

BIOLOGICAL TECHNICAL REPORT

PG&E R-1402 L-130 SACRAMENTO RIVER CROSSING PIPELINE REPLACEMENT PROJECT SOLANO AND SACRAMENTO COUNTIES, CALIFORNIA

Project No. 2002-5361

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1.0 INTRODUCTION

Pacific Gas and Electric (PG&E) Gas Transmission division proposes to replace the PG&E L-130 pipeline where it crosses the Sacramento River at Rio Vista. The National Transportation Safety Board (NTSB) has issued a safety recommendation to PG&E that the existing pipeline be assessed by December 22, 2022. PG&E has determined that the pipeline should be replaced prior to the assessment deadline to meet the NTSB recommendation and maintain natural gas service to customers. The objectives of the L-130 Sacramento River Crossing Replacement Project (Project) are to install a new 16-inch diameter pipeline underneath the Sacramento River using horizontal directional drilling (HDD) techniques, tie the new crossing into the existing pipeline network, and then decommission the PG&E portion of the existing Sacramento River crossing.

The purpose of this Biological Technical Report is to detail the findings of the biological reconnaissance surveys conducted for proposed L-130 Replacement Project in Solano and Sacramento Counties, California. This technical report includes a review of pertinent literature, a review of regulatory requirements, results of reconnaissance field surveys, and a preliminary analysis of general impacts of project implementation on biological resources.

Following this introduction, there is a description of the proposed Project, followed by the methodology section, which describes field studies and analytical methods used to assess the Project area. The methodology section includes a review of literature concerning special-status species, sensitive habitats, and general biological conditions, and a description of field reconnaissance methods. The environmental setting describes abiotic and biotic conditions at the Project area including climate, soils, typical habitats and associated plant and wildlife species, and special-status species reported in or near the Project area. A review of regulatory requirements is then provided, and the final section summarizes the anticipated impacts of Project implementation along with suggested mitigation measures and applicant proposed avoidance and minimization measures to reduce Project impacts to less than significant levels.

2.0 BACKGROUND

PG&E is proposing to replace the natural gas pipeline L-130 at its crossing of the Sacramento River. The Project objective is to replace the affected pipeline segment at a new location using HDD methods and to decommission the existing pipeline crossing. Replacement of the river crossing segment will address shallow depth of burial concerns and meet NTSB safety recommendations.

2.1 LOCATION

The terrestrial landing of the western portion of the Project area is located at the south end of the City of Rio Vista and the eastern portion of the Project area is located within residential and agricultural lands on Brannan Island (Figure 1). The site is located within the *Rio Vista, California* United States Geological Survey (USGS) 7.5-Minute Series topographic quadrangle map. The Project area is in Township 4 North, Range 3 East, Solano and Sacramento Counties, California. The Project area is bordered by the City of Rio Vista to the north, Montezuma Hills to the west, and agricultural lands within the Sacramento River Delta to the south and east. See Figures 2 and 3 for an overview of the L-130 Project area.

2.1.1 Western Terrestrial Landing

The western terrestrial landing for L-130 is primarily located within a vacant lot owned by the City of Rio Vista. There are remnants of a peach orchard on this property, but the site is now a vacant lot dominated by non-native weeds. The vacant lot does not have any wetland areas aside from a narrow band of in-channel emergent wetland at the base of the west bank of the Sacramento River, which is located at the bottom of a steeply eroded cliff.

2.1.2 Eastern Terrestrial Landing

The eastern terrestrial landing for L-130 is within a disturbed area supporting non-native weedy vegetation and largely unvegetated lands. The east bank of the Sacramento River is a federal levee and State Route 160 is on the crown of the levee. The Project area for the HDD entry location and pipeline laydown area extends eastward across agricultural lands, access roads, and agricultural ditches.

2.2 PROJECT DESCRIPTION

In response to the NTSB recommendation, PG&E is proposing to install a new 16-inch diameter pipeline underneath the Sacramento River using horizontal directional drilling (HDD) techniques, tie the new crossing into the existing pipeline network, and then decommission the PG&E portion of the existing crossing.

2.2.1 Pipeline Replacement

The pipeline replacement involves the installation of a 16-inch pipeline under the Sacramento River using HDD techniques. The western bore pit will be located within a vacant lot owned by the City of Rio Vista and will measure approximately 20 feet wide, 50 feet long and 6 feet deep. Soils excavated from the bore pits will be stockpiled within the adjacent work areas to be used for backfilling and site restoration on completion of the Project.

A bore pit approximately 8 feet wide, 20 feet long and 6 feet deep will also be excavated at the HDD entry point at the east work area located in an agricultural field east of Highway 160. The drilling subcontractor may choose to elevate the drilling rig above the River's mean high water elevation by importing fill and creating a temporary raised earthen platform (HDD platform) with sloped sides to the east of this pit in order to elevate the end of the casing above river mean high water elevation to further minimize risk of seepage or flooding through the bore hole. This HDD platform would be approximately 70 feet long and 20 feet wide at the top, and approximately 13 feet above the existing grade. With sloped sides, the base of this earthen mound is expected to be approximately 147 feet long and 70 feet wide. Casings will be installed at both HDD entry points. The HDD platform will be removed, and the site restored at the conclusion of work.

The HDD will be performed using two horizontal directional drilling rigs from each bore location, drilling the pilot hole under the Sacramento River and intersecting near the center of the River at a depth of approximately 60 feet below the riverbed. Above ground guide wires may be placed along the bore alignment within terrestrial areas to assist with positioning and steering of the drill heads and may require vegetation removal along the alignment for placement. Once the pilot bore is completed, reaming operations will widen the bore to its final diameter in preparation for pullback of the new pipeline (see Figure 2).

The HDD design includes several measures to minimize the potential for inadvertent returns of drilling fluids to the River. First, using the intersect drilling technique will substantially minimize the potential for inadvertent returns of drilling fluids to the River by reducing the distance drilling fluid travels through the bore, which in turn reduces the drilling fluid pressure in the bore. Next, the depth of the pilot bore under the river has been designed to keep the bore in the deeper layers of soil that are less susceptible to failure when subjected to elevated pressures. To further minimize the risk of inadvertent returns to the surface, steel casings will be installed at each of the terrestrial bore pit locations. Casings are expected to extend approximately 410 feet in length on the west side and 260 feet in length on the east side. Throughout the drilling of the pilot hole, the annular pressure will be monitored and continuously recorded to compare with and maintain expected annular pressures and the volume of drilling fluid used and returned with the drill cuttings will be monitored to ensure rapid detection in the unlikely event of an inadvertent return of drilling fluids to the surface. In addition, the Drilling Program Plan developed for the Project includes a hydrofracture risk analysis for the proposed bore alignment and a Surface Spill and Inadvertent Drilling Fluid Return Contingency Plan that outlines response and cleanup methods to be employed in the unlikely event of an inadvertent return of drilling fluid to the surface (Bennett Trenchless Engineers, 2021).

Concurrent with HDD activities, approximately 40-foot-long joints of steel pipe will be laid out on rollers in the pipe staging area east of the eastern bore pit location. Temporary crossings will be installed across the agricultural ditches that occur within the pipe staging area to allow for truck and equipment access along both sides of the fabricