juveniles. These construction-generated disturbances could also cause SWHA to temporarily avoid foraging on some or all the solar development area.

Conversion of grassland to solar fields (i.e., disturbed habitat) could result in impacts on SWHA through permanent loss of foraging habitat. However, the grassland (i.e., includes California annual grassland plus valley grassland vegetation communities) that composes most of the solar development area (96%-357.61 acres of the 371.72-acre area) is abundant in the region. For example, within 5 miles of the solar development area, approximately 41,098 acres (61%) of the 66,539-acre area is grassland. Although there is a large amount of available foraging habitat for SWHAs in the Project vicinity (i.e., within 5 miles of the

PSA), grassland conversion of the solar development area would decrease available foraging habitat for locally nesting SWHAs. Depending on the intensity of SWHA use of the affected foraging habitat, this decrease could result in displacement of nesting pairs, reduction in reproductive potential, or decreased survival rates, particularly for hawks nesting within 0.5 miles of the solar development area. However, SWHA foraging within the solar development area was not intensive during surveys conducted in 2021 and 2022. During seven survey passes conducted from February to June 2021, and June to July 2022, SWHA foraging behavior was observed within the PSA three times, and SWHA was observed seven other times in the PSA in non-foraging behavior such as perching, courtship flight, and transiting flight. Due to the dry conditions present in 2021 and 2022, foraging intensity on the solar development area may have been suppressed due to lower prey availability or reduced SWHA breeding.

The results of studies conducted by Estep Environmental Consulting (i.e., 2013 and preliminary 2021-2022 findings) indicate that properly designed and managed solar arrays can provide suitable SWHA foraging habitat. As noted in Section 4.5.3.11, solar arrays will be spaced to allow for foraging by SWHA between array rows and under arrays. The Project would retain approximately 206.64 acres of grassland within the photovoltaic area of the solar development area. Furthermore, the Project components that would convert foraging grassland habitat within the solar development area include the array footings, (aggregate base) access and fire roads, the battery energy storage system, utility line pole risers, and the substation, totaling approximately 15.07 acres (4.22% of the grassland within the solar development area). Therefore, approximately 342.54 acres (95.79%) of grassland within the solar development area is expected to remain available for SWHA foraging upon Project completion.

The solar arrays are proposed to be approximately 6 feet above ground level when at a level position (e.g., mid-day), though distances will vary depending on the panel tilt of 60 degrees to each side. Although the area under the solar arrays may limit restrict aerial foraging, it would still provide habitat for rodents and large insects that form the SWHA prey base. Studies indicate that SWHA forage within solar projects. SWHA may also pursue prey under the panels by hopping short distances, especially when the tracking panels are tilted in early morning and late afternoon to better expose the area on each side of the post. SWHA would also likely perch on the solar arrays, potentially enhancing their foraging efficiency within the remaining foraging habitat.

As a state-listed species, impacts to SWHA may be considered take under CESA if the activity results in injury to a SWHA. Take of SWHA requires consultation and subsequent authorization (i.e., in the form of an Incidental Take Permit) from CDFW pursuant to Section 2081 of CESA.

To reduce impacts to SWHA and habitat to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance, and Minimization Measures.** The following measures are recommended to avoid, minimize, and mitigate direct or indirect impacts to this species:

- If nesting SWHA are determined present within the solar development area or within 0.5 miles of the solar development area during construction of the Project, ongoing monitoring by a qualified biologist may be required to ensure there are no impacts to this species and its habitat. The

requirement for monitoring will be determined in consultation with CDFW biologists after they are notified of the nesting SWHA.

- SWHA shall be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.
- A SWHA Management Plan should be developed and implemented by the Project to ensure that the solar development area and adjacent suitable SWHA foraging habitat achieve a performance standard of no net loss of SWHA habitat function and value following Project completion. The SWHA Management Plan should include, at a minimum, (1) requirements for timing of vegetation management and vegetation height to maximize SWHA access to prey species; (2) procedures to be followed in the event SWHA are present in an area, especially during nesting season; (3) elimination of interior fencing within the site and maximizing of visibility of perimeter fencing through flagging or other techniques to allow freedom of movement by SWHA and avoid collision; and (4) measures to potentially increase prey populations (e.g., burrowing rodents) such as avoiding rodenticide use or vegetation management. The SWHA Management Plan will be reviewed and approved by USFWS and CDFW and implemented for the Project duration, until decommissioning.
- Compensatory mitigation shall be provided for impacts to SWHA foraging habitat by Project infrastructure to achieve a performance standard of no net loss of habitat value to SWHA. The methods and implementation measures to achieve this performance standard shall be described in a mitigation plan to be submitted to the County of Sacramento for review prior to the start of construction. The Project may achieve the performance standard through the County of Sacramento Swainson's Hawk Mitigation Program or other compensatory programs (e.g., mitigation banks; conservation easements). Under the County of Sacramento program, mitigation would be provided for the change in habitat value from existing (75% of foraging habitat value remaining based on the AG-20 zoning) and the post-Project habitat value. Because the impacted area would be larger than 40 acres, the County Swainson's Hawk Mitigation Program would require the Project to provide mitigation lands.

#### a.8 Tricolored Blackbird

TRBL is a federal BCC and state threatened species, an SSC, and an SSHCP Covered Species. Dense stands of emergent vegetation, willows, thistle, Himalayan blackberry, or similar in the solar development area, although minimal, provide nesting habitat for TRBL, and open grassland and cultivated land provide foraging habitat for this species. Dudek conducted focused TRBL surveys within the solar development area from February through May 2021. Three TRBL species observations, including perching and foraging but no nesting, were made within the solar development area during the four survey passes conducted in 2021. No nesting colonies were observed. As a state-listed species, impacts to TRBL would be considered take under CESA and a significant impact under CEQA. If take of TRBL is anticipated, this Project action would require consultation and subsequent authorization in the form of a CDFW Incidental Take Permit pursuant to Section 2081 of CESA.

To reduce impacts to TRBL and habitat to *less than significant with mitigation incorporated*, the measures below are recommended.

*Recommended Avoidance and Minimization Measures.* The following measures are recommended to avoid and minimize direct or indirect impacts to this species:

- A qualified biologist should conduct a pre-construction survey for nesting TRBL approximately 2 days prior to vegetation or tree removal or ground-disturbing activities during the nesting season (April through August). The survey should cover the limits of construction and suitable nesting habitat within 500 feet.
- If any active nests are observed during surveys, a qualified biologist should establish a suitable avoidance buffer from the active nest. The buffer distance for TRBL will be 500 feet and should be determined based on factors such as topographic features, intensity and extent of the disturbance, timing relative to the nesting cycle, and anticipated ground disturbance schedule. Limits of construction to avoid active nests should be established in the field with flagging, fencing, or other appropriate barriers and should be maintained until the chicks have fledged and the nests are no longer active, as determined by the qualified biologist.
- If vegetation removal activities are delayed, additional nest surveys should be conducted such that no more than 7 days elapse between the survey and vegetation removal activities. It is recommended that disturbing potential nesting habitat (i.e., trimming and/or vegetation removal) be performed outside of the nesting season (September through March) to avoid impacts to nesting birds.
- If an active nest is identified within 500 feet of the construction zone after construction has started, work within 500 feet of the nest should be halted until the qualified biologist can provide appropriate avoidance and minimization measures to ensure that the nest is not disturbed by construction. Appropriate measures may include a no-disturbance buffer until the birds have fledged, limitations on construction activities that generate substantial vibration and/or noise, and/or full-time monitoring by a qualified biologist during construction activities conducted near the nest.
- This species should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

#### a.9 Valley Elderberry Longhorn Beetle

VELB is a federally threatened species and an SSHCP Covered Species. As a federally listed species, direct impacts to VELB would be considered take under the FESA. If the Project affects VELB and/or VELB habitat, then the Project would require consultation and subsequent incidental take authorization (in the form of a Biological Opinion or Letter of Concurrence) from USFWS pursuant to Section 7 of the FESA.

Suitable habitat for VELB has been identified within the PSA (i.e., elderberry plants within riparian and adjacent non-riparian areas). Dudek conducted focused surveys of elderberry plants within the solar

development area and adjacent other lands (i.e., PSA) on February 19 and 25, 2021, and January 12, 2022, in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (USFWS 2017b) and the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999).

A total of 13 elderberry plants were identified within the PSA, with one plant within 165 feet of the Project solar development area within non-riparian uplands, and two within non-riparian uplands of the solar development area. The focused surveys found that four plants, 2A-C, 7, 8, and 12, exhibited relict bore/exit holes from a burrowing insect, and no observations of VELB were recorded. Elderberry plant 2A-C is approximately 275 feet outside of the riparian habitat in the western vicinity of the PSA, and greater than 165 feet (i.e., avoidance buffer distance) from the Project solar development area. Elderberry plant 7 is approximately 145 feet outside of the riparian habitat and is greater than 165 feet from the Project solar development area. Elderberry plant 8 through 11 are approximately 130 feet outside of the riparian habitat and greater than 165 feet from the Project solar development area. Elderberry plant 12 is approximately 335 feet outside of the riparian habitat and is located greater than 165 feet from the Project solar development area. For the three elderberry plants occurring within the Project solar development area or within 165 of the Project solar development area that could be directly impacted by the Project, no observations of VELB were observed during focused surveys. All three plants were located within non-riparian uplands. Additionally, one of the three has clusters of stems that were both greater and less than 1 inch in diameter. No bore/exit holes or observations of VELB were recorded for these elderberry plants (see Table 18 for a complete summary of VELB focused survey results, impact types based on survey result findings and proximity to the solar development area, and proposed mitigation).

**Table 18. Summary of VELB Focused Survey Results, Impacts, and Mitigation**

| ID             | Location                            | Focused Survey Results                       | Impact Type <sup>a</sup> | Mitigation                           |
|----------------|-------------------------------------|----------------------------------------------|--------------------------|--------------------------------------|
| 1 <sup>b</sup> | Riparian                            | No presence observed                         | No impact                | None                                 |
| 2 <sup>b</sup> | Upland                              | Relict bore/exit holes, no presence observed | No impact                | None                                 |
| 3 <sup>b</sup> | Riparian                            | No presence observed                         | No impact                | None                                 |
| 4 <sup>b</sup> | Non-riparian, upland                | No presence observed                         | Direct                   | Compensatory mitigation at 1:1 ratio |
| 5              | Non-riparian, upland                | No presence observed                         | No impact                | None                                 |
| 6              | Non-riparian, upland                | No presence observed                         | Indirect                 | AMMs                                 |
| 7              | Riparian                            | Relict bore/exit holes, no presence observed | No impact                | None                                 |
| 8              | Non-riparian, converted agriculture | Relict bore/exit holes, no presence observed | No impact                | None                                 |
| 9              | Non-riparian, converted agriculture | No presence observed                         | No impact                | None                                 |
| 10             | Non-riparian, converted agriculture | No presence observed                         | No impact                | None                                 |



**Table 18. Summary of VELB Focused Survey Results, Impacts, and Mitigation**

| ID | Location                            | Focused Survey Results                       | Impact Type <sup>a</sup> | Mitigation                           |
|----|-------------------------------------|----------------------------------------------|--------------------------|--------------------------------------|
| 11 | Non-riparian, converted agriculture | No presence observed                         | No impact                | None                                 |
| 12 | Non-riparian, converted agriculture | Relict bore/exit holes, no presence observed | No impact                | None                                 |
| 13 | Non-riparian, upland                | No presence observed                         | Direct                   | Compensatory mitigation at 1:1 ratio |

**Notes:**

<sup>a</sup> Impact Type: Direct- permanent physical loss (“take”) typically due to clearing and grading associated with implementation of a project; Indirect- reasonably foreseeable effects of a project implementation on remaining or adjacent resources outside the direct disturbance zone that may occur during typical grading or maintenance activities or later in time because of a project; None- no associated impacts.

<sup>b</sup> Cluster of more than one elderberry plant in one location.

To reduce impacts to VELB and habitat to **less than significant with mitigation incorporated**, the measures below are recommended.

**Recommended Avoidance and Minimization Measures:** The following measures are recommended to avoid and minimize impacts:

Transplantation for direct impacts is not recommended for elderberry plants within the Project solar development area due to the unlikelihood of survival. As such, direct impacts (i.e., within 20 feet or less of solar development construction) will be mitigated at a 1:1 ratio and secured in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (USFWS 2017b) and the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999).

Indirect impacts (i.e., plants between 20 to 100 feet of solar development construction) will be avoided and are subject to the implementation of the following AMMs:

- **Avoidance and Fencing.** Project activities that may damage or kill an elderberry plant (e.g., trenching, paving, etc.) should be avoided to the extent feasible. If avoidance of all plants is not feasible, impacts to plants will be compensated through planting of elderberry plants in areas not subject to project disturbance at a ratio of 1:1. All areas to be avoided during construction activities will be fenced and/or flagged as close to the Project solar development area as feasible. Temporary construction fencing and flagging shall be installed at least 165 feet outside the edge of the driplines of the elderberry plants. Environmentally sensitive area signs shall be erected along the edge of the avoidance area. In areas where encroachment on the 165-foot buffer has been approved by USFWS, a minimum setback of at least 20 feet from the dripline of each elderberry plant shall be provided, as well as documentation of USFWS setback approval.
- **Timing.** All activities that could occur within 165 feet of an elderberry plant will be conducted outside of the flight season of the VELB (i.e., March through July) to the maximum extent feasible.

- Trimming. If necessary, trimming may remove or destroy VELB eggs and/or larvae and may reduce the health and vigor of the elderberry plant. Therefore, to avoid and minimize direct impacts to VELB, trimming will occur between November and February and will avoid the removal of any branches or stems that are greater than 1 inch in diameter. Measures to address regular and/or large-scale maintenance (trimming) should be established and approved by USFWS.
- Mowing. Mechanical weed removal within the dripline of any elderberry plant will be limited to the season when adult VELB are not active (i.e., August through February) and will avoid damage to the elderberry plant.
- Construction Monitoring. A qualified biologist will monitor the Project solar development area if work is approved to occur within the 165-foot avoidance buffer 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 USFWS.
- WEAP. A qualified biologist will provide training for all contractors, work crews, and any on-site 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 not complying with these requirements.

#### a.10 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Vernal pool fairy shrimp are a federally threatened and SSHCP Covered Species with a low potential to occur within the solar development area. There are known occurrences of this species within 5 miles of the PSA. Vernal pool tadpole shrimp are a federally endangered species with recorded known historic occurrences within the solar development area. Approximately 5.92 acres of low quality suitable aquatic habitat is present within the solar development area. Dudek conducted protocol-level surveys for both dry and wet season large-listed branchiopods within the solar development area. No observation of vernal pool fairy shrimp or vernal pool tadpole shrimp were made during the protocol-level surveys. Note that negative survey findings (i.e., no presence) does not demonstrate species absence, but does support the conclusion that this habitat is of low quality.

Vernal pool fairy shrimp and vernal pool tadpole shrimp species and their habitat are subject to agency jurisdiction pursuant to regulations under FESA, CESA, CFGC, and CEQA Guidelines. Measures to avoid, minimize, and mitigate impacts to jurisdictional wetlands and waters that provide potential large listed branchiopod habitat are provided in Section 6.2(c).

To reduce impacts to vernal pool fairy shrimp and vernal pool tadpole shrimp to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance and Minimization Measures.** The following measures are recommended to avoid and minimize impacts:

Unless a smaller buffer is approved through formal consultation with USFWS, construction fencing shall be installed a minimum of 250 feet from the delineated wetland edge. All construction activities are prohibited within this buffer area. If total avoidance is achieved, no further action is required.

### a.11 American Badger

American badger is a state SSC and SSHCP Covered Species with a high potential to occur in grassland habitat such as that within the solar development area. American badger has not been documented within the solar development area, but there are known occurrences of American badger within 5 miles. Additionally, although American badger has not been documented in the solar development area, one collapsed burrow with badger sign (i.e., claw marks along both sides of entrance) was documented in the northern portion of the solar development area. In addition, this species is known to occur in the vicinity, and suitable habitat, as well as SSHCP modeled habitat, is present (Sacramento County 2018). Eventual solar development in the PSA could impact this species if the species is denning in or near the construction footprint during ground disturbance.

Impacts to this species would be ***less than significant with implementation of recommended avoidance and minimization measures.***

**Recommended Avoidance and Minimization Measures.** The following measures are recommended to avoid and minimize impacts:

- A qualified biologist should conduct focused surveys for American badger dens within 2 weeks prior to ground-disturbing activities in undeveloped grassland. The survey should cover the limits of ground disturbance and a 100-foot buffer. Any winter or natal American badger dens located during the survey should be evaluated (typically with remote cameras) to determine activity status.
- If American badger is identified, then prior to construction, the qualified biologist should establish a 100-foot no-disturbance buffer (e.g., mesh exclusion fencing, flagging, or similar) around any active American badger natal dens identified during the survey. The buffer should be maintained until the qualified biologist determines that the den is no longer active, and the young are no longer dependent upon the den for survival.
- If construction occurs during the non-breeding period (i.e., typically from June through February) and an active non-natal den is found in or adjacent to the construction footprint, a qualified biologist should attempt to trap or flush the individual and relocate it to suitable habitat away from construction. If no dens are observed, and/or after a trapping or flushing effort is completed, and/or after it is confirmed that a natal den is no longer active, the vacated or unoccupied den can be excavated, and construction can proceed.
- If American badger is determined present within the solar development area of the PSA, then ongoing monitoring by a qualified biologist may be required to ensure there are no impacts to this species and its habitat during construction and operation and maintenance activities for the Project.
- This species should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

### a.12 Native Bats

Native bat roosting habitat in the solar development area is limited to isolated trees near seasonal ponds or other aquatic habitat that provide nearby foraging opportunities. No active bat roosts or signs of occupation, such as guano or staining, were detected during the reconnaissance-level field surveys. If bats are roosting in or adjacent to the solar development area, impacts could result from the permanent removal of roosting sites, such as trees and snags, or from Project-related noise disturbance to an occupied roosting site in the vicinity of construction. Native bat species are protected by the state under CFGC Section 4150 for non-game mammals (including bats). Should bats be roosting during construction activities, removal of active roost sites that would result in the harm or mortality of native bats and would be considered a violation of the take provisions of Section 4150 of the CFGC.

Impacts to native bats would be ***less than significant with implementation of recommended avoidance and minimization measures.***

**Recommended Avoidance and Minimization Measures.** The following measures are recommended to avoid and minimize impacts:

- A qualified biologist should conduct a habitat assessment for roosting bats within the solar development area. The habitat assessment should include a visual inspection of potential roosting features (bats need not be present) and presence of guano within the solar development area, access routes, and 300 feet around these areas. The qualified biologist should survey these areas no less than 30 days prior to the start of work. Potential roosting features found during the survey should be flagged or marked.
- Removal of potential roost habitat identified during the assessment (described above) should be avoided during the bat maternity season (i.e., May 1 through August 15). If removal of potential roost habitat occurs outside of the maternity season, no further mitigation should be required.
- If a bat roosting or maternity colony cannot be completely avoided, the individuals should be safely evicted under the direction of the qualified bat biologist. If individuals cannot be safely evicted due to factors such as lack of alternative roosting sites or the young still being reliant on adults, as determined by the qualified bat biologist, ground-disturbing activities within a specified distance of the roost (specified distance to be determined by the bat biologist, based on surroundings and vulnerability of roost site, etc.) should be postponed or halted until conditions are suitable for safe eviction or the roost has vacated naturally.
- If native bats are determined present within the solar development area, then ongoing monitoring by a qualified biologist may be required to ensure there are no impacts to this species and its habitat during construction and operation and maintenance activities for the Project.
- Prior to Project initiation, a Bat and Avian Protection Plan will be prepared in coordination with CDFW and USFWS to reduce/eliminate impacts to bat and avian species.

- Native bats should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

#### a.13 Nesting Raptors and Migratory Birds

Potential nesting habitat for migratory bird species within the solar development area is generally limited to that for ground-nesting species. Other non-ground nesting species like bald eagles and white-tailed kites were observed within the solar development area and adjacent area (i.e., the PSA), but nesting habitat for the species is not present in the solar development area. Bank swallows have low to no potential to occur within the solar development area and there are known occurrences within 5 miles of the solar development area. Eventual development within the solar development area could involve removal of vegetation and isolated trees, which has the potential to impact nesting birds protected by the federal MBTA and CFGC. In addition to violating the protections under the MBTA and CFGC, direct or indirect impacts to nesting birds would likely be considered a potentially significant impact under CEQA. To avoid impacting active nests, it is recommended that tree or vegetation removal be conducted outside of the nesting season (i.e., February through August).

Impacts to nesting birds would be ***less than significant with implementation of recommended avoidance and minimization measures.***

**Recommended Avoidance and Minimization Measures.** The following measures are recommended to avoid and minimize impacts:

- A qualified biologist should conduct a survey for nesting birds within 1 week prior to vegetation removal or ground-disturbing activities during the nesting season within suitable habitat (i.e., February through August). The survey should cover the limits of construction and accessible suitable nesting habitat within 150 feet.
- If any active nests are observed during surveys, a qualified biologist should establish a suitable avoidance buffer from the active nest. The buffer distance will typically range from 50 to 300 feet and should be determined based on factors such as the species of bird, topographic features, intensity and extent of the disturbance, timing relative to the nesting cycle, and anticipated ground disturbance schedule. Limits of construction to avoid active nests should be established in the field with flagging, fencing, or other appropriate barriers and should be maintained until the chicks have fledged and the nests are no longer active, as determined by the qualified biologist.
- Throughout the duration of the Project, a qualified biologist will conduct up to twice-weekly bird mortality surveys, with particular attention on areas of recent or current Project activities.
- Vegetation or trees planned for removal shall be removed during the period of September through January, to avoid the nesting season. Any trees that are to be removed during the nesting season, which is February through August, will be surveyed by a qualified biologist and will only be removed if no nesting migratory birds are found. If vegetation removal activities are delayed, additional nest surveys should be conducted such that no more than 7 days elapse between the survey and vegetation removal activities.

- If an active nest is identified in or adjacent to the construction zone after construction has started, work in the vicinity of the nest should be halted as-needed until the Project biologist can provide appropriate avoidance and minimization measures to ensure that the nest is not disturbed by construction. Appropriate measures may include a no-disturbance buffer until the nest has fledged and/or full-time monitoring by a qualified biologist during construction activities conducted near the nest.
- Nesting birds should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

**b) *The Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS.***

Sensitive natural communities and DCH, including riparian habitat, fall under the jurisdiction of CDFW pursuant to CESA and Section 1600 of the CFGC, and USFWS pursuant to FESA. These communities are habitats that have a limited distribution and are often vulnerable to the environmental effects of projects. In addition, riparian habitat may also be subject to Sacramento County tree permits and fees for the removal of protected tree species within the riparian habitat zone (i.e., *Quercus* spp.). These communities may or may not contain special-status species or their habitats.

No sensitive natural communities were identified within the solar development area, including riparian habitat. Three CDFW sensitive natural communities, northern hardpan vernal pool, valley oak woodland, and riparian vegetation community, were identified within 5 miles of the PSA.

Impacts to sensitive natural communities that are present within the solar development area may be reduced to ***less than significant with mitigation incorporated*** with the implementation of measures recommended to address potential impacts to wetlands and other jurisdictional waters (see Section 6.2[c] below) and measures recommended to address potential impacts to oak species (see Section 6.2[e] below).

**c) *The Project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.***

There are approximately 5.85 acres (9,260.86 linear feet) of aquatic resources in the solar development area. Of the total aquatic resources present within the solar development area that meet the criteria for jurisdictional waters of the U.S. under CWA Section 404 regulated by USACE and waters of the state under CWA Section 401 regulated by RWQCB and the definition of aquatic resources under CFGC Section 1602 regulated by the CDFW. Unlike USACE, RWQCB asserts jurisdiction over ephemeral drainages and isolated wetlands, and CDFW jurisdiction extends to the top of bank or edge of wetland or riparian vegetation (if present) rather than the OHWM of applicable aquatic resources. Furthermore, each resource present may be impacted by Project activities either indirectly, permanently, or temporarily. For permanent impact areas within the solar development area, approximately 0.08-acre of waters of the U.S. and/or state may be

impacted. Table 19 below outlines the indirect, direct permanent, and temporary by jurisdictional authority within the solar development area of the PSA.

**Table 19. Summary of Aquatic Resources Impacts by Jurisdiction within the Solar Development Area**

| Impact Type | Total Impacts in the Solar Development area By Jurisdictional Authority (acres) <sup>1</sup> |       |       |
|-------------|----------------------------------------------------------------------------------------------|-------|-------|
|             | CDFW                                                                                         | RWQCB | USACE |
| Indirect    | 2.44                                                                                         | 2.59  | 2.59  |
| Permanent   | 0.08                                                                                         | 0.08  | 0.08  |
| Temporary   | 3.17                                                                                         | 3.17  | 3.17  |

**Notes:** CDFW= California Department of Fish and Wildlife, RWQCB= Regional Water Quality Control Board, USACE= U.S. Army Corps of Engineers.

To reduce impacts to state and federally protected wetlands and waters to ***less than significant with mitigation incorporated***, the measures below are recommended.

**Recommended Avoidance, and Minimization Measures:** The following measures are recommended to avoid and minimize impacts:

- Impacts to jurisdictional aquatic resources will require prior authorization from the resource agencies listed above in the form of waters and wetland permits (e.g., 404 Nationwide or Individual Permit, 401 Water Quality Certification, 1600 Lake or Streambed Alteration Agreement, and Floodplain Encroachment Permit), as well as compensatory mitigation to ensure no net loss of jurisdictional resources. Potential mitigation options include purchasing mitigation credits from an agency-approved wetlands mitigation bank, paying an agency-approved in-lieu fee, and/or developing conservations lands to compensate for permanent loss of resources. An Aquatic Resources Mitigation Plan and/or a Restoration and Revegetation Plan that includes aquatic resources may need to be prepared if impacts cannot be avoided.
- An Approved Jurisdictional Delineation from USACE for the final ARD Report must be completed prior to and/or in conjunction with permit submittals for USACE, CDFW, and RWQCB.
- Jurisdictional wetlands that provide habitat to special-status species (e.g., CTS, large-listed branchiopods, WST, northwestern pond turtle). Additional mitigation for potential direct and indirect impacts to special-status species habitat will achieve a no net loss of habitat value at a mitigation ratio determined by the USFWS and CDFW for species within their respective jurisdiction.
- Aquatic resources should be included in the WEAP described above for special-status plant species that will also educate staff on the presence of special-status wildlife species and ways to avoid and minimize impacts.

- d) ***The Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.***

As stated above, agricultural areas and undeveloped grassland in the solar development area provide nursery and migratory habitat for common wildlife species, and the Cosumnes River corridor in the western vicinity of the PSA within less than 1,500 feet from the solar development area is a potential riparian connection, providing native habitat for resident wildlife, as well as linkages to additional native habitat in the surrounding area.

According to the California Essential Habitat Connectivity, grasslands within the solar development area are not specifically identified as Essential Connectivity Areas or Natural Landscape Blocks. In addition, there is ample similar open land available in the Project vicinity and many thousands of acres of habitat for migrating birds. Potential Project impacts to wildlife corridors and habitat linkages would be considered a significant impact under CEQA because of the sensitivity of the riparian corridor within the adjacent other lands of the PSA. However, recommended avoidance and minimization measures would ensure this impact remains ***less than significant with mitigation incorporated.***

- e) ***The Project would conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.***

Protected tree species are primarily located within the valley oak woodland/riparian corridor adjacent to the Cosumnes River in the PSA, outside of the solar development area. To the extent feasible, it is recommended that the Project avoid all impacts to tree resources, specifically the removal of trees and/or work within the dripline of each tree. Tree numbers 4001 through 4420 and 4422 are located either within the solar development area and/or adjacent to the solar development area and may be directly impacted by Project activities. Tree numbers 4412 and 4422 are native oak trees; however, they are not protected as they are dead. No trees will require a Sacramento County Tree Removal Permit, as none of the trees fall within the Sacramento County Tree Preservation Ordinance requirements.

To reduce impacts to biological resources, such as trees, to ***less than significant with mitigation incorporated***, the measures below are recommended.

Recommended Avoidance, and Minimization Measures: The following measures are recommended to avoid and minimize impacts:

- If tree removal and/or work within the dripline cannot be avoided, then the Sacramento County Tree Preservation Ordinance requires a tree removal permit for the removal of any native oak with a single trunk measuring 6 inches or greater in DBH, or a multiple-trunked tree with an aggregate DBH measuring 10 inches or greater. This ordinance also prohibits grading, trenching, or filling any area within the dripline of a native oak without being issued a permit. Potential impacts to trees must be mitigated in accordance with the Sacramento County Tree Preservation Ordinance.
- For trees that need removal and do not fall within Sacramento County Tree Preservation Ordinance requirements, a Landscaping Plan will be prepared and submitted prior to the start of Project activities.



f) ***The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.***

The County adopted the SSHCP in 2019, which established a regional habitat conservation program for the South Sacramento area. The SSHCP provides simplified permitting for the impacts of identified covered activities to certain special-status covered species and wetlands. Most SSHCP covered activities are located within Sacramento County's Urban Services Boundary and the Urban Development Area defined in the SSHCP. The Project land is outside of those areas. Solar development outside the Urban Development Area is not a covered activity, is not subject to the SSHCP permitting process, and is not otherwise subject to regulation under the SSHCP.

The SSHCP contemplates those activities that are not covered activities, and therefore are not regulated by the SSHCP, may nevertheless occur within the Plan Area of the SSHCP with the approval of the applicable state and federal environmental agencies. For example, the SSHCP acknowledges that the Sacramento County General Plan provides for land uses that are not covered activities, but that are within the Plan Area of the SSHCP. The SSHCP recognizes that land uses outside of the Plan Area that are not covered activities may be permitted through separate federal and state authorization. While mitigation banks in the Plan Area are not a covered activity, the SSHCP provides for the acquisition of mitigation bank credits by the South Sacramento Conservation Agency to meet certain of the SSHCP goals and objectives (Sacramento County 2018).

The Project will obtain applicable permits and other approvals from the USFWS, USACE, CDFW, and RWQCB, and will further minimize and mitigate impacts on natural resources to achieve comply with the regulatory standards of these agencies. These are the same regulatory standards applied by the USFWS and the other environmental agencies in their review and approval of the SSHCP. Therefore, the Project mitigation strategy is designed to achieve the mitigation standards applicable to covered activities under the SSHCP.

During the 30-year life of the Project, the lands within the solar development area would not be available for acquisition by the South Sacramento Conservation Agency and inclusion within the SSHCP Preserve System. The solar development area will continue to provide some habitat value for SSHCP Covered Species, the lands in the solar development area but could not be acquired and considered for inclusion in the SSHCP preserve System prior to the decommissioning of the Project.

The Project will provide compensatory mitigation for impacts to aquatic resources and specific SSHCP covered species through the acquisition of credits from existing mitigation banks and other compensatory mitigation.

The SSHCP included an inventory of undeveloped potential habitat for SSHCP Covered Species in the SSHCP Plan Area and in each Preserve Planning Unit; the Project is in Preserve Planning Unit 5. That inventory is excerpted below and compared with the acres of land cover proposed within only the solar development area for the Project (Table 20).

**Table 20. South Sacramento Habitat Conservation Plan Modeled Special-Status Wildlife Species Habitat and Land Cover within Undeveloped Lands in Plan Area and the Solar Development Area**

| Habitat Model Land Cover Types                                 | Total Modeled Habitat Potentially Available in SSHCP Plan Area (acres) | Total Modeled Habitat Potentially Available in SSHCP Preserve Planning Unit 5 (acres) | Total Modeled Habitat with the Solar Development Area of the Project (acres) |
|----------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp</b> |                                                                        |                                                                                       |                                                                              |
| Valley Grassland                                               | 97,349                                                                 | 13,028                                                                                | 293.75                                                                       |
| Vernal Pool                                                    | 4,536                                                                  | 339                                                                                   | 3.31                                                                         |
| Swale                                                          | 1,252                                                                  | 89                                                                                    | 1.80                                                                         |
| Streams/Creeks (VPIH)                                          | 73                                                                     | 0.4                                                                                   | 0                                                                            |
| <b>Valley Elderberry Longhorn Beetle</b>                       |                                                                        |                                                                                       |                                                                              |
| Mine Tailing Riparian Woodland                                 | 641                                                                    | 59                                                                                    | 0                                                                            |
| Mixed Riparian Woodland                                        | 5,785                                                                  | 1,169                                                                                 | 0                                                                            |
| Mixed Riparian Scrub                                           | 1,451                                                                  | 173                                                                                   | 0                                                                            |
| <b>California Tiger Salamander – Upland Habitat</b>            |                                                                        |                                                                                       |                                                                              |
| Blue Oak Savanna                                               | 3,322                                                                  | 242                                                                                   | 0                                                                            |
| Blue Oak Woodland                                              | 3,774                                                                  | 992                                                                                   | 0                                                                            |
| Valley Grassland <sup>1</sup>                                  | 78,274                                                                 | 13,897                                                                                | 353.23                                                                       |
| <b>California Tiger Salamander – Aquatic Habitat</b>           |                                                                        |                                                                                       |                                                                              |
| Vernal Pool                                                    | 3,033                                                                  | 277                                                                                   | 3.31                                                                         |
| Seasonal Wetland                                               | 1,391                                                                  | 355                                                                                   | 0                                                                            |
| <b>Western Spadefoot – Upland Habitat</b>                      |                                                                        |                                                                                       |                                                                              |
| Blue Oak Savanna                                               | 5,637                                                                  | 692                                                                                   | 0                                                                            |
| Blue Oak Woodland                                              | 9,132                                                                  | 5,864                                                                                 | 0                                                                            |
| Valley Grassland <sup>1</sup>                                  | 135,094                                                                | 27,463                                                                                | 353.23                                                                       |
| <b>Western Spadefoot – Aquatic Habitat</b>                     |                                                                        |                                                                                       |                                                                              |
| Vernal Pool                                                    | 4,536                                                                  | 339                                                                                   | 3.31                                                                         |
| Swale                                                          | 1,252                                                                  | 89                                                                                    | 1.80                                                                         |
| Seasonal Wetland                                               | 2,600                                                                  | 446                                                                                   | 0                                                                            |
| Open Water                                                     | 2,344                                                                  | 365                                                                                   | 0                                                                            |
| Streams/Creeks                                                 | 2,674                                                                  | 481                                                                                   | 0                                                                            |

**Table 20. South Sacramento Habitat Conservation Plan Modeled Special-Status Wildlife Species Habitat and Land Cover within Undeveloped Lands in Plan Area and the Solar Development Area**

| Habitat Model Land Cover Types                          | Total Modeled Habitat Potentially Available in SSHCP Plan Area (acres) | Total Modeled Habitat Potentially Available in SSHCP Preserve Planning Unit 5 (acres) | Total Modeled Habitat with the Solar Development Area of the Project (acres) |
|---------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Streams/Creeks (VPIH)                                   | 73                                                                     | 0.4                                                                                   | 0                                                                            |
| <b>Northwestern Pond Turtle – Upland Habitat</b>        |                                                                        |                                                                                       |                                                                              |
| Blue Oak Woodland                                       | 7,610                                                                  | 4,983                                                                                 | 0                                                                            |
| Blue Oak Savanna                                        | 4,825                                                                  | 519                                                                                   | 0                                                                            |
| Valley Grassland <sup>1</sup>                           | 91,580                                                                 | 22,373                                                                                | 46.48                                                                        |
| Mine Tailing Riparian Woodland                          | 306                                                                    | 59                                                                                    | 0                                                                            |
| Mixed Riparian Woodland                                 | 5,347                                                                  | 1,152                                                                                 | 0                                                                            |
| Mixed Riparian Scrub                                    | 1,178                                                                  | 170                                                                                   | 0                                                                            |
| <b>Northwestern Pond Turtle – Aquatic Habitat</b>       |                                                                        |                                                                                       |                                                                              |
| Freshwater Marsh                                        | 2,240                                                                  | 122                                                                                   | 0                                                                            |
| Open Water                                              | 1,441                                                                  | 205                                                                                   | 0                                                                            |
| Stream/Creeks                                           | 2,674                                                                  | 480                                                                                   | 0                                                                            |
| <b>Swainson’s Hawk – Nesting Habitat</b>                |                                                                        |                                                                                       |                                                                              |
| Mixed Riparian Woodland                                 | 5,785                                                                  | 1,169                                                                                 | 0                                                                            |
| Mixed Riparian Scrub                                    | 1,449                                                                  | 173                                                                                   | 0                                                                            |
| <b>Swainson’s Hawk – Foraging Habitat</b>               |                                                                        |                                                                                       |                                                                              |
| Valley Grassland <sup>1</sup>                           | 133,705                                                                | 26,503                                                                                | 353.23                                                                       |
| Cropland                                                | 47,905                                                                 | 2,549                                                                                 | 5.91                                                                         |
| Irrigated Pasture-Grassland                             | 15,991                                                                 | 2,203                                                                                 | 0                                                                            |
| Vernal Pool                                             | 4,536                                                                  | 339                                                                                   | 3.31                                                                         |
| Seasonal Wetland                                        | 2,600                                                                  | 446                                                                                   | 0                                                                            |
| Swale                                                   | 1,252                                                                  | 89                                                                                    | 1.80                                                                         |
| <b>Western Burrowing Owl – Nesting/Foraging Habitat</b> |                                                                        |                                                                                       |                                                                              |
| Valley Grassland <sup>1</sup>                           | 135,112                                                                | 27,463                                                                                | 353.23                                                                       |
| Blue Oak Savanna                                        | 5,637                                                                  | 692                                                                                   | 0                                                                            |
| Cropland                                                | 47,905                                                                 | 2,549                                                                                 | 5.91                                                                         |

**Table 20. South Sacramento Habitat Conservation Plan Modeled Special-Status Wildlife Species Habitat and Land Cover within Undeveloped Lands in Plan Area and the Solar Development Area**

| Habitat Model Land Cover Types                         | Total Modeled Habitat Potentially Available in SSHCP Plan Area (acres) | Total Modeled Habitat Potentially Available in SSHCP Preserve Planning Unit 5 (acres) | Total Modeled Habitat with the Solar Development Area of the Project (acres) |
|--------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Irrigated Pasture-Grassland                            | 15,991                                                                 | 2,203                                                                                 | 0                                                                            |
| <b>Western Burrowing Owl – Foraging Habitat</b>        |                                                                        |                                                                                       |                                                                              |
| Vernal Pool                                            | 4,536                                                                  | 339                                                                                   | 3.31                                                                         |
| Swale                                                  | 1,252                                                                  | 89                                                                                    | 1.80                                                                         |
| Seasonal Wetland                                       | 2,600                                                                  | 446                                                                                   | 0                                                                            |
| Stream/Creek (VPIH)                                    | 73                                                                     | 0.4                                                                                   | 0                                                                            |
| <b>Tricolored Blackbird – Nesting/Foraging Habitat</b> |                                                                        |                                                                                       |                                                                              |
| Valley Grassland <sup>1</sup>                          | 135,112                                                                | 27,463                                                                                | 353.23                                                                       |
| Cropland                                               | 47,905                                                                 | 2,549                                                                                 | 5.91                                                                         |
| Seasonal Wetland                                       | 2,600                                                                  | 446                                                                                   | 0                                                                            |
| Freshwater Marsh                                       | 2,922                                                                  | 159                                                                                   | 0                                                                            |
| <b>Tricolored Blackbird – Foraging Habitat</b>         |                                                                        |                                                                                       |                                                                              |
| Irrigated Pasture-Grassland                            | 15,991                                                                 | 2,203                                                                                 | 0                                                                            |
| Vernal Pool                                            | 4,536                                                                  | 339                                                                                   | 3.51                                                                         |
| Swale                                                  | 1,222                                                                  | 89                                                                                    | 1.80                                                                         |
| Open Water                                             | 2,344                                                                  | 365                                                                                   | 0                                                                            |

**Source:** Sacramento County 2018

**Notes:**

<sup>1</sup> Valley Grassland is synonymous with California Annual Grassland

- SSHCP= South Sacramento Habitat Conservation Plan; VPIH= Vernal Pool Invertebrate Habitat.
- No SSHCP Valley Grassland landcover was modeled within the solar development area of the Project Study Area (PSA), however, approximately 357.61 acres of FRAP grassland landcover, a similar vegetation community, was mapped within the solar development area of the PSA.
- For this table, the aquatic resource acreages are based on the total of SSHCP modeled landcover and differs from the final acreages defined by the aquatic resource delineation conducted for the Project, as analyzed further within this document.

As Table 20 indicates, The Project impacts an extremely small percentage of the SSCHP modeled habitat in SSHCP Preserve Planning Unit 5. During the 30-year life of the Project, approximately 0.001% of the inventory of seasonal wetlands, and less than 2.02% of swales and 1.04% of vernal pools in Planning Unit 5 would not be available for acquisition by the South Sacramento Conservation Agency.

The solar development area is a potential connectivity site between the Cosumnes River and the existing preserves to the southeast of Dillard Road. The SSHCP design focus in Preserve Planning Unit 5 is primarily to provide habitat linkages among existing and future preserves both outside and inside the Urban Development Area, primarily along the Cosumnes River/Deer Creek Corridor.

The existing fencing around the solar development area currently may limit movement of certain larger mammals (i.e., American badger). Small to medium-sized mammals such as coyotes, raccoons, and possums will have the ability to move through the site, either digging under the existing fencing or passing through gaps. Coyotes were observed several times during visits to the site. Dillard Road does not carry a high traffic volume<sup>1</sup> and the orchard to the southeast of the site is unfenced, making transit possible from the Cosumnes River through the subject property to the large preserves southeast of the orchard. In addition to terrestrial mammals, the open grassland of the subject property can provide a movement corridor for bird species that are less likely to move through a developed area, including the red-tailed hawk and northern harrier that were observed perching on and moving through the site.

The solar development area will allow for continued wildlife movement through the Cosumnes River corridor and across the project lands for common species and SSHCP covered species. Therefore, the Project fencing may impair wildlife movement through the solar development area by larger mammals (i.e., American badger). However, based on the extended analysis conducted for the Project for SWHA space use (Section 5.7.1.4), areas with solar panels can continue to provide foraging habitat for raptor species if appropriate vegetation is maintained under and between solar arrays (Estep Environmental Consulting 2021).

The impacts to SSHCP land cover types from Project development are a small percentage of the inventory of those lands in Preserve Planning Unit 5 and an even smaller percentage of the modeled habitat in the SSHCP Plan Area. Mitigation for the Project would include incorporating the AMMs from the SSHCP, despite the Project not receiving permit coverage under the SSHCP. This mitigation would ensure that Project effects on SSHCP Covered Species, if present, would be avoided and minimized in the same way as if the SSHCP permits applied to the Project.

---

<sup>1</sup> Measured 24-hour traffic volumes on Dillard Road at Meiss Road ranged from 4032 to 5410 daily vehicles during measurements taken from 2015 through 2019. No measurements are available that specify the time of day for traffic levels. However, if it assumed that 75% of this traffic happens during the hours of 6:00 a.m.–6:00 p.m., that daily traffic amounts to 5.6 cars per minute during the day (including both directions) and 1.9 cars per minute during the evening (again, including both directions).

INTENTIONALLY LEFT BLANK

---

## 7 References

- 14 CCR 15000–15387 and Appendices A–N. *Guidelines for Implementation of the California Environmental Quality Act, as amended*.
- 86 FR 69372–69450. *Proposed Rule: Revised Definition of Waters of the United States*. December 7, 2021. Accessed January 2022. <https://www.federalregister.gov/documents/2021/12/07/2021-25601/revised-definition-of-waters-of-the-united-states>.
- Anthony, R. G., R. L. Knight, G. T. Allen, B R. McClelland, and J. I. Hodges. 1982. *Habitat Use by Nesting and Roosting Bald Eagles in the Pacific Northwest*, 332–342. In *Transactions of the Forty-Seventh North American Wildlife and Natural Resources Conference*, edited by K. Sabol. Washington, D.C.: Wildlife Management Institute.
- Baker Williams (Baker Williams Engineering Group). 2020. *Site Plan for the Sloughhouse Solar Farm, 7794 Dillard Road, A.P.N. 126-0110-001 & 003, Sacramento County, California, December 16, 2020*. Carmichael, California.
- Buehler, D.A. 2000. *Bald Eagle (Haliaeetus leucocephalus)*. In the *Birds of North America Online*, edited by A. Poole. Ithaca, New York: Cornell Lab of Ornithology. Accessed June 2021. <http://bna.birds.cornell.edu/bna>.
- Calflora. 2021. *The Calflora Database*. Berkeley, California: Calflora. Accessed June 2021. <http://www.calflora.org>.
- California Burrowing Owl Consortium. 1993. *Burrowing Owl Survey Protocol and Mitigation Guidelines*. April 1993. Accessed June 17, 2021. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83842>.
- CalTLC (California Tree and Landscape Consulting, Inc.). 2020. *Updated Arborist Report and Tree Inventory for the Sloughhouse Solar (AKA Wanlass), Dillard Road at Meiss Road, County of Sacramento Jurisdiction, California*. December 31, 2020.
- CARI (California Aquatic Resource Inventory). 2016. *CARI v0.2 dataset for ArcGIS*. San Francisco Estuary Institute and the Aquatic Science Center. Accessed June 2021. <https://www.sfei.org/cari>.
- CDEC (California Data Exchange Center). 2020. *Real-Time Station Locator*. Sacramento WB City, California Weather Station (Station ID-SCR). Accessed November 2020. <https://cdec.water.ca.gov/webgis/?appid=cdecstation>.
- CDFG (California Department of Fish and Game). 1994. *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley*. November 8, 1994. Accessed June 2021. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83992>.
- CDFG. 2012. *Staff Report on Burrowing Owl Mitigation*. Department of Fish and Game, Natural Resources Agency, State of California. March 7, 2012. Accessed June 2021. [file:///C:/Users/mkennedy/Downloads/BUOW\\_MIT\\_StaffReport2012.pdf](file:///C:/Users/mkennedy/Downloads/BUOW_MIT_StaffReport2012.pdf)

- CDFW (California Department of Fish and Wildlife). 2015. *Staff Guidance Regarding Avoidance of impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields*. March 19, 2015. Accessed June 2021. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=99310&inline>.
- CDFW. 2018. *Protocols for Surveying and Evaluating Impact to Special-Status Native Plant Populations and Sensitive Natural Communities*. Department of Fish and Wildlife, California Natural Resources Agency, State of California. March 20, 2018. Accessed June 2021. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>.
- CDFW. 2021a. *Threatened and Endangered Species Protected Under the California Endangered Species Act*. Accessed June 2021. <https://wildlife.ca.gov/Conservation/CESA>.
- CDFW. 2021b. *Natural Communities*. Accessed June 2021. <https://wildlife.ca.gov/data/vegcamp/natural-communities>.
- CDFW. 2021c. *Lake and Streambed Alteration Program*. Accessed June 2021. <https://wildlife.ca.gov/conservation/lisa>.
- CDFW. 2021d. *A Summary of the California Environmental Quality Act (CEQA)*. Accessed April 2021. <https://wildlife.ca.gov/Conservation/CEQA/Purpose>.
- CDFW. 2022. *Database Search Within Five Miles of the PSA and within the Nine USGS 7.5Minute Quadrangles (Buffalo Creek, Carbondale, Carmichael, Clay, Elk Grove, Folsom SE, Galt, Goose Creek, and Sloughhouse)*. California Natural Diversity Database (CNDDB). CDFW. Sacramento, California: CDFW, Biogeographic Branch. Accessed July 2022. <https://wildlife.ca.gov/Data/CNDDB>.
- CLI (California Legislative Information). 2016. *AB-2162 Oak Woodlands Protection Act (2015-2016)*. Assembly Bill. February 17, 2016. Accessed June 2021. [https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160AB2162#:~:text=The%20Oak%20Woodlands%20Conservation%20Act,protection%20of%20California's%20oak%20woodlands.&text=By%20June%2C%2030%2C%202116%2C,oak%20removal%20permit%20application%20fee](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB2162#:~:text=The%20Oak%20Woodlands%20Conservation%20Act,protection%20of%20California's%20oak%20woodlands.&text=By%20June%2C%2030%2C%202116%2C,oak%20removal%20permit%20application%20fee).
- CLI. 2021. *California Fish and Game- Division 2. California Department of Fish and Wildlife (700 – 1940), Chapter 10. Native Plant Protection Act (1900 – 1913)*. Accessed June 2021. [http://leginfo.legislature.ca.gov/faces/codes\\_displayText.xhtml?division=2.&chapter=10.&lawCode=FGC](http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=2.&chapter=10.&lawCode=FGC).
- CNPS (California Native Plant Society). 2001. *Botanical Survey Guidelines*. Revised June 2, 2001. Accessed May 2021. [http://cnps.org/wp-content/uploads/2018/03/cnps\\_survey\\_guidelines.pdf](http://cnps.org/wp-content/uploads/2018/03/cnps_survey_guidelines.pdf).
- CNPS. 2021a. *CNPS Rare Plant Ranks*. Rare Plant Program. Accessed December 2021. <https://www.cnps.org/rare-plants/cnps-rare-plant-ranks>.
- CNPS. 2021b. *A Manual of California Vegetation Online*. Accessed June 2021. <http://vegetation.cnps.org/>.
- CNPS. 2022. *Inventory of Rare and Endangered Plants*. Advanced Nine USGS 7.5 Minute Quad Search (Buffalo Creek, Carbondale, Carmichael, Clay, Elk Grove, Folsom SE, Galt, Goose Creek, and Sloughhouse).



Accessed July 2022. <http://www.rareplants.cnps.org/advanced.html#quad=3812153:3812152:3812151:3812143:3812142:3812141:3812133:3812132:3812131>.

Cornell Lab. 2021-2022. *All About Birds*. Cornell University. Accessed June 2021 and July 2022. <https://www.allaboutbirds.org/guide/>.

DESRI (D.E. Shaw Renewable Resources). 2022. *Final Environmentally Preferred Alternative Site Plan for the Sloughhouse Solar Project*. Sloughhouse Solar, California. June 24, 2022.

EPA (U.S. Environmental Protection Agency). 2000. *Legal Memoranda Regarding Solid Waste Agency of Northern Cook County (SWANCC) v. United States. Waters of the United States*. Accessed January 2022. <https://www.epa.gov/wotus/legal-memoranda-regarding-solid-waste-agency-northern-cook-county-swancv-united-states>.

EPA. 2008. *Rapanos v. United States & Carabell v. United States. Waters of the United States*. Accessed January 2022. <https://www.epa.gov/wotus/rapanos-v-united-states-carabell-v-united-states>.

EPA. 2022. *Overview of Clean Water Act Section 404— Section 404 of the Clean Water Act*. Accessed January 2022. <https://www.epa.gov/cwa-401/overview-cwa-section-401-certification>.

Estep Environmental Consulting. 2013. *Swainson's Hawk and Other Raptor Foraging Use of Solar Array Fields with an Agricultural Landscape in Sacramento County*. Prepared for Dudek on behalf of Sloughhouse Solar, LLC. Sacramento, California. October 13, 2013.

Estep Environmental Consulting. 2021. *Swainson's Hawk and Other Raptor Foraging Use of Solar Array Fields with an Agricultural Landscape in Sacramento County, Year 2*. Prepared for Recurrent Energy. Sacramento, California. November 2021.

Ewins, P.J., and R.A. Andress. 1995. *The Diet of Bald Eagles, Haliaeetus leucocephalus, Wintering in the Lower Great Lakes Basin, 1987–1995*. *Canadian Field-Naturalist* 109: 418–424.

FEMA (Federal Emergency Management Agency). 2021. *National Flood Hazard Layer Viewer*. Accessed December 2020. <https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>.

Fisher, R.N., and H.B. Shaffer. 1996. *The Decline of Amphibians in California's Great Central Valley*. *Conservation Biology* 10(5): 1387–1397.

FRAP (Fire Resource Assessment Program). 2019. *CalVeg. GIS Data*. State of California. Accessed 2020-2022. <https://frap.fire.ca.gov/mapping/gis-data/>.

Garrett, K., and J. Dunn. 1981. *Golden Eagle, Aquila chrysaetos*. In *Birds of Southern California: Status and Distribution*, 134–135. Los Angeles, California: Los Angeles Audubon Society.

Gervais, J.A., D.K. Rosenberg, and L.A. Comrack. 2008. *Various Species Accounts*. In *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*, edited by W.D. Shuford and T. Gardali, 218–226. Studies

of Western Birds, no. 1. California: Western Field Ornithologists (Camarillo), and California Department of Fish and Game (Sacramento). February 4, 2008. <http://www.dfg.ca.gov/wildlife/nongame/ssc/birds.html>.

Google Earth. 2021. *Google Earth Pro, Version 7.3.2.5776*. Accessed October 2020 – June 2021.

Hansen, G. E. 1988. *Review of the Status of The Giant Garter Snake (Thamnophis couchi gigas) and It's Supporting Habitat During 1986-1987*. Final report for California Department of Fish and Game, Contract C-2060. Unpublished report.

Helm, B.P. 1998. *Biogeography of Eight Large Branchiopods Endemic to California*. In *Ecology, Consecration and Management of Vernal Pool Ecosystems*, 124–139.

Holland, D.C., and R.H. Goodman. 1998. *A Guide to the Amphibians and Reptiles of MCB Camp Pendleton, San Diego County, California*. Prepared for AC/S Environmental Security Resource Management Division MCB Camp Pendleton, California. Contract M00681-94-C-0039.

Jepson eFlora. 2021. *Jepson Flora Project*. Berkeley, California: University of California. Accessed June 2021. <https://ucjeps.berkeley.edu/eflora/>.

Johnsgard, P.A. 1990. "Golden Eagle." In *Hawks, Eagles, and Falcons of North America: Biology and Natural History*, 260–268. Washington, D.C.: Smithsonian Institution Press.

Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. "Golden Eagle." In *The Birds of North America Online*, edited by A. Poole. Ithaca, New York: Cornell Lab of Ornithology. doi: 10.2173/bna.684.

McEwan, D., and T. A. Jackson. 1996. *Steelhead Restoration and Management Plan of California*. Sacramento, California: Inland Fisheries Division, Department of Fish and Game. February 1996.

Moyle, P.B. 2002. *Inland Fishes of California: Revised and Expanded*. University of California Press.

NOAA (National Ocean and Atmospheric Administration). 2014. *Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead*. NOAA, West Coast Region. July 2014. Accessed June 2021. [https://media.fisheries.noaa.gov/dam-migration/central\\_valley\\_salmonids\\_recovery\\_plan-accessible.pdf](https://media.fisheries.noaa.gov/dam-migration/central_valley_salmonids_recovery_plan-accessible.pdf).

NOAA. 2022. *Essential Fish Habitat—Data Inventory. West Coast GIS Data for Essential Fish Habitat (EFH)*. NOAA Fisheries. Accessed July 2022. <https://www.habitat.noaa.gov/application/efhinventory/index.html>.

Orloff, S. 2007. *Migratory Movements of California Tiger Salamander in Upland Habitat – A Five-Year Study (Pittsburg, California)*. Ibis Environmental, Inc., prepared for Bailey Estates LLC, May 2007.

Orloff, S. 2011. "Movement Patterns and Migration Distances in An Upland Population of California Tiger Salamander (*Ambystoma Californiense*).” *Herpetological Conservation and Biology* 6(2): 266–276.

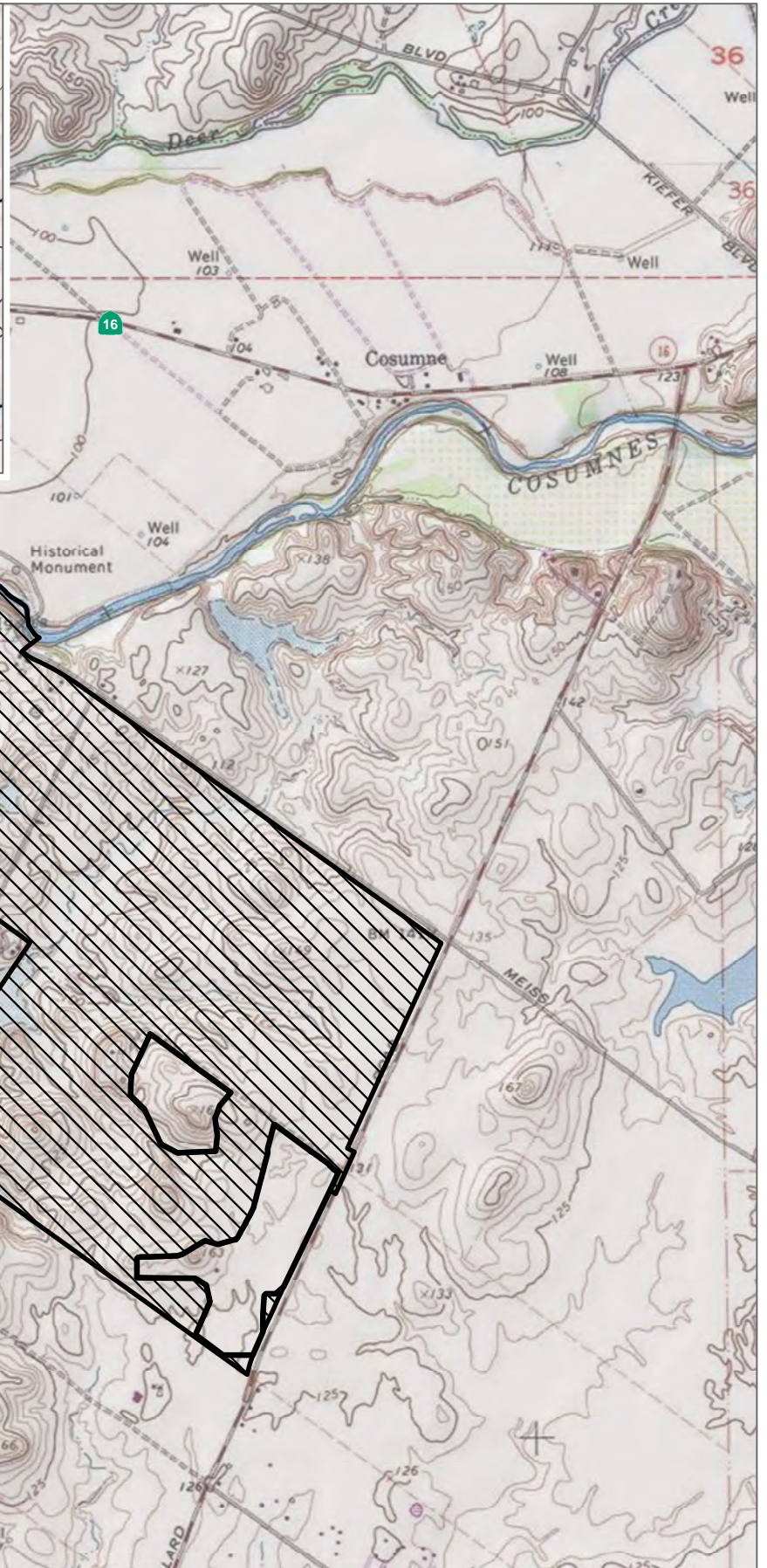
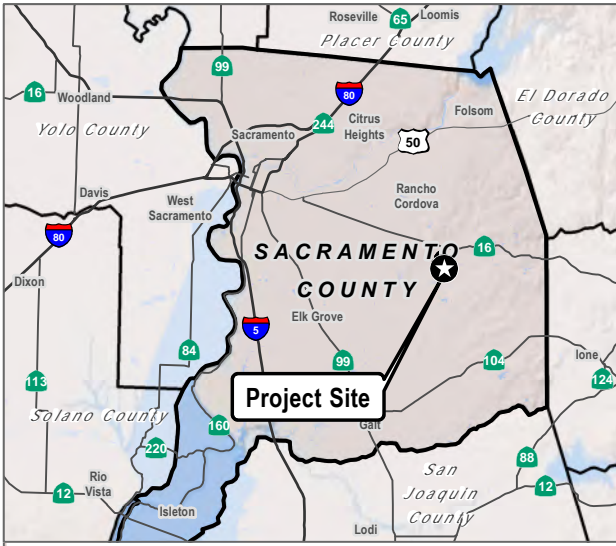
- Poulin, R. G., L.D. Todd, E.A. Haug, B.A. Millsap, and M.S. Martell. 2011. *The Burrowing Owl (Speotyto cunicularia)*. In the Birds of North America Online, edited by A. Poole. Ithaca, New York: Cornell Lab of Ornithology. Accessed December 2020. [https://www.allaboutbirds.org/guide/Burrowing\\_Owl/](https://www.allaboutbirds.org/guide/Burrowing_Owl/).
- Sacramento County. 2017. *Sacramento General Plan of 2005-2030*. Conservation Element. Office of Planning and Environmental Review. Adopted December 15, 1993 Amended November 9, 2011 Amended December 13, 2016 Amended September 26, 2017. Accessed June 2021. <https://planning.saccounty.net/LandUseRegulationDocuments/Documents/General-Plan/Conservation%20Element%20-%20Amended%2009-26-17.pdf>.
- Sacramento County. 2018. *Final South Sacramento Habitat Conservation Plan*. County of Sacramento, City of Rancho Cordova, City of Galt, Sacramento County Water Agency, Sacramento Regional County Sanitation District, and the Southeast Connector Joint Powers Authority. January 2018. Sacramento, California. Accessed June 2021. <https://www.southsachcp.com/sshcp-chapters--final.html>.
- Sacramento County. 2021. Chapter 19.12. *Tree Preservation and Protection*. Sacramento County Code. Accessed June 2021. [http://qcode.us/codes/sacramentocounty/view.php?topic=19-19\\_12&frames=on](http://qcode.us/codes/sacramentocounty/view.php?topic=19-19_12&frames=on).
- Scott, T.A. 1985. *Human Impacts on the Golden Eagle Population of San Diego County from 1928 to 1981*. November 21, 1985.
- Searcy, C.A., and H.B. Shaffer. 2011. "Determining the Migration Distance of a Vagile Vernal Pool Specialist: How Much Land Is Required for Conservation of California Tiger Salamanders?" In *Research and Recovery in Vernal Pool Landscapes*, edited by D.G. Alexander and R.A. Schlising. California State University, Chico.
- SHTAC (Swainson's Hawk Technical Advisory Committee). 2000. *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley*. May 31, 2000. Accessed June 2021. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83990&inline>.
- SSHCP (South Sacramento Habitat Conservation Plan). 2021. *What is the South Sacramento HCP*. Accessed December 2021. <https://www.southsachcp.com/>.
- SSLCC (Sloughhouse Solar, LLC). 2020. *Updated Arborist Report and Tree Inventory, Sloughhouse Solar (AKA Wanlass), Dillard Road at Meiss Road, County of Sacramento Jurisdiction, California*. Prepared by California Tree and Landscape Consulting, Inc. December 31, 2020.
- SSLCC. 2021a. *USFWS 90-Day Dry Season Protocol Survey Letter Report for Federally Listed Branchiopods*. Prepared by Dudek. Sacramento, California. 2021.
- SSLCC. 2021b. *USFWS 90-Day Wet Season Protocol Survey Letter Report for Federally Listed Branchiopods*. Prepared by Dudek. Sacramento, California. 2021.
- SSLCC. 2022. *Final Aquatic Resources Delineation Report for the Sloughhouse Solar Project*. Prep Prepared by Dudek. Sacramento, California: Dudek. May 2021. Updated July 2021.


- Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California*. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.
- Stalmaster, M.V. 1987. *The Bald Eagle*. New York, New York: Universe Books.
- Stebbins, R.C. 1972. "Amphibians and Reptiles of California." In *California Natural History Guides*. No. 31. Berkeley, California: University of California Press.
- Stebbins, R.C. 2003. *Western Reptiles and Amphibians*. 3rd ed. *Peterson Field Guide*. New York, New York: Houghton Mifflin Company.
- Stebbins, R.C., and S.M. McGinnis. 2012. *Field Guide to Amphibians and Reptiles of California (revised edition)*. University of California Press, Berkeley, California.
- SWRCB (State Water Resources Control Water Board). 2019. *Porter-Cologne Water Quality Control Act, Water Code Division 7, and Related Sections (as amended, including Statutes 2018)*. January 2019. Accessed June 2021. [https://www.waterboards.ca.gov/laws\\_regulations/docs/portercologne.pdf](https://www.waterboards.ca.gov/laws_regulations/docs/portercologne.pdf).
- Todd, C.S., L.S. Young, R.B. Owen, and F.J. Gramlich. 1982. "Food Habits of Bald Eagles in Maine." *Journal of Wildlife Management* 46:636–645.
- Trenham, P.C., and H.B. Shaffer. 2005. "Amphibian Upland Habitat Use and Its Consequences for Population Viability." *Ecological Applications* 15:1158–1168.
- Tulare Basin Wildlife Partners. 2021. *Northern Hardpan Vernal Pools*. *Vernal Pools*. Accessed June 2021. <http://www.tularebasinwildlifepartners.org/vernal-pools.html>.
- USACE (U.S. Army Corps of Engineers). 1987. *Corps of Engineers Wetlands Delineation Manual*. Online ed. Environmental Laboratory, Wetlands Research Program Technical Report Y-87-1. Vicksburg, Mississippi: United States Army Engineer Waterways Experiment Station. January 1987.
- USACE. 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. Environmental Laboratory, ERDC/EL TR-08-28. U.S. Army Engineer Research and Development Center. Vicksburg, Mississippi. September 2008.
- USACE. 2008b. *A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the United States*. Cold Regions Research and Engineering Laboratory, ERDC/CRREL TR-08-12. U.S. Army Engineer Research and Development Center. Hanover, New Hampshire. August 2008.
- USDA (U.S. Department of Agriculture). 2021. *Hydric Soils List Criteria*. *Soil use, Hydric Soils*. USDA, Natural Resources Conservation Service. Accessed June 2021. [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/hydric/?cid=nrcs142p2\\_053959](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/hydric/?cid=nrcs142p2_053959).

- USDA. 2022. *Web Soil Survey*. USDA, Natural Resources Conservation Service, Soil Survey Staff. Accessed October 2020. <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.
- USFWS (U.S. Fish and Wildlife Service). 1986. *Pacific Bald Eagle Recovery Plan*. Portland, Oregon: USFWS. Portland, Oregon.
- USFWS 1999. *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. July 9, 1999. Accessed June 17, 2021. [https://www.fws.gov/sacramento/ES/Survey-Protocols-Guidelines/Documents/velb\\_conservation.pdf](https://www.fws.gov/sacramento/ES/Survey-Protocols-Guidelines/Documents/velb_conservation.pdf).
- USFWS. 2000. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants*. January 2000. Accessed June 17, 2021. <https://www.fws.gov/ventura/docs/species/protocols/botanicalinventories.pdf>.
- USFWS. 2002a. *Recovery Plan for the California-Red Legged Frog (Rana aurora draytonii)*. Region1, USFWS. May 28, 2002. Portland, Oregon. Accessed June 2021. <https://www.nps.gov/goga/learn/management/upload/-1493-red-legged-frog-plan.pdf>.
- USFWS. 2002b. *General Rare Plant Survey Guidelines*. Cyper, E. A. Endangered Species Program, California State University Stanislaus. Revised July 2002. Accessed June 2021. [https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/rare\\_plant\\_protocol.pdf](https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/rare_plant_protocol.pdf).
- USFWS. 2003. *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or Negative Findings of California Tiger Salamander*. October 2003. Accessed June 2021. [https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/cts\\_survey\\_protocol.pdf](https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/cts_survey_protocol.pdf).
- USFWS. 2005. *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon*. Region 1, U.S. Fish and Wildlife Service, Portland, Oregon. December 15, 2005. Accessed June 2021. <https://www.fws.gov/sacramento/es/Recovery-Planning/Vernal-Pool/>.
- USFWS. 2009. *Species Account, Sacramento Orcutt Grass, Orcuttia viscida*. Sacramento Fish and Wildlife Office. USFWS. December 21, 2009. Sacramento, California. Accessed June 2021. [https://www.fws.gov/sacramento/es\\_kids/Vernal-Pool-Fairy-Shrimp/Documents/Sacramento\\_Orcutt\\_grass.pdf](https://www.fws.gov/sacramento/es_kids/Vernal-Pool-Fairy-Shrimp/Documents/Sacramento_Orcutt_grass.pdf).
- USFWS. 2015. *Survey Guidelines for Large Listed Branchiopods*. [https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/VernalPoolBranchiopodSurveyGuidelines\\_20150531.pdf](https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/VernalPoolBranchiopodSurveyGuidelines_20150531.pdf).
- USFWS. 2017a. *Recovery Plan for the Giant Garter Snake (Thamnophis gigas)*. U.S. Fish and Wildlife Service, Sacramento, California. Accessed June 2021. [https://www.fws.gov/sacramento/documents/20170928\\_Signed%20Final\\_GGS\\_Recovery\\_Plan.pdf](https://www.fws.gov/sacramento/documents/20170928_Signed%20Final_GGS_Recovery_Plan.pdf).
- USFWS. 2017b. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)*. Accessed June 2021. [https://www.fws.gov/sacramento/documents/VELB\\_Framework.pdf](https://www.fws.gov/sacramento/documents/VELB_Framework.pdf).

- USFWS. 2020a. *USFWS Threatened and Endangered Species Active Critical Habitat Report*. ECOS (Environmental Conservation Online System). Accessed December 2020. <https://ecos.fws.gov/ecp/report/table/critical-habitat.html>.
- USFWS. 2020b. *The National Wetlands Inventory (NWI)*. Accessed December 2020. [fws.gov/wetlands/NWI/index.html](https://fws.gov/wetlands/NWI/index.html).
- USFWS. 2020c. *Sacramento Orcutt grass (Orcuttia viscida)*. ECOS (Environmental Conservation Online System). USFWS. Sacramento Fish and Wildlife Office. Accessed December 2020. <https://ecos.fws.gov/ecp/species/5507>.
- USFWS. 2020d. *Slender Orcutt grass (Orcuttia tenuis)*. ECOS (Environmental Conservation Online System). USFWS. Sacramento Fish and Wildlife Office. Accessed December 2020. <https://ecos.fws.gov/ecp/species/1063>.
- USFWS. 2021a. *Migratory Bird Treaty Act*. USFWS, Migratory Bird Program. Accessed June 2021. <https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php>.
- USFWS. 2021b. *Bald and Golden Eagle Protection Act*. USFWS, Migratory Bird Program. Accessed June 2021. <https://www.fws.gov/birds/policies-and-regulations/laws-legislations/bald-and-golden-eagle-protection-act.php>.
- USFWS. 2022. *Information for Planning and Consultation (IPaC)*. Accessed July 2022. <https://ecos.fws.gov/ipac/>.
- USGS (U.S. Geological Survey). 2021. *National Hydrography Dataset: GIS Online Viewer*. Accessed June 2021. <http://nhd.usgs.gov/>.
- WCB (Wildlife Conservation Fund). 2021. *Oak Woodlands Conservation Program*. Accessed June 2021. <https://wcb.ca.gov/Programs/Oaks>.
- WRCC (Western Regional Climate Center). 2020. *Historical Climate Information: Sacramento, California (047633)*. Accessed December 2020. <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7633>.

INTENTIONALLY LEFT BLANK



 Project Study Area Boundary  
(732.26 acres)

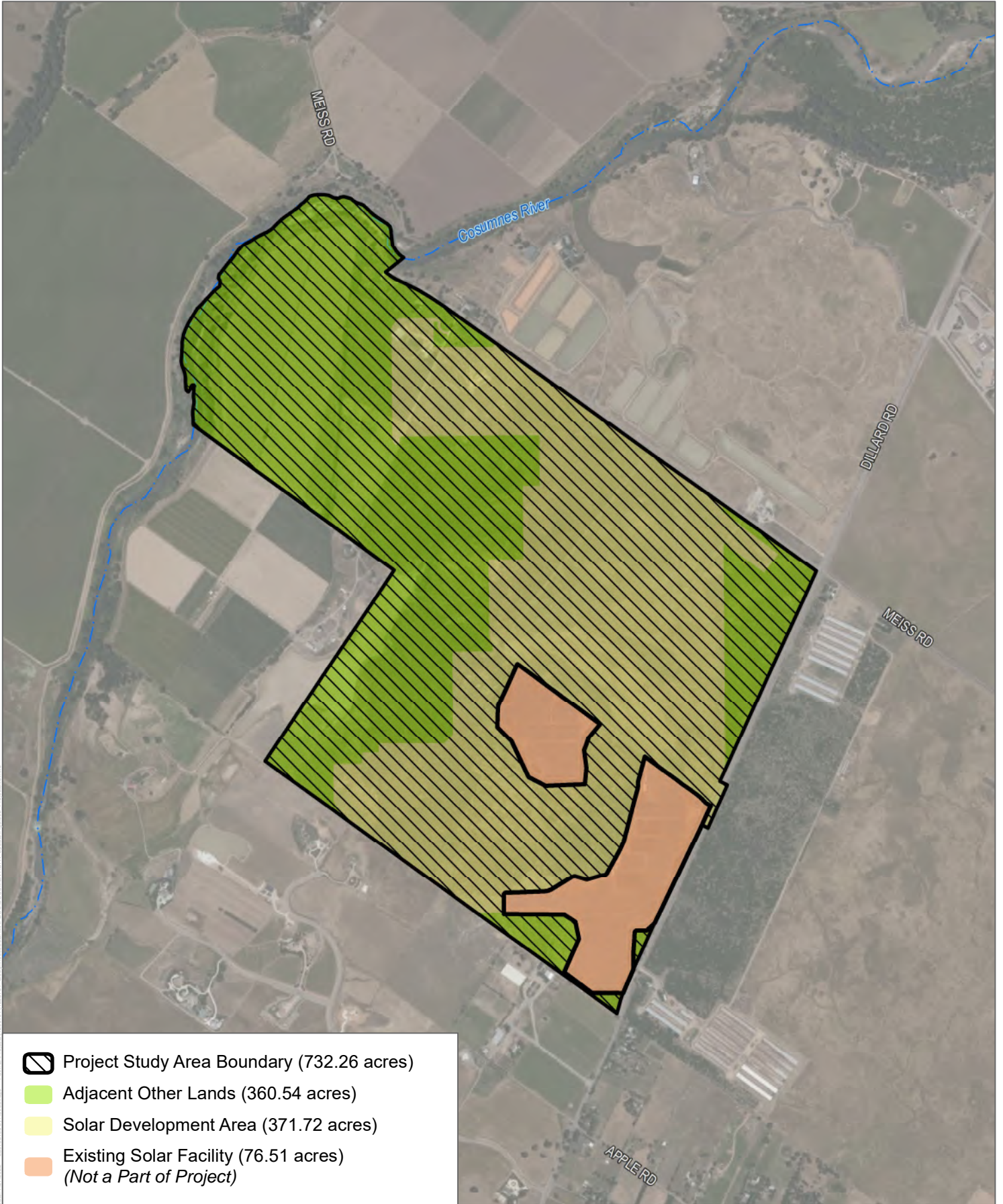
SOURCE: USGS 7.5-Minute Series Sloughouse Quadrangle, Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

**FIGURE 1**

**Project Location**



INTENTIONALLY LEFT BLANK

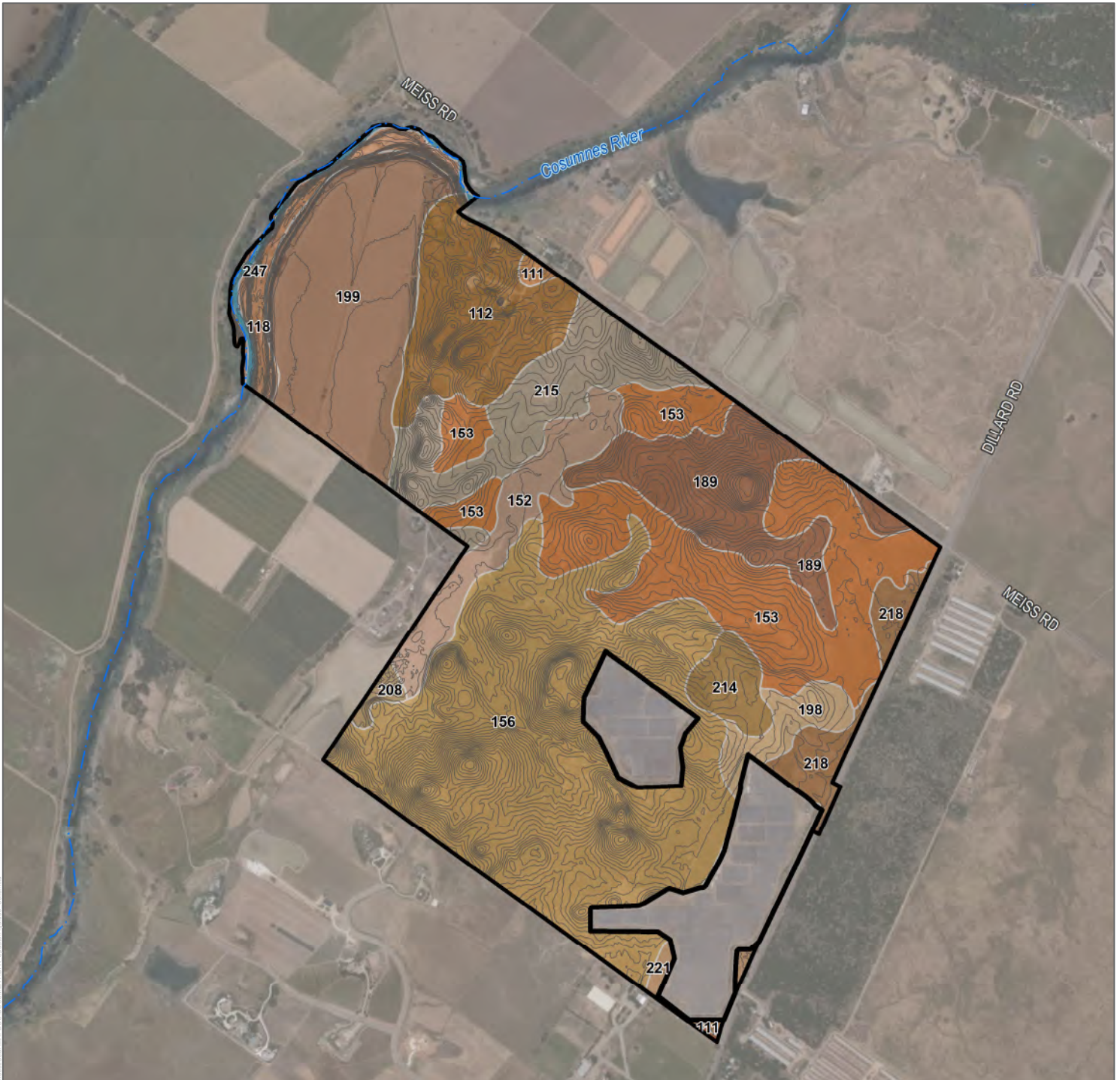


SOURCE: Bing Maps (2020), Sacramento County (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

**FIGURE 2**

**Project Setting**

INTENTIONALLY LEFT BLANK



Project Study Area Boundary (732.26 acres)

NHD Flowline

2-foot Contours

**Soil Classification**

- 111 : Bruella sandy loam, 0 to 2 percent slopes
- 112 : Bruella sandy loam, 2 to 5 percent slopes
- 118 : Columbia sandy loam, drained, 0 to 2 percent slopes, occasionally flooded
- 152 : Galt clay, 0 to 2 percent slopes
- 153 : Galt clay, 2 to 5 percent slopes
- 156 : Hadselville-Pentz complex, 2 to 30 percent slopes
- 189 : Peters clay, 1 to 8 percent slopes

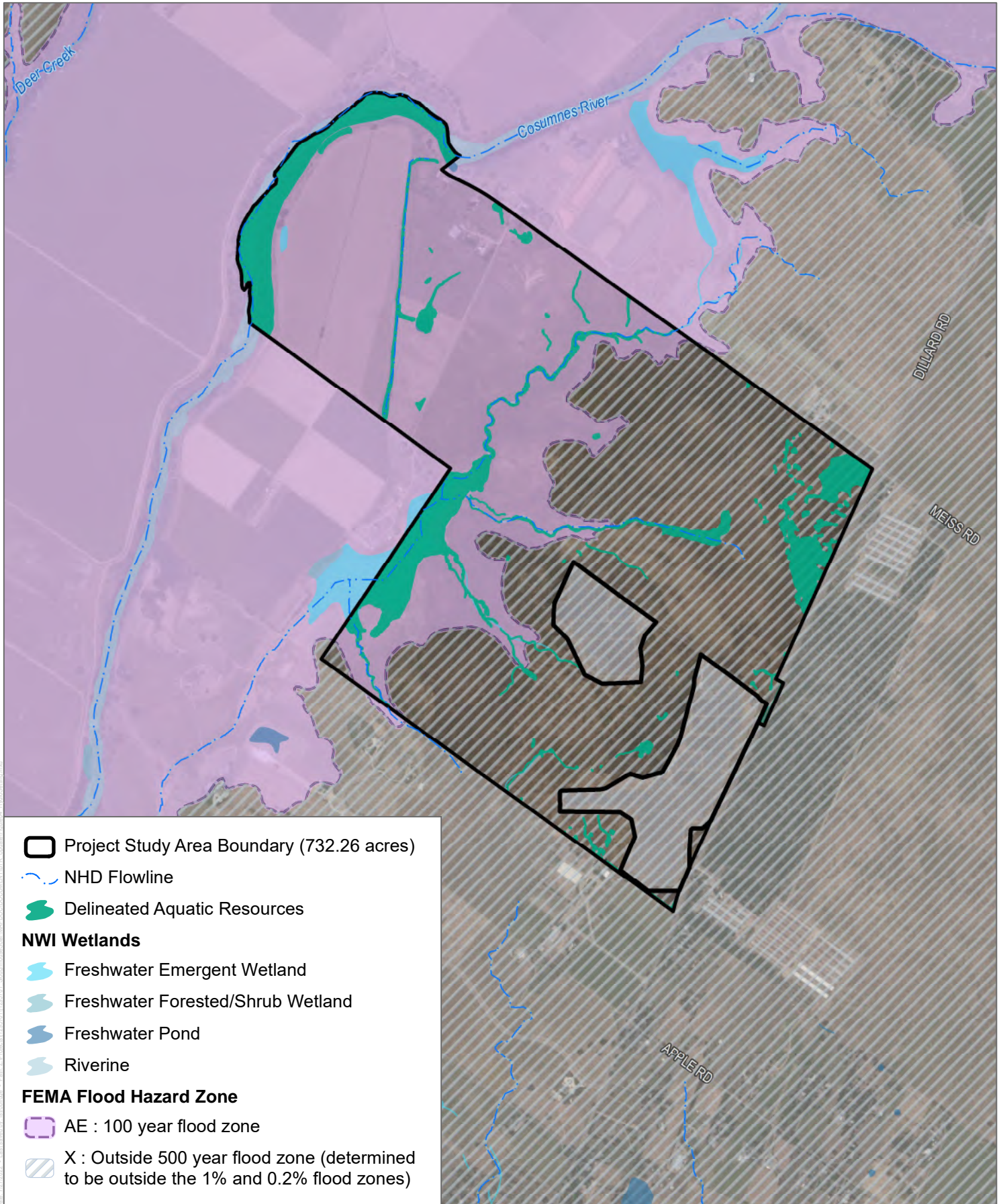
- 198 : Redding gravelly loam, 0 to 8 percent slopes
- 199 : Reiff fine sandy loam, 0 to 2 percent slopes, occasionally flooded
- 208 : Sailboat silt loam, drained, 0 to 2 percent slopes, occasionally flooded
- 214 : San Joaquin silt loam, 0 to 3 percent slopes
- 215 : San Joaquin silt loam, 3 to 8 percent slopes
- 216 : San Joaquin-Durixeralfs complex, 0 to 1 percent slopes
- 217 : San Joaquin-Galt complex, leveled, 0 to 1 percent slopes
- 218 : San Joaquin-Galt complex, 0 to 3 percent slopes
- 221 : San Joaquin-Xerarents complex, leveled, 0 to 1 percent slopes
- 247 : Water

SOURCE: Bing Maps (2020), Sacramento County (2019), USDA 2019, Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

**FIGURE 3**

**Soil and Terrain Setting**

INTENTIONALLY LEFT BLANK

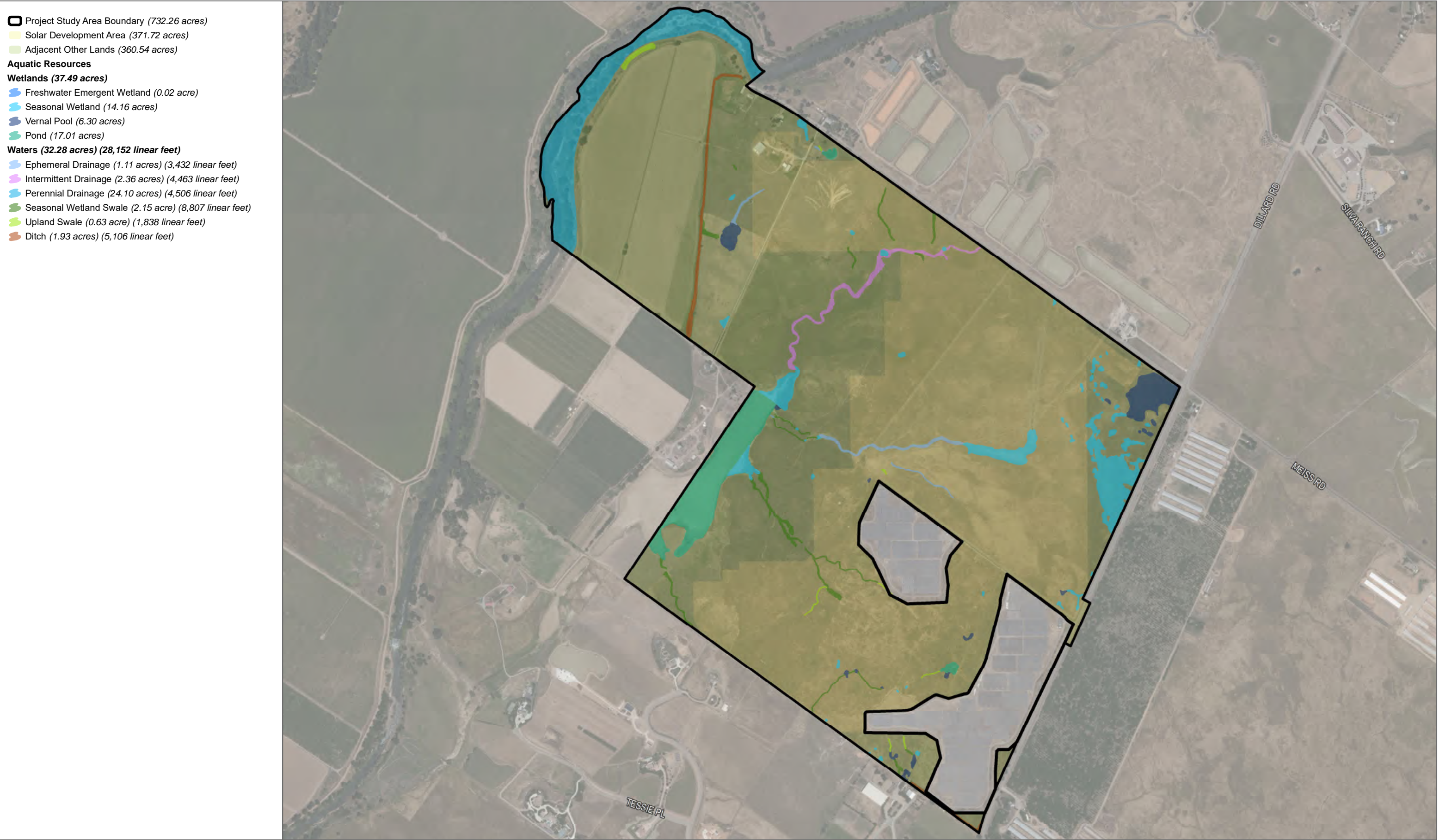


SOURCE: Bing Maps (2020), NHD (2019), Sacramento County (2019), USFWS (2020), FEMA (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

**FIGURE 4**

Hydrologic Setting

INTENTIONALLY LEFT BLANK



- ☐ Project Study Area Boundary (732.26 acres)
- Solar Development Area (371.72 acres)
- Adjacent Other Lands (360.54 acres)
- Aquatic Resources**
- Wetlands (37.49 acres)**
- Freshwater Emergent Wetland (0.02 acre)
- Seasonal Wetland (14.16 acres)
- Vernal Pool (6.30 acres)
- Pond (17.01 acres)
- Waters (32.28 acres) (28,152 linear feet)**
- Ephemeral Drainage (1.11 acres) (3,432 linear feet)
- Intermittent Drainage (2.36 acres) (4,463 linear feet)
- Perennial Drainage (24.10 acres) (4,506 linear feet)
- Seasonal Wetland Swale (2.15 acre) (8,807 linear feet)
- Upland Swale (0.63 acre) (1,838 linear feet)
- Ditch (1.93 acres) (5,106 linear feet)

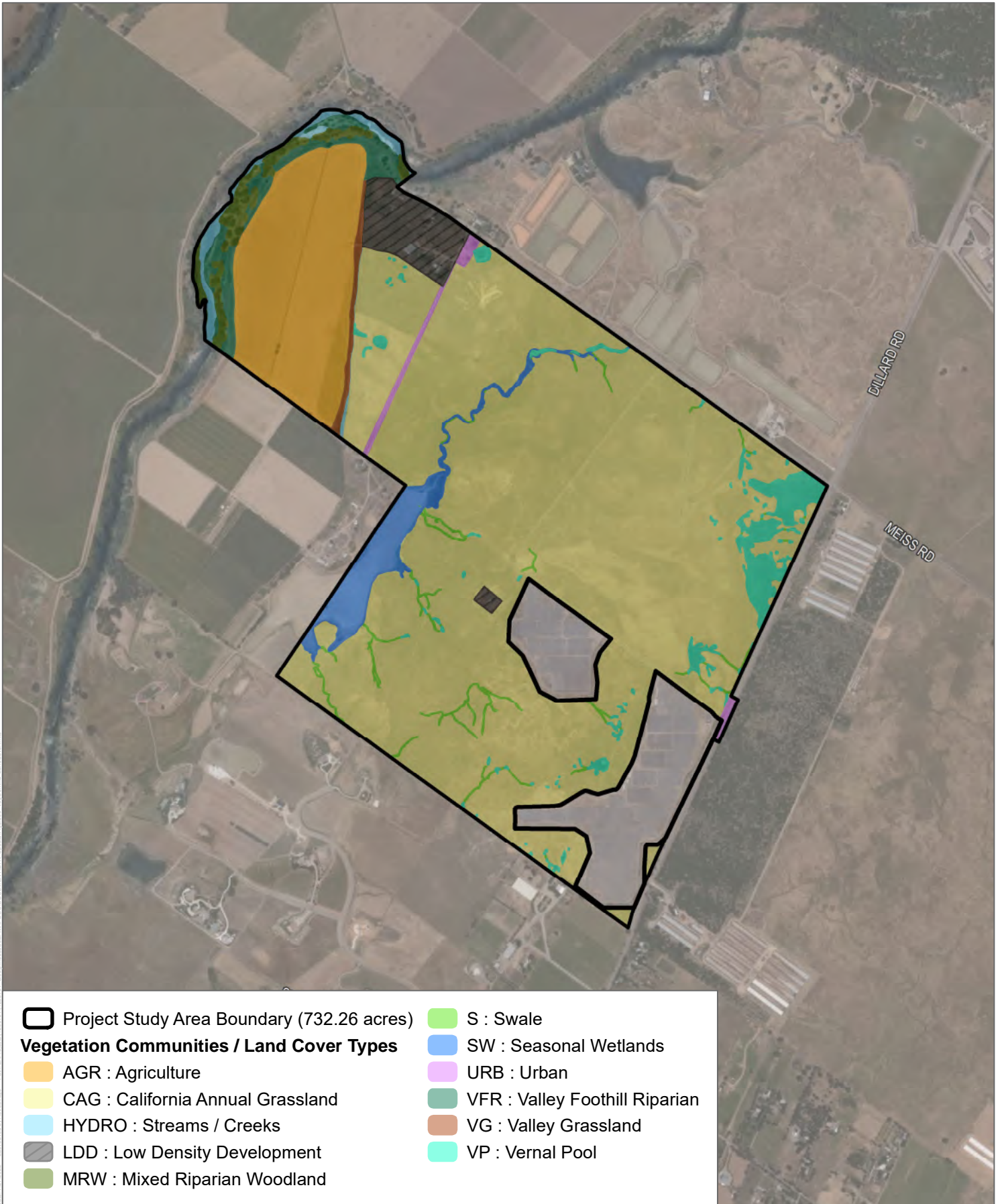
SOURCE: Bing Maps (2020), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)



**FIGURE 5**  
**Aquatic Resources Delineation**  
 Biological Technical Report for the Sloughhouse Solar Project



INTENTIONALLY LEFT BLANK



SOURCE: Bing Maps (2020), Sacramento County (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

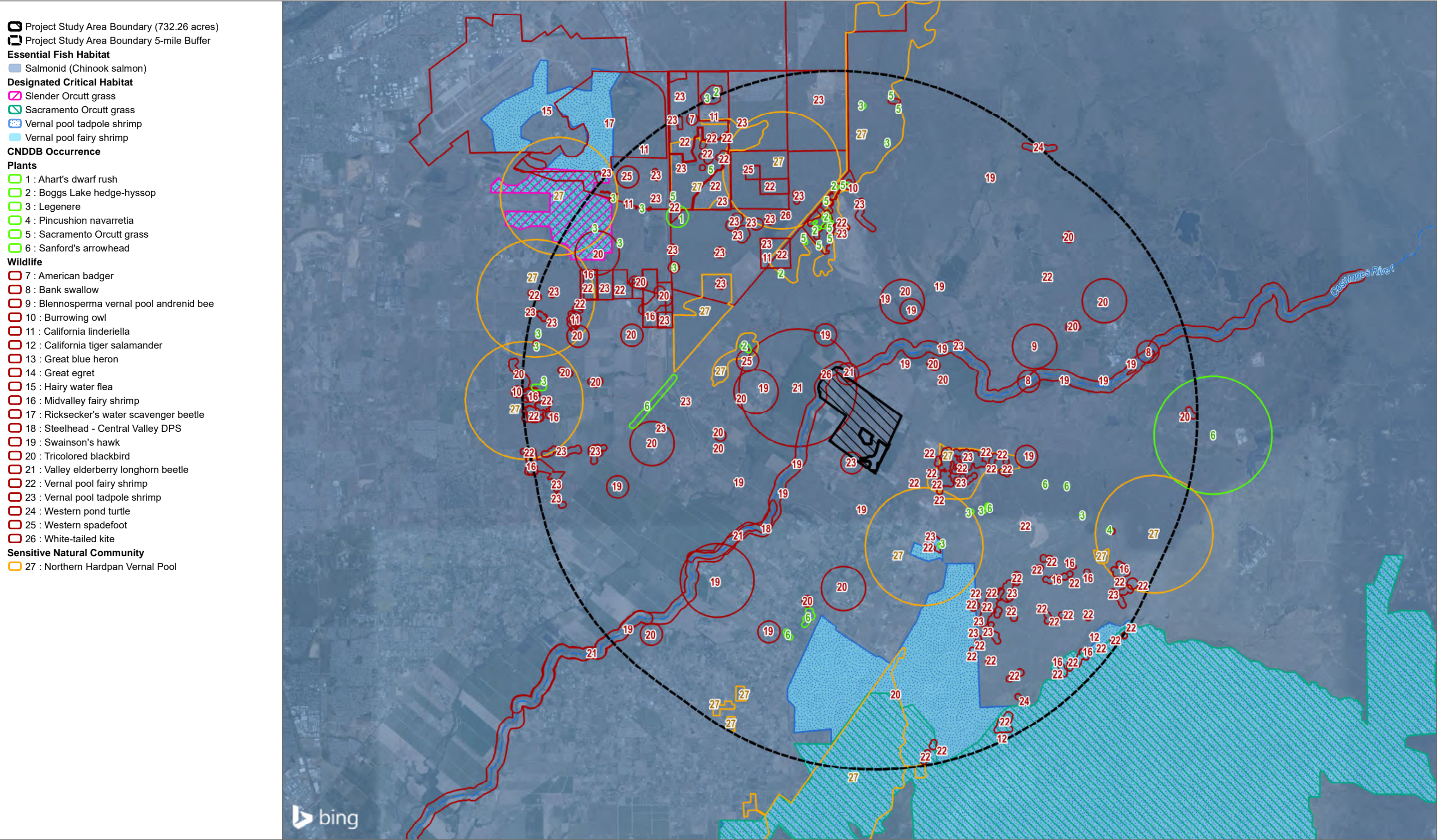
**FIGURE 6**

**Vegetation and Land Cover**

Biological Technical Report for the Sloughouse Solar Project



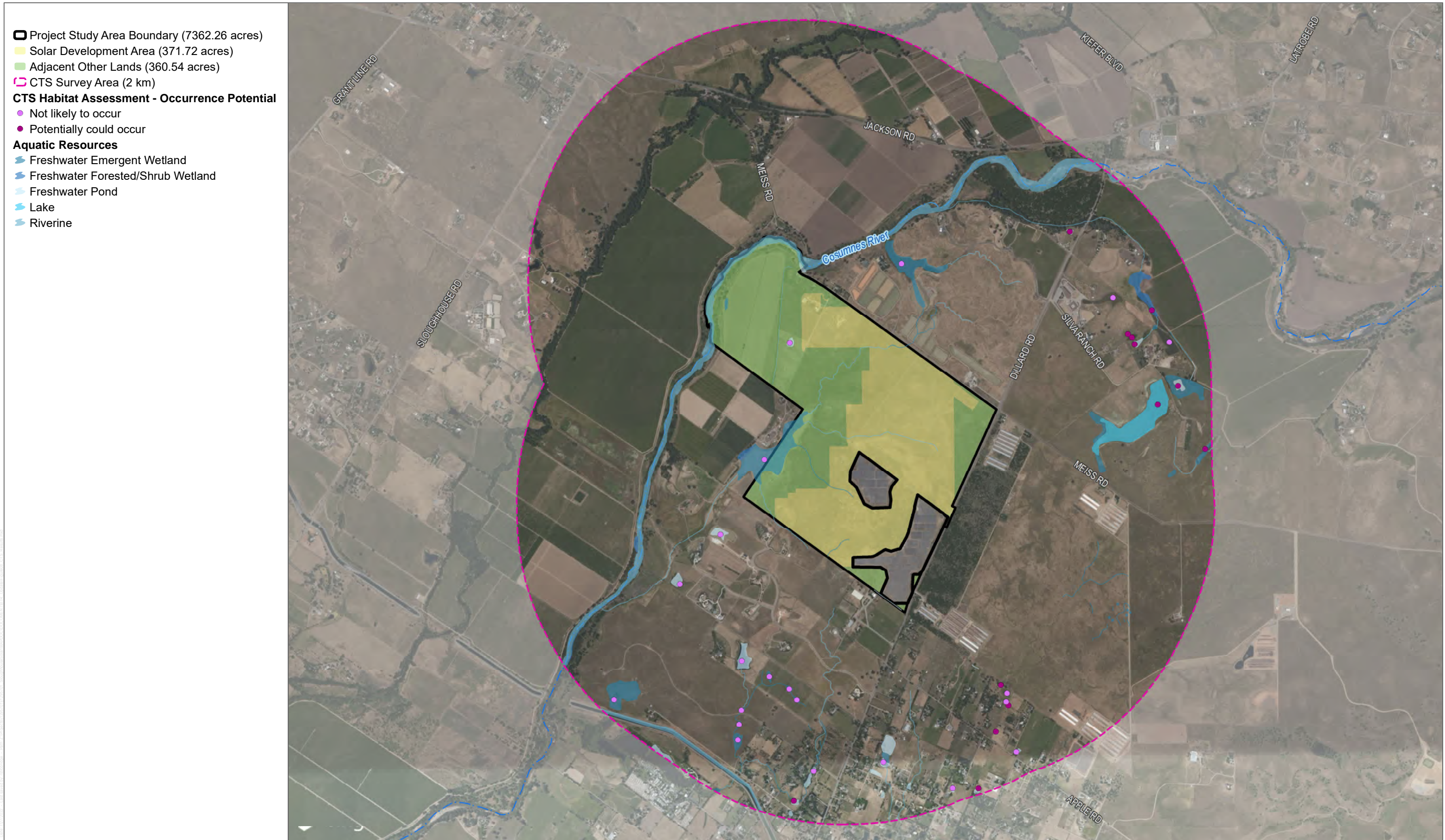
INTENTIONALLY LEFT BLANK



SOURCE: Bing Maps (2020), CDFW (2020), USFWS (2020), NOAA (2021), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

FIGURE 7

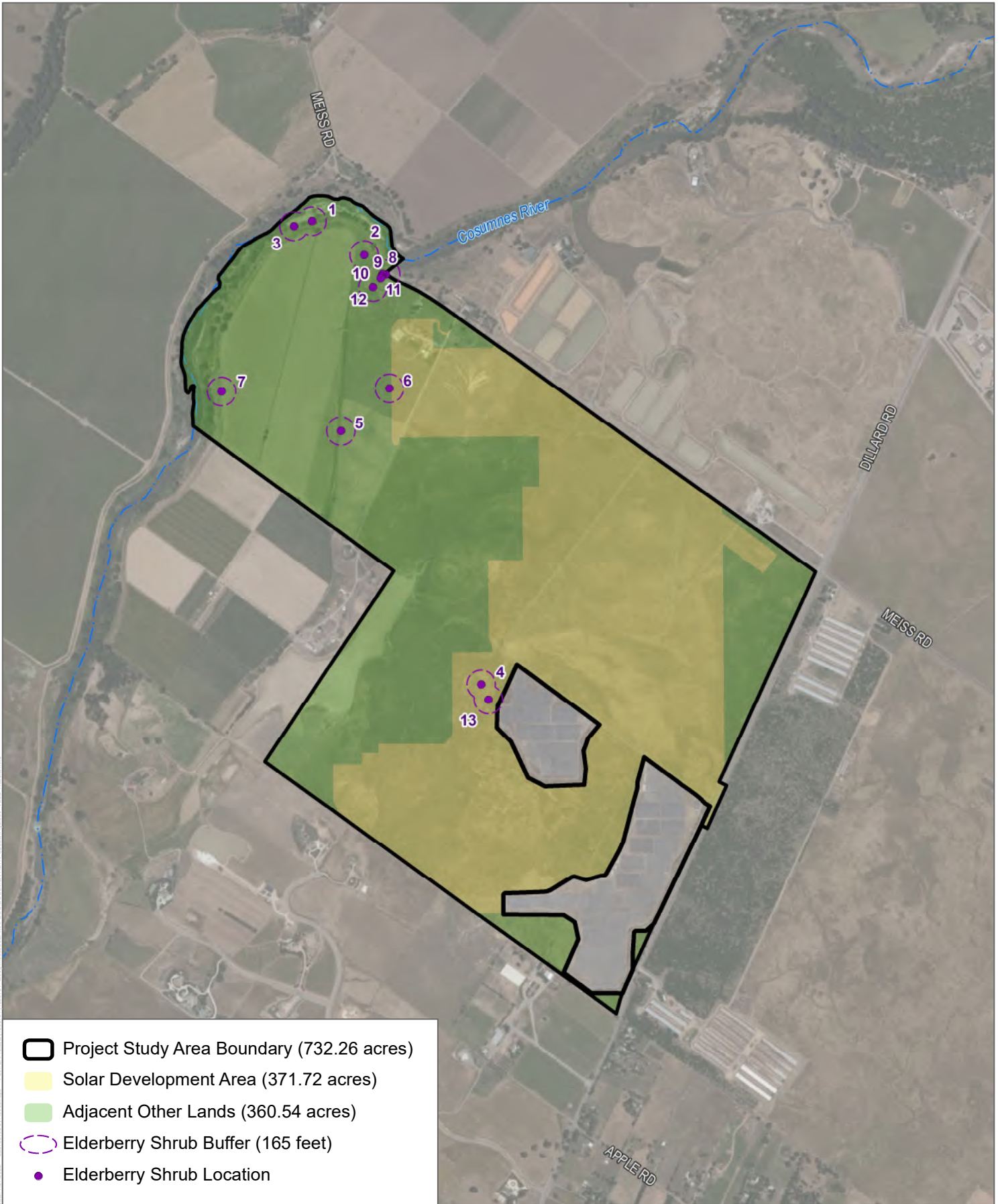
INTENTIONALLY LEFT BLANK



SOURCE: Bing Maps (2020), Sacramento County (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

**FIGURE 8**

INTENTIONALLY LEFT BLANK

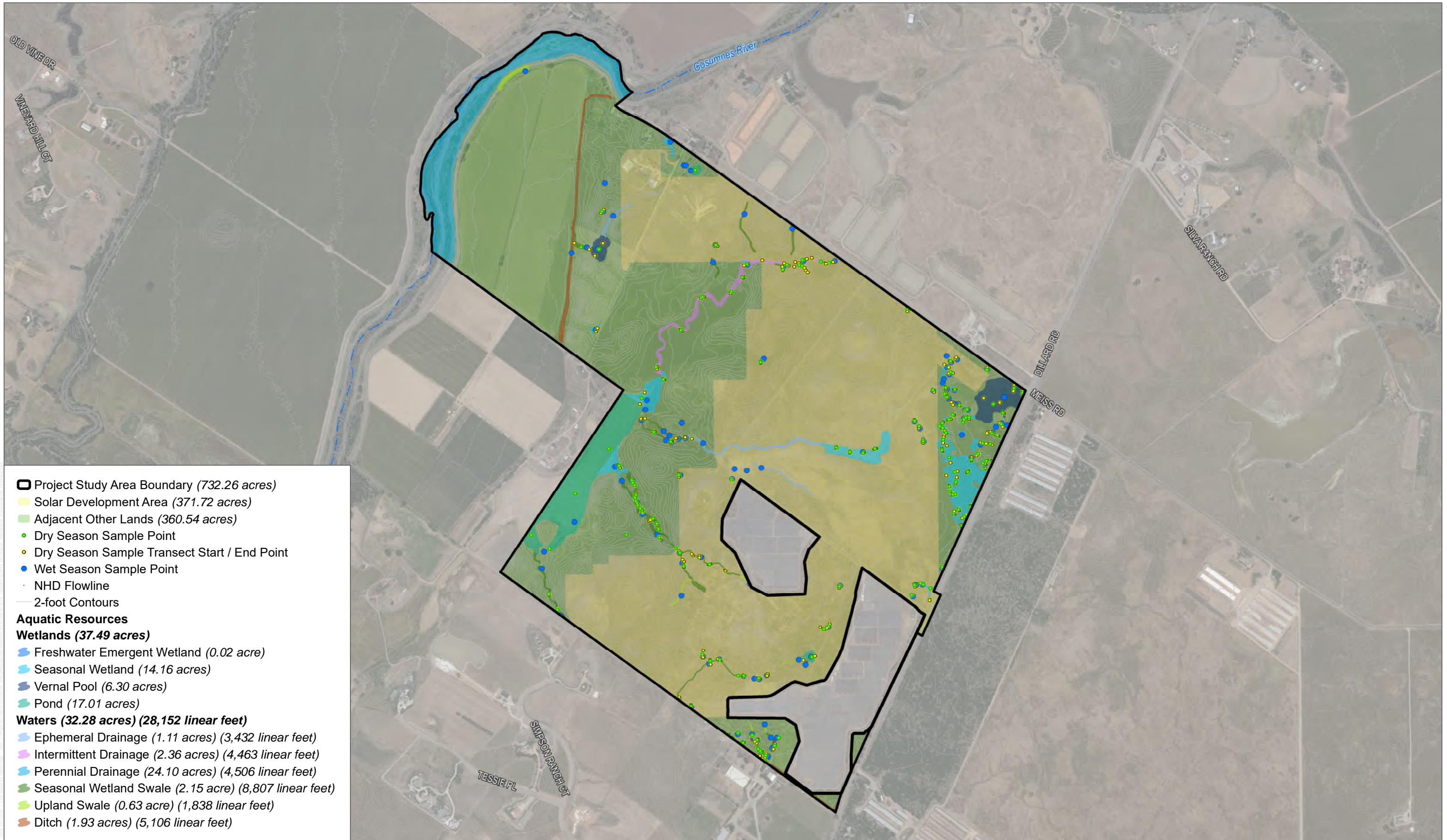


SOURCE: Bing Maps (2020), Sacramento County (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

**FIGURE 9**

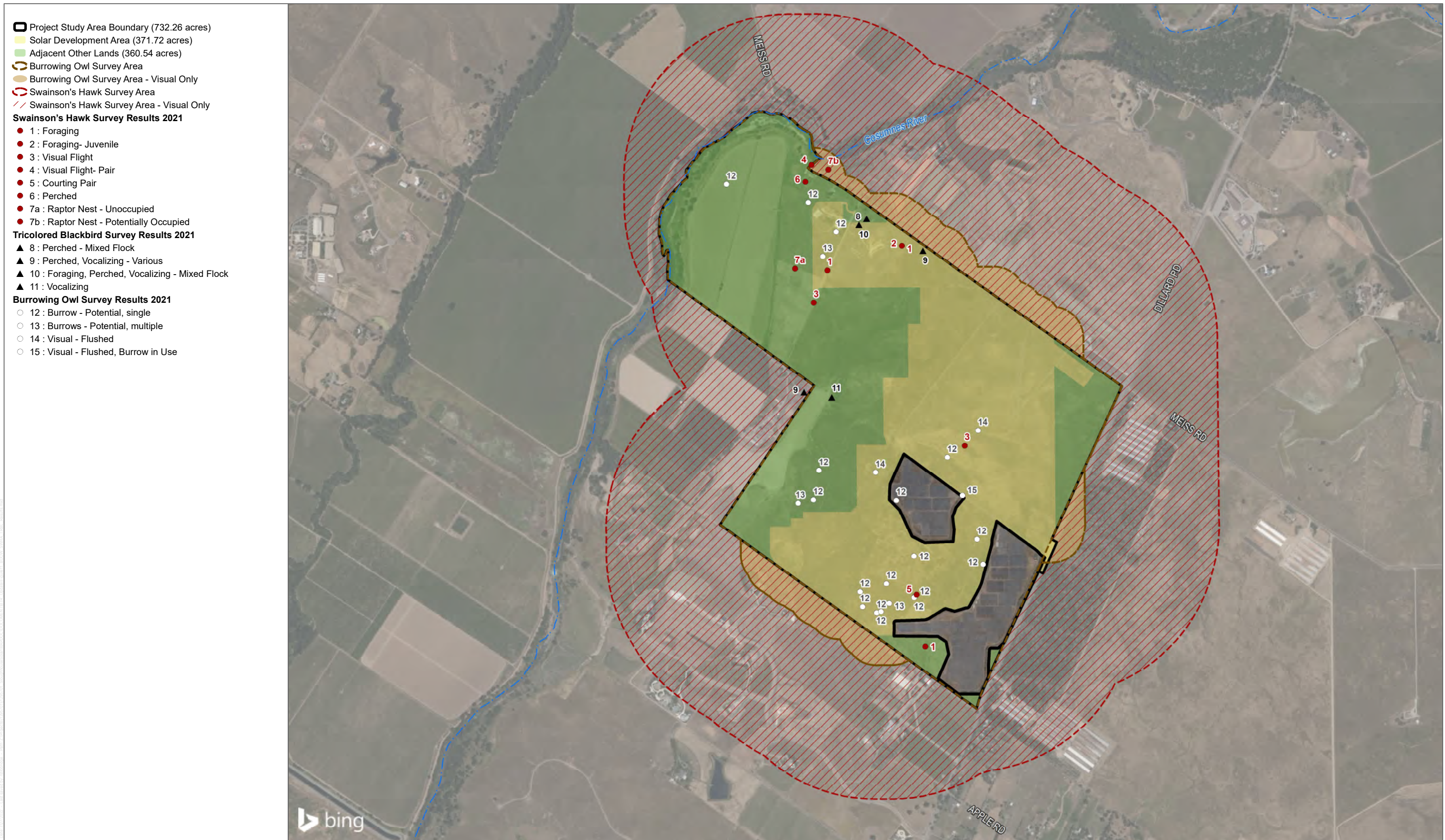


INTENTIONALLY LEFT BLANK



SOURCE: Bing Maps (2020), Sacramento County (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)

INTENTIONALLY LEFT BLANK



SOURCE: Bing Maps (2020), Sacramento County (2019), Environmentally Preferred Alternative Site Plan - DESRI (6/24/2022)



**FIGURE 11**

Burrowing Owl , Swainson's Hawk, and Tricolored Blackbird Survey Results

Biological Technical Report for the Sloughhouse Solar Project

INTENTIONALLY LEFT BLANK

---

## **Appendix A**

Swainson's Hawk and Other Raptor Foraging Use of  
Solar Array Fields within an Agricultural Landscape in  
Sacramento County, Year 2

# Swainson's Hawk and Other Raptor Foraging Use of Solar Array Fields within an Agricultural Landscape in Sacramento County

Year 2

November 2021



*Prepared for:*

**DUDEK**

*Prepared by:*

**ESTEP**



*Environmental  
Consulting*

**Swainson's Hawk and Other Raptor Foraging Use  
of Solar Array Fields within an Agricultural Landscape in  
Sacramento County**

**Year 2**

Prepared for:

Dudek  
853 Lincoln Way, Suite 105  
Auburn, CA 95603  
Contact: Michael Henry  
530.863.4654

Prepared by:

Estep Environmental Consulting  
3202 Spinning Rod Way  
Sacramento, CA 95833  
Contact: Jim Estep  
916.921.2515

November 2021



# Introduction

This report presents data from the second year of a study to evaluate the use of photovoltaic solar energy projects by Swainson's hawks (*Buteo Swainsoni*) and other raptors within an agricultural landscape in the Sacramento Valley.

## Background

Four photovoltaic solar energy projects were constructed in south Sacramento County in 2012. All occur within an agricultural landscape used by foraging raptors, including the state-listed Swainson's hawk. Because of its dependence on agricultural foraging habitats in the Central Valley, loss of suitable agricultural lands to urban development has been considered a potentially significant environmental impact on the Swainson's hawk pursuant to the California Environmental Quality Act (CEQA) (CDFG 1994). Since the early 1990s, impacts considered significant were usually mitigated through a compensatory process of acquisition, management, and preservation of replacement agricultural lands. This process was based initially on guidance provided by the California Department of Fish and Wildlife (CDFG 1994) and later in Sacramento County through an ordinance enacted in 2006 (Sacramento County 2006). Because neither the CDFG guidance nor the county ordinance addressed the relationship between land conversion and the status of the Swainson's hawk breeding population or differentiated between different types of land use conversion, but instead assumed significance pursuant to CEQA based on broadly defined habitat availability/species abundance relationships, the proponents of the four solar projects questioned the reliability of the existing process to require compensatory mitigation relative to the specific conditions of a photovoltaic solar project compared with other types of land conversion, mainly urban development. As a result, through consultation with the county and CDFW, a one-year study was undertaken to assess the use of the photovoltaic solar projects by Swainson's hawks and other raptors.

The initial study was completed in 2013 (Estep 2013) and results were presented to the county and CDFW staff. Despite the evidence of ongoing Swainson's hawk and other raptor use of the solar projects, CDFW determined that the evidence gathered during a single year was insufficient and that the project should remain subject to the earlier guidelines (CDFG 1994) and county ordinance, and with concurrence from Sacramento County, the request to reevaluate the need for and extent of compensatory mitigation was rejected.

In 2018, the South Sacramento County Habitat Conservation Plan was approved and subsequently became the framework for ongoing mitigation and conservation efforts in Sacramento County, superseding earlier CDFW guidance and the county ordinance to address land conversion impacts to Swainson's hawk related to most development projects. However, solar energy projects were not included in the HCP as covered projects, and thus remain under the purview of independent CEQA review by Sacramento County to determine the significance of the land use conversion and the need for compensatory mitigation.

In 2021, Bona Terra Energy, LLC proposed construction of additional photovoltaic projects in South Sacramento County. Aware of the efforts in 2013 to investigate ongoing use of solar

projects and the resulting unsuccessful negotiations with the county and CDFW, they decided to undertake a second year of study in order to provide additional data to supplement the results from the initial 2013 study. If results were similar to the 2013 study, this additional information would again be presented to the county and CDFW in an effort to reassess the need for and extent of compensatory mitigation. This report summarizes the results of this additional research.

## **Summary of 2013 Results**

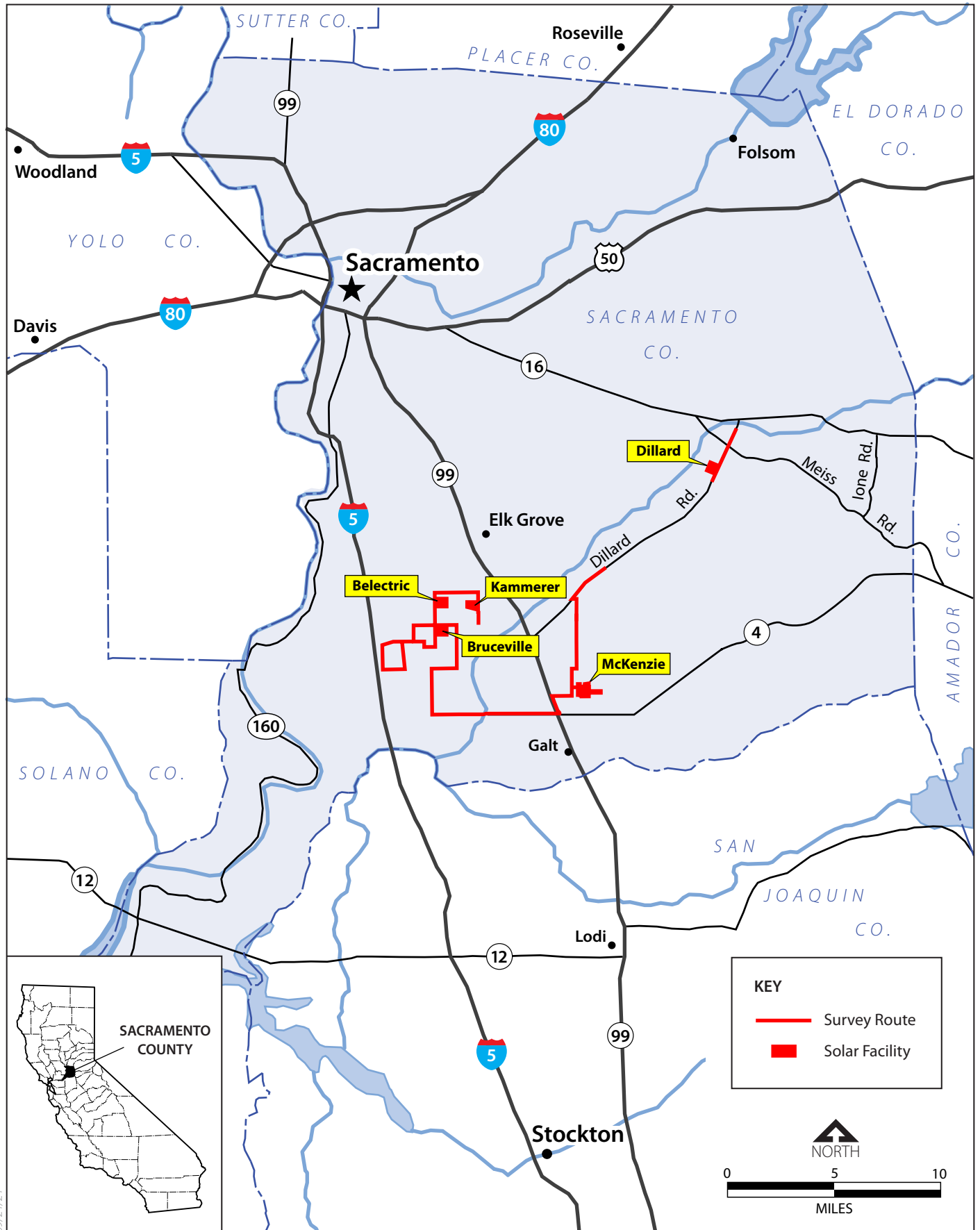
The 2013 study, which is largely repeated in 2021, poses a simple question: Do Swainson's hawks and other raptors use photovoltaic solar arrays for foraging, and if so, within a diverse agricultural landscape, to what extent are they, and other land cover types, used in proportion to their availability? The results documented use by Swainson's hawk, red-tailed hawk (*Buteo jamaiscensis*), American kestrel (*Falco sparverious*), and northern harrier (*Circus hudsonius*), and indicated that Swainson's hawks used solar array fields at a significantly greater frequency than would be expected relative to their availability, suggesting that solar array fields were being selected by foraging Swainson's hawks. This result was also found for American kestrels. The report concluded that integrated within a diverse agricultural landscape, the presence solar array fields of moderate size and that maintain a suitable grassland substrate are unlikely to have a negative affect on Swainson's hawk distribution or abundance.

## **Location**

The four solar projects installed in 2012 (referred to as Bruceville, Kammerer, McKenzie, and Dillard projects) were all used in this study. A fifth solar project (Belectric project), installed earlier, was also included. The study area is located at and in the vicinity of these five projects in South Sacramento County. All are south of the City of Sacramento and east of Interstate 5 (Figure 1). The Kammerer, Bruceville, and Belectric project sites are immediately south of the City of Elk Grove between Interstate 5 and State Route 99. The McKenzie project site is just north of the City of Galt and just east of State Route 99, and the Dillard project is further northeast, just south of State Route 16 (Figure 1).

## **Description of the Solar Projects**

The four solar projects installed in 2012 range in size from approximately 45 acres to 200 acres and consist of an array of photovoltaic solar panels installed in east-west-facing rows. The earlier-installed 140-acre Belectric project is similarly designed with northeast-southwest-facing rows. The panels are connected uniformly in rows along a solar tracker frame that maintains conformity and allows the panels to pivot along a single axis as they track the sun. The trackers are set into the ground using 4-inch galvanized steel poles set in 1-foot concrete pads spaced approximately 10 feet apart along the row. The 8-foot-long solar panels are installed onto the frame with a 2-foot minimum clearance from the ground to panel edge at a 45-degree angle, the maximum tilt angle. The total height of the structure reaches a maximum of approximately 10 feet at full 45-degree tilt. Panel rows are spaced 20 feet apart from pole to pole. With 8-foot-long panels, this leaves 12 feet of open space between each row at horizontal, and slightly larger open space as the trackers angle. The collection systems are underground with the exception of grid tie



**Figure 1**  
**Regional Location of Survey Route and Photovoltaic Solar Facilities**

inverters, which are spaced uniformly throughout each project site. Power is delivered to an onsite solar substation. Each project also includes internal gravel access roads and an 8-foot-high chain link security fence around the perimeter.

A management plan was prepared for each of the sites constructed in 2012, which includes the establishment of grasses throughout the project sites, including beneath and between the trackers and solar panels. The grasses are maintained at a low (4 to 12 inches) height through a sheep grazing program that periodically rotates between the sites as needed. The grass ground cover is designed to encourage the establishment of rodent populations to promote raptor use of the site as well as to provide for rodent refugia to aid in the reestablishment of rodent prey populations on adjacent farmlands following cultivation. The earlier-installed Belectric project also includes a similar grass substrate.

### **Differentiating the Structure and Management of Solar Arrays from Cultivated Habitats**

The extent to which raptors are likely to use solar arrays compared with cultivated fields is largely a function of their design and management as well as the foraging behavior of each species. For example, Swainson's hawks are highly active aerial hunters. Typical foraging behavior is a relatively low (less than 100 meters) circling flight above suitable foraging habitat. They avoid fields with tall or dense vegetation because this condition reduces visibility and access to prey (Bechard 1982, Estep 2009). As a result, at first glance it would seem that a solar array, like a vineyard or orchard, would not provide suitable foraging conditions. Swolgaard et al. (2007) found some use of vineyards by foraging Swainson's hawks, but not to the extent of other crops and land cover types in the surrounding landscape. Still, the Swolgaard et al. (2007) study revealed that Swainson's hawks are not entirely averse to hunting in these conditions.

A typical solar array, however, has greater separation between rows than do most vineyards. For most photovoltaic solar projects, including the five included in this study, at least 60 percent of the area within the solar array remains potentially available at any given time. Most projects also retain open areas between array cells, along access roads, and between the arrays and the perimeter fence. Management of the substrate is also essential to ensure that the project supports available rodent prey for foraging raptors. In order to encourage a sustainable source of small rodent prey, a grass substrate is maintained year-round throughout the project area (Plate 1). Sheep grazing is used to control vegetation height and density, which also encourages accessibility of raptors to rodent prey (Plate 2). Because the grass substrate is maintained, it also functions as a stable source of recolonization of rodent populations into adjacent fields, which may be subject to seasonal fluctuations of rodent populations resulting from the planting/harvesting regime. In some cases, it is also possible to apply the principals of agrivoltaics (Goetzberger and Zastrow, 1982; Dolezal et al. 2021), the practice of agriculture in and around solar PV facilities, by including a mixture of grasses, forbs, and a variety of pollinator plant species. In addition to further encouraging rodent prey populations, this deep-rooted system helps save water, holds and improves the topsoil on-site, and encourages pollinators, which can benefit neighboring crops.



Plate 1. Solar array with grassland substrate.



Plate 2. Sheep grazing the grasslands at the Bruceville solar project site, 2021.

## **Physiography and Land use**

The surrounding land use is entirely agricultural, consisting of a combination of irrigated pasture, dry pasture, and irrigated cropland. Dominant crop types in the area include oat hay, alfalfa, corn, wheat, and vineyards. Agricultural land use has changed since the 2013 study. Orchards, a land cover providing unsuitable foraging habitat for most raptors, have increased substantially, replacing row and grain crops, and potentially reducing overall use of the landscape by foraging raptors. Urbanization from the City of Elk Grove has also expanded southward toward the survey route. Although these dense urban developments were not included within the survey area, their increasingly close proximity likely affects raptor use of the surrounding area and thus may influence occurrences within the survey area.

Rural urban areas also occur throughout the area including farm and ranch residences and related facilities and dairies. The landscape is flat with virtually no topographic relief other than seasonal and perennial drainages, with the exception of the low grassland hills surrounding the Dillard project and to a lesser extent on the open grassland/rangelands of the Cosumnes River Preserve, north of the McKenzie project. Trees occur along riparian corridors, roadsides, and field borders, and around farm and ranch residences. These trees provide nesting habitat for several of the raptor species in the study area including Swainson's hawk, red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), white-tailed kite (*Elanus leucurus*), American kestrel, and great-horned owl (*Bubo virginianus*).

## **Distribution and Foraging Behavior of Nesting Swainson's Hawks and other Raptor Species in South Sacramento County**

Because of its status as a state-threatened species and its association with mitigation and conservation actions in the Central Valley, our target species for this study was the Swainson's hawk. However, all raptor species were recorded during the survey. A brief description of those species known to occur in the vicinity of the study area follows.

The Swainson's hawk is a medium-sized buteo most often characterized by its long, narrow, and tapered wings held in flight in a slight dihedral shape. The body size is somewhat smaller, thinner, and less robust than other buteos, although the wings are at least as long as other buteos. This body and wing shape allow for efficient soaring flight and aerial maneuverability, important for foraging, which Swainson's hawks do primarily from the wing, and during courtship and inter-specific territorial interactions (Plate 3). The species nests in trees along riparian corridors, field edges, roadsides, isolated trees, and around rural homesites; and forages in compatible cultivated landscapes and grasslands.



*Plate 3. Adult Swainson's hawk showing the long, tapered wings that allow for efficient soaring and flight maneuverability.*

The Swainson's hawk occurs throughout the undeveloped portions of Sacramento County. Surveys have been conducted throughout Sacramento County for several decades resulting in a substantial number of breeding records (California Natural Diversity Data Base 2021, Estep 2007, 2009a, 2012). Surveys conducted in 2006 reported a total of 188 active breeding sites in Sacramento County south of Jackson Highway (State Route 16) (Estep 2007). More recent surveys (Estep 2009a, 2012) reported additional active breeding sites within and south of the City of Elk Grove. Additional nesting sites are reported in eBird, a publicly-accessed online repository of bird occurrence data. Several additional nest sites were also reported during road transect surveys conducted for this study, one of which is located within the substation of the Kammerer solar project site (Plates 4 and 5).



Plate 4. Swainson's hawk nest in the Kammerer substation, 2021.



Plate 5. Swainson's hawk nest at Kammerer solar site, 2021.

Figure 2 illustrates the locations of reported Swainson's hawk nests in South Sacramento County in the vicinity of the solar project sites. The highest nesting density was found in the interior of the county where the land use is predominantly irrigated cropland and irrigated pastureland.

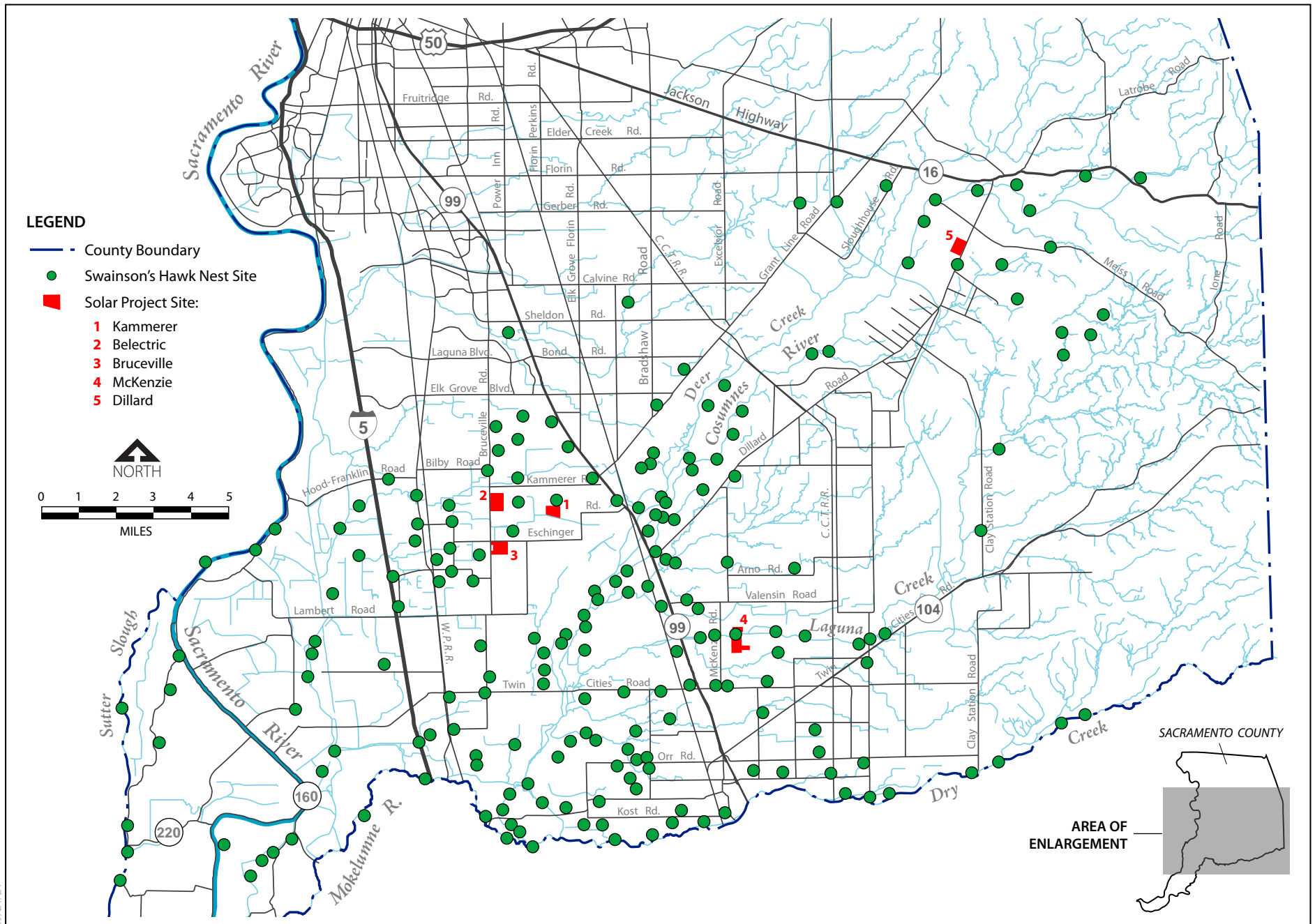
In the Central Valley, the distribution of the red-tailed hawk is similar to the Swainson's hawk. There is substantial overlap in the habitat associations of the two species. Similar in size, but more robust in body than the Swainson's hawk, red-tailed hawks are somewhat less-active hunters, often hunting from perches. Distribution in the vicinity of the study area is similar to the Swainson's hawk, and although red-tailed hawks are more common range-wide, they are less abundant than Swainson's hawks in the irrigated agricultural landscape of the Central Valley (Estep 2007, 2008, 2012, 2020, Estep and Dinsdale 2012).

Red-shouldered hawks are distributed throughout the Central Valley, and are found primarily in riparian and other woodland habitats. As a result, their distribution is less uniform across the landscape compared with Swainson's hawk and red-tailed hawk, and although underreported, they are also less common. Red-shouldered hawks forage primarily in woodlands and along woodland edges, but will opportunistically hunt in open agricultural and grassland habitats.

White-tailed kites also occur throughout the Central Valley, using similar nesting and foraging habitats as Swainson's hawk and red-tailed hawk. However, they are substantially less common and more specialized in their use of foraging habitats and their hunting behavior, particularly their use of kiting or hovering technique while searching for rodent prey.

American kestrel is also distributed throughout the Central Valley, and although populations fluctuate, the species is relatively common and ubiquitous in agricultural landscapes. Kestrels also nest in similar riparian and other woodland habitats, in tree rows, or in small woodlots or in





09/21/21  
SOURCE: Estep 2021.

**Figure 2**  
**Swanson's Hawk Distribution in the Vicinity of the Solar Project Sites**

trees surrounding rural farm houses. They typically hunt from a perch – often seen along utility line corridors – or using a hovering technique similar to white-tailed kite.

Northern harrier is a ground-nesting raptor also commonly observed in agricultural and grassland landscapes in the Central Valley that uses a low-elevation coursing flight technique while hunting for small rodents. Great-horned owl, with a similar Central Valley distribution, nests in riparian and other woodland habitats and hunts, usually from a perch, in cultivated fields and grasslands. Burrowing owl, also a ground-nesting species, occurs primarily in open grassland habitats but is also occasionally found in cultivated landscapes. Cooper's hawk (*Accipiter cooperii*) is uncommonly found in riparian and other woodland habitats in the Central Valley where it uses a meandering flight pattern under the canopy to surprise prey. However, like all raptors in the altered landscape of the Central Valley, they will opportunistically hunt in open cultivated or grassland habitats.

## **Purpose**

This study was designed to meet the following objectives (1) examine how and the extent to which Swainson's hawks and other raptors forage on or otherwise use the solar facilities; and (2) evaluate raptor use of solar facilities and other available land cover types relative to their availability on the landscape. Through this investigation, the purpose was to provide a general estimation of the use of the solar project facilities compared to other available land cover types and to provide data that can be used to assess the potential for changes in the distribution and abundance of Swainson's hawks resulting from the presence of moderately-sized solar facilities within an otherwise diverse, expansive, and dynamic agricultural landscape.

## **Methods**

### **Strip Transect Road Surveys**

The strip transect road survey method (Fuller and Mosher 1987) was used to evaluate relative foraging use of different land cover types, including the solar arrays. The transect route included the same 26-mile route used during the 2013 study, but included an additional 14 miles for a total route distance of approximately 40 miles. The survey route was selected based on the following:

- Incorporating the five solar facilities into the design
- Road/vehicle accessibility
- Visibility
- Road safety
- Diversity of land cover types

The survey area extended 600 feet from each side of the road for a total width of 1,200 feet. Initially, all land cover types were mapped and classified along the survey route. To conduct the survey, the surveyor slowly drove at a consistent pace between 10 and 15 mph, stopping as needed to identify and record raptors and raptor behavior. Recorded behaviors included:

- Circling below 100 meters
- Soaring below 200 meters
- Flying through the survey area below 200 meters
- Kiting/Hovering
- Perching (adjacent poles/trees/fences)
- Standing on ground
- Prey capture attempt
- Prey capture successful
- Prey capture unsuccessful
- Aerial foraging

The surveyor recorded data as raptors were observed within the 1,200-foot-wide transect survey area. Land cover type and status, including vegetation height, and farming activity were recorded for each occurrence. Start times were variable in order to account for differences in foraging use patterns. Using this method, a reliable statistical analysis can be performed that measures habitat use as a proportion of availability. In other words, it determines whether a habitat type is used more or less than expected relative to its availability. In this way we can evaluate the relative use of all cover types in the survey area, including the solar array fields.

A survey form along with an accompanying data code sheet and field maps with the route and land cover types illustrated were used to record observational and related data while in the field. Surveys were conducted during daylight hours and were not conducted during severe weather events such as heavy rainfall, winds greater than 20 mph or foggy conditions. Surveys were conducted twice weekly by the same surveyor between April 19 and August 31, 2021 for a total of 39 surveys.

**Habitat Mapping.** Land cover types were mapped and characterized in the field along the survey route on 7.5-minute USGS quadrangle maps. Current 2021 land use was documented in the field according to the land cover type categories listed below.

- Oats
- Alfalfa
- Dry Pasture
- Irrigated pasture
- Ruderal/Developed
- Vineyard
- Orchard
- Grassland
- Corn
- Tilled
- Solar Array field
- Idle/Fallow
- Riparian/Wetland
- Wheat

Field boundaries were recorded, confirmed, or adjusted as needed on USGS base maps. Tilled was included separately because some fields were tilled and unplanted for approximately one-half of the survey period before being planted. Rural residences and their surrounding footprint (e.g., barns, out buildings, yards, and equipment storage areas), adjacent ruderal areas, and other agricultural facilities, mainly dairies, were combined into a single category – Ruderal/Developed. Following the initial field mapping of habitat/land use categories, the data were then re-mapped using aerial photos to confirm field boundaries.

These maps were then converted to graphic maps using Adobe Illustrator. Habitat/land use cover type acreages were calculated from the graphic maps using a plug-in filter from Telegraphics Inc. While this process provided a reasonably accurate representation of land cover types along the survey route, it did not exclude interior farm roads and other edge features. As a result, the acreage totals may exceed the actual acreage for some types. However, this was considered to have a negligible effect on the total calculations or the relative abundance of the various types.

Several crop type rotations occurred during the survey including wheat, oats, and tilled fields rotating to corn. These rotations or conversions occurred at approximately the mid-point of the survey. To account for these changes and to satisfy the assumption that habitat availability is constant throughout the study (Manly et al. 2002), we used the same approach as Swolgaard et al. (2008) by tallying the areas of all fields that changed crops midseason, dividing the values in half, and assigning those values to each habitat.

**Analysis.** Documented raptor occurrences and acreages of land cover types were compiled and proportions of land cover types and occurrences within each land cover type calculated. As in the 2013 study, of the nine species documented during the survey, only Swainson's hawk, red-tailed hawk, and American kestrel had sufficient occurrences to be included in the statistical analysis. The null hypothesis stated that Swainson's hawks and other raptor species used each habitat for foraging in proportion to its availability in the survey area. Therefore, only behaviors that represented foraging were included in the analysis. To ensure consistency with the 2013 results, foraging behaviors for Swainson's hawk included circling below 100 meters, the typical foraging behavior of Swainson's hawks, kiting/hovering, and prey capture attempts. Perching behavior was initially excluded because the species does not typically hunt from a perch. However, in 2021, additional calculations were run that included perching as a foraging behavior to account for observed behavioral changes in Swainson's hawk use of solar array fields since 2013. Perching was included as a foraging behavior for red-tailed hawk and American kestrel, species that often hunt from perches.

Hypothesis testing for selection of foraging habitat consisted of a chi-square test for goodness of fit, followed by chi-square testing of individual types to determine if use was disproportionate to availability and whether it was positively or negatively correlated. While this approach may be regarded as very conservative compared with other more robust statistical tests used in habitat use/availability studies, it was considered appropriate to address the rather narrow objectives (use of solar array fields) of this study.

## Stationary Observation Point Surveys

In addition to the strip transect road surveys, surveys were also conducted from stationary observation points around the perimeter of four of the five solar arrays (not including the Belectric project). The purpose of these surveys was to document additional use of the solar fields by all raptor species and to increase the opportunity to record prey captures or prey capture attempts, which are generally less frequently observed during road transect surveys. Stationary observation point surveys were conducted at the four solar projects once per week in a rotational sequence between April 22 and August 25 for a total of 19 separate four-hour observation periods totaling 76 hours of observation.

## Results and Discussion

### Land Cover Types within the Survey Area

Table 1 presents the types and corresponding acreages of land cover within the survey area. Figures 3a through 3h illustrate the distribution of these types along the survey route. The land use along the approximately 40-mile route and throughout much of the south Sacramento County area consists of a mixture of grazing lands in the form of both irrigated and non-irrigated pasturelands and cultivated lands. Of the 5,501 acres within the survey area, 79 percent are active agricultural types including irrigated and non-irrigated pasturelands (21.7 percent), seasonally or annually cultivated crops (28.8 percent), semi-perennial hays (12.2 percent), and perennial crops (16.1 percent). The remaining 21 percent of the land cover consists of ruderal/developed (9.7 percent), uncultivated grassland (6.2 percent), riparian (1.4 percent), and solar array fields (3.7 percent). Two primary changes occurred since the 2013 survey: the expansion of orchards – largely at the expense of irrigated pasture acreage, and the increase in grassland, which is due mainly to expanding the survey route through a portion of the Cosumnes River preserve (Table 1).

**Table 1. Land use types and acreages in the survey area, 2021 and 2013.**

| Land Cover Type   | Acres | Percent of Total<br>2021 | Percent of Total<br>2013 |
|-------------------|-------|--------------------------|--------------------------|
| Oats              | 844   | 15.3                     | 19.2                     |
| Alfalfa           | 672   | 12.2                     | 10.6                     |
| Dry Pasture       | 613   | 11.1                     | 7.2                      |
| Irrigated Pasture | 585   | 10.6                     | 23.6                     |
| Ruderal/Developed | 531   | 9.7                      | 10.8                     |
| Vineyard          | 495   | 9.0                      | 6.5                      |
| Orchard           | 393   | 7.1                      | 0                        |
| Grassland         | 340   | 6.2                      | 1.3                      |
| Corn              | 283   | 5.1                      | 4.6                      |
| Tilled            | 235   | 4.3                      | 4.7                      |
| Solar Array Field | 206   | 3.7                      | 6.9                      |
| Idle/Fallow       | 159   | 2.9                      | 0.2                      |
| Riparian/Wetland  | 77    | 1.4                      | 1.1                      |
| Wheat             | 68    | 1.2                      | 3.3                      |
| Total             | 5,501 | 100                      | 100                      |

**Seasonally or Annually Cultivated Crops.** Within the survey area, these include oat hay, corn, and wheat crops, much of which is grown as silage to support local dairy operations. Tilled lands are cultivated lands that are between plantings and were included as a separate type because most of these areas were in a tilled condition for approximately one-half of the survey period before being planted to corn, which is often planted later in the season. These crops have variable suitability as foraging habitat depending on vegetation height and density, which influences prey accessibility (Bechard 1982, Estep 2009). Of the types found in the survey area, oat hay likely provides the highest value due to large rodent prey populations and relatively early harvest, which increases prey accessibility. After cutting, oat fields may continue to provide foraging value if the field is not disked and prepared for the following planting.

**Semi-Perennial Hays.** These are alfalfa hay fields that remain uncultivated for at least 3 consecutive years. During the spring and summer months, alfalfa fields are mowed approximately once per month and may be irrigated as frequently as once per week. This is considered a high value foraging crop type for Swainson's hawk and other raptors because of the lack of seasonal or annual cultivation and because the regular mowing and irrigation operations increase prey accessibility (Estep 2009).

**Irrigated and Non-irrigated Pasturelands.** Irrigated pastures are planted with grasses (e.g., bromes, ryegrass, clovers), irrigated, and grazed by livestock. They may be periodically cultivated and replanted. Non-irrigated, or dry pastures are uncultivated natural grasslands that are grazed by livestock. Both types are used by Swainson's hawks and other foraging raptors but are considered to have only moderate value due to low rodent prey populations compared to some cultivated lands (Estep 1989, 2009).

**Perennial Crops.** Perennial crops include vineyards and orchards. Although some use by Swainson's hawks has been documented (Swolgaard et al 2008), vineyards are generally considered to have low foraging value because as they mature, the vegetation becomes tall and dense and largely precludes foraging access (Estep 1989). Orchards, primarily nut orchards, have expanded throughout the region and in 2021 represent 7.1 percent of the land cover in the survey area, up from 0 percent in 2013. This land cover is considered unsuitable for Swainson's hawk foraging due to the dense canopy and inaccessibility to the ground.

**Urban/Ruderal.** Rural farm and ranch residences and associated out-buildings, dairy facilities, and other farming and ranching facilities occur along the survey route. Ruderal weedy or grassy patches also occur within or adjacent to some of the developed areas. Although these areas provide relatively little foraging value, they often provide perching habitat or nest sites where suitable trees or utility poles occur around their perimeter.

**Uncultivated Grassland and Riparian.** The survey route crosses the flood plain of the Cosumnes River where a small amount of riparian and associated uncultivated grassland were documented. The riparian forest in this area supports high value nesting habitat but would not typically be used for foraging by raptor species documented during the survey with the exception of red-shouldered hawk and Cooper's hawk. The small patches of grassland may be used by foraging raptors, but usually do not support the prey abundance and accessibility compared with open, cultivated lands. The expanded route for 2021 included additional open grassland through

the Cosumnes River Preserve and in the vicinity of the Dillard project at the eastern terminus of the route.

**Solar Array Fields.** A description of the five solar fields is provided in the Introduction section.

## Strip Transect Road Surveys

Data on species occurrence, land cover, and behavior are compiled into the following tables, which provide insight into the use of solar fields compared with other land cover types by each raptor species, and inform the statistical outcome presented in the chi-square value tables from which the relative importance of each land cover can be inferred.

A total of 1,029 raptor occurrences were documented within the survey area. Three of the seven documented species, Swainson’s hawk, red-tailed hawk, and American kestrel comprised 92.4 percent of the total occurrences. Swainson’s hawk comprised 30.4 percent of the total occurrences (Table 2), down from 38.5 percent in 2013, speculatively due to orchard expansion in the region. In 2021, red-tailed hawks were the most commonly documented species in the survey area at 39.8 percent, up from 31.2 percent in 2013.

**Table 2. Species occurrences documented within the survey area, 2021.**

| Species             | Number of Occurrences | Percent of Total |
|---------------------|-----------------------|------------------|
| Red-tailed hawk     | 410                   | 39.8             |
| Swainson’s hawk     | 313                   | 30.4             |
| American kestrel    | 228                   | 22.2             |
| Red-shouldered hawk | 42                    | 4.1              |
| White-tailed kite   | 20                    | 1.9              |
| Osprey              | 5                     | 0.5              |
| Cooper’s Hawk       | 5                     | 0.5              |
| Northern harrier    | 4                     | 0.4              |
| Great-horned Owl    | 2                     | 0.2              |
| Total               | 1,029                 | 100              |

Table 3 shows the number of occurrences by species within each land cover type. Alfalfa was associated with the largest proportion of all raptor occurrences at 23.6 percent, and the largest proportion of occurrences for red-tailed hawk (21.2 percent), Swainson’s hawk (27.2 percent), American kestrel (26.3 percent), and red-shouldered hawk (23.8 percent). Dry pasture, irrigated pasture, solar fields, and oats also supported relatively high overall raptor occurrences, particularly red-tailed hawks, Swainson’s hawks, and American kestrels.

Although solar fields made up only 3.7 percent of the survey area (Table 1), 8.7 percent of all raptor occurrences and 11.2 percent of all Swainson’s hawk occurrences were documented in solar fields. Nearly 13 percent of all American kestrel occurrences and 4.6 percent of all red-tailed hawk occurrences were in solar fields.

**Table 3. Species occurrences documented within each land cover type, 2021.**

| Land Cover Type    | Species |      |      |      |      |      |      |      |      | Total | % of Total |
|--------------------|---------|------|------|------|------|------|------|------|------|-------|------------|
|                    | RTHA    | SWHA | AMKE | RSHA | WTKI | OSPR | NOHA | COHA | GHOW |       |            |
| Alfalfa            | 87      | 85   | 60   | 10   | 1    |      |      |      |      | 243   | 23.6       |
| Dry pasture        | 56      | 34   | 11   | 3    | 1    |      |      |      |      | 105   | 10.2       |
| Irrigated. pasture | 53      | 20   | 15   | 5    |      |      |      |      |      | 93    | 9.0        |
| Solar field        | 19      | 35   | 29   | 4    |      |      |      | 2    | 1    | 90    | 8.7        |
| Oats               | 14      | 33   | 32   |      | 3    |      |      |      | 1    | 83    | 8.1        |
| Vineyard           | 48      | 16   | 7    | 3    |      |      | 2    | 2    |      | 78    | 7.6        |
| Corn               | 24      | 16   | 25   | 2    |      |      |      | 1    |      | 68    | 6.6        |
| Field edge*        | 13      | 15   | 16   | 8    | 6    | 5    |      |      |      | 63    | 6.1        |
| Tilled             | 11      | 25   | 20   | 3    | 1    |      | 1    |      |      | 61    | 5.9        |
| Idle/Fallow        | 27      | 2    | 6    |      | 8    |      |      |      |      | 43    | 4.2        |
| Orchard            | 38      | 4    | 1    |      |      |      |      |      |      | 43    | 4.2        |
| Wheat              | 4       | 16   | 5    |      |      |      |      |      |      | 25    | 2.4        |
| Grassland          | 15      | 5    | 1    |      |      |      | 1    |      |      | 22    | 2.1        |
| Riparian/wetland   | 1       | 2    |      | 4    |      |      |      |      |      | 7     | 0.7        |
| Ruderal/Develop    | 0       | 5    |      |      |      |      |      |      |      | 5     | 0.5        |
| Total              | 410     | 313  | 228  | 42   | 20   | 5    | 4    | 5    | 2    | 1,029 | 100        |

SWHA = Swainson’s hawk; RTHA = red-tailed hawk; AMKE = American kestrel; NOHA = northern harrier; WTKI = white-tailed kite; RSHA = red-shouldered hawk; OSPR = osprey; COHA = Cooper’s hawk, GHOW = great-horned owl.

\*Field or road edge was not a mapped habitat type, so these data are not included in the statistical analysis.

Species occurrences by behavior type are presented in Table 4. Perched occurrences were most common followed by circling below 100 meters, and together comprised nearly 82 percent of all occurrences. A total of 831 occurrences (81 percent) were considered potential foraging occurrences (Table 4).

**Table 4. Behaviors documented by species. Potential foraging behaviors are highlighted.**

| Behavior Code | Species |      |      |      |      |      |      |      |      | Total | % of Total |
|---------------|---------|------|------|------|------|------|------|------|------|-------|------------|
|               | RTHA    | SWHA | AMKE | RSHA | WTKI | COHA | OSPR | NOHA | GHOW |       |            |
| P             | 304     | 122  | 145  | 31   | 14   | 2    | 3    |      | 1    | 622   | 60.4       |
| C             | 81      | 122  | 10   | 4    | 2    |      | 1    |      |      | 220   | 21.4       |
| F             | 13      | 14   | 24   | 4    | 3    | 3    | 1    | 3    | 1    | 66    | 6.4        |
| G             | 1       | 28   | 1    | 1    |      |      |      |      |      | 31    | 3.0        |
| CS            | 1       | 9    | 12   | 1    |      |      |      |      |      | 23    | 2.2        |
| K             |         | 5    | 14   |      | 1    |      |      |      |      | 20    | 1.9        |
| CU            | 2       | 3    | 11   |      |      |      |      |      |      | 16    | 1.6        |
| S             | 5       | 9    |      |      |      |      |      | 1    |      | 15    | 1.5        |
| CA            | 3       | 1    | 9    | 1    |      |      |      |      |      | 14    | 1.4        |
| AF            |         |      | 2    |      |      |      |      |      |      | 2     | 0.2        |
| Total         | 410     | 313  | 228  | 42   | 20   | 5    | 5    | 4    | 2    | 1029  | 100        |

SWHA = Swainson’s hawk; RTHA = red-tailed hawk; AMKE = American kestrel; NOHA = northern harrier; WTKI = white-tailed kite; RSHA = red-shouldered hawk; OSPR = osprey. P-perching; C-circling below 100m; F-flying through below 200m; G-on the ground; CS-successful prey capture; K-kiting/hovering; CU-unsuccessful prey capture; S-soaring below 200m; CA-prey capture attempt; AF-aerial foraging.

Table 5 summarizes all raptor behaviors by land cover type. Tables 6, 7, and 8 show the behaviors associated with each occurrence in each land cover type for the Swainson’s hawk, red-tailed hawk, and American kestrel, respectively. Swainson’s hawks (Table 6) generally spend less time perching, particularly while foraging, than do red-tailed hawks and American kestrels, species that often hunt from perches. Typical hunting behavior of Swainson’s hawk is a circling



flight at an altitude less than 100 meters. Nearly 40 percent of all Swainson’s hawk occurrences were of circling flights below 100 meters. The proportion of perching occurrences (39%) was similar (up from 29% in 2013); however, in contrast, the largest proportion of Red-tailed hawk and American kestrel occurrences (74 percent and 64 percent, respectively) were of perching individuals (Tables 7 and 8).

**Table 5. All raptor behaviors by land cover type**

| Land Cover Type   | Behaviors |    |     |    |    |    |    |    |    |    | Total |
|-------------------|-----------|----|-----|----|----|----|----|----|----|----|-------|
|                   | P         | S  | C   | F  | CA | CS | CU | G  | K  | AF |       |
| Oats              | 48        | 2  | 23  | 1  |    |    | 3  | 1  | 5  |    | 83    |
| Alfalfa           | 141       | 2  | 39  | 9  | 5  | 12 | 8  | 18 | 9  |    | 243   |
| Dry pasture       | 66        | 1  | 22  | 8  | 1  | 2  | 1  | 4  |    |    | 105   |
| Irrigated pasture | 59        | 4  | 17  | 5  | 1  | 3  | 1  | 2  |    | 1  | 93    |
| Ruderal/Developed | 4         |    | 1   |    |    |    |    |    |    |    | 5     |
| Vineyard          | 44        | 2  | 26  | 6  |    |    |    |    |    |    | 78    |
| Orchard           | 35        |    | 8   |    |    |    |    |    |    |    | 43    |
| Grassland         | 12        |    | 7   | 2  | 1  |    |    |    |    |    | 22    |
| Corn              | 44        | 1  | 13  | 6  |    | 1  | 2  |    |    | 1  | 68    |
| Field edge*       | 38        |    | 13  | 11 |    |    |    |    | 1  |    | 63    |
| Tilled            | 35        |    | 16  | 5  |    | 1  |    | 4  |    |    | 61    |
| Solar field       | 51        |    | 22  | 10 | 4  | 2  | 1  |    |    |    | 90    |
| Idle/fallow       | 32        |    | 7   | 2  | 2  |    |    |    |    |    | 43    |
| Riparian/Wetland  | 4         |    | 1   | 1  |    |    |    |    | 1  |    | 7     |
| Wheat             | 6         | 3  | 8   |    |    | 2  |    | 2  | 4  |    | 25    |
| Total             | 619       | 15 | 223 | 66 | 14 | 23 | 16 | 31 | 20 | 2  | 1029  |

P = perching; S = soaring below 200 m; C = circling below 100 meters; F = Flying below 200 meters; CA = prey capture attempt; CS = prey capture successful; CU = prey capture unsuccessful; G = standing on the ground; K = kiting/hovering, AF = aerial foraging. \*Field or road edge was not a mapped habitat type, so these data are not included in the statistical analysis.

**Table 6. Swainson’s hawk behaviors by land cover type**

| Land Cover Type   | Behaviors |   |     |    |    |    |    |    |   |    | Total |
|-------------------|-----------|---|-----|----|----|----|----|----|---|----|-------|
|                   | P         | S | C   | F  | CA | CS | CU | G  | K | AF |       |
| Oats              | 9         | 2 | 21  |    |    |    |    | 1  |   |    | 33    |
| Alfalfa           | 26        | 1 | 24  | 5  | 1  | 7  | 2  | 17 | 2 |    | 85    |
| Dry pasture       | 13        | 1 | 14  | 2  |    | 1  |    | 3  |   |    | 34    |
| Irrigated pasture | 9         | 1 | 8   |    |    |    | 1  | 1  |   |    | 20    |
| Ruderal/Developed | 4         |   | 1   |    |    |    |    |    |   |    | 5     |
| Vineyard          | 5         |   | 11  |    |    |    |    |    |   |    | 16    |
| Orchard           |           |   | 4   |    |    |    |    |    |   |    | 4     |
| Grassland         | 2         |   | 2   | 1  |    |    |    |    |   |    | 5     |
| Corn              | 10        | 1 | 5   |    |    |    |    |    |   |    | 16    |
| Field edge        | 7         |   | 4   | 3  |    |    |    |    | 1 |    | 15    |
| Tilled            | 8         |   | 11  | 2  |    |    |    | 4  |   |    | 25    |
| Solar field       | 24        |   | 10  |    |    | 1  |    |    |   |    | 35    |
| Idle/fallow       | 2         |   |     |    |    |    |    |    |   |    | 2     |
| Riparian/wetland  |           |   |     | 1  |    |    |    |    | 1 |    | 2     |
| Wheat             | 3         | 3 | 7   |    |    |    |    | 2  | 1 |    | 16    |
| Total             | 122       | 9 | 122 | 14 | 1  | 9  | 3  | 28 | 5 |    | 313   |

P = perching; S = soaring below 200 m; C = circling below 100 meters; F = Flying below 200 meters; CA = prey capture attempt; CS = prey capture successful; CU = prey capture unsuccessful; G = standing on the ground; K = kiting/hovering. \*Field or road edge was not a mapped habitat type, so these data are not included in the statistical analysis.

**Table 7. Red-tailed hawk behaviors by land cover type**

| Land Cover Type   | Behaviors |   |    |    |    |    |    |   |   |    | Total |
|-------------------|-----------|---|----|----|----|----|----|---|---|----|-------|
|                   | P         | S | C  | F  | CA | CS | CU | G | K | AF |       |
| Oats              | 12        |   | 2  |    |    |    |    |   |   |    | 14    |
| Alfalfa           | 71        | 1 | 11 | 1  | 1  |    | 2  |   |   |    | 87    |
| Dry pasture       | 45        |   | 8  | 2  |    |    |    | 1 |   |    | 56    |
| Irrigated pasture | 37        | 3 | 8  | 3  | 1  | 1  |    |   |   |    | 53    |
| Ruderal/Developed |           |   |    |    |    |    |    |   |   |    | 0     |
| Vineyard          | 32        | 1 | 14 | 1  |    |    |    |   |   |    | 48    |
| Orchard           | 34        |   | 4  |    |    |    |    |   |   |    | 38    |
| Grassland         | 9         |   | 5  |    | 1  |    |    |   |   |    | 15    |
| Corn              | 15        |   | 8  | 1  |    |    |    |   |   |    | 24    |
| Field edge        | 8         |   | 4  | 1  |    |    |    |   |   |    | 13    |
| Tilled            | 9         |   | 1  | 1  |    |    |    |   |   |    | 11    |
| Solar field       | 7         |   | 10 | 2  |    |    |    |   |   |    | 19    |
| Idle/Fallow       | 22        |   | 4  | 1  |    |    |    |   |   |    | 27    |
| Riparian/wetland  |           |   | 1  |    |    |    |    |   |   |    | 1     |
| Wheat             | 3         |   | 1  |    |    |    |    |   |   |    | 4     |
| Total             | 304       | 5 | 81 | 13 | 3  | 1  | 2  | 1 |   |    | 410   |

P = perching; S = soaring below 200 m; C = circling below 100 meters; F = Flying below 200 meters; CA = prey capture attempt; CS = prey capture successful; CU = prey capture unsuccessful; G = standing on the ground; K = kiting/hovering. \*Field or road edge was not a mapped habitat type, so these data are not included in the statistical analysis.

**Table 8. American kestrel behaviors by land cover type**

| Land Cover Type   | Behaviors |   |    |    |    |    |    |   |    |    | Total |
|-------------------|-----------|---|----|----|----|----|----|---|----|----|-------|
|                   | P         | S | C  | F  | CA | CS | CU | G | K  | AF |       |
| Oats              | 23        |   |    | 1  |    |    | 3  |   | 5  |    | 32    |
| Alfalfa           | 35        |   | 3  | 3  | 3  | 5  | 4  | 1 | 6  |    | 60    |
| Dry pasture       | 5         |   |    | 4  |    | 1  | 1  |   |    |    | 11    |
| Irrigated pasture | 11        |   | 1  | 1  |    | 1  |    |   |    | 1  | 15    |
| Ruderal/Developed |           |   |    |    |    |    |    |   |    |    | 0     |
| Vineyard          | 4         |   | 1  | 2  |    |    |    |   |    |    | 7     |
| Orchard           | 1         |   |    |    |    |    |    |   |    |    | 1     |
| Grassland         | 1         |   |    |    |    |    |    |   |    |    | 1     |
| Corn              | 17        |   |    | 4  |    | 1  | 2  |   |    | 1  | 25    |
| Field edge        | 9         |   | 2  | 5  |    |    |    |   |    |    | 16    |
| Tilled            | 18        |   | 1  |    |    | 1  |    |   |    |    | 20    |
| Solar field       | 17        |   | 2  | 4  | 4  | 1  | 1  |   |    |    | 29    |
| Idle/fallow       | 4         |   |    |    | 2  |    |    |   |    |    | 6     |
| Riparian/Wetland  |           |   |    |    |    |    |    |   |    |    | 0     |
| Wheat             |           |   |    |    |    | 2  |    |   | 3  |    | 5     |
| Total             | 145       |   | 10 | 24 | 9  | 12 | 11 | 1 | 14 | 2  | 228   |

P = perching; S = soaring below 200 m; C = circling below 100 meters; F = Flying below 200 meters; CA = prey capture attempt; CS = prey capture successful; CU = prey capture unsuccessful; G = standing on the ground; K = kiting/hovering, AF = aerial foraging. \*Field or road edge was not a mapped habitat type, so these data are not included in the statistical analysis.

To examine the extent of foraging within solar fields and to evaluate the foraging use of solar fields and other land cover types relative to their availability within the survey area, those behaviors that were considered foraging behaviors were isolated from the total occurrences and used in the statistical analysis. For Swainson’s hawk this included the following behaviors:

- Circling below 100 meters

- Kiting/Hovering
- Standing on ground
- Prey capture (attempt, successful, unsuccessful)

However, review of the data revealed an increase in Swainson's hawk perching occurrences compared with 2013, particularly at solar array fields (Plate 6). Although many of these were attributed to the proximity of the active nest at the Kammerer solar site, it also appeared that Swainson's hawk perching within the solar arrays had increased and may be attributed to using the structures as hunting perches within the array. The proportion of perching occurrences within in the solar array in 2021 (7.7 percent) increased nearly four times of that reported in 2013 (2.1 percent). As a result, although the analysis was initially conducted using the behaviors noted above, it was repeated using perching as a potential foraging behavior. Only those perching events within the solar arrays that were not attributed to the nesting activity at the Kammerer solar site were used.



Plate 6. Adult Swainson's hawk perched on solar panel at the McKenzie site. This use of the solar array suggests potential onsite foraging activity.

For the red-tailed hawk and American kestrel, perching was also included as a foraging behavior since these species commonly hunt from a perch. Note that with the exception of prey capture types and kiting/hovering, the remaining behaviors could be attributed to activities other than foraging. However, these are the primary foraging techniques of these species, and including them provides a reasonable estimation of foraging use for purposes of a comparative analysis.

### **Swainson's Hawk**

Table 9 shows the relationship between foraging occurrences and habitat/land use type acreages for Swainson's hawk. As expected, 33.3 percent of the foraging occurrences were in alfalfa.

Oats, dry pasture, and tilled fields account for an additional 34.5 percent. Although comprising only 3.7 percent of the land cover, 6.9 percent of the foraging occurrences were in solar fields. Table 10 shows the same relationship but includes additional perching occurrences within solar fields considered potential foraging occurrences, increasing the proportion of foraging occurrences in solar fields to 10.6 percent.

**Table 9. Swainson’s hawk foraging occurrences within each land cover type.**

| Land Cover Type   | Acres | Percent of Total | SWHA Foraging Observations | Percent of Total |
|-------------------|-------|------------------|----------------------------|------------------|
| Oats              | 844   | 15.3             | 22                         | 13.8             |
| Alfalfa           | 672   | 12.2             | 53                         | 33.3             |
| Dry Pasture       | 613   | 11.1             | 18                         | 11.3             |
| Irrigated Pasture | 585   | 10.6             | 10                         | 6.3              |
| Ruderal/Developed | 531   | 9.7              | 1                          | 0.6              |
| Vineyard          | 495   | 9.0              | 11                         | 6.9              |
| Orchard           | 393   | 7.1              | 4                          | 2.5              |
| Grassland         | 340   | 6.2              | 2                          | 1.3              |
| Corn              | 283   | 5.1              | 5                          | 3.1              |
| Tilled            | 235   | 4.3              | 15                         | 9.4              |
| Solar Array Field | 206   | 3.7              | 11                         | 6.9              |
| Idle/Fallow       | 159   | 2.9              | 0                          | 0                |
| Riparian/Wetland  | 77    | 1.4              | 1                          | 0.6              |
| Wheat             | 68    | 1.2              | 10                         | 6.3              |
| Total             | 5,501 | 100              | 163                        | 100              |

**Table 10. Swainson’s hawk foraging occurrences within each land cover type (including perching occurrences within solar array fields).**

| Land Cover Type   | Acres | Percent of Total | SWHA Foraging Observations | Percent of Total |
|-------------------|-------|------------------|----------------------------|------------------|
| Oats              | 844   | 15.3             | 22                         | 12.9             |
| Alfalfa           | 672   | 12.2             | 53                         | 31.2             |
| Dry Pasture       | 613   | 11.1             | 18                         | 10.6             |
| Irrigated Pasture | 585   | 10.6             | 10                         | 5.9              |
| Ruderal/Developed | 531   | 9.7              | 1                          | 0.6              |
| Vineyard          | 495   | 9.0              | 11                         | 6.5              |
| Orchard           | 393   | 7.1              | 4                          | 2.4              |
| Grassland         | 340   | 6.2              | 2                          | 1.2              |
| Corn              | 283   | 5.1              | 5                          | 2.9              |
| Tilled            | 235   | 4.3              | 15                         | 8.2              |
| Solar Array Field | 206   | 3.7              | 18                         | 10.6             |
| Idle/Fallow       | 159   | 2.9              | 0                          | 0                |
| Riparian/Wetland  | 77    | 1.4              | 1                          | 0.6              |
| Wheat             | 68    | 1.2              | 10                         | 5.9              |
| Total             | 5,501 | 100              | 170                        | 100              |

The first chi-square test determines whether or not foraging use was in proportion to the availability of the land cover types in the survey area. As expected, the pattern of use indicates a high degree of habitat selectivity and thus the null hypothesis was rejected ( $\chi^2_{13, d.f.} = 34.528$ ,  $P < 0.001$ ) (Table 11). In other words, Swainson’s hawks are selecting or avoiding specific crop or land cover types for foraging. Next, the contribution of the individual types was evaluated with regard to their significant contribution (positive or negative) to the chi-square

determination. Those with an observed use that exceeds the expected use, have a significant positive contribution (brown highlighting) and those with an expected use that exceeds the observed use have a significant negative contribution (blue highlighting) ( $\chi^2_{1.d.f.}=3.84$   $P<0.05$ ). In other words, Table 11 indicates that Swainson’s hawks appear to be using alfalfa, tilled, wheat, and solar array fields at a significantly greater frequency than would be expected relative to their availability in the survey area.

Table 12 shows the same relationship but includes the additional perching occurrences within solar fields considered potential foraging occurrences (Table 10), resulting in a similar outcome, but with a substantially greater positive contribution from solar array fields. In other words, Swainson’s hawks are not avoiding solar array fields within the agricultural landscape and appear to be using them at a greater frequency than would be expected given their availability.

Some caution is needed when interpreting these results. While the results indicate that land cover types overall are not used in proportion to their availability and that certain types have a significant contribution to this result, it does not necessarily indicate that those that do not have a significant contribution or that have a significant negative association lack value. For example, dry pasture accounted for the third highest number of Swainson’s hawk foraging occurrences, but because dry pasture was relatively common within the survey area, the expected use was similar to the observed use. So, while it does not appear to have been selected over other land cover types or used in proportion to its availability, 10.6 percent of all documented Swainson’s hawk foraging occurred in dry pastures, and therefore this type, regardless of its availability or use, clearly has foraging value to this species.

**Table 11. Chi-square values for Swainson’s hawk.**

| Land Cover Type   | Available Land Cover (%) | Observed Use of Land Cover (Frequency) | Expected Use of Land Cover (Frequency) | Chi-square Contribution |
|-------------------|--------------------------|----------------------------------------|----------------------------------------|-------------------------|
| Oats              | 15.3                     | 22                                     | 24.94                                  | 0.35                    |
| Alfalfa           | 12.2                     | 53                                     | 19.89                                  | 55.12                   |
| Dry Pasture       | 11.1                     | 18                                     | 18.09                                  | 0.00                    |
| Irrigated Pasture | 10.6                     | 10                                     | 17.28                                  | 3.07                    |
| Ruderal/Developed | 9.7                      | 1                                      | 15.81                                  | 13.87                   |
| Vineyard          | 9.0                      | 11                                     | 14.67                                  | 0.92                    |
| Orchard           | 7.1                      | 4                                      | 11.57                                  | 4.95                    |
| Grassland         | 6.2                      | 2                                      | 10.11                                  | 6.51                    |
| Corn              | 5.1                      | 5                                      | 8.31                                   | 1.32                    |
| Tilled            | 4.3                      | 15                                     | 7.01                                   | 9.11                    |
| Solar Array Field | 3.7                      | 11                                     | 6.03                                   | 4.10                    |
| Idle/Fallow       | 2.9                      | 0                                      | 4.72                                   | 4.72                    |
| Riparian/Wetland  | 1.4                      | 1                                      | 2.28                                   | 0.72                    |
| Wheat             | 1.2                      | 10                                     | 1.96                                   | 32.98                   |
| Total             | 100                      | 163                                    | 163                                    | 137.74*                 |

\*137.74 represents the sample statistic in the chi-square analysis. To be considered significant, this value must exceed the Critical Value ( $\chi^2_{13.d.f.}=34.528$   $P<0.001$ ), indicating that the observed frequencies are significantly different from the expected frequencies. The brown-highlighted rows indicate the land cover types that have a significant positive contribution and the blue-highlighted rows indicate a significant negative contribution ( $\chi^2_{1.d.f.}=3.84$   $P<0.05$ ).

**Table 12. Chi-square values for Swainson’s hawk (including perching in solar arrays).**

| Land Cover Type   | Available Land Cover (%) | Observed Use of Land Cover (Frequency) | Expected Use of Land Cover (Frequency) | Chi-square Contribution |
|-------------------|--------------------------|----------------------------------------|----------------------------------------|-------------------------|
| Oats              | 15.3                     | 22                                     | 26.01                                  | 0.62                    |
| Alfalfa           | 12.2                     | 53                                     | 20.74                                  | 50.18                   |
| Dry Pasture       | 11.1                     | 18                                     | 18.87                                  | 0.04                    |
| Irrigated Pasture | 10.6                     | 10                                     | 18.02                                  | 3.57                    |
| Ruderal/Developed | 9.7                      | 1                                      | 16.49                                  | 14.55                   |
| Vineyard          | 9.0                      | 11                                     | 15.30                                  | 1.21                    |
| Orchard           | 7.1                      | 4                                      | 12.07                                  | 5.40                    |
| Grassland         | 6.2                      | 2                                      | 10.54                                  | 6.92                    |
| Corn              | 5.1                      | 5                                      | 8.67                                   | 1.55                    |
| Tilled            | 4.3                      | 15                                     | 7.31                                   | 8.09                    |
| Solar Array Field | 3.7                      | 18                                     | 6.29                                   | 21.80                   |
| Idle/Fallow       | 2.9                      | 0                                      | 4.93                                   | 4.93                    |
| Riparian/Wetland  | 1.4                      | 1                                      | 2.38                                   | 0.80                    |
| Wheat             | 1.2                      | 10                                     | 2.04                                   | 31.06                   |
| Total             | 100                      | 170                                    | 170                                    | 150.72*                 |

\*150.72 represents the sample statistic in the chi-square analysis, which exceeds the Critical Value ( $\chi^2_{13,d.f.} = 34.528$  P<0.001), indicating that the observed frequencies are significantly different from the expected frequencies. The brown-highlighted rows indicate the land cover types that have a significant positive contribution and the blue-highlighted rows indicate a significant negative contribution ( $\chi^2_{1,d.f.} = 3.84$  P<0.05).

### Red-tailed Hawk

Table 13 shows the relationship between foraging occurrences and land use type acreages for red-tailed hawk. Three types comprised nearly 50 percent of the foraging occurrences, alfalfa, irrigated pasture, and dry pasture. Red-tailed hawk was also found more frequently in vineyards and orchards, which together comprised 22 percent of the total foraging occurrences. Most of these were perching individuals and were thus considered potential foraging occurrences, although it is likely that many were roosting rather than foraging. Solar fields accounted for 4.5 percent of the red-tailed hawk occurrences and just 3.7 percent of the total land cover.

**Table 13. Red-tailed hawk foraging occurrences within each land cover type.**

| Land Cover Type   | Acrees | Percent of Total | RTHA Foraging Observations | Percent of Total |
|-------------------|--------|------------------|----------------------------|------------------|
| Oats              | 844    | 15.3             | 14                         | 3.7              |
| Alfalfa           | 672    | 12.2             | 85                         | 22.4             |
| Dry Pasture       | 613    | 11.1             | 54                         | 14.2             |
| Irrigated Pasture | 585    | 10.6             | 47                         | 12.4             |
| Ruderal/Developed | 531    | 9.7              | 0                          | 0                |
| Vineyard          | 495    | 9.0              | 46                         | 12.1             |
| Orchard           | 393    | 7.1              | 38                         | 10.0             |
| Grassland         | 340    | 6.2              | 15                         | 3.9              |
| Corn              | 283    | 5.1              | 23                         | 6.1              |
| Tilled            | 235    | 4.3              | 10                         | 2.6              |
| Solar Array Field | 206    | 3.7              | 17                         | 4.5              |
| Idle/Fallow       | 159    | 2.9              | 26                         | 6.8              |
| Riparian/Wetland  | 77     | 1.4              | 1                          | 0.3              |
| Wheat             | 68     | 1.2              | 4                          | 1.1              |
| Total             | 5,501  | 100              | 380                        | 100              |

As expected, the pattern of use for red-tailed hawk also indicates a high degree of habitat selectivity and thus the null hypothesis was rejected ( $\chi^2_{13,d.f.} = 34.528$   $P < 0.001$ ) (Table 14). The contribution of the individual types indicated that alfalfa, idle/fallow fields, and to a marginal extent vineyards and orchards, were used significantly more than their relative availability and oats and ruderal/developed, were used significantly less than their relative availability ( $\chi^2_{1,d.f.} = 3.84$   $P < 0.05$ ). Although not contributing significantly to the sample statistic, the results also indicate that solar fields were not avoided by foraging red-tailed hawks. Instead, they accounted for 4.5 percent of all red-tailed hawk foraging occurrences with observed use higher than expected use.

As noted above, lack of a significant contribution or a significant negative contribution does not necessarily indicate lack of value. For example, dry and irrigated pastures accounted for 14.2 and 12.4 percent of foraging occurrences, respectively (Table 13). But because these types occurred more frequently in the survey area, even though observed use exceeded expected use, neither had a significant positive contribution. However, the proportion of occurrences clearly suggests the importance of these land cover types to foraging red-tailed hawks.

**Table 14. Chi-square values for red-tailed hawk.**

| Land Cover Type   | Available Land Cover (%) | Observed Use of Land Cover (Frequency) | Expected Use of Land Cover (Frequency) | Chi-square Contribution |
|-------------------|--------------------------|----------------------------------------|----------------------------------------|-------------------------|
| Oats              | 15.3                     | 14                                     | 58.14                                  | 33.51                   |
| Alfalfa           | 12.2                     | 85                                     | 46.36                                  | 32.21                   |
| Dry Pasture       | 11.1                     | 54                                     | 42.18                                  | 3.31                    |
| Irrigated Pasture | 10.6                     | 47                                     | 40.28                                  | 1.12                    |
| Ruderal/Developed | 9.7                      | 0                                      | 36.86                                  | 36.86                   |
| Vineyard          | 9.0                      | 46                                     | 34.20                                  | 4.07                    |
| Orchard           | 7.1                      | 38                                     | 26.98                                  | 4.50                    |
| Grassland         | 6.2                      | 15                                     | 23.56                                  | 3.11                    |
| Corn              | 5.1                      | 23                                     | 19.38                                  | 0.68                    |
| Tilled            | 4.3                      | 10                                     | 16.34                                  | 2.46                    |
| Solar Array Field | 3.7                      | 17                                     | 14.06                                  | 0.61                    |
| Idle/Fallow       | 2.9                      | 26                                     | 11.02                                  | 20.36                   |
| Riparian/Wetland  | 1.4                      | 1                                      | 5.32                                   | 3.51                    |
| Wheat             | 1.2                      | 4                                      | 4.56                                   | 0.07                    |
| Total             | 100                      | 380                                    | 380                                    | 146.38*                 |

\*146.38 represents the sample statistic in the chi-square analysis. To be considered significant, this value must exceed the Critical Value ( $\chi^2_{13,d.f.} = 34.528$   $P < 0.001$ ), indicating that the observed frequencies are significantly different from the expected frequencies. The brown-highlighted rows indicate the land cover types that have a significant positive contribution and the blue-highlighted rows indicate a significant negative contribution ( $\chi^2_{1,d.f.} = 3.84$   $P < 0.05$ ).

### American Kestrel

Table 15 shows the relationship between foraging occurrences and habitat/land use type acreages for American kestrel. Three types made up 58.6 percent of the foraging occurrences, alfalfa, oats, and solar array fields. Thirteen percent of all foraging occurrences were in solar fields.

**Table 15. American kestrel foraging occurrences within each land cover type.**

| Land Cover Type   | Acres | Percent of Total | AMKE Foraging Observations | Percent of Total |
|-------------------|-------|------------------|----------------------------|------------------|
| Oats              | 844   | 15.3             | 31                         | 16.1             |
| Alfalfa           | 672   | 12.2             | 57                         | 29.5             |
| Dry Pasture       | 613   | 11.1             | 7                          | 3.6              |
| Irrigated Pasture | 585   | 10.6             | 14                         | 7.3              |
| Ruderal/Developed | 531   | 9.7              | 0                          | 0                |
| Vineyard          | 495   | 9.0              | 5                          | 2.6              |
| Orchard           | 393   | 7.1              | 1                          | 0.5              |
| Grassland         | 340   | 6.2              | 1                          | 0.5              |
| Corn              | 283   | 5.1              | 21                         | 10.9             |
| Tilled            | 235   | 4.3              | 20                         | 10.4             |
| Solar Array Field | 206   | 3.7              | 25                         | 13.0             |
| Idle/Fallow       | 159   | 2.9              | 6                          | 3.1              |
| Riparian/Wetland  | 77    | 1.4              | 0                          | 0                |
| Wheat             | 68    | 1.2              | 5                          | 2.6              |
| Total             | 5,501 | 100              | 193                        | 100              |

The pattern of use for American kestrel also indicates a high degree of habitat selectivity and thus the null hypothesis was rejected ( $\chi^2_{13,d.f.} = 34.528$   $P < 0.001$ ) (Table 16). The contribution of the individual types indicate that alfalfa, solar fields, tilled, and corn fields were used significantly more than their relative availability, and dry pasture, ruderal/developed, vineyard, orchard, and grassland were used significantly less than their relative availability ( $\chi^2_{1,d.f.} = 3.84$   $P < 0.05$ ).

Foraging use of solar fields by American kestrels was particularly high due mainly to the high proportion of perching occurrences (63.6 percent) (Table 8). The solar panels and the perimeter fence provided excellent perching habitat for kestrels (Plate 7).

**Table 16. Chi-square values for American kestrel.**

| Land Cover Type   | Available Land Cover (%) | Observed Use of Land Cover (Frequency) | Expected Use of Land Cover (Frequency) | Chi-square Contribution |
|-------------------|--------------------------|----------------------------------------|----------------------------------------|-------------------------|
| Oats              | 15.3                     | 31                                     | 29.53                                  | 0.07                    |
| Alfalfa           | 12.2                     | 57                                     | 23.55                                  | 47.51                   |
| Dry Pasture       | 11.1                     | 7                                      | 21.42                                  | 9.71                    |
| Irrigated Pasture | 10.6                     | 14                                     | 20.46                                  | 2.04                    |
| Ruderal/Developed | 9.7                      | 0                                      | 18.72                                  | 18.72                   |
| Vineyard          | 9.0                      | 5                                      | 17.37                                  | 8.81                    |
| Orchard           | 7.1                      | 1                                      | 13.70                                  | 11.77                   |
| Grassland         | 6.2                      | 1                                      | 11.97                                  | 10.05                   |
| Corn              | 5.1                      | 21                                     | 9.84                                   | 12.66                   |
| Tilled            | 4.3                      | 20                                     | 8.30                                   | 11.70                   |
| Solar Array Field | 3.7                      | 25                                     | 7.14                                   | 44.68                   |
| Idle/Fallow       | 2.9                      | 6                                      | 5.60                                   | 0.03                    |
| Riparian/Wetland  | 1.4                      | 0                                      | 2.70                                   | 2.70                    |
| Wheat             | 1.2                      | 5                                      | 2.32                                   | 3.09                    |
| Total             | 100                      | 193                                    | 193                                    | 183.54                  |

\*183.54 represents the sample statistic in the chi-square analysis. To be considered significant, this value must exceed the Critical Value ( $\chi^2_{13,d.f.} = 34.528$   $P < 0.001$ ), indicating that the observed frequencies are significantly different from the expected frequencies. Brown-highlight indicates a significant contribution and blue indicates negative contribution ( $\chi^2_{1,d.f.} = 3.84$   $P < 0.05$ ).





Plate 7. American kestrel perch-hunting on a solar panel at the Kammerer Site.

## All Raptors

Table 17 shows the relationship between foraging occurrences and land cover type acreages for all raptors combined. Not unexpectedly, the largest proportion of foraging occurrences for all raptors combined occurred in alfalfa fields (26.2 percent), although this land cover type made up just 12.2 percent of the survey area. Dry pasture, irrigated pasture, and oats were also relatively frequently used and combined for a total of 29.3 percent of the occurrences, although they made up 37 percent of the survey area. Solar array fields, 3.7 percent of the survey area, contributed 7.2 percent of the foraging occurrences for all raptors combined.

The overall pattern of use for all raptor species combined also indicates a high degree of habitat selectivity and thus the null hypothesis was rejected ( $\chi^2_{13, d.f.} = 34.528$   $P < 0.001$ ) (Table 18). The contribution of the individual types indicates that alfalfa, solar fields, idle/fallow, and tilled fields were used significantly more than their relative availability, and ruderal/developed, grassland, and oats were used significantly less than their relative availability ( $\chi^2_{1, d.f.} = 3.84$   $P < 0.05$ ). With the same cautionary notes expressed above relating to existing knowledge of observed habitat value and the availability/frequency formulation used here, it is clear that raptors are not avoiding solar array fields and at least to some extent appear to be selecting them.

**Table 17. All raptor foraging occurrences within each land cover type.**

| Land Cover Type   | Acres | Percent of Total | All Raptor Foraging Observations | Percent of Total |
|-------------------|-------|------------------|----------------------------------|------------------|
| Oats              | 844   | 15.3             | 71                               | 9.1              |
| Alfalfa           | 672   | 12.2             | 205                              | 26.2             |
| Dry Pasture       | 613   | 11.1             | 83                               | 10.6             |
| Irrigated Pasture | 585   | 10.6             | 75                               | 9.6              |
| Ruderal/Developed | 531   | 9.7              | 1                                | 0.1              |
| Vineyard          | 495   | 9.0              | 67                               | 8.6              |
| Orchard           | 393   | 7.1              | 43                               | 5.5              |
| Grassland         | 340   | 6.2              | 19                               | 2.4              |
| Corn              | 283   | 5.1              | 51                               | 6.5              |
| Tilled            | 235   | 4.3              | 46                               | 5.9              |
| Solar Array Field | 206   | 3.7              | 56                               | 7.2              |
| Idle/Fallow       | 159   | 2.9              | 39                               | 5.0              |
| Riparian/Wetland  | 77    | 1.4              | 6                                | 0.8              |
| Wheat             | 68    | 1.2              | 19                               | 2.4              |
| Total             | 5,501 | 100              | 781                              | 100              |

**Table 18. Chi-square values for all raptors.**

| Land Cover Type   | Available Land Cover (%) | Observed Use of Land Cover (Frequency) | Expected Use of Land Cover (Frequency) | Chi-square Contribution |
|-------------------|--------------------------|----------------------------------------|----------------------------------------|-------------------------|
| Oats              | 15.3                     | 71                                     | 119.49                                 | 19.68                   |
| Alfalfa           | 12.2                     | 205                                    | 95.28                                  | 126.35                  |
| Dry Pasture       | 11.1                     | 83                                     | 86.69                                  | 0.16                    |
| Irrigated Pasture | 10.6                     | 75                                     | 82.79                                  | 0.73                    |
| Ruderal/Developed | 9.7                      | 1                                      | 75.76                                  | 73.77                   |
| Vineyard          | 9.0                      | 67                                     | 70.29                                  | 0.15                    |
| Orchard           | 7.1                      | 43                                     | 55.45                                  | 2.80                    |
| Grassland         | 6.2                      | 19                                     | 48.42                                  | 17.88                   |
| Corn              | 5.1                      | 51                                     | 39.83                                  | 3.13                    |
| Tilled            | 4.3                      | 46                                     | 33.58                                  | 4.59                    |
| Solar Array Field | 3.7                      | 56                                     | 28.90                                  | 25.41                   |
| Idle/Fallow       | 2.9                      | 39                                     | 22.65                                  | 11.80                   |
| Riparian/Wetland  | 1.4                      | 6                                      | 10.93                                  | 2.22                    |
| Wheat             | 1.2                      | 19                                     | 9.37                                   | 9.90                    |
| Total             | 100                      | 781                                    | 781                                    | 298.57                  |

\*298.57 represents the sample statistic in the chi-square analysis. To be considered significant, this value must exceed the Critical Value ( $\chi^2_{13, d.f.} = 34.528$   $P < 0.001$ ), indicating that the observed frequencies are significantly different from the expected frequencies. The brown-highlighted rows indicate the land cover types that have a significant positive contribution and the blue-highlighted rows indicate a significant negative contribution ( $\chi^2_{1, d.f.} = 3.84$   $P < 0.05$ ).

## Stationary Observation Points

A total of 160 raptor occurrences were reported within the solar array fields during the stationary observation point surveys (Table 19). Of these, 126 (78.8 percent) were considered foraging occurrences. Consistent with the driving transect survey results, American kestrel (38.8 percent) and Swainson’s hawk (36.9 percent) were the most commonly observed raptors. Nearly 60 percent of the Swainson’s hawk occurrences were considered foraging occurrences. Some of the perching occurrences may also have been associated with foraging behavior, but were excluded for consistency with the 2013 data.

Although fewer Swainson’s hawks were observed in 2021 (59) than in 2013 (108), the proportion of foraging occurrences (59.3 percent in 2021 and 63.9 percent in 2013) was similar. Results were also consistent for all other species between 2013 and 2021.

Table 20 shows the different behaviors of each species within the solar fields. Similar to the road transect results, the most common behaviors were circling below 100 meters and perching, comprising 78.6 percent of foraging occurrences. Nearly 17 percent of the foraging occurrences were prey captures or prey capture attempts.

**Table 19. Total number of occurrences and the proportion of foraging occurrences in solar fields for all species observed.**

| Species             | Total occurrences | Foraging occurrences | Percent Foraging occurrences |
|---------------------|-------------------|----------------------|------------------------------|
| Swainson’s hawk     | 59                | 35                   | 59.3                         |
| Red-tailed hawk     | 27                | 26                   | 96.3                         |
| American kestrel    | 62                | 55                   | 88.7                         |
| Red-shouldered hawk | 2                 | 1                    | 50.0                         |
| Cooper’s hawk       | 8                 | 7                    | 87.5                         |
| Northern harrier    | 1                 | 1                    | 100                          |
| Peregrine falcon    | 1                 | 1                    | 100                          |
| Total               | 160               | 126                  | 78.8                         |

**Table 20. Behaviors in solar fields (all species). Foraging behaviors are highlighted.**

|              | Behaviors |   |    |   |    |   |    |    |    |
|--------------|-----------|---|----|---|----|---|----|----|----|
|              | P         | S | C  | K | F  | G | CA | CS | CU |
| SWHA         | 14        | 2 | 32 | 1 | 8  |   | 1  | 1  |    |
| RTHA         | 3         | 1 | 21 |   |    | 1 | 1  |    |    |
| AMKE         | 31        |   | 5  | 2 | 8  |   | 9  | 5  | 2  |
| RSHA         |           |   | 1  |   | 1  |   |    |    |    |
| COHA         | 2         |   | 3  |   | 1  |   | 2  |    |    |
| NOHA         |           |   |    |   | 1  |   |    |    |    |
| PEFA         |           |   | 1  |   |    |   |    |    |    |
| <b>Total</b> | 50        | 3 | 63 | 3 | 19 | 1 | 13 | 6  | 2  |

P = perching; S = soaring below 200 m; C = circling below 100 meters; F = Flying below 200 meters; CA = prey capture attempt; CS = prey capture successful; CU = prey capture unsuccessful; G = standing on the ground; K = kiting/hovering. SWHA = Swainson’s hawk; RTHA = red-tailed hawk; AMKE = American kestrel; RSHA = red-shouldered hawk; COHA = Cooper’s hawk; NOHA = northern harrier; PEFA = peregrine falcon.

## Summary and Conclusions

The results of this study indicate ongoing raptor use of moderately-sized solar array fields following conversion from cultivated uses. Results of the strip transect road survey indicate raptor use in general, and specifically Swainson's hawk and American kestrel use of solar array fields exceeds expected use based on their availability within the agricultural landscape. This suggests that solar array fields are not avoided by these species and may be selected at a greater frequency than many cultivated land cover types. The stationary observation point surveys confirm use within solar array fields, including foraging or potential foraging use by all species observed.

### Comparison with 2013 Results

Data from 2021 are consistent with the 2013 results. Although there were some differences in the use of specific cultivated land cover types for some species, similar use patterns were found, particularly the overall use of solar array fields.

The total number and the relative proportion of Swainson's hawks in 2021 (30.4 percent) was less than in 2013 (38.5 percent), while the numbers of other species, including red-tailed hawk, American kestrel, and red-shouldered hawk, increased in 2021 (Table 21). This may have been due in part to the expansion of the strip transect road survey route, which increased the proportion of grasslands, and to the conversion to orchards along the route, which decreased the proportion of irrigated pasture (Table 22). The extent of orchard expansion throughout the region has resulted in declines of available habitat for Swainson's hawk (Estep 2020).

The proportion of Swainson's hawk foraging observations in solar array fields was greater in 2013 (12.8 percent) than in 2021 (6.9 percent). However, the observed use of solar array fields by Swainson's hawk has changed since 2013, with a greater proportion of perching occurrences in 2021. Perching was not included as a potential foraging behavior in 2013, but 2021 observations suggest that perching within the solar array may have become a more common technique for foraging within the array. Thus, the data were recalculated by including several perching occurrences considered to be foraging behaviors, resulting in the proportion of foraging observations approaching 11 percent and greater consistency with 2013 results. However, either result (including and not including the additional perching occurrences) resulted in an observed use of solar array fields by Swainson's hawks that exceeded expected use. In other words, in either case, Swainson's hawks appear to be using solar array fields at a significantly greater frequency than would be expected relative to their availability.

### Conclusions

The following conclusions are the same as were made in the 2013 study (Estep 2013).

**1. Swainson's hawks use and forage within managed solar array fields.** The results of the driving transect surveys and the stationary observation point surveys indicate foraging use of the solar array fields by Swainson's hawks and other raptors. While it is difficult to observe the precise locations of prey capture attempts in solar array fields due to their height, the rows of

solar trackers may not preclude foraging in the open grasslands between them. However, foraging hawks may also be focused primarily on the wider spaces between the sub-areas within the projects and around the perimeter of the projects. Of key importance is the management of a grassland substrate to promote rodent populations and maintaining this substrate at a height that promotes visibility and access to prey. Unlike most crop types, this condition is available in solar fields throughout the spring and summer breeding season, and thus provides a consistent and available source of prey. Many crop types, while important in the overall agricultural matrix, may be available for a relatively short period of time during the breeding season due to the planting, growth, and harvesting regime.

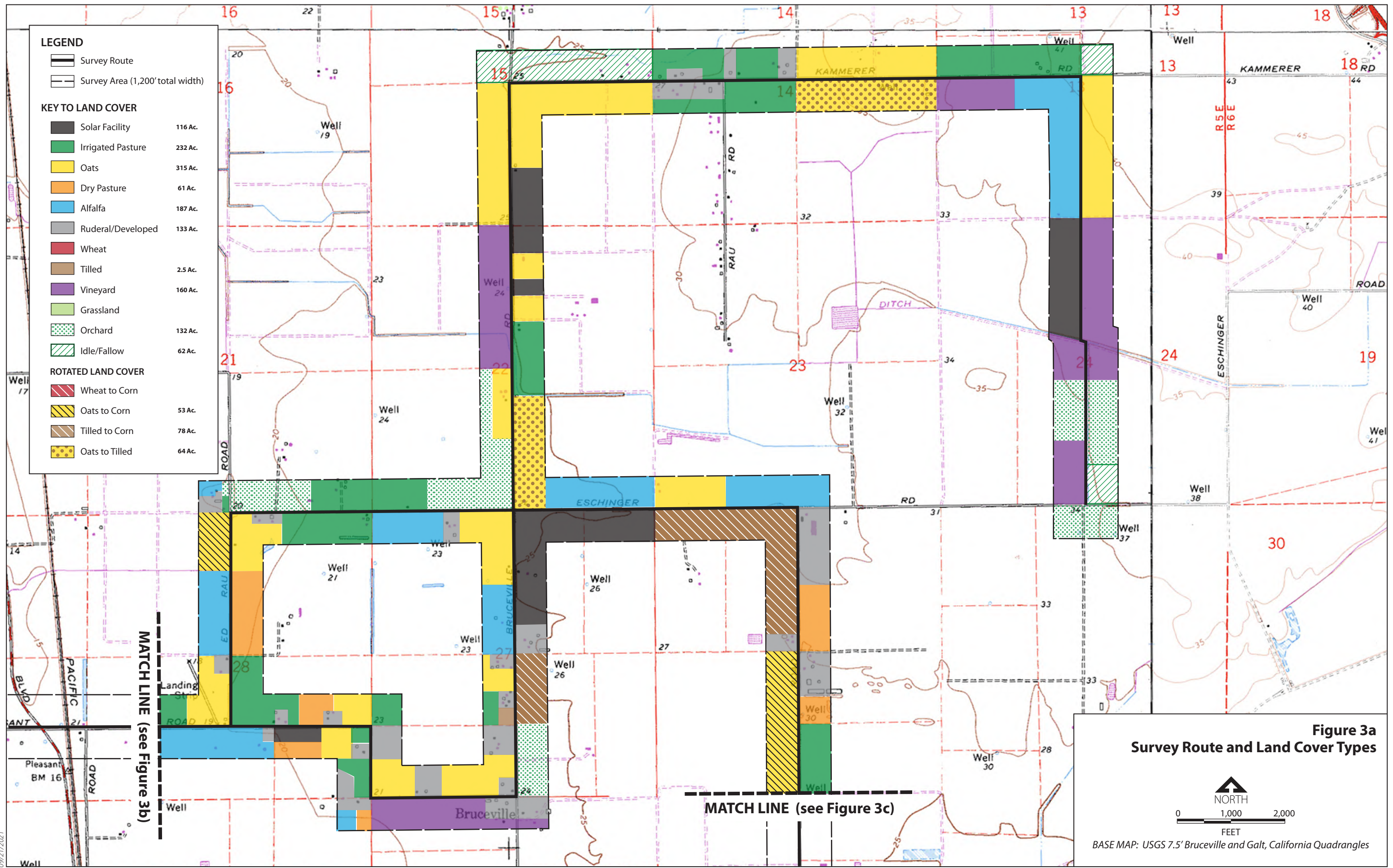
**2. Swainson's hawk foraging use of solar array fields exceeds what would be expected based on their availability.** This suggests that not only were the solar array fields being used by foraging Swainson's hawks, but that they were being selectively used at greater frequency than some of the other land cover types in the survey area. The data indicates a similar conclusion for American kestrel, and although not selected at a greater frequency, data on red-tailed hawk use of solar array fields indicate they were not avoided.

**3. Within the diverse agricultural landscape of the study area, the presence of the managed solar array fields (i.e., managed grassland substrate) did not appear to negatively affect the Swainson's hawk and other raptors.** The solar array fields were used for foraging similarly to other moderate to high value agricultural cover types and their presence did not appear to affect the overall use of the landscape by Swainson's hawks or other raptors. As one element of an otherwise diverse agricultural matrix, the solar array fields provided a consistent and an apparently reasonably accessible source of prey, particularly for Swainson's hawks and American kestrels. However, this outcome should be viewed with some caution in that while this study indicated a positive relationship, only a small percent of the survey area was solar array field. But these results suggest that solar array fields designed and managed similarly as those included within this study and integrated into a diverse agricultural landscape may not negatively affect Swainson's hawk and other raptors.

## References

- Bechard, M. J. 1982. Effect of Vegetative Cover on Foraging Site Selection by Swainson's Hawk. *Condor* 84:153–159.
- California Department of Fish and Game. 1994. Staff report regarding mitigation for impacts to Swainson's hawk (*Buteo swainsoni*) in the Central Valley, California.
- California Natural Diversity Data Base. 2021. Data search of Sacramento County quadrangles. California Department of Fish and Wildlife, Sacramento, CA.
- Dolezal, A., J. Torres, and M. O'Neal. 2021. Can Solar Energy Fuel Pollinator Conservation?, *Environmental Entomology*, 2021; nvab041 <https://doi.org/10.1093/ee/nvab041>
- Estep, J.A. 1989. Biology, movements, and habitat relationships of the Swainson's Hawk in the Central Valley of California, 1986-87. California Department of Fish and Game. Unnumbered Report.
- Estep, J.A. 2007. The Distribution, Abundance, and Habitat Associations of the Swainson's Hawk (*Buteo swainsoni*) in South Sacramento County. Prepared by Estep Environmental Consulting for the City of Elk Grove.
- Estep, J.A. 2009a. Monitoring Swainson's hawk (*Buteo swainsoni*) nesting activity in South Sacramento County. Prepared by Estep Environmental Consulting for the City of Elk Grove.
- Estep, J.A. 2009b. The influence of vegetation structure on Swainson's hawk (*Buteo swainsoni*) foraging habitat suitability in Yolo County, CA. Prepared for the Yolo Natural Heritage Program, Woodland, CA.
- Estep, J.A. 2011. Swainson's hawk habitat assessment of four proposed solar energy facilities in Sacramento County. Prepared by Estep Environmental Consulting for Recurrent Energy, San Francisco, CA.
- Estep, J.A. 2012. The distribution, abundance, and habitat associations of the Swainson's hawk (*Buteo swainsoni*) in the City of Elk Grove and proposed expansion area. Prepared by Estep Environmental Consulting for the City of Elk Grove, CA.
- Estep, J.A. 2013. Swainson's hawk and other raptor foraging use of solar array fields within an agricultural landscape in Sacramento County. Prepared for Recurrent Energy, San Francisco.
- Estep, J.A. 2020. The 2020 Distribution, Abundance, and Habitat Associations of the Swainson's Hawk (*Buteo swainsoni*) in Yolo County, CA. Prepared for the Yolo Habitat Conservancy, Woodland, CA.

- Estep, J. A., and J. Dinsdale. 2012. Distribution, abundance, and habitat associations of nesting Swainson's hawks in the Central San Joaquin Valley. *Central Valley Bird Club Bulletin* 15(4):84-106.
- Fuller, M.R. and J.A. Mosher. 1987. Raptor survey techniques. Pages 37–66 in B.A. Giron Pendleton, B.A. Millsap, K.W. Cline, and D.M. Bird [EDS.], *Raptor Management Techniques Manual*. Natl. Wildl. Fed., Washington, DC U.S.A.
- Goetzberger, A. and A. Zastrow. 1982. On the Coexistence of Solar-Energy Conversion and Plant Cultivation. *International Journal of Solar Energy*, 1(1):55–69.
- Manly, B.F., J.L. McDonald, D.L. Thomas, T.L. McDonald, and W.P. Erickson. 2002. *Resource selection by animals: statistical design and analysis for field studies*, Second Ed. Kluwer Academic Publishers, Boston, MA U.S.A.
- Sacramento County. 2006. Swainson's hawk impact mitigation fees. [http://www.msa2.saccounty.net/planning/Documents/SwainsonsHawk/Swainsons\\_Issues\\_0210.pdf](http://www.msa2.saccounty.net/planning/Documents/SwainsonsHawk/Swainsons_Issues_0210.pdf).
- Swolgaard, C.A., K.A. Reeves, and D.A. Bell. 2008. Foraging by Swainson's Hawks in a vineyard-dominated landscape. *Journal of Raptor Research* 42: 188-196.



**LEGEND**

- Survey Route
- Survey Area (1,200' total width)

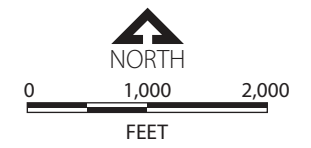
**KEY TO LAND COVER**

|                   |         |
|-------------------|---------|
| Solar Facility    | 116 Ac. |
| Irrigated Pasture | 232 Ac. |
| Oats              | 315 Ac. |
| Dry Pasture       | 61 Ac.  |
| Alfalfa           | 187 Ac. |
| Ruderal/Developed | 133 Ac. |
| Wheat             |         |
| Tilled            | 2.5 Ac. |
| Vineyard          | 160 Ac. |
| Grassland         |         |
| Orchard           | 132 Ac. |
| Idle/Fallow       | 62 Ac.  |

**ROTATED LAND COVER**

|                |        |
|----------------|--------|
| Wheat to Corn  |        |
| Oats to Corn   | 53 Ac. |
| Tilled to Corn | 78 Ac. |
| Oats to Tilled | 64 Ac. |

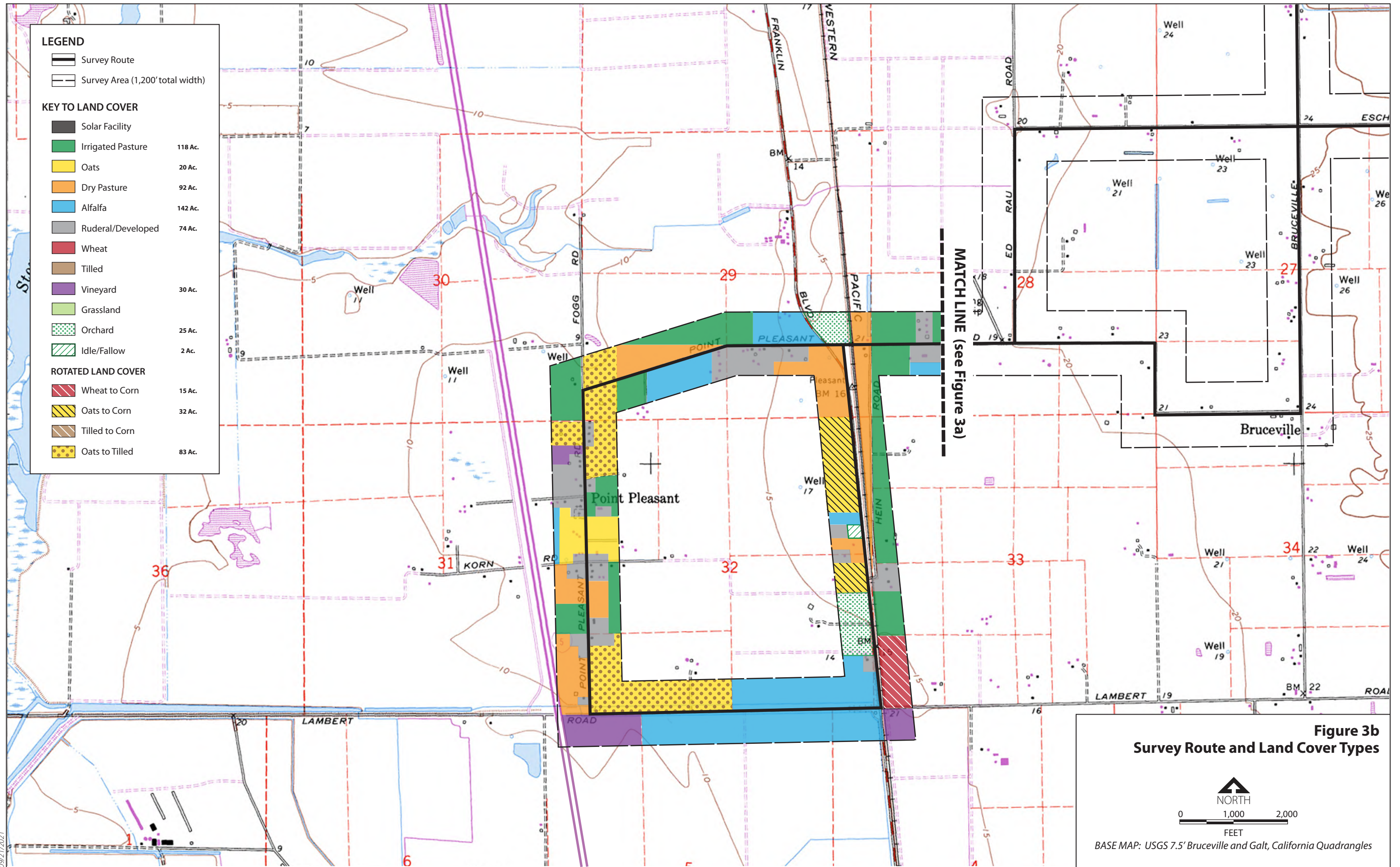
**Figure 3a**  
Survey Route and Land Cover Types



BASE MAP: USGS 7.5' Bruceville and Galt, California Quadrangles

09/21/2021





**LEGEND**

- Survey Route
- Survey Area (1,200' total width)

**KEY TO LAND COVER**

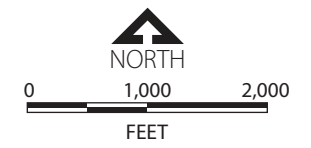
- Solar Facility
- Irrigated Pasture 118 Ac.
- Oats 20 Ac.
- Dry Pasture 92 Ac.
- Alfalfa 142 Ac.
- Ruderal/Developed 74 Ac.
- Wheat
- Tilled
- Vineyard 30 Ac.
- Grassland
- Orchard 25 Ac.
- Idle/Fallow 2 Ac.

**ROTATED LAND COVER**

- Wheat to Corn 15 Ac.
- Oats to Corn 32 Ac.
- Tilled to Corn
- Oats to Tilled 83 Ac.

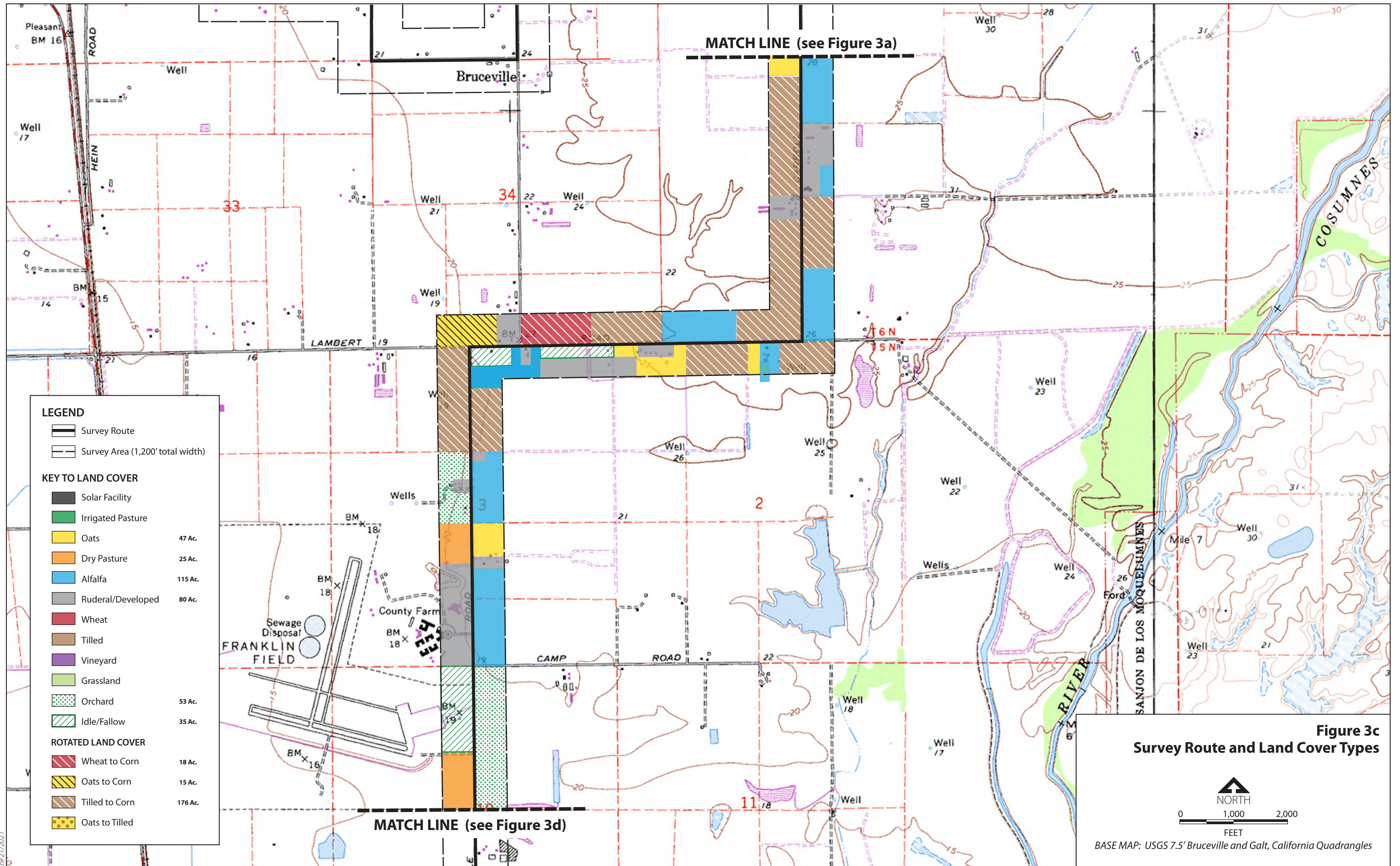
MATCH LINE (see Figure 3a)

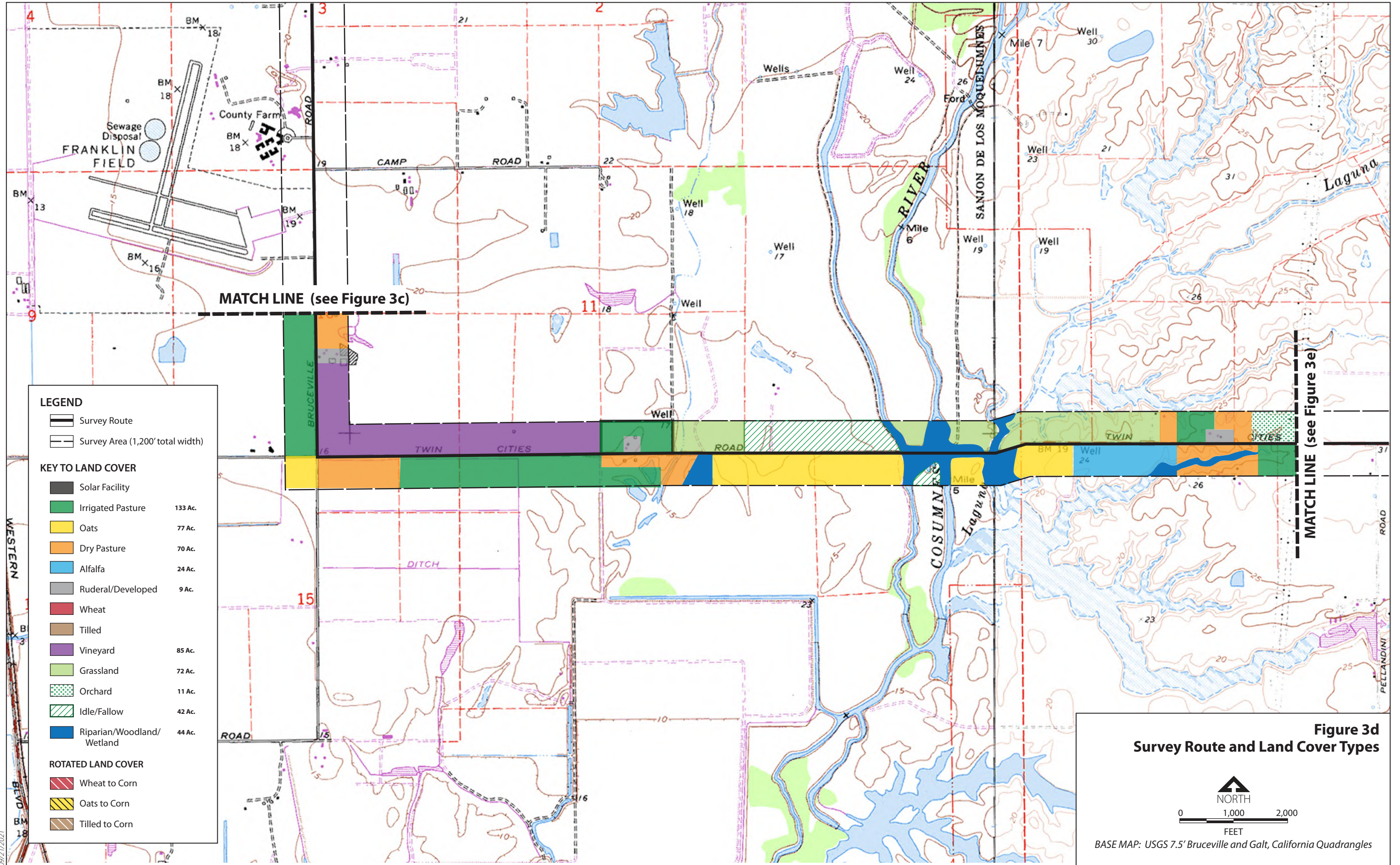
**Figure 3b**  
Survey Route and Land Cover Types



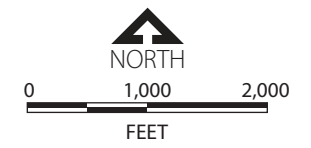
BASE MAP: USGS 7.5' Bruceville and Galt, California Quadrangles

09/21/2021



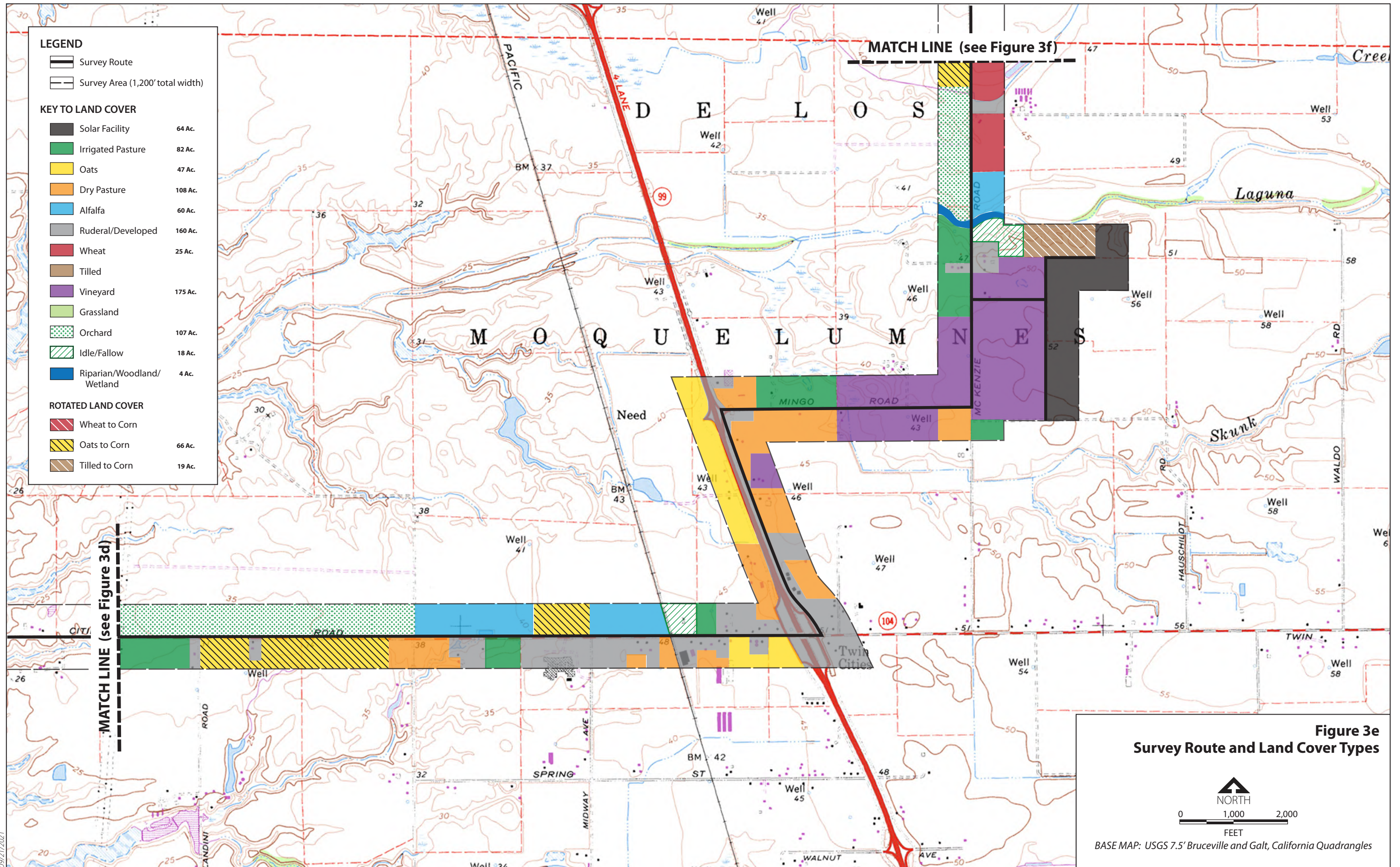


**Figure 3d**  
Survey Route and Land Cover Types



BASE MAP: USGS 7.5' Bruceville and Galt, California Quadrangles

09/21/2021



**LEGEND**

- Survey Route
- Survey Area (1,200' total width)

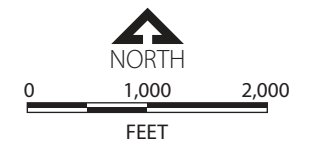
**KEY TO LAND COVER**

- Solar Facility 64 Ac.
- Irrigated Pasture 82 Ac.
- Oats 47 Ac.
- Dry Pasture 108 Ac.
- Alfalfa 60 Ac.
- Ruderal/Developed 160 Ac.
- Wheat 25 Ac.
- Tilled
- Vineyard 175 Ac.
- Grassland
- Orchard 107 Ac.
- Idle/Fallow 18 Ac.
- Riparian/Woodland/Wetland 4 Ac.

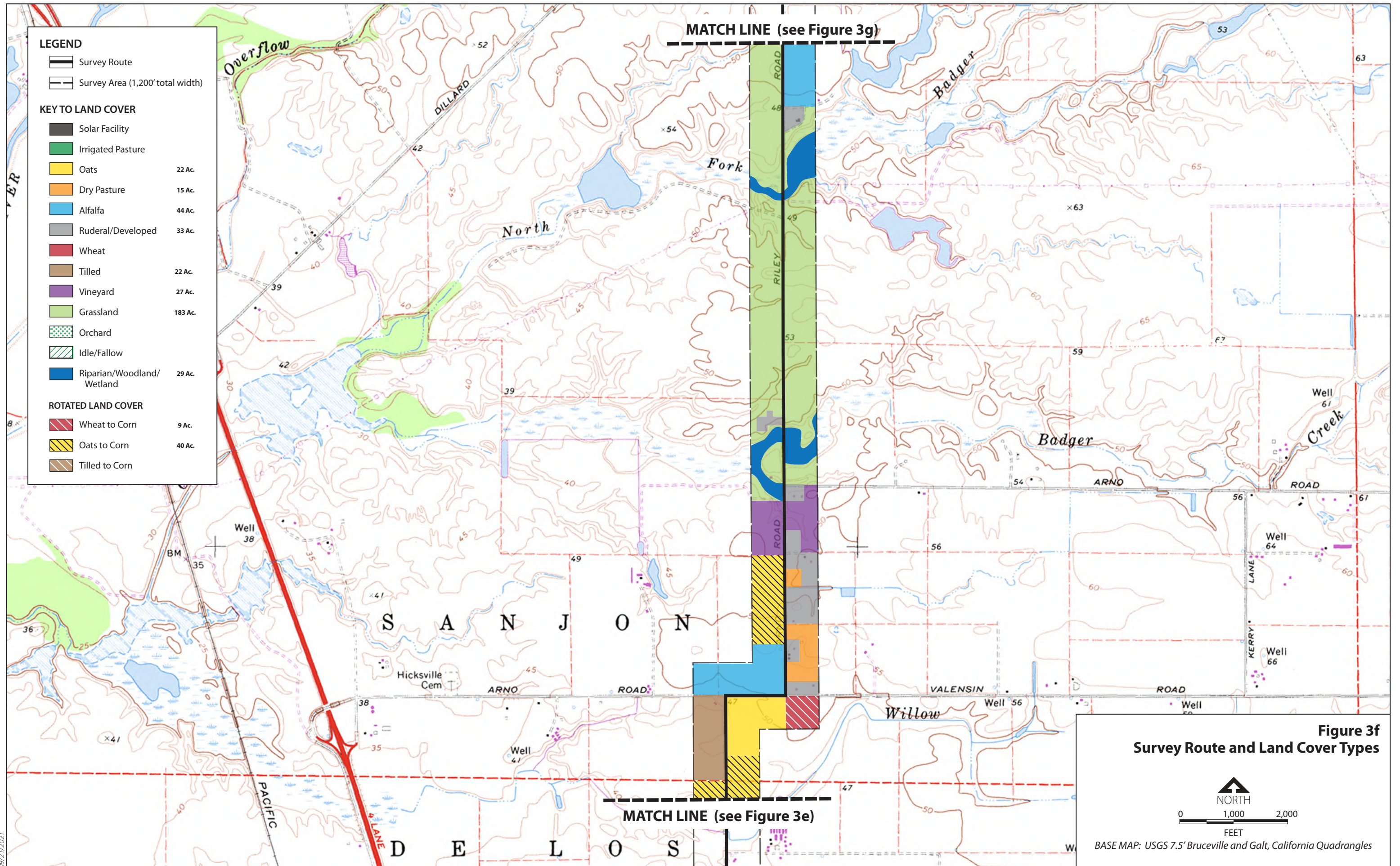
**ROTATED LAND COVER**

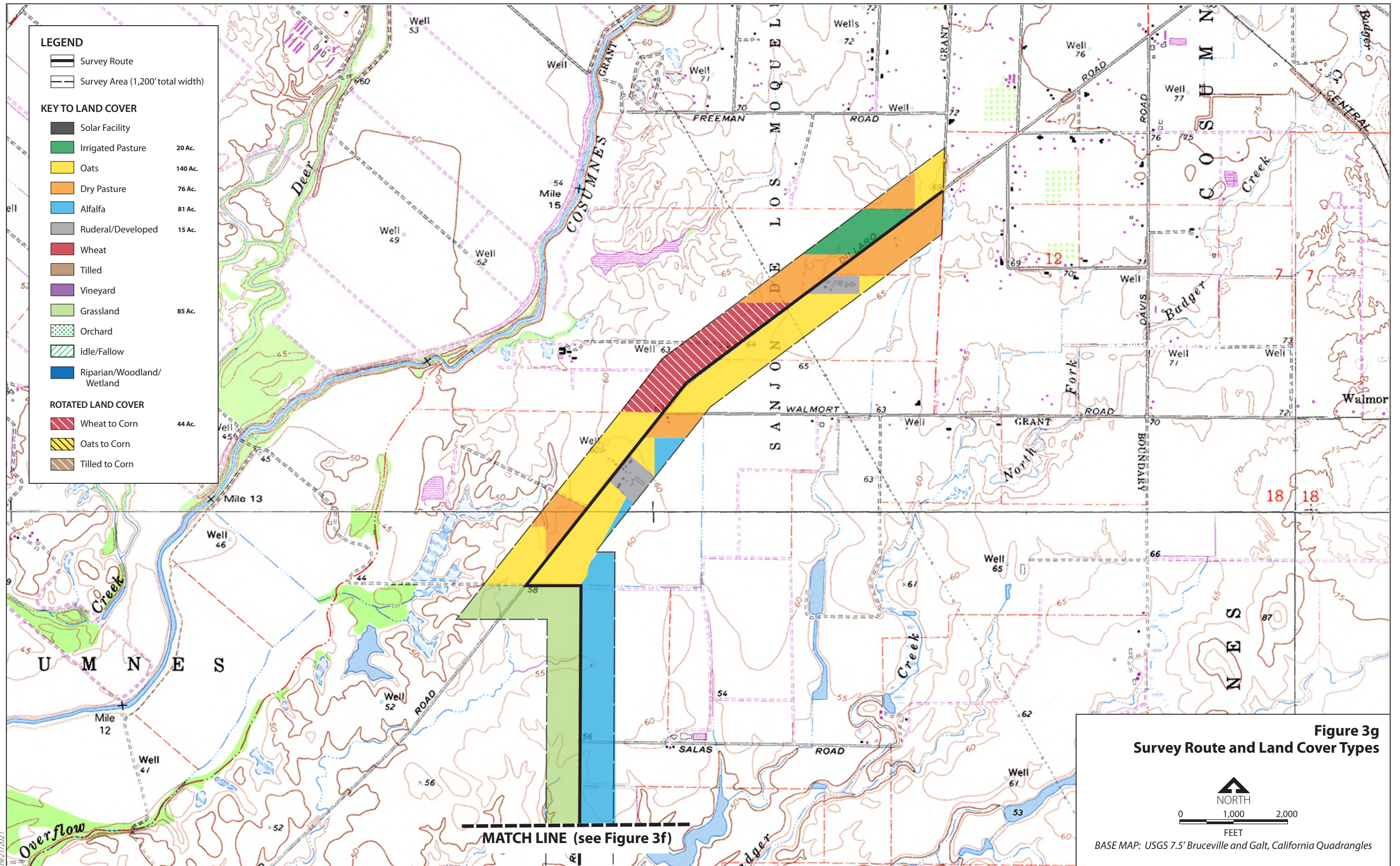
- Wheat to Corn
- Oats to Corn 66 Ac.
- Tilled to Corn 19 Ac.

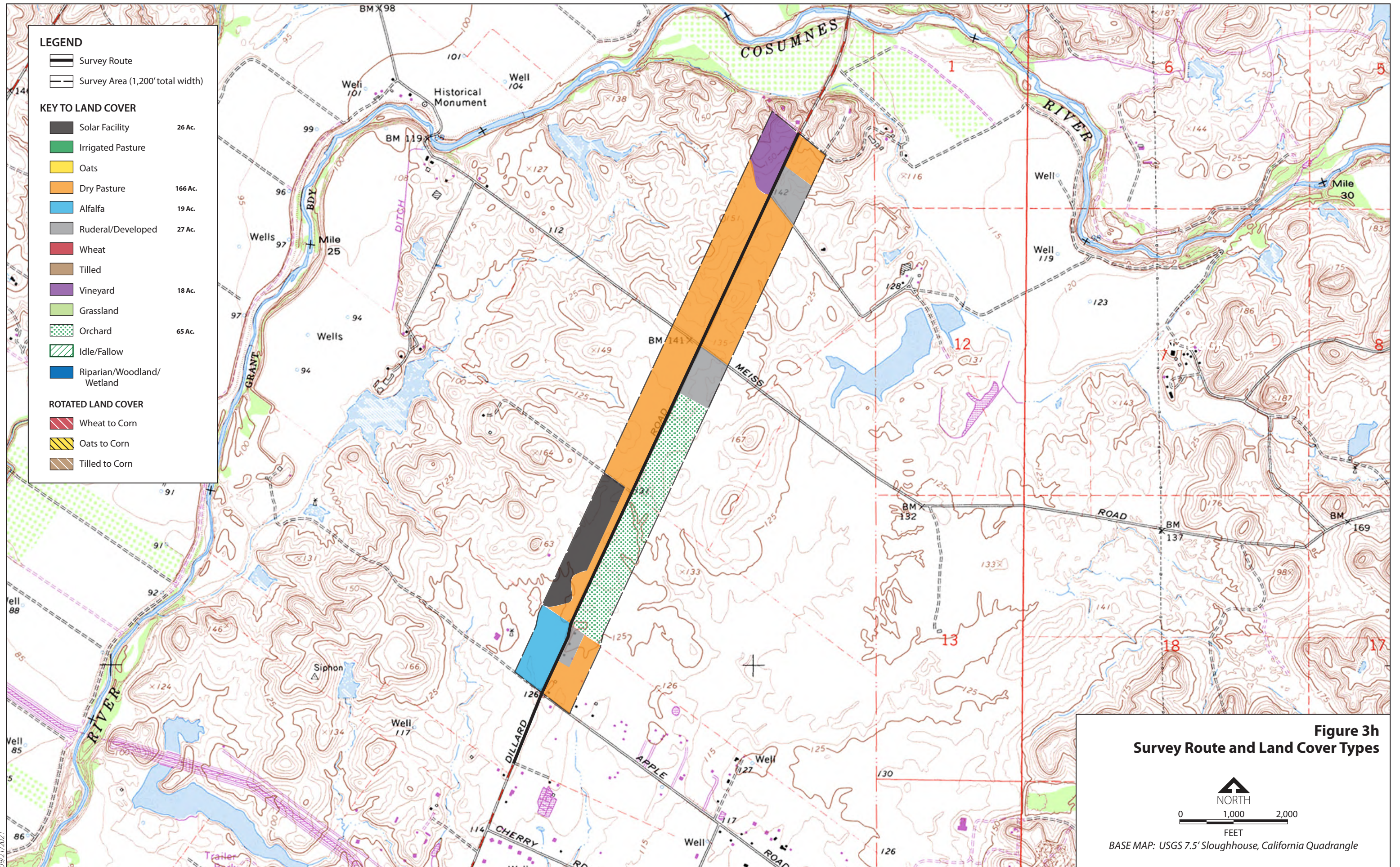
**Figure 3e**  
**Survey Route and Land Cover Types**



BASE MAP: USGS 7.5' Bruceville and Galt, California Quadrangles







INTENTIONALLY LEFT BLANK



---

# **Appendix B**

## Observed Species Compendium

# Plant Species

## VASCULAR SPECIES

### EUDICOTS

#### ADOXACEAE—MUSKROOT FAMILY

*Sambucus nigra*—blue elderberry

#### AMARANTHACEAE—AMARANTH FAMILY

*Amaranthus albus*—prostrate pigweed<sup>1</sup>

#### APIACEAE—CARROT FAMILY

*Conium maculatum*—poison hemlock<sup>1</sup>

*Eryngium castrense*—Great Valley eryngo

*Foeniculum vulgare*—fennel<sup>1</sup>

*Torilis arvensis*—spreading hedgeparsley<sup>1</sup>

#### ASTERACEAE—SUNFLOWER FAMILY

*Baccharis pilularis*—coyote brush

*Carduus pycnocephalus*—Italian plumeless thistle<sup>1</sup>

*Centaurea solstitialis*—yellow star-thistle<sup>1</sup>

*Dittrichia graveolens*—stinkwort<sup>1</sup>

*Erigeron canadensis*—Canadian horseweed

*Holocarpha virgata*—yellowflower tarweed

*Hypochaeris glabra*—smooth cat's ear<sup>1</sup>

*Hypochaeris radicata*—hairy cat's ear<sup>1</sup>

*Lactuca serriola*—prickly lettuce<sup>1</sup>

*Matricaria discoidea*—disc mayweed

*Psilocarphus brevissimus*—short woollyheads

*Sonchus arvensis*—field sowthistle<sup>1</sup>

*Xanthium strumarium*—cocklebur

#### BORAGINACEAE—BORAGE FAMILY

*Plagiobothrys bracteatus*—bracted popcornflower

#### BRASSICACEAE—MUSTARD FAMILY

*Brassica nigra*—black mustard<sup>1</sup>

*Lepidium latifolium*—perennial pepper weed<sup>1</sup>

#### CARYOPHYLLACEAE—PINK FAMILY

*Spergularia rubra*—red sandspurry<sup>1</sup>

**CONVOLVULACEAE—MORNING-GLORY FAMILY**

*Convolvulus arvensis*—field bindweed<sup>1</sup>

**CUCURBITACEAE—GOURD FAMILY**

*Cucurbita foetidissima*—Missouri gourd

**EUPHORBIACEAE—SPURGE FAMILY**

*Croton setiger*—dove weed

**FABACEAE—LEGUME FAMILY**

*Lupinus microcarpus*—valley lupine

*Trifolium hirtum*—rose clover<sup>1</sup>

**FAGACEAE—OAK FAMILY**

*Quercus agrifolia*—coast live oak

*Quercus lobata*—valley oak

**GERANIACEAE—GERANIUM FAMILY**

*Erodium botrys*—longbeak stork's bill<sup>1</sup>

*Erodium cicutarium*—redstem stork's bill<sup>1</sup>

**JUGLANDACEAE—WALNUT FAMILY**

*Juglans hindsii*—Northern California black walnut

**LAMIACEAE—MINT FAMILY**

*Trichostema lanceolatum*—vinegarweed

**LYTHRACEAE—LOOSESTRIFE FAMILY**

*Lythrum hyssopifolia*—hyssop loosestrife<sup>1</sup>

**MALVACEAE—MALLOW FAMILY**

*Malva parviflora*—cheeseweed mallow<sup>1</sup>

**ONAGRACEAE—EVENING PRIMROSE FAMILY**

*Epilobium brachycarpum*—tall annual willowherb

*Epilobium ciliatum*—fringed willowherb

**POLYGONACEAE—BUCKWHEAT FAMILY**

*Polygonum aviculare*—prostrate knotweed<sup>1</sup>

*Rumex crispus*—curly dock<sup>1</sup>

*Rumex dentatus*—toothed dock<sup>1</sup>

*Rumex pulcher*—fiddle dock<sup>1</sup>

**RANUNCULACEAE—BUTTERCUP FAMILY**

*Ranunculus aquatilis*—white water crowfoot

*Ranunculus sceleratus*—cursed buttercup

**ROSACEAE—ROSE FAMILY**

*Rubus armeniacus*—Himalayan blackberry<sup>1</sup>

**SALICACEAE—WILLOW FAMILY**

*Populus fremontii*—Fremont cottonwood

*Salix gooddingii*—Goodding's willow

**SOLANACEAE—NIGHTSHADE FAMILY**

*Solanum elaeagnifolium*—silverleaf nightshade<sup>1</sup>

**VERBENACEAE—VERVAIN FAMILY**

*Phyla nodiflora*—turkey tangle fogfruit

**VITACEAE—GRAPE FAMILY**

*Vitis californica*—California wild grape

**MONOCOTS**

**CYPERACEAE—SEDGE FAMILY**

*Cyperus eragrostis*—tall flatsedge

*Eleocharis macrostachya*—pale spike rush

**JUNACEAE—RUSH FAMILY**

*Juncus balticus*—Baltic rush

*Juncus effusus*—soft rush

**POACEAE—GRASS FAMILY**

*Alopecurus saccatus*—Pacific foxtail

*Avena barbata*—slender oat<sup>1</sup>

*Avena fatua*—wild oat<sup>1</sup>

*Briza minor*—little quakinggrass<sup>1</sup>

*Bromus diandrus*—ripgut brome<sup>1</sup>

*Bromus hordeaceus*—soft brome<sup>1</sup>

*Crypsis schoenoides*—swamp prickleggrass<sup>1</sup>

*Cynodon dactylon*—Bermudagrass<sup>1</sup>

*Elymus caput-medusae*—medusahead<sup>1</sup>

*Festuca myuros*—rat-tail fescue<sup>1</sup>

*Festuca perennis*—perennial rye grass<sup>1</sup>

*Gastridium phleoides*—nit grass<sup>1</sup>

*Hordeum marinum*—seaside barley<sup>1</sup>

*Hordeum murinum*—mouse barley<sup>1</sup>

*Melica californica*—California melicgrass

*Phalaris aquatica*—Harding grass<sup>1</sup>

*Poa secunda*—onesided bluegrass

*Polypogon monspeliensis*—annual rabbitsfoot grass<sup>1</sup>

**THEMIDACEAE—BRODIAEA FAMILY**

*Brodiaea elegans*—harvest brodiaea

*Triteleia laxa*—Ithuriel's spear

**TYPHACEAE—CATTAIL FAMILY**

*Typha latifolia*—broadleaf cattail

# Wildlife Species

## VERTEBRATES

### BIRDS

#### **BLACKBIRDS, ORIOLES & ALLIES**

**ICTERIDAE—BLACKBIRDS**

*Agelaius phoeniceus*—red-winged blackbird

*Agelaius tricolor*—tricolored blackbird<sup>2,3</sup>

*Euphagus cyanocephalus*—Brewer's blackbird

*Molothrus ater*—brown-headed cowbird<sup>1</sup>

#### **FALCONS**

**FALCONIDAE—CARACARAS & FALCONS**

*Falco peregrinus anatum*—American peregrine falcon<sup>1</sup>

#### **HAWKS**

**ACCIPITRIDAE—HAWKS, KITES, EAGLES, & ALLIES**

*Buteo jamaicensis*—red-tailed hawk<sup>2</sup>

*Buteo swainsoni*—Swainson's hawk<sup>2,3</sup>

*Elanus leucurus*—white-tailed kite<sup>2</sup>

*Haliaeetus leucocephalus*—bald eagle<sup>2</sup>

*Circus hudsonius*—northern harrier<sup>2</sup>

#### **HERONS & BITTERNS**

**ARDEIDAE—HERONS, BITTERNS, & ALLIES**

*Ardea alba*—great egret

*Ardea herodias*—great blue heron

#### **JAYS, MAGPIES & CROWS**

**CORVIDAE—CROWS & JAYS**

*Corvus brachyrhynchos*—American crow

*Pica nuttalli*—yellow-billed magpie<sup>2</sup>

## **NEW WORLD VULTURES**

### **CATHARTIDAE—NEW WORLD VULTURES**

*Cathartes aura*—turkey vulture

## **OWLS**

### **STRIGIDAE—TYPICAL OWLS**

*Athene cunicularia*—burrowing owl<sup>2,3</sup>

## **PIGEONS & DOVES**

### **COLUMBIDAE—PIGEONS & DOVES**

*Zenaida macroura*—mourning dove

## **SHOREBIRDS**

### **CHARADRIIDAE—LAPWINGS & PLOVERS**

*Charadrius vociferus*—killdeer

## **STARLINGS & ALLIES**

### **STURNIDAE—STARLINGS**

*Sturnus vulgaris*—European starling<sup>1</sup>

## **WATERFOWL**

### **ANATIDAE—DUCKS, GEESE, & SWANS**

*Anas platyrhynchos*—mallard

*Branta canadensis*—Canada goose

## **CRANES**

### **GRUIDAE—CRANES**

*Antigone canadensis tabida*—greater sandhill crane<sup>2</sup>

## **NEW WORLD SPARROWS**

### **PASSERELLIDAE—NEW WORLD SPARROWS**

*Melospiza melodia*—song sparrow<sup>1</sup>

## **VIREOS**

### **VIREONIDAE—VIREOS**

*Vireo* sp.—Vireo species

## **MAMMALS**

## **CANIDS**

### **CANIDAE—WOLVES & FOXES**

*Canis latrans*—coyote<sup>3</sup>

*Vulpes vulpes*—red fox<sup>1</sup>

## **HARES & RABBITS**

### LEPORIDAE—HARES & RABBITS

*Lepus californicus*—black-tailed jackrabbit

## **MUSTELIDS**

### MUSTELIDAE—WEASELS, SKUNKS, & OTTERS

*Taxidea taxus*—American badger<sup>2,3</sup>

## **POCKET GOPHERS**

### GEOMYIDAE—POCKET GOPHERS

*Thomomys bottae*—Botta's pocket gopher

## **SQUIRRELS**

### SCIURIDAE—SQUIRRELS

*Otospermophilus beecheyi*—California ground squirrel

## REPTILES

### **SNAKES**

#### COLUBRIDAE—COLUBRID SNAKES

*Thamnophis sirtalis*—common garter snake

### **TURTLES**

#### EMYDIDAE—OLD AND NEW WORLD TURTLES

*Unknown sp.*—Freshwater turtle species<sup>3</sup>

## AMPHIBIANS

### **FROGS**

#### HYLIDAE—TREE FROGS AND THEIR ALLIES

*Pseudacris regilla*—northern pacific treefrog<sup>3</sup>

## Insects

### **AQUATIC INSECTS**

#### CORIXIDAE—AQUATIC INSECTS

*Corixa sp.*—water boatmen

#### HYDRACHNELLAE—BENTHIC ARTHROPODS

Various sp.—water mites

## INVERTEBRATES

### **Crustaceans**

#### **CHIROCEPHALIDAE—FAIRY SHRIMP**

*Lindieriella occidentalis*—California lindieriella

#### **CYZICIDAE—CLAM SHRIMP**

*Cyzicus californicus*—clam shrimp

#### **CANDONIDAE**

*Cladocera sp.*—water flea species

*Copepod sp.*—freshwater copepod species

*Ostracod sp.*—seed shrimp species

- 1 Signifies introduced (non-native) species
- 2 Signifies special-status species
- 3 Signifies secondary species observation such as nest, den, burrow, skat/larvae, and/or tracks



INTENTIONALLY LEFT BLANK

---

## **Appendix C**

### Special-Status Plants with Potential to Occur

### Appendix C. Special-Status Plants with Potential to Occur

| Scientific Name                             | Common Name           | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet)                                                                               | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|-----------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Arctostaphylos myrtifolia</i>            | lone manzanita        | FT/None/1B.2/None                    | Chaparral, Cismontane woodland; acidic, lone soil, clay, or sandy/ perennial evergreen shrub/ Nov-Mar/ 197-1,900.                                                  | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. The nearest known occurrence for this species is located to the east of the PSA in the 'Carbondale' U.S. Geological Survey (USGS) 7.5-Minute Quadrangle (Quad) (CNPS 2022; USFWS 2022).                                                                                                                                                                                                                                                      |
| <i>Brodiaea rosea</i> ssp. <i>vallicola</i> | valley brodiaea       | None/None/4.2/None                   | Valley and foothill grassland (swales), Vernal pools; Old alluvial terraces; silty, sandy, and gravelly loam/ perennial bulbiferous herb/ Apr-May (June)/33-1,095. | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for this species is present. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands in grasslands, floodplains, terraces, and vernal pools where silt, sandy or loam soils are present. The nearest known occurrence for this species is recorded approximately four miles northwest of the PSA (CDFW 2022; Jepson eFlora 2021). |
| <i>Crocانthemum suffrutescens</i>           | Bisbee Peak rush-rose | None/None/3.2/None                   | Chaparral; Often gabbroic or lone soil; often burned or disturbed areas/ perennial evergreen shrub/ Apr-Aug/ 246-2,195.                                            | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. The nearest known occurrence for this species is located to the east of the PSA in the 'Carbondale' USGS 7.5-Minute Quad (CNPS 2022).                                                                                                                                                                                                                                                                                                        |
| <i>Downingia pusilla</i>                    | dwarf downingia       | None/None/2B.2/Covered               | Valley and foothill grassland (mesic), Vernal pools/annual herb/ Mar-May/ 3-1,455.                                                                                 | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present. There is observed suitable habitat for this species, as well as SSHCP modeled habitat in the PSA. Specifically, within the PSA suitable habitat for this species is                                                                                                                                                                                                                         |

### Appendix C. Special-Status Plants with Potential to Occur

| Scientific Name                                 | Common Name            | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet)                                 | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------|------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 |                        |                                      |                                                                                                                      | located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. The nearest known occurrences for this species are located west of the PSA in the 'Elk Grove' USGS 7.5-Minute Quad, and south to southwest in the 'Clay' and 'Galt' USGS 7.5-Minute Quads (CNPS 2022; Sacramento County 2018).                                                                |
| <i>Eriogonum apricum</i> var. <i>apricum</i>    | lone buckwheat         | FE/SE/1B.1/None                      | Chaparral (openings, lone soil)/perennial herb/July–Oct/197–475.                                                     | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. The nearest known occurrence for this species is located to the east of the PSA in the 'Carbondale' USGS 7.5-Minute Quad (CNPS 2022; USFWS 2022).                                                                                                                                                                                                                      |
| <i>Eriogonum apricum</i> var. <i>prostratum</i> | Irish Hill buckwheat   | FE/SE/1B.1/None                      | Chaparral (openings, lone soil)/perennial herb/ June–July/ 295–395.                                                  | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. The nearest known occurrence of this species is located to the east of the PSA in the 'Carbondale' USGS 7.5-Minute Quad (CNPS 2022; USFWS 2022).                                                                                                                                                                                                                       |
| <i>Eryngium pinnatisectum</i>                   | Tuolumne button-celery | None/None/1B.2/None                  | Cismontane woodland, Lower montane coniferous forest, Vernal pools; mesic/annual/ perennial herb/ May–Aug/230–3,000. | <b>Low potential to occur.</b> This species has not been documented in the vicinity of the PSA, but the PSA is within the known range of the species. Habitat for the species in the PSA is minimal and of low quality. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. The |

**Appendix C. Special-Status Plants with Potential to Occur**

| Scientific Name              | Common Name             | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet)                                                                                         | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|-------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                         |                                      |                                                                                                                                                                              | nearest known occurrences for this species are located to the east and northeast of the PSA in the 'Carbondale' and 'Folsom SE' USGS 7.5-Minute Quads (CNPS 2022).                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Fritillaria agrestis</i>  | stinkbells              | None/None/4.2/None                   | Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley, and foothill grassland; Clay, Serpentinite (sometimes)/ perennial bulbiferous herb/ Mar-June/ 35-5,100. | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. The nearest known occurrence for this species is located to the east of the PSA in the 'Sloughhouse' USGS 7.5-Minute Quad (CNPS 2022).                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Gratiola heterosepala</i> | Boggs Lake hedge-hyssop | None/SE/1B.2/Covered                 | Marshes and swamps (lake margins), Vernal pools; clay/ annual herb/ Apr-Aug/ 33-7,790.                                                                                       | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and suitable habitat for the species and SSHCP modeled habitat is present. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. The nearest known occurrence for this species is within five miles of the PSA, located approximately 0.85 miles southwest of the junction at Sloughhouse Road and Jackson Road (Highway 16) (CDFW 2022; CNPS 2022; Sacramento County 2018). |
| <i>Hesperevax caulescens</i> | hogwallow starfish      | None/None/4.2/None                   | Valley and foothill grassland, Vernal pools; Alkaline (sometimes)/ annual herb/ Mar-June/ 0-1,655.                                                                           | <b>Low potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present however minimal and of low quality. The nearest known occurrence for this species is                                                                                                                                                                                                                                                                                                                                                                                                                         |

### Appendix C. Special-Status Plants with Potential to Occur

| Scientific Name                               | Common Name        | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet)               | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------|--------------------|--------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               |                    |                                      |                                                                                                    | located to the east of the PSA in the 'Buffalo Creek' USGS 7.5-Minute Quad (CNPS 2022).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Horkelia parryi</i>                        | Parry's horkelia   | None/None/1B.2/None                  | Chaparral, Cismontane woodland; lone formation and other soils/ perennial herb/ Apr-Sep/262-3,510. | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. There are no known lone soils in the PSA. The nearest known occurrence for this species is located to the east of the PSA in the 'Carbondale' USGS 7.5-Minute Quad (CNPS 2022; USDA 2022).                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Juncus leiospermus</i> var. <i>ahartii</i> | Ahart's dwarf rush | None/None/1B.2/Covered               | Valley and foothill grassland (mesic)/ annual herb/ Mar-May/ 98-750.                               | <b>Low potential to occur.</b> This species has not been documented in the vicinity of the PSA but is within the known range of the species. Habitat for the species is minimal and of low quality in the PSA, though the PSA does include SSHCP modeled habitat. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. The nearest known occurrence for this species is within five miles of the PSA, located at the southeast corner of Keifer Boulevard and Sunrise Boulevard (CNPS 2022; Sacramento County 2018). |

**Appendix C. Special-Status Plants with Potential to Occur**

| Scientific Name               | Common Name      | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet)                 | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|------------------|--------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Legenere limosa</i>        | legenere         | None/None/1B.1/Covered               | Vernal pools/ annual herb/ Apr–June/ 3–2,885.                                                        | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present. There is also SSHCP modeled habitat in the PSA. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. The nearest known occurrences for this species are within five miles of the PSA, located approximately two miles northeast of the Nimbus Fish Hatchery and 1.8 miles east of the junction of Apple Road and Dillard Road (CDFW 2022; CNPS 2022; Sacramento County 2018). |
| <i>Navarretia eriocephala</i> | hoary navarretia | None/None/4.3/Covered                | Cismontane woodland, Valley, and foothill grassland; vernal mesic/ annual herb/ May–June/ 344–1,310. | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and minimal habitat for the species present. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. The nearest known occurrence for this species is located to the west of the PSA in the 'Elk Grove' USGS 7.5-Minute Quad (CNPS 2022; Jepson eFlora 2021).                                                                                                                                                            |

### Appendix C. Special-Status Plants with Potential to Occur

| Scientific Name                               | Common Name             | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet) | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------|-------------------------|--------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Navarretia myersii</i> ssp. <i>myersii</i> | pincushion navarretia   | None/None/1B.1/Covered               | Vernal pools; often acidic/ annual herb/ Apr–May/ 66–1,080.                          | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present. The PSA is also mapped as SSHCP modeled habitat for the species. Specifically, the Hadselville-Pentz and Redding Gravelly Loam soil complexes within the are slightly acidic, therefore vernal pools located in these soils provide potential suitable habitat. The nearest known occurrence for this species is within five miles of the PSA, located approximately six miles east of Highway 16, south of the Schneider Ranch property near Meiss Road (CNPS 2022; Sacramento County 2018; USDA 2022). |
| <i>Orcuttia tenuis</i>                        | slender Orcutt grass    | FT/SE/1B.1/Covered                   | Vernal pools; Often gravelly/ annual herb/ May–Sep (Oct)/ 115–5,770.                 | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present. Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. Designated Critical Habitat (DCH) is located approximately four miles northwest of the PSA. A known occurrence is also recorded for this species to the west of the PSA in the 'Elk Grove' USGS 7.5-Minute Quad (CNPS 2022; USFWS 2020e; USFWS 2022).                            |
| <i>Orcuttia viscida</i>                       | Sacramento Orcutt grass | FE/SE/1B.1/Covered                   | Vernal pools/ annual herb/ Apr–July (Sep)/ 98–330.                                   | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |



### Appendix C. Special-Status Plants with Potential to Occur

| Scientific Name             | Common Name              | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet)                                                       | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------|--------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                          |                                      |                                                                                                                                            | Specifically, within the PSA suitable habitat for this species is located throughout both the solar development area and adjacent other lands, specifically in the vernal pools, wetlands swales and seasonal wetlands. DCH is located approximately four miles northwest of the PSA. There are also several known occurrences for this species within five miles of the PSA, including numerous locations off Kefer Boulevard near the intersection with Grant Line Road (CDFW 2022; USFWS 2020d; USFWS 2022). |
| <i>Ranunculus lobbii</i>    | Lobb's aquatic buttercup | None/None/4.2/None                   | Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools/ annual herb (aquatic)/ Feb–May/ 50–1,540. | <b>Not expected to occur.</b> Habitat for this species is absent in the PSA. The nearest known occurrence for this species is located to the east of the PSA in the 'Goosecreek' USGS 7.5-Minute Quad (CNPS 2022).                                                                                                                                                                                                                                                                                              |
| <i>Sagittaria sanfordii</i> | Sanford's arrowhead      | None/None/1B.2/Covered               | Marshes and swamps (assorted shallow freshwater)/ perennial rhizomatous herb (emergent)/ May–Oct (Nov)/ 0–2,130.                           | <b>Low potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present however minimal and of low quality. The PSA also includes SSHCP modeled habitat for the species. Specifically, within the PSA, there is limited and low-quality habitat for this species (perennially inundated habitat). The nearest known occurrence for this species is within five miles of the PSA, located approximately 0.60 miles south of Meiss Road and southeast of          |

**Appendix C. Special-Status Plants with Potential to Occur**

| Scientific Name | Common Name | Status (Federal/ State/ CRPR/ SSHCP) | Primary Habitat Associations, Lifeforms/ Blooming Period/ and Elevation Range (Feet) | Potential to Occur                                          |
|-----------------|-------------|--------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------|
|                 |             |                                      |                                                                                      | Sloughhouse (CDFW 2022; CNPS 2022; Sacramento County 2018). |

**Sources:** CDFW 2022; CNPS 2021b; Jepson eFlora 2021; Sacramento County 2018; USDA 2022; USFWS 2022; USFWS 2020c; USFWS 2020d.

**Federal Status**

FE: Federally listed as endangered.

FT: Federally listed as threatened

**State Status**

SE: State listed as endangered

**California Rare Plant Rank (CRPR) Status**

1B: plants rare, threatened, or endangered in California and elsewhere.

2B: plants rare, threatened, or endangered in California but more common elsewhere.

3: Plants about which more information is needed – A Review List.

4: Plants of limited distribution – A Watch List.

**Threat Rank**

0.1: Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat).

0.2: Moderately threatened in California (20%-80% occurrences threatened/moderate degree and immediacy of threat).

0.3: Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known).

None: No conservation status.

**SSHCP (South Sacramento Habitat Conservation Plan)**

Covered: Currently listed as threatened or endangered under the California Endangered Species Act (CESA) or the Federal Endangered Species Act (FESA) and covered within the Plan Area by the SSHCP.

None: Not covered under the SSHCP.

**Potential for Occurrence Ranks**

Moderate Potential to Occur: the species has not been documented in the vicinity, but the Project site is within the known range of the species, and habitat for the species is present.

Low Potential to Occur: The species has not been documented in the vicinity and the PSA is within the known range of the species, but habitat for the species is of low quality.

Not Expected to Occur: The PSA is outside the known range of the species, and habitat for the species is either absent or of low quality.

INTENTIONALLY LEFT BLANK

---

## **Appendix D**

### Special-Status Wildlife with Potential to Occur

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                | Common Name                       | Status (Federal/State/SSHCP) | Habitat                                                                                                                                                                                                                                                                   | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------|-----------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Amphibians</b>              |                                   |                              |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Ambystoma californiense</i> | California tiger salamander (CTS) | FT/ST, WL/Covered            | Upland habitat is annual grassland, valley-foothill hardwood, and valley-foothill riparian habitats; aquatic breeding habitat is vernal pools and other ephemeral pools, and less commonly in man-made pools and along stream courses and if predatory fishes are absent. | <b>Low potential to occur.</b> This species has not been documented in the PSA, however this species is known to occur in the Project vicinity, some suitable habitat is present, as well as South Sacramento Habitat Conservation Plan (SSHCP) modeled aquatic and upland habitat (Sacramento County 2018). Specifically, there are known occurrences for this species within five miles of the PSA, located southeast of Laguna Creek, approximately 0.25 miles southeast of Katena Lane at Clay Station Road (CDFW 2022, USFWS 2022). No CTS were identified during aquatic larval surveys conducted by Dudek 2021. |
| <i>Spea hammondi</i>           | western spadefoot toad (WST)      | None/SSC/Covered             | Primarily grassland and vernal pools, but also in ephemeral wetlands that persist at least 3 weeks in chaparral, coastal scrub, valley-foothill woodlands, pastures, and other agriculture.                                                                               | <b>Moderate potential to occur.</b> This species has not been documented in the PSA, however this species is known to occur in the Project vicinity, habitat is present, as well as SSHCP modeled aquatic and upland habitat (Sacramento County 2018). There are known occurrences for this species within five miles of the PSA, located on the west side of Sloughhouse Road, approximately 0.9 miles south of Highway 16 (CDFW 2022). No WST were identified during focused field studies conducted by Dudek in 2021.                                                                                               |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                            | Common Name                    | Status (Federal/State/SSHCP) | Habitat                                                                                                                                                             | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|--------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fishes</b>                              |                                |                              |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Hypomesus transpacificus</i>            | Delta smelt                    | FT/SE/None                   | Sacramento–San Joaquin Delta; seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay.                                                                        | <b>Not expected to occur.</b> The PSA is just outside the known range for this species, and habitat for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (CDFW 2022, USFWS 2022).                                                                                                                                                                               |
| <i>Oncorhynchus mykiss irideus</i> pop. 11 | steelhead - Central Valley DPS | FT/None/None                 | Coastal basins from Redwood Creek south to the Gualala River, inclusive; does not include summer-run steelhead.                                                     | <b>Known to occur.</b> This species has been documented in the Cosumnes River in the PSA. There is Essential Fish Habitat (EFH) for this species located approximately 10 miles northwest of the PSA along the American River in Rancho Cordova (CDFW 2022; NOAA 2022).                                                                                                                                                    |
| <b>Reptiles</b>                            |                                |                              |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>Actinemys marmorata</i>                 | northwestern pond turtle       | None/SSC/Covered             | Slow-moving permanent or intermittent streams, ponds, small lakes, and reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter. | <b>Moderate potential to occur.</b> This species has not been documented in the PSA. However, this species is known to occur in the Project vicinity, and habitat and SSHCP modeled aquatic and upland habitat is present (Sacramento County 2018). There are known occurrences for this species within five miles of the PSA, located at Laguna Creek approximately 2.7 miles northeast of Clay Station Road (CDFW 2022). |
| <i>Thamnophis gigas</i>                    | giant garter snake             | FT/ST/Covered                | Freshwater marsh habitat and low-gradient streams; also uses canals and irrigation ditches.                                                                         | <b>Low potential to occur.</b> This species has not been documented in the vicinity of the PSA and the habitat on site is of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                        |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                              | Common Name                    | Status (Federal/State/SSHCP) | Habitat                                                                                                                                                                                                                                     | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------|--------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Birds</b>                                 |                                |                              |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Aechmophorus clarkii</i>                  | Clark's grebe                  | BCC/None/None                | Fresh water lakes and marshes, generally with extensive areas of open water bordered by emergent vegetation.                                                                                                                                | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Agelaius tricolor</i><br>(nesting colony) | tricolored blackbird<br>(TRBL) | BCC/SSC, ST/Covered          | Nests near freshwater, emergent wetland with cattails or tules; but also, in Himalayan blackberry; forages in grasslands, woodland, and agriculture.                                                                                        | <b>Known to occur.</b> Quality suitable habitat is present within the PSA for this species. SSHCP modeled nesting and foraging habitat is located within the western and eastern development sites (Sacramento County 2018). There are several known occurrences of this species within five miles of the PSA, with the nearest approximately 0.40 miles south of Dillard Road and the intersection of Highway 16 (CDFW 2022, USFWs 2022). This species was documented within the PSA during TRBL focused surveys conducted by Dudek in 2021. No nesting activity was observed during these surveys. |
| <i>Ardea alba</i>                            | great egret                    | None/None/None               | Nests and roosts in large trees over water or on islands, both in freshwater and marine estuarine habitats; forages in wetlands, including marshes, streams, ditches, and fish-rearing ponds, but also in irrigated pastures and croplands. | <b>Known to occur.</b> The PSA provides suitable foraging habitat for this species. There are known recorded occurrences of this species approximately 3.8 miles northeast of the PSA, specifically along the Cosumnes River across from the Rancho Murietta Airport (CDFW 2022). In addition, this species was observed during reconnaissance-level biological field surveys conducted by Dudek in 2021.                                                                                                                                                                                            |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                                                      | Common Name          | Status (Federal/State/SSHCP) | Habitat                                                                                                                                            | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------|----------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Ardea Herodias</i>                                                | great blue heron     | None/None/None               | Nests in large trees or snags; forages in wetlands, water bodies, watercourses, and opportunistically in uplands, including pasture and croplands. | <b>Known to occur.</b> The PSA provides suitable foraging habitat for this species. There are known recorded occurrences of this species approximately 3.8 miles northeast of the PSA, specifically along the Cosumnes River across from the Rancho Murietta Airport (CDFW 2022). In addition, this species was observed during reconnaissance-level biological field surveys conducted by Dudek in 2021.                                                                                                                                                                                                                                                                            |
| <i>Asio otus</i>                                                     | long-eared owl       | BCC/SCC/None                 | Nests in riparian habitat, live oak thickets, other dense stands of trees, edges of coniferous forest; forages in nearby open habitats.            | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Athene cunicularia</i><br>(burrow sites and some wintering sites) | burrowing owl (BUOW) | BCC/SSC/Covered              | Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows.                                            | <b>Known to occur.</b> There is suitable habitat for this species in the PSA, as well as recorded presence. One BUOW was recorded as occupying an exposed pipe on APN 126-0110-001 during a November 2018 site visit, and presumably the same BUOW was observed the following day within APN 126-0110-003. There is some SSHCP modeled wintering habitat within the western and eastern development sites (Sacramento County 2018). There are additional known occurrences for this species within five miles of the PSA (CDFW 2022). Active burrows and BUOW presence were observed within the PSA during protocol-level surveys conducted by Dudek in 2021. No active burrows were |



**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                                     | Common Name            | Status (Federal/State/SSHCP) | Habitat                                                                                                                                                                                                                                            | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------|------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                     |                        |                              |                                                                                                                                                                                                                                                    | observed within the PSA during protocol-level surveys conducted by Dudek in 2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Aquila chrysaetos</i><br>(nesting and wintering) | golden eagle           | BCC, FP/WL/None              | Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats. | <b>Low potential for occurrence.</b> The PSA provides suitable foraging habitat for this species. There are no known occurrences of this species within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Baeolophus inornatus</i>                         | oak titmouse           | BCC/None/None                | Nests and forages in oak woodlands; also, open pine forest, pinyon woodland, and riparian and chaparral with oak.                                                                                                                                  | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>Buteo swainsoni</i><br>(nesting)                 | Swainson's hawk (SWHA) | BCC/ST/Covered               | Nests in riparian, open woodland, and savanna, and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture.                                                                      | <b>Known to occur.</b> There are known occurrences for this species within the PSA (CDFW 2022). One SWHA was observed foraging in the undeveloped portion of APN 126-0110-003 during the November 2018 site visit. The SSHCP shows several SWHA nesting occurrences along the riparian habitat adjacent to the Cosumnes River, including at the northern edge of APN 126-0110-001 (Sacramento County 2018). Suitable nesting habitat is concentrated along the Cosumnes River corridor, and suitable foraging habitat is located throughout the PSA. SWHA were observed foraging and courting within the PSA and within 0.5 mile of the PSA during protocol-level surveys conducted by Dudek in 2021 and 2022. Observations were |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                  | Common Name            | Status (Federal/State/SSHCP) | Habitat                                                                                                                                                                                             | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------|------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                        |                              |                                                                                                                                                                                                     | concentrated to the western vicinity of the PSA, within the adjacent other lands. No nesting activity was observed during these surveys.                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Chamaea fasciata</i>          | wrentit                | BCC/None/None                | Primarily coastal scrub and chaparral, but also riparian habitats, oak woodland, mixed hardwood, and mixed conifer forests.                                                                         | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                                    |
| <i>Chlidonias niger</i>          | black tern             | BCC/SSC/None                 | Freshwater marsh with emergent vegetation; in the Central Valley primarily nests and forages in rice fields and other flooded agricultural fields with weeds and other residual aquatic vegetation. | <b>Low potential for occurrence.</b> The PSA provides suitable foraging habitat for this species. There are no known occurrences of this species within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                               |
| <i>Contopus cooperi</i>          | olive-sided flycatcher | BCC/SSC/None                 | Nests in mixed-conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine habitats; usually close to water.                                                               | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                                                                                                                    |
| <i>Elanus leucurus</i> (nesting) | white-tailed kite      | None/FP/Covered              | Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands.            | <b>Known to occur.</b> There are known occurrences for this species within the PSA (CDFW 2022). The SSHCP shows one white-tailed kite occurrence and modeled nesting habitat along the riparian habitat adjacent to the Cosumnes River at the northern edge of APN 126-0110-001. There is also SSHCP modeled foraging habitat within the site (Sacramento County 2018). This species was observed during reconnaissance-level biological field surveys conducted by Dudek in 2021. No nesting activity was observed during these surveys. |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                                         | Common Name            | Status (Federal/State/SSHCP) | Habitat                                                                                                                                                                    | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------|------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Geothlypis trichas sinuosa</i>                       | common yellowthroat    | BCC/SSC/None                 | Nests and forages in emergent wetlands including woody swamp, brackish marsh, and freshwater marsh.                                                                        | <b>Low potential for occurrence.</b> The PSA provides suitable foraging habitat for this species. There are no known occurrences of this species within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                              |
| <i>Haliaeetus leucocephalus</i> (nesting and wintering) | bald eagle             | FDL, BCC/SE/None             | Nests in forested areas adjacent to large bodies of water, including seacoasts, rivers, swamps, large lakes; winters near large bodies of water in lowlands and mountains. | <b>Known to occur.</b> Nesting habitat for the species is either absent or of low quality, however foraging habitat for this species is present within the PSA. There are no known occurrences of this species within five miles of the PSA (CDFW 2020, USFWS 2022). This species was observed in various locations throughout the PSA and vicinity during the reconnaissance-level biological field surveys conducted by Dudek in 2021. |
| <i>Limnodromus griseus</i>                              | Short-billed dowitcher | BCC/None/None                | Coastal mud flats and brackish lagoons.                                                                                                                                    | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                                   |
| <i>Pica nuttalli</i>                                    | yellow-billed magpie   | BCC/None/None                | Nests and forages in open oak and riparian woodland; also farm and ranchlands with large trees.                                                                            | <b>Known to Occur.</b> The PSA is within the known range of the species, and habitat for the species is present (USFWS 2022). In addition, this species was observed during reconnaissance-level biological field surveys conducted by Dudek in 2021.                                                                                                                                                                                    |
| <i>Picoides nuttallii</i>                               | Nuttall's woodpecker   | BCC/None/None                | Primarily oak woodlands, but also riparian woodland, chaparral, and rarely conifer forests.                                                                                | <b>Low potential for occurrence.</b> The PSA provides suitable foraging habitat for this species. There are no known occurrences of this species within five miles of the PSA (USFWS 2022).                                                                                                                                                                                                                                              |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                          | Common Name                              | Status (Federal/State/SSHCP) | Habitat                                                                                                                                             | Potential to Occur                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Riparia riparia</i><br>(nesting)      | bank swallow                             | None/ST/None                 | Nests in riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with sandy soils; open country and water during migration. | <b>Moderate potential for occurrence.</b> The PSA provides suitable migratory habitat for this species but is outside the breeding range for this species. There are known occurrences of this species within five miles of the PSA, located on the Cosumnes River approximately 0.25 miles downstream of Bridge House (CDFW 2022, Cornell Lab 2021). |
| <i>Spinus lawrencei</i>                  | Lawrence's goldfinch                     | BCC/None/None                | Nests and forages in open oak, arid woodlands, and chaparral near water.                                                                            | <b>Low potential for occurrence.</b> The PSA provides suitable foraging habitat for this species. There are no known occurrences of this species within five miles of the PSA (USFWS 2022).                                                                                                                                                           |
| <i>Tringa semipalmata</i>                | willet                                   | BCC/None/None                | Breeds in and adjacent to wetlands. Overwinters in mudflat, marsh, sandy beach, and rocky coast habitats.                                           | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                |
| <b>Insects</b>                           |                                          |                              |                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                       |
| <i>Danaus plexippus</i>                  | Monarch butterfly                        | FC/None/None                 | Wind-protected tree groves with nectar sources and nearby water sources.                                                                            | <b>Not expected to occur.</b> The habitat within the PSA for the species is either absent or of low quality. There are no known occurrences within five miles of the PSA (USFWS 2022).                                                                                                                                                                |
| <i>Desmocerus californicus dimorphus</i> | valley elderberry longhorn beetle (VELB) | FT/None/Covered              | Occurs only in the Central Valley of California, in association with blue elderberry ( <i>Sambucus nigra</i> ssp. <i>caerulea</i> ).                | <b>Known to occur.</b> There is suitable habitat for this species within the PSA, specifically observed elderberry shrubs ( <i>Sambucus</i> sp.). In addition, there are known occurrences of this species documented in the western part of the PSA (CDFW 2022, USFWS 2022). During VELB                                                             |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                 | Common Name                         | Status (Federal/State/SSHCP) | Habitat                                                                                        | Potential to Occur                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-------------------------------------|------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |                                     |                              |                                                                                                | focused surveys conducted by Dudek in 2021, no presence or ancillary data for this (e.g., bore holes, scat) were observed when assessing elderberry shrubs within the PSA.                                                                                                                                                                                                     |
| <i>Dumontia oregonensis</i>     | hairy water flea                    | None/None/None               | Vernal pools; in California, known only from Mather Field,                                     | <b>Low potential for occurrence.</b> The PSA provides marginal suitable habitat for this species. There are known occurrences for this species within 5 miles of the PSA, specifically at Mather Field (CDFW 2022)                                                                                                                                                             |
| <i>Hydrochara rickseckeri</i>   | Ricksecker's water scavenger beetle | None/None/Covered            | Aquatic                                                                                        | <b>Moderate potential to occur.</b> The PSA is within the known range of the species, and habitat for the species is present. There are several potential vernal pools and SSHCP modeled habitat within the PSA (County of Sacramento et al. 2018). There are known occurrences for this species within 5 miles of the PSA, located at Mather Field Regional Park (CDFW 2022). |
| <b>Invertebrates</b>            |                                     |                              |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Branchinecta conservatio</i> | Conservancy fairy shrimp            | FE/None/None                 | Larger, more turbid vernal pools, playa pools.                                                 | <b>Not expected to occur.</b> The PSA is outside the known range of the species, and habitat for the species is either absent or of low quality. This species is known to occur in 10 populations; the closest two are Yolo Bypass Wildlife Area in Yolo County and Jepson Prairie in Solano County (USFWS 2012, USFWS 2022).                                                  |
| <i>Branchinecta lynchi</i>      | vernal pool fairy shrimp            | FT/None/Covered              | Vernal pools, seasonally ponded areas within vernal swales, and ephemeral freshwater habitats. | <b>Low potential to occur.</b> This species has not been documented in the PSA; however, this species is known to occur in                                                                                                                                                                                                                                                     |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name            | Common Name             | Status (Federal/State/SSHCP) | Habitat                                                                                                                  | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------|-------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                         |                              |                                                                                                                          | the PSA vicinity. Suitable habitat and SSHCP modeled habitat are present in the PSA, including vernal pools (Sacramento County 2018). There are various Designated Critical Habitat (DCH) areas for this species within five miles of the PSA, with the nearest 1.3 miles southeast of the PSA (USFWS 2022). There are several known occurrences for this species within five miles of the PSA, with the nearest being located within 0.25 miles of the PSA on the south side of Meiss Road, approximately 0.75 miles southeast of the Dillard Road intersection (CDFW 2022). Protocol-level wet and dry season large listed branchiopod surveys conducted in 2020 through 2021 yielded no presence (SSLIC 2021a-b). |
| Branchinecta mesovallensis | mid-valley fairy shrimp | None/None/Covered            | Small, shallow, grass-bottomed, ephemeral vernal pools and swales; also, artificial habitats such as railroad toe-drains | <b>High potential to occur.</b> This species has not been documented in the PSA, however this species is known to occur in the Project vicinity, suitable habitat is present including vernal pools in the PSA, as well as modeled habitat (County of Sacramento et al. 2018). There are various known occurrences for this species within 5 miles of the PSA, with the nearest being located northwest of the junction at Florin Road and Sunrise Boulevard on the north and south sides of Highway 16 (CDFW 2022).                                                                                                                                                                                                 |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name                 | Common Name                | Status (Federal/State/SSHCP) | Habitat                                                                                                            | Potential to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|----------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Lepidurus packardi</i>       | vernal pool tadpole shrimp | FE/None/Covered              | Ephemeral freshwater habitats including alkaline pools, clay flats, vernal lakes, vernal pools, and vernal swales. | <b>Known to occur.</b> This species has historically been documented in the PSA, and suitable habitat and SSHCP modeled habitat is present in the PSA, including vernal pools (Sacramento County 2018). There are various DCH areas for this species within five miles of PSA, with the nearest 1.3 miles southeast of the PSA (USFWS 2022). This species has known occurrences within the PSA (CDFW 2022). Protocol-level wet and dry season large listed branchiopod surveys conducted in 2020 through 2021 yielded no presence (SLLC 2021a-b). |
| <i>Linderiella occidentalis</i> | California linderiella     | None/None/None               | Cool soft-water vernal pools in grasslands below 1,000 feet above mean sea level                                   | <b>Known to occur.</b> The PSA provides suitable aquatic habitat for this species. The nearest recorded observation is approximately 1.3 miles southeast of the PSA off Apple Road (CDFW 2022). This species was observed during Protocol-level wet season large listed branchiopod surveys conducted in 2021 (SLLC 2021b).                                                                                                                                                                                                                       |
| <b>Mammals</b>                  |                            |                              |                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Taxidea taxus</i>            | American badger            | None/SSC/Covered             | Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils.    | <b>High potential to occur.</b> This species has not been documented in the PSA. However, this species is known to occur in the Project vicinity, and suitable habitat and SSHCP modeled habitat is present (Sacramento County 2018). There are known occurrences for this species within five miles of the PSA, with one located 0.4 miles east of Sunrise Boulevard in                                                                                                                                                                          |

**Appendix D. Special-Status Wildlife with Potential to Occur**

| Scientific Name | Common Name | Status (Federal/State/SSHCP) | Habitat | Potential to Occur                                                                                                                                                                          |
|-----------------|-------------|------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |             |                              |         | southeast Rancho Cordova (CDFW 2022). A den characteristic of this species was observed within the PSA during the reconnaissance-level biological field surveys conducted by Dudek in 2021. |

**Sources:** CDFW 2022; Cornell Lab 2021; NOAA 2022; Sacramento County 2018; SLLC 2021a-b; USFWS 2002a; USFWS 2012; USFWS 2022.

**Federal Status**

- BCC: USFWS Bird of Conservation Concern
- FDL: Federally delisted
- FE: Federally listed as endangered
- FP: Fully Protected
- FT: Federally listed as threatened

**State Status**

- FP: fully protected
- SSC: Species of Special Concern
- ST: State listed as threatened
- WL: Watch List
- None: No conservation status
- None: No conservation status.

**SSHCP (South Sacramento Habitat Conservation Plan)**

- Covered: Currently listed as threatened or endangered under the California Endangered Species Act (ESA) or the federal ESA and covered within the Plan Area by the SSHCP.
- None: Not covered under the SSHCP.

**Potential for Occurrence Ranks**

- Known to Occur: The species has been documented in the PSA.
- High Potential to Occur: The species has not been documented in the Project site but is known to occur in the vicinity and species habitat is present.
- Moderate Potential to Occur: The species has not been documented in the vicinity, but the PSA is within the known range of the species, and habitat for the species is present.
- Low Potential to Occur: The species has not been documented in the vicinity and the PSA is within the known range of the species, but habitat for the species is of low quality. is either absent or of low quality.
- Not Expected to Occur: The Project site is outside the known range of the species, and habitat for the species is either absent or of low quality.



INTENTIONALLY LEFT BLANK

---

# **Appendix E**

## Photo Record

APPENDIX E  
PHOTO LOG



**Photo 1:** Example of an aquatic resource/wetland feature within the Project Study Area (PSA).



**Photo 2:** Annual grassland and general overview of the PSA.



**Photo 3:** Annual grassland and general overview of the PSA.



**Photo 4:** Example of an aquatic resource/pond feature within PSA, adjacent to annual grasslands.



Photo 5: Grading within the PSA during the October/November field surveys.



Photo 6: Example of an aquatic resource/vernal pool feature within PSA, showing the concentric rings of hydrophytic vegetation. Adjacent to annual grassland (i.e., upland habitat).

APPENDIX E  
PHOTO LOG



Photo 7: Upland vegetation within the PSA.



Photo 8: Western vicinity of PSA, agricultural land cover.

APPENDIX E  
PHOTO LOG



Photo 9: PSA and Intersection at Meiss Road.

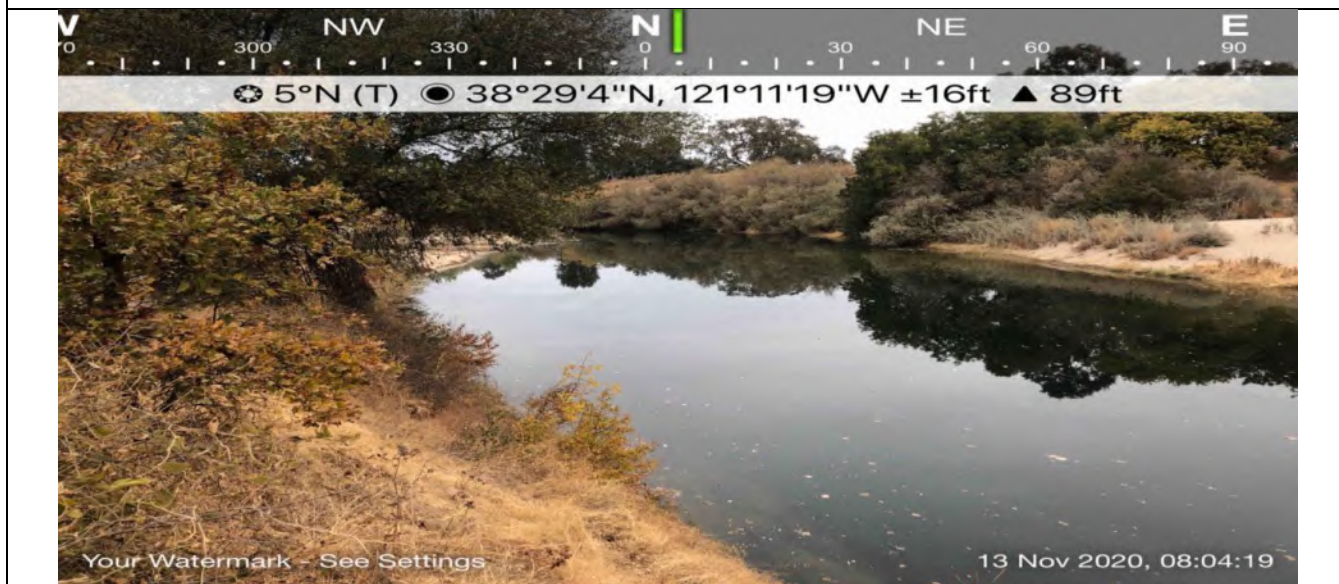


Photo 10: A portion of the Cosumnes River flowing within the western boundary of the PSA.



**Photo 11:** Annual grassland and seasonal wetland, and general overview of the PSA.



**Photo 12:** Annual grassland/uplands, and general overview of the PSA. Existing solar facility in the foreground.



**D-6 IPaC Letter July 13, 2022 (Project Study Area)**



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Sacramento Fish And Wildlife Office  
Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846  
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:  
Project Code: 2022-0063369  
Project Name: Sloughhouse Solar Project

July 13, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2))

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

**Migratory Birds:** In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

---

Attachment(s):

- Official Species List

## **Official Species List**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

### **Sacramento Fish And Wildlife Office**

Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846  
(916) 414-6600

---

## Project Summary

Project Code: 2022-0063369  
Event Code: None  
Project Name: Sloughhouse Solar Project  
Project Type: Power Gen - Solar  
Project Description: County – Sacramento  
Public Land Survey System – Cosumnes Land Grant  
U.S. Geological Survey (USGS) 7.5-Minute Quadrangle (Quad) –  
Sloughhouse  
Latitude, Longitude (decimal degrees) – 38.473731, -121.184568  
(Centroid)  
Assessor Parcel Numbers – 12601100010000, 12601100030000  
Elevation Range/Average – 95 to 160 feet above mean sea level (amsl)/  
128 feet amsl  
PSA – 732.26 acres

### Project Location:

Approximate location of the project can be viewed in Google Maps: [https://  
www.google.com/maps/@38.4734833,-121.18399345831887,14z](https://www.google.com/maps/@38.4734833,-121.18399345831887,14z)



Counties: Sacramento County, California

---

## Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [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.

## Reptiles

| NAME                                                                                                                                                                                                                  | STATUS     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Giant Garter Snake <i>Thamnophis gigas</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/4482">https://ecos.fws.gov/ecp/species/4482</a> | Threatened |

## Amphibians

| NAME                                                                                                                                                                                                                                                                                                                               | STATUS     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| California Tiger Salamander <i>Ambystoma californiense</i><br>Population: U.S.A. (Central CA DPS)<br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/2076">https://ecos.fws.gov/ecp/species/2076</a> | Threatened |

## Fishes

| NAME                                                                                                                                                                                                                                                                       | STATUS     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Delta Smelt <i>Hypomesus transpacificus</i><br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/321">https://ecos.fws.gov/ecp/species/321</a> | Threatened |

## Insects

| NAME                                                                                                                                                                                                                                                                                                        | STATUS     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Monarch Butterfly <i>Danaus plexippus</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>                                                                                        | Candidate  |
| Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i><br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/7850">https://ecos.fws.gov/ecp/species/7850</a> | Threatened |

## Crustaceans

| NAME                                                                                                                                                                                                                                                                                      | STATUS     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Conservancy Fairy Shrimp <i>Branchinecta conservatio</i><br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/8246">https://ecos.fws.gov/ecp/species/8246</a> | Endangered |
| Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/498">https://ecos.fws.gov/ecp/species/498</a>                  | Threatened |
| Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/2246">https://ecos.fws.gov/ecp/species/2246</a>              | Endangered |

## Flowering Plants

| NAME                                                                                                                                                                                                                                                                   | STATUS     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Ione (incl. Irish Hill) Buckwheat <i>Eriogonum apricum (incl. var. prostratum)</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/8301">https://ecos.fws.gov/ecp/species/8301</a>          | Endangered |
| Ione Manzanita <i>Arctostaphylos myrtifolia</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/1806">https://ecos.fws.gov/ecp/species/1806</a>                                             | Threatened |
| Sacramento Orcutt Grass <i>Orcuttia viscida</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/5507">https://ecos.fws.gov/ecp/species/5507</a> | Endangered |
| Slender Orcutt Grass <i>Orcuttia tenuis</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/1063">https://ecos.fws.gov/ecp/species/1063</a>     | Threatened |

## Critical habitats

There are 4 critical habitats wholly or partially within your project area under this office's jurisdiction.



| NAME                                                                                                                                                               | STATUS |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Sacramento Orcutt Grass <i>Orcuttia viscida</i><br><a href="https://ecos.fws.gov/ecp/species/5507#crithab">https://ecos.fws.gov/ecp/species/5507#crithab</a>       | Final  |
| Slender Orcutt Grass <i>Orcuttia tenuis</i><br><a href="https://ecos.fws.gov/ecp/species/1063#crithab">https://ecos.fws.gov/ecp/species/1063#crithab</a>           | Final  |
| Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i><br><a href="https://ecos.fws.gov/ecp/species/498#crithab">https://ecos.fws.gov/ecp/species/498#crithab</a>     | Final  |
| Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i><br><a href="https://ecos.fws.gov/ecp/species/2246#crithab">https://ecos.fws.gov/ecp/species/2246#crithab</a> | Final  |

---

## **IPaC User Contact Information**

Agency: Dudek

Name: Morgan Kennedy

Address: 853 Lincoln Way #208

City: Auburn

State: CA

Zip: 95603

Email: mkennedy@dudek.com

Phone: 9166612498

---

**D-7 IPaC Letter January 17, 2023 (Proposed Action Area)**



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Sacramento Fish And Wildlife Office  
Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846  
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:  
Project Code: 2023-0034666  
Project Name: Sloughouse Solar

January 17, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

**Migratory Birds:** In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

---

Attachment(s):

- Official Species List

## **Official Species List**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

### **Sacramento Fish And Wildlife Office**

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

---

## Project Summary

Project Code: 2023-0034666  
Project Name: Sloughouse Solar  
Project Type: Power Gen - Solar  
Project Description: Solar Project  
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.47368245,-121.18026077055904,14z>



Counties: Sacramento County, California

---



## Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [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.

### Amphibians

| NAME                                                                                                                                                                                                                                                                                                                             | STATUS     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| California Tiger Salamander <i>Ambystoma californiense</i><br>Population: U.S.A. (Central CA DPS)<br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/2076">https://ecos.fws.gov/ecp/species/2076</a> | Threatened |

### Fishes

| NAME                                                                                                                                                                                                                                                                     | STATUS     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Delta Smelt <i>Hypomesus transpacificus</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/321">https://ecos.fws.gov/ecp/species/321</a> | Threatened |

### Insects

| NAME                                                                                                                                                                                                                                                                                                      | STATUS     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Monarch Butterfly <i>Danaus plexippus</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>                                                                                      | Candidate  |
| Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/7850">https://ecos.fws.gov/ecp/species/7850</a> | Threatened |

## Crustaceans

| NAME                                                                                                                                                                                                                                                                                    | STATUS     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Conservancy Fairy Shrimp <i>Branchinecta conservatio</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/8246">https://ecos.fws.gov/ecp/species/8246</a> | Endangered |
| Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/498">https://ecos.fws.gov/ecp/species/498</a>        | Threatened |
| Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/2246">https://ecos.fws.gov/ecp/species/2246</a>    | Endangered |

## Flowering Plants

| NAME                                                                                                                                                                                                                                                                       | STATUS     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Slender Orcutt Grass <i>Orcuttia tenuis</i><br>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/1063">https://ecos.fws.gov/ecp/species/1063</a> | Threatened |

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

## **IPaC User Contact Information**

Agency: AECOM

Name: Amy Dalton

Address: 10 Patewood Drive Building VI, Suite 500

City: GREENVILLE

State: SC

Zip: 29615

Email: amy.dalton@aecom.com

Phone: 9047552997

---

**D-8 Biological and Aquatic Resource Compensatory Mitigation Plan April 14, 2022**

## MEMORANDUM

---

**To:** Alison Little, Associate Planner- Sacramento Planning and Environmental Review; Dylan Wood, Environmental Scientist California Department of Fish and Wildlife (CDFW) North Central Region; Angela Nguyen-Tan, Environmental Scientist- Central Valley Regional Water Quality Control Board (RWQCB); Erin Campbell, Project Manager- Sacramento District United States Army Corps of Engineers (USACE)

**From:** David Hochart and Morgan Kennedy - Dudek

**Subject:** Biological and Aquatic Resource Compensatory Mitigation Plan, Sloughhouse Solar Project

**Date:** April 14, 2022

**cc:** Daniel Menahem - Sloughhouse Solar, LLC

**Attachment(s):** Figure 1, Potential Offsite Compensatory Mitigation Lands – Biological Resources 2016 and 2019 Swainson’s Hawk Reports for Van Vleck Ranch (Estep 2016; Estep 2019) 2021 Report on Swainson’s Hawk Foraging Use of Solar Array Fields in Agricultural Landscapes in Sacramento County (Estep 2021)

---

This memorandum provides the Biological and Aquatic Resource Compensatory Mitigation Plan (Plan) for the Sloughhouse Solar Project (Project) and supplements the Amended Biological Technical Report (Amended BTR; Dudek 2022) by describing additional details on the proposed biological and aquatic resource compensatory mitigation approach to mitigate potential impacts to from the Project.

## 1 Introduction

### 1.1 Project Overview

The Project is a solar photovoltaic energy-generating facility located on the southwest corner of Meiss Road and Dillard Road, adjacent to an existing solar energy facility (Dillard Road Solar Power Facility) located at 7794 Dillard Road, Sloughhouse, Sacramento County, California. The Project would construct, operate, and decommission a solar generation and energy storage facility within a solar development area of approximately 381.29 acres. The solar development area, or the limits of disturbance, is inclusive of solar fields, energy storage, substation[s], roads, retention basins, and all other Project infrastructure. The design and construction of the buildings, solar arrays (panels, etc.), energy storage facilities, and auxiliary facilities will be consistent with Sacramento County building standards.

### 1.2 Project Location

The approximately 732.26-acre Project Study Area (PSA), which is comprised of a solar development area (381.29 acres) and adjacent other lands (350.97 acres), is located at the southwest corner of the intersection of Meiss

Road and Dillard Road in Sloughhouse, an unincorporated area in eastern Sacramento County. The southeast portion of the PSA is comprised of an existing solar facility (Dillard Road Solar Power Facility). The remainder of the PSA is largely comprised of vacant lands used for cattle ranching. The PSA is surrounded by rural residences, specifically Simpson Ranch to the south, an existing solar facility (Dillard Road Solar Power Facility) a caviar aquaculture farm to the north, orchards and a turkey farm to the east, and the Cosumnes River to the west. The PSA can be accessed from gates off both Dillard Road and Meiss Road.

## 2 Compensatory Mitigation Approach

The following summary of the proposed biological and aquatic resource compensatory mitigation approach is based on Project information provided in the Amended BTR (Dudek 2022) and is intended to supplement the BTR by providing additional mitigation details. The Project is in the process of obtaining all regulatory permits necessary for construction and operation, and the Project Amended BTR is part of the documentation developed to support those approvals. Through the permitting processes, Sacramento County (County) and the regulatory agencies may identify mitigation measures and permit conditions to achieve permitting standards that supersede or supplement the Amended BTR measures and the approach proposed within this Plan at this time, and if so, those additional measures or conditions would be anticipated to strengthen the biological resource avoidance, minimization, and mitigation (AMMs) beyond that described below.

The Project Amended BTR provides comprehensive analysis of the biological and aquatic resources in the PSA and recommends a set of AMMs for resources that occur or have the potential to occur. Additionally, as noted above, the County and regulatory agencies may require additional conditions of approval or permit conditions that provide additional resource avoidance and minimization.

The following provides a summary of the potential impacts to special-status species and species habitats based on the Project Amended BTR.

- **Special-Status Plant Species:** No special-status plant species were observed during protocol-level botanical field surveys. Eight special-status plant species have a moderate potential to occur within the solar development area of the PSA and could be impacted absent AMMs. These species include Boggs Lake hedge-hyssop (*Gratiola heterosepala*), dwarf downingia (*Downingia pusilla*), hoary navarretia (*Navarretia eriocephala*), legenere (*Legenere limosa*), pincushion navarretia (*Navarretia myersii* ssp. *myersii*), Sacramento Orcutt grass (*Orcuttia viscida*), slender Orcutt grass (*Orcuttia tenuis*), and valley brodiaea (*Brodiaea rosea* ssp. *vallicola*).
- **Sensitive Natural Communities:** No CDFW sensitive natural communities were identified within the solar development area of the PSA and no impacts would occur. Vernal pool habitat is present within the solar development area (see aquatic resources below).
- **Aquatic Resources:** Permanent impacts to aquatic resources in the solar development area include 0.079 acres to CDFW jurisdiction; 0.079 acres RWQCB jurisdiction, and 0.046 acres USACE jurisdiction. Temporary impacts to aquatic resources in the solar development area include 3.054 acres to CDFW jurisdiction, 3.054 acres to RWQCB jurisdiction, and 2.376 acres to USACE jurisdiction. Indirect impacts to aquatic resources in the solar development area include 2.629 acres to CDFW jurisdiction, 2.629 acres to RWQCB jurisdiction, and 1.997 acres to USACE jurisdiction.

- **Designated Critical Habitat (DCH)/Essential Fish Habitat (EFH):** No U.S. Fish and Wildlife Service (USFWS) DCH or National Oceanic and Atmospheric Administration EFH was identified within the solar development area of the PSA and no impacts would occur.
- **Special-Status Wildlife Species:** Seven special-status wildlife species have known occurrences within the solar development area of the PSA and could be impacted absent AMMs: bald eagle (*Haliaeetus leucocephalus*), western burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), tricolored blackbird (*Agelaius tricolor*), white-tailed kite (*Elanus leucurus*), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and vernal pool tadpole shrimp (*Lepidurus packardii*). Other special-status wildlife species with a moderate or high potential to occur based on potential suitable habitat in the solar development area of the PSA include northwestern pond turtle (*Actinemys marmorata*), western spadefoot toad (*Spea hammondi*), American badger (*Taxidea taxus*), native bats, and other nesting raptors and migratory birds. Although not detected during protocol surveys and considered to have a low potential to occur in the solar development area of the PSA, AMMs have also been included for California tiger salamander (*Ambystoma californiense*) and vernal pool fairy shrimp (*Branchinecta lynchi*).
- **Protected Tree Species:** 16 individual trees, two of which are dead, are located within the solar development area of the PSA and may be directly impacted by Project activities. No trees will require a Sacramento County Tree Removal Permit, as none of the trees fall within the Sacramento County Tree Preservation Ordinance requirements.

Compensatory mitigation for Project impacts to aquatic resources and specific special-status species will focus on onsite habitat preservation (within the adjacent other lands of the PSA, which outside the solar development area). If necessary, compensatory mitigation may also be provided through purchase of credits from existing in-lieu fee program or conservation/mitigation banks and/or offsite habitat acquisition and preservation that meet the criteria established during the California Environmental Quality Act (CEQA) and regulatory permitting process. Any onsite habitat preservation or offsite acquisition and preservation lands used for compensatory mitigation would require legal protections (e.g., conservation easement, restrictive covenant, or other approved mechanism), funding for long-term habitat management and monitoring, and preparation of a Preserve Management Plan that describes the preserved biological and aquatic resources, responsible parties, management goals and objectives, management and monitoring activities, and reporting requirements. Funding for onsite preservation lands, or lands acquired and preserved offsite, will be estimated through preparation of a Property Analysis Record (PAR), or PAR-Equivalent Analysis, that is an itemized cost estimate of the initial and capital period costs and annual, ongoing costs.

Table 1, Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project, provides the proposed compensatory mitigation program for the potential impacts to special-status biological and aquatic resources for the Sloughhouse Solar Project. As detailed in Table 1, the Project compensatory mitigation program proposes to provide the following compensatory mitigation:

- **Aquatic Resources and Potential Habitat for Large, Listed Branchiopods (i.e., vernal pool fairy shrimp and vernal pool tadpole shrimp):** Compensatory mitigation at the ratios and acreages listed in Table 1 through onsite habitat preservation and/or mitigation/preservation credit purchase from existing in-lieu fee programs or banks. The Project site is within the service area for the Sacramento District California In-Lieu Fee Program the following existing banks: Clay Station Mitigation Bank, Bryte Ranch Conservation Bank, Laguna Creek Mitigation Bank, and Van Vleck Ranch Mitigation Bank.
- **Swainson's Hawk, Burrowing Owl, Tricolored Blackbird, and White-Tailed Kite Foraging Habitat:** Compensatory mitigation at the ratios and acreages listed in Table 1 through one or more of the following

options: onsite preservation, preservation credit purchase from existing banks, and/or offsite acquisition and preservation of lands from willing sellers. Compensatory mitigation for Swainson's hawk and burrowing owl foraging habitat likely to benefit other species as described in Table 1.

- **Valley Elderberry Longhorn Beetle Shrub Replacement:** Compensatory mitigation for the lost elderberry shrubs (*Sambucus* sp.) at the ratios listed in Table 1 consistent with existing U.S. Fish and Wildlife Service (USFWS) guidance.

All temporary impacts to potential habitat within the Project solar development area will be restored to pre-Project conditions following Project construction. The biological and aquatic resource values of the adjacent other lands within the PSA, outside the solar development area of the Project, are described in the Amended BTR and provides documentation of suitability for compensatory mitigation. The biological and aquatic resources in the potential offsite compensatory mitigation lands are shown in the attached Figure 1, Potential Offsite Compensatory Mitigation Lands - Biological and Aquatic Resources. The attached reports (Estep 2016; Estep 2019) provide details of the habitat suitability, abundance, and distribution of Swainson's hawk for the potential offsite compensatory mitigation lands (i.e., Van Vleck Ranch). Tricolored blackbird has known occurrences and Swainson's hawk and burrowing owl are known from the immediate vicinity of the potential offsite compensatory mitigation lands based on regional databases. Additionally as shown in the attached Figure 1, the potential offsite mitigation lands are located within the same South Sacramento Habitat Conservation Plan (SSHCP) preserve planning unit (PPU) as the Project (i.e., PPU 5), and the available portions (i.e., outside the portion of the lands in Existing Preserve) of the offsite lands contain SSHCP modeled suitable habitat for the following species: American badger (1,623 acres), burrowing owl (1,786 acres), California tiger salamander (88 acres aquatic; 1,872 acres upland), Swainson's hawk (11 acres nesting; 1,815 acres foraging), tricolored blackbird (1,571 acres foraging/nesting; 362 acres foraging), Valley elderberry longhorn beetle (11 acres), vernal pool fairy shrimp and vernal pool tadpole shrimp (585 acres), western pond turtle (66 acres aquatic; 1,509 upland), western spadefoot toad (189 acres breeding/foraging; 1,872 acres foraging/aestivation), western red bat (411 acres roosting/foraging; 1,689 acres foraging), and white-tailed kite (350 acres nesting; 1,876 acres foraging) (County of Sacramento et al. 2018).

**Table 1. Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project**

| Special-Status Resource                                                                           | Impact Acreage                                                                                                                             | Mitigation Ratio <sup>1</sup> | Compensatory Mitigation Acreage                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Special-Status Plant Species</b>                                                               |                                                                                                                                            |                               |                                                                                                                                                                                                                                                                                                       |
| No special-status plant species detected in the solar development area                            | No impacts to individuals with avoidance and minimization measures (AMMs) <sup>2</sup>                                                     | NA                            | NA                                                                                                                                                                                                                                                                                                    |
| Eight special-status plant species <sup>3</sup> have potential to occur in aquatic resource areas | Potential suitable habitat impacts in aquatic resources areas (see Aquatic Resources below) and valley grasslands (Permanent: 14.39 acres, | NA                            | Compensatory mitigation for potentially suitable habitat for special-status plant species is not considered necessary. Compensation provided for aquatic resources (see Aquatic Resources below) and valley grassland habitat (see Swainson's hawk below) has the potential to benefit these species. |



**Table 1. Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project**

| Special-Status Resource                                                    | Impact Acreage           | Mitigation Ratio <sup>1</sup>                 | Compensatory Mitigation Acreage                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------|--------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| and Valley grasslands                                                      | Temporary: 273.11 acres) |                                               |                                                                                                                                                                                                                                                                                    |
| <b>Aquatic Resources<sup>4</sup></b>                                       |                          |                                               |                                                                                                                                                                                                                                                                                    |
| California Department of Fish and Wildlife (CDFW) Jurisdictional Resources | Permanent: 0.079 acres   | If considered occupied by listed species: 3:1 | 0.158 to 0.237 acres. A minimum of 1:1 (0.079 acres) must be creation; remainder can be creation or preservation. If considered occupied, compensate with occupied habitat. Fulfill through preservation onsite and/or mitigation/preservation bank credit purchase <sup>5</sup> . |
|                                                                            |                          | If considered unoccupied: 2:1                 |                                                                                                                                                                                                                                                                                    |
|                                                                            | Temporary: 3.054 acres   | If considered occupied by listed species: 1:1 |                                                                                                                                                                                                                                                                                    |
|                                                                            |                          | If considered unoccupied: 1:1                 |                                                                                                                                                                                                                                                                                    |
|                                                                            | Indirect: 2.629 acres    | If considered occupied by listed species: 2:1 |                                                                                                                                                                                                                                                                                    |
|                                                                            |                          | If considered unoccupied: 1:1                 |                                                                                                                                                                                                                                                                                    |
| Regional Water Quality Control Board (RWQCB) Jurisdictional Resources      | Permanent: 0.079 acres   | If considered occupied by listed species: 3:1 | 0.158 to 0.237 acres. A minimum of 1:1 (0.079 acres) must be creation; remainder can be creation or preservation. If considered occupied, compensate with occupied habitat. Fulfill through preservation onsite and/or mitigation/preservation bank credit purchase <sup>5</sup> . |
|                                                                            |                          | If considered unoccupied: 2:1                 |                                                                                                                                                                                                                                                                                    |
|                                                                            | Temporary: 3.054 acres   | If considered occupied by listed species: 1:1 |                                                                                                                                                                                                                                                                                    |
|                                                                            |                          | If considered unoccupied: 1:1                 |                                                                                                                                                                                                                                                                                    |
|                                                                            | Indirect: 2.629 acres    | If considered occupied by listed species: 2:1 |                                                                                                                                                                                                                                                                                    |
|                                                                            |                          | If considered unoccupied: 1:1                 |                                                                                                                                                                                                                                                                                    |
| U.S. Army Corps of Engineers (USACE) Jurisdictional Resources              | Permanent: 0.046 acres   | If considered occupied by listed species: 3:1 | 0.092 to 0.138 acres. A minimum of 1:1 (0.046 acres) must be creation; remainder can be creation or preservation. If considered occupied, compensate with occupied habitat. Fulfill through preservation onsite and/or mitigation/preservation bank credit purchase <sup>5</sup> . |
|                                                                            |                          | If considered unoccupied: 2:1                 |                                                                                                                                                                                                                                                                                    |

**Table 1. Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project**

| Special-Status Resource                | Impact Acreage                                                                                                                                        | Mitigation Ratio <sup>1</sup>                    | Compensatory Mitigation Acreage                                                                                                                                                                                                                                                                                                     |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        | Temporary:<br>2.376 acres                                                                                                                             | If considered occupied by listed species:<br>1:1 | 2.376 acres will be restoration of temporary impacts onsite.                                                                                                                                                                                                                                                                        |
|                                        |                                                                                                                                                       | If considered unoccupied: 1:1                    |                                                                                                                                                                                                                                                                                                                                     |
|                                        | Indirect:<br>1.997 acres                                                                                                                              | If considered occupied by listed species:<br>2:1 | 1.997 to 3.994 acres. If considered occupied, compensate with occupied habitat. Fulfill through preservation onsite and/or mitigation/preservation bank credit purchase <sup>5</sup> .                                                                                                                                              |
|                                        |                                                                                                                                                       | If considered unoccupied: 1:1                    |                                                                                                                                                                                                                                                                                                                                     |
| <b>Special-Status Wildlife Species</b> |                                                                                                                                                       |                                                  |                                                                                                                                                                                                                                                                                                                                     |
| California tiger salamander            | No impacts to individuals with AMMs                                                                                                                   | NA                                               | NA                                                                                                                                                                                                                                                                                                                                  |
|                                        | Potential aquatic habitat -<br>No impacts to occupied or suitable aquatic habitat                                                                     | NA                                               | NA                                                                                                                                                                                                                                                                                                                                  |
|                                        | Potential upland habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres                                                                | NA                                               | Compensatory mitigation for potential upland habitat impacts is not considered necessary. All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson's hawk below) have the potential to benefit this species. |
| western spadefoot toad                 | No impacts to individuals with AMMs                                                                                                                   | NA                                               | NA                                                                                                                                                                                                                                                                                                                                  |
|                                        | Potential aquatic habitat -<br>No impacts to occupied aquatic habitat. See impacts to aquatic resources above for impacts to suitable aquatic habitat | NA                                               | Compensatory mitigation for suitable aquatic habitat for species is not considered necessary. Compensation provided for aquatic resources (see aquatic resources above) has the potential to benefit this species.                                                                                                                  |
|                                        | Potential upland habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres                                                                | NA                                               | Compensatory mitigation for potential upland habitat is not considered necessary. All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson's hawk                                                            |

**Table 1. Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project**

| Special-Status Resource  | Impact Acreage                                                                                                                                                                                                                                                                                                             | Mitigation Ratio <sup>1</sup>                                                                                                     | Compensatory Mitigation Acreage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |                                                                                                                                                                                                                                                                                                                            |                                                                                                                                   | below) have the potential to benefit this species.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| northwestern pond turtle | No impacts to individuals with AMMs                                                                                                                                                                                                                                                                                        | NA                                                                                                                                | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Potential aquatic habitat – No impacts to occupied or suitable aquatic habitat                                                                                                                                                                                                                                             | NA                                                                                                                                | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Potential upland habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres                                                                                                                                                                                                                                     | NA                                                                                                                                | Compensatory mitigation for potential upland habitat is not considered necessary. All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson’s hawk below) have the potential to benefit this species.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| western burrowing owl    | No impacts to nesting or non-nesting individuals with AMMs                                                                                                                                                                                                                                                                 | NA                                                                                                                                | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Potential nesting, wintering, and/or foraging habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres                                                                                                                                                                                                        | See Swainson’s hawk below                                                                                                         | All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson’s hawk below) will also provide suitable habitat to offset impacts to western burrowing owl.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Swainson’s hawk          | No impacts to nesting individuals with AMMs                                                                                                                                                                                                                                                                                | NA                                                                                                                                | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Foraging habitat –<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres<br><br>Solar development area includes 361.91 acres of valley grassland habitat suitable for foraging. 190.47 acres would likely be unavailable for foraging beneath solar arrays; 190.82 acres would remain available as foraging habitat. | 1:1 restoration of temporary impacts onsite<br><br>1:1 compensatory mitigation for potentially lost foraging acreage <sup>6</sup> | All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction.<br><br>190.47 acres of compensatory mitigation for potentially lost foraging acreage <sup>6</sup> . Fulfill through preservation onsite, grassland restoration and management to promote foraging, mitigation/preservation bank credit purchase <sup>5</sup> , or offsite acquisition and preservation from willing seller. Compensatory mitigation acreage should provide suitable foraging habitat for Swainson’s hawk, western burrowing owl, tricolored blackbird, and white-tailed kite. The biological resources onsite and outside the solar development area (as documented in the Amended BTR) and/or on the potential offsite mitigation land (shown in |

**Table 1. Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project**

| Special-Status Resource                                 | Impact Acreage                                                                                                                                                    | Mitigation Ratio <sup>1</sup> | Compensatory Mitigation Acreage                                                                                                                                                                                                                                             |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                         |                                                                                                                                                                   |                               | the attached Figure 1 and attached reports) would fulfill this compensatory mitigation.                                                                                                                                                                                     |
| tricolored blackbird                                    | No impacts to nesting individuals or colonies with AMMs                                                                                                           | NA                            | NA                                                                                                                                                                                                                                                                          |
|                                                         | Potential foraging habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres                                                                          | See Swainson's hawk above     | All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson's hawk above) will also provide suitable habitat to offset impacts to tricolored blackbird. |
| white-tailed kite                                       | No impacts to nesting individuals or colonies with AMMs                                                                                                           | NA                            | NA                                                                                                                                                                                                                                                                          |
|                                                         | Potential foraging habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres                                                                          | See Swainson's hawk above     | All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson's hawk above) will also provide suitable habitat to offset impacts to white-tailed kite.    |
| valley elderberry longhorn beetle                       | No impacts to individuals with AMMs                                                                                                                               | NA                            | NA                                                                                                                                                                                                                                                                          |
|                                                         | 8 elderberry shrubs impacted                                                                                                                                      | 1:1                           | 8 elderberry shrubs mitigated in accordance with the Framework for Assessing Impacts to the valley elderberry longhorn beetle and the Conservation Guidelines for the valley elderberry longhorn beetle.                                                                    |
| vernal pool fairy shrimp and vernal pool tadpole shrimp | No impacts to individuals with AMMs                                                                                                                               | NA                            | NA                                                                                                                                                                                                                                                                          |
|                                                         | Potential aquatic habitat -<br>No impacts to aquatic habitat known to be occupied. See impacts to aquatic resources above for impacts to suitable aquatic habitat | See aquatic resources above   | See aquatic resources above.                                                                                                                                                                                                                                                |
| American badger                                         | No impacts to individuals with AMMs                                                                                                                               | NA                            | NA                                                                                                                                                                                                                                                                          |
|                                                         | Potential upland habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:                                                                                            | NA                            | Compensatory mitigation for potential American badger habitat is not considered necessary. All temporary impacts to potential habitat will be restored to pre-project conditions following Project construction. Compensation provided for valley grasslands                |

**Table 1. Proposed Biological and Aquatic Resources Compensatory Mitigation Program for the Potential Impacts Resulting from the Sloughhouse Solar Project**

| Special-Status Resource             | Impact Acreage                                                                                       | Mitigation Ratio <sup>1</sup> | Compensatory Mitigation Acreage                                                                                                                                                                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | 273.11 acres                                                                                         |                               | (see Swainson’s hawk above) has the potential to benefit this species.                                                                                                                                                                                                                                                                     |
| native bats                         | No impacts to roosting individuals or maternity colonies with AMMs                                   | NA                            | NA                                                                                                                                                                                                                                                                                                                                         |
|                                     | Potential foraging habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres             | NA                            | Compensatory mitigation for potential bat foraging habitat is not considered necessary. All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson’s hawk above) have the potential to benefit these species.         |
| nesting raptors and migratory birds | No impacts to nesting individuals with AMMs                                                          | NA                            | NA                                                                                                                                                                                                                                                                                                                                         |
|                                     | Potential nesting and foraging habitat -<br>Permanent:<br>14.39 acres,<br>Temporary:<br>273.11 acres | NA                            | Compensatory mitigation for potential nesting and foraging habitat is not considered necessary. All temporary impacts to potential habitat will be restored to pre-Project conditions following Project construction. Compensation provided for valley grasslands (see Swainson’s hawk above) have the potential to benefit these species. |

- <sup>1</sup> Mitigation ratio is the ratio (compensation acreage to impact acreage) assumed to be required by the Sacramento County (County) and/or regulatory agencies to calculate the required compensatory mitigation acreage. Mitigation ratios and the resources requiring compensatory mitigation subject to change based discussions with the County and regulatory agencies to achieve applicable regulatory and permitting standards.
- <sup>2</sup> AMMs include additional pre-activity botanical surveys according to standard guidelines. If special-status plant species are detected at that time, avoidance measures will be implemented. If avoidance is not possible, a Botanical Mitigation Plan will be prepared to compensate for the unavoidable impacts to achieve applicable California Endangered Species Act and federal Endangered Species Act permitting standards.
- <sup>3</sup> Special-status species with a moderate potential to occur in solar development area: Boggs Lake hedge-hyssop, dwarf downingia, hoary navarretia, legenera, pincushion navarretia, Sacramento Orcutt grass, slender Orcutt grass, and valley brodiaea
- <sup>4</sup> Aquatic resource impacts and mitigation are separated into the regulatory agencies with jurisdiction. Compensatory mitigation may be the same for all regulatory agencies if they meet the applicable permitting requirements of each agency. Mitigation ratios, compensatory mitigation acreage, and proposed mitigation approach subject to approval from the County and regulatory agencies. Aquatic resources have the potential to provide habitat for large, listed Branchiopod species (vernal pool fairy shrimp and vernal pool tadpole shrimp); however, protocol surveys for these species were negative. If the regulatory agencies consider the aquatic resources to be occupied by these species despite the negative survey results, the compensatory mitigation ratios are likely to be higher as is reflected here.
- <sup>5</sup> The Project site is within the service area for the following existing in-lieu fee program and banks: Sacramento District California In-Lieu Fee Program, Clay Station Mitigation Bank, Bryte Ranch Conservation Bank, Laguna Creek Mitigation Bank, and Van Vleck Ranch Mitigation Bank.
- <sup>6</sup> The Project proposes to compensate for potential lost foraging acreage beneath solar arrays; however, a majority of this acreage (i.e., areas not permanently impacted by project components) would likely continue to provide habitat and refuge for Swainson’s hawk prey species following construction of the Project. See attached report on Swainson’s hawk foraging use of solar array fields within agricultural landscapes in Sacramento County (Estep 2021).

### 3           References

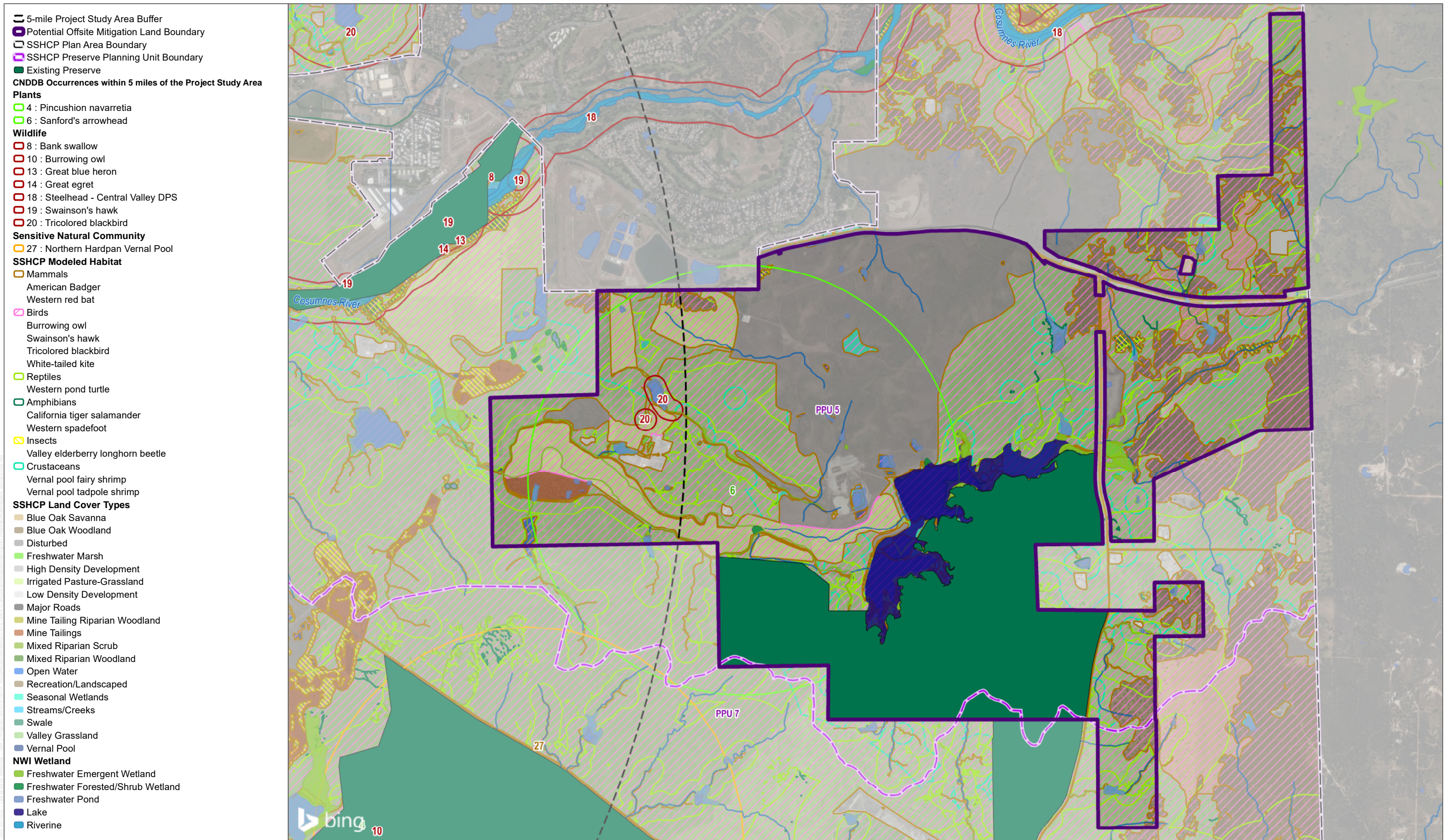
County of Sacramento, City of Rancho Cordova, City of Galt, Sacramento County Water Agency, Sacramento Regional County Sanitation District, and the Southeast Connector Joint Powers Authority. 2018. *Final South Sacramento Habitat Conservation Plan*. January 2018. <https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/SSHCPPlan.aspx>.

Dudek. 2022. *Biological Technical Report – Amended, Sloughhouse Solar Project*. Prepared for Sloughhouse Solar, LLC. February 2022.

Estep (Estep Environmental Consulting). 2016. *Habitat Suitability Assessment for the State-listed Swainson’s Hawk on the Van Vleck Ranch, Sacramento County*. Prepared for Downy Brand, LLC. October.

Estep. 2019. *Distribution and Abundance of the Swainson’s Hawk on and in the Vicinity of the Van Vleck Ranch, Sacramento County*. Prepared for Downy Brand, LLP. August.

Estep. 2021. *Swainson’s Hawk and Other Raptor Foraging Use of Solar Array Fields within an Agricultural Landscape in Sacramento County Year 2*. Prepared for Dudek. November.



SOURCE: Bing Maps 2022; Sacramento County 2019

**FIGURE 1**  
 Potential Offsite Compensatory Mitigation Lands - Biological and Aquatic Resources  
 Sloughhouse Solar Project

**D-9 ESA Section 7 Consultation with USFWS, November 2022**





Rural Development

November 22, 2022

Rural Utilities Service

Michael Fris  
Field Supervisor  
United States Department of the Interior  
FISH AND WILDLIFE SERVICE  
Sacramento Fish and Wildlife Office  
Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846

1400 Independence  
Ave SW, Room 4121  
Stop 1510  
Washington, DC  
20250

Voice 202.720.9540

Re: USDA Rural Utilities Service (RUS) Improvement Project: Sloughhouse Solar Project, Sacramento County, CA, Request for Formal Consultation

Dear Mr. Fris,

USDA Rural Utilities Service is in receipt of an application for financial assistance submitted by Sloughhouse Solar, LLC for the purpose of constructing a 50-megawatt solar photovoltaic energy-generating facility. The proposed project is located approximately 18 miles southeast of the City of Sacramento, Sacramento County, California and involves construction and operation of a solar generation and energy storage facility within a 371.72-acre Solar Development Area encompassed within a broader 732.26-acre Action Area. Construction would include grading the ground surface (disc and roll compaction), pile driving to construct panel supports, minor wetland fill, and minor removal/trimming of shrubs. Construction of this project is anticipated to last eight months starting on/around May 2023 and concluding by December 2023.

On November 16, 2022 the U.S. Army Corps of Engineers designated the U.S. Department of Agriculture (USDA) as the lead federal agency to act on USACE's behalf for purposes of compliance with Section 7 of the Endangered Species Act (see attached letter).

Based on results from FWS's IPaC planning tool (attached) obtained on July 13, 2022, and the attached Biological Assessment, the following species and/or habitat may be present in the action area:

| Species                                                                        | Critical Habitat | Status     | Notes                                                                                                                                                                                                                                                                                                                                                                      | ESA Determination                              |
|--------------------------------------------------------------------------------|------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Vernal Pool Fairy Shrimp ( <i>Branchinecta lynchi</i> )                        | Final            | Threatened | Suitable habitat and SSHCP modeled habitat present. Dry surveys conducted in October and November 2020: negative. Wet surveys conducted February through April 2021: negative.                                                                                                                                                                                             | May affect, likely to adversely affect         |
| Vernal Pool Tadpole Shrimp ( <i>Lepidurus packardi</i> )                       | Final            | Endangered | Suitable habitat and SSHCP modeled habitat present. Dry surveys conducted in October and November 2020: negative. Wet surveys conducted February through April 2021: negative.                                                                                                                                                                                             | May affect, likely to adversely affect         |
| Valley Elderberry Longhorn Beetle ( <i>Desmocerus californicus dimorphus</i> ) | Final            | Threatened | Suitable habitat present. Survey conducted on February 19 and 25, 2021, and January 12, 2022: negative.                                                                                                                                                                                                                                                                    | May affect, but not likely to adversely affect |
| Giant Garter ( <i>Snake Thamnophis gigas</i> )                                 | None             | Threatened | Site not within current range for GGS. Species has not been documented in the vicinity of the Action Area or within 5 miles of the Action Area.                                                                                                                                                                                                                            | No effect                                      |
| California Tiger Salamander ( <i>Ambystoma californiense</i> )                 | Final            | Threatened | Action Area is within the range of the CTS; the nearest occurrence was determined to be approx. 5 miles from the Action Area, beyond the dispersal distance for the species. Few to no suitable burrows were identified during surveys, and no CTS salamander or larvae were detected during focused surveys conducted on March 16, April 15, and April 28, 2021: negative | No effect                                      |
| Delta Smelt ( <i>Hypomesus transpacificus</i> )                                | Final            | Threatened | The Action Area is just outside the known range for this species, and habitat for the species is either absent or of low quality. There are no                                                                                                                                                                                                                             | No effect                                      |

|                                                                                                |       |            |                                                                                                                                                                                                                                                                                                                                         |           |
|------------------------------------------------------------------------------------------------|-------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                                                                |       |            | known occurrences within five miles of the Action Area.                                                                                                                                                                                                                                                                                 |           |
| Conservancy Fairy Shrimp ( <i>Branchinecta conservation</i> )                                  | Final | Endangered | The Action Area is outside the known range of the species, and habitat for the species is either absent or of low quality. This species is known to occur in 10 populations; the closest two are Yolo Bypass Wildlife Area in Yolo County and Jepson Prairie in Solano County. Surveys conducted February through April 2021: negative. | No effect |
| lone (incl. Irish Hill) Buckwheat ( <i>Eriogonum apricum</i> ) (incl. var. <i>prostratum</i> ) | None  | Endangered | Habitat for this species is absent in the Action Area. The nearest known occurrence for this species is located to the east of the Action Area in the 'Carbondale' USGS 7.5-Minute Quad. Protocol-level botanical field surveys were conducted within the Action Area on May 4, 2021: Negative.                                         | No effect |
| lone Manzanita ( <i>Arctostaphylos myrtifolia</i> )                                            | None  | Threatened | Habitat for this species is absent in the Action Area. The nearest known occurrence for this species is located to the east of the Action Area in the 'Carbondale' USGS 7.5-Minute Quad. Protocol-level botanical field surveys were conducted within the Action Area on May 4, 2021: Negative.                                         | No effect |
| Sacramento Orcutt Grass ( <i>Orcuttia viscida</i> )                                            | Final | Endangered | The Action Area is within the known range of Sacramento Orcutt Grass, and low-quality suitable habitat for the species is present. DCH is located approximately 4 miles northwest of the Action Area. There are also known occurrences for this                                                                                         | No effect |

|                                                    |       |            |                                                                                                                                                                                                                                                      |           |
|----------------------------------------------------|-------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                    |       |            | species within 5 miles of the Action Area. Reference population checks were performed for special-status plant species on April 22, 2021, and protocol-level botanical field surveys were conducted within the Action Area on May 4, 2021: Negative. |           |
| Slender Orcutt Grass<br>( <i>Orcuttia tenuis</i> ) | Final | Threatened | See Sacramento Orcutt grass above.                                                                                                                                                                                                                   | No effect |

Based on the above analysis, we conclude that financial assistance for this project is likely to adversely affect the [list species or designated habitat which may be adversely affected]. With this letter, we request your participation in formal consultation per Section 7 of the Endangered Species Act.

RUS is submitting the attached Biological Assessment in support of this request; please provide a courtesy receipt acknowledging a complete submittal package within 30 days.

Sincerely,

**JOSEPH  
RANSON**

Digitally signed by  
JOSEPH RANSON  
Date: 2022.11.21  
11:59:28 -07'00'

Joseph A. Ranson  
Director  
Environmental and Historic Preservation Division  
Rural Utilities Service

Cc: Megan Cook, Sacramento Valley Division Supervisor

#### Attachments

1. USACE designation letter
2. IPaC Species List
3. Biological Assessment (via email link due to size)



**DEPARTMENT OF THE ARMY**  
**U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT**  
**1325 J STREET**  
**SACRAMENTO CA 95814-2922**

November 16, 2022

Regulatory Division (SPK-2021-00086)

United States Department of Agriculture  
Attn: Elisa Sims Albury  
Rural Utilities Service, Rural Development  
Washington, District of Columbia 20250-0003  
[elisa.albury@usda.gov](mailto:elisa.albury@usda.gov)

Dear Ms. Albury:

This letter concerns our designation of lead Federal agency for the proposed Sloughhouse Solar Farm project. The approximately 732.3-acre project site is located at the southwest corner of Dillard Road and Meiss Road in Section 1, Township 7 North, Range 7 East, MDB&M, Latitude 38.47373°, Longitude -121.18457°, Sloughhouse, Sacramento County, California.

Following early coordination with your agency on beginning via email on July 7, 2022, we hereby designate the United States Department of Agriculture (USDA) as the lead Federal agency to act on our behalf for purposes of compliance with the Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA) for Department of the Army authorization required for the Sloughhouse Solar Farm project.

Prior to initiating consultation with the appropriate agency, please coordinate your draft determinations for ESA and NHPA, as well as the information used in making that determination, with our office. Additionally, please include a statement in your consultation letters indicating that we have designated the USDA as the lead federal agency for the proposed action, along with a copy of this letter.

Please refer to identification number SPK-2021-00086 in any correspondence concerning this project. If you have any questions, please contact Matt Hirkala by email at [matthew.j.hirkala@usace.army.mil](mailto:matthew.j.hirkala@usace.army.mil) or by phone at (916) 557-5148. We appreciate feedback, especially about interactions with our staff and processes. For program information or to complete our Customer Survey, visit our website at [www.spk.usace.army.mil/missions/regulatory.aspx](http://www.spk.usace.army.mil/missions/regulatory.aspx).

Sincerely,

A handwritten signature in cursive script that reads "Mary R. Pakenham-Walsh".

Mary Pakenham-Walsh  
Chief, CA Delta Section  
Regulatory Division

cc:

Ms. Morgan Kennedy, Dudek, [mkennedy@dudek.com](mailto:mkennedy@dudek.com)  
Mr. Hy Martin, Sloughhouse Solar, LLC, [hy.martin@deshaw.com](mailto:hy.martin@deshaw.com)  
Mr. Clark Skillman, D. E. Shaw Renewable Investments, [clark.skillman@deshaw.com](mailto:clark.skillman@deshaw.com)  
Mr. Jeffrey D. Larson, USDA, Environmental & Historic Preservation Division,  
[jeffrey.larson@usda.gov](mailto:jeffrey.larson@usda.gov)  
Mr. Ian Perkins-Taylor, U.S. Fish & Wildlife Service, [ian\\_perkins-taylor@fws.gov](mailto:ian_perkins-taylor@fws.gov)  
Mr. Dylan Wood, California Department of Fish & Wildlife, [dylan.a.wood@wildlife.ca.gov](mailto:dylan.a.wood@wildlife.ca.gov)  
Ms. Stephanie Tadlock, Regional Water Quality Control Board,  
[Stephanie.Tadlock@waterboards.ca.gov](mailto:Stephanie.Tadlock@waterboards.ca.gov)



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Sacramento Fish And Wildlife Office  
Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846  
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:  
Project Code: 2022-0063369  
Project Name: Sloughhouse Solar Project

July 13, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

## To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2))

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

**Migratory Birds:** In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

---

Attachment(s):

- Official Species List



## **Official Species List**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

### **Sacramento Fish And Wildlife Office**

Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846  
(916) 414-6600

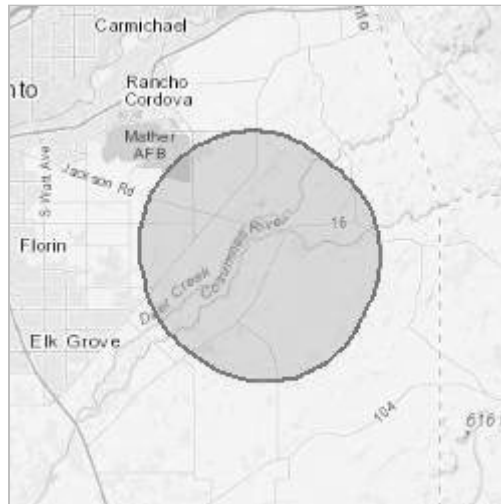
---

## Project Summary

Project Code: 2022-0063369  
Event Code: None  
Project Name: Sloughhouse Solar Project  
Project Type: Power Gen - Solar  
Project Description: County – Sacramento  
Public Land Survey System – Cosumnes Land Grant  
U.S. Geological Survey (USGS) 7.5-Minute Quadrangle (Quad) –  
Sloughhouse  
Latitude, Longitude (decimal degrees) – 38.473731, -121.184568  
(Centroid)  
Assessor Parcel Numbers – 12601100010000, 12601100030000  
Elevation Range/Average – 95 to 160 feet above mean sea level (amsl)/  
128 feet amsl  
PSA – 732.26 acres

### Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.4734833,-121.18399345831887,14z>



Counties: Sacramento County, California

---

## Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [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.

### Reptiles

| NAME                                                                                                                                                                                                                  | STATUS     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Giant Garter Snake <i>Thamnophis gigas</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/4482">https://ecos.fws.gov/ecp/species/4482</a> | Threatened |

### Amphibians

| NAME                                                                                                                                                                                                                                                                                                                               | STATUS     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| California Tiger Salamander <i>Ambystoma californiense</i><br>Population: U.S.A. (Central CA DPS)<br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/2076">https://ecos.fws.gov/ecp/species/2076</a> | Threatened |

### Fishes

| NAME                                                                                                                                                                                                                                                                       | STATUS     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Delta Smelt <i>Hypomesus transpacificus</i><br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/321">https://ecos.fws.gov/ecp/species/321</a> | Threatened |

---

## Insects

| NAME                                                                                                                                                                                                                                                                                                        | STATUS     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Monarch Butterfly <i>Danaus plexippus</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>                                                                                        | Candidate  |
| Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i><br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/7850">https://ecos.fws.gov/ecp/species/7850</a> | Threatened |

## Crustaceans

| NAME                                                                                                                                                                                                                                                                                      | STATUS     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Conservancy Fairy Shrimp <i>Branchinecta conservatio</i><br>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/8246">https://ecos.fws.gov/ecp/species/8246</a> | Endangered |
| Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/498">https://ecos.fws.gov/ecp/species/498</a>                  | Threatened |
| Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/2246">https://ecos.fws.gov/ecp/species/2246</a>              | Endangered |

## Flowering Plants

| NAME                                                                                                                                                                                                                                                                   | STATUS     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Ione (incl. Irish Hill) Buckwheat <i>Eriogonum apricum (incl. var. prostratum)</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/8301">https://ecos.fws.gov/ecp/species/8301</a>          | Endangered |
| Ione Manzanita <i>Arctostaphylos myrtifolia</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/1806">https://ecos.fws.gov/ecp/species/1806</a>                                             | Threatened |
| Sacramento Orcutt Grass <i>Orcuttia viscida</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/5507">https://ecos.fws.gov/ecp/species/5507</a> | Endangered |
| Slender Orcutt Grass <i>Orcuttia tenuis</i><br>There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/1063">https://ecos.fws.gov/ecp/species/1063</a>     | Threatened |

## Critical habitats

There are 4 critical habitats wholly or partially within your project area under this office's jurisdiction.

| NAME                                                                                                                                                               | STATUS |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Sacramento Orcutt Grass <i>Orcuttia viscida</i><br><a href="https://ecos.fws.gov/ecp/species/5507#crithab">https://ecos.fws.gov/ecp/species/5507#crithab</a>       | Final  |
| Slender Orcutt Grass <i>Orcuttia tenuis</i><br><a href="https://ecos.fws.gov/ecp/species/1063#crithab">https://ecos.fws.gov/ecp/species/1063#crithab</a>           | Final  |
| Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i><br><a href="https://ecos.fws.gov/ecp/species/498#crithab">https://ecos.fws.gov/ecp/species/498#crithab</a>     | Final  |
| Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i><br><a href="https://ecos.fws.gov/ecp/species/2246#crithab">https://ecos.fws.gov/ecp/species/2246#crithab</a> | Final  |

---

## **IPaC User Contact Information**

Agency: Dudek  
Name: Morgan Kennedy  
Address: 853 Lincoln Way #208  
City: Auburn  
State: CA  
Zip: 95603  
Email: mkennedy@dudek.com  
Phone: 9166612498

---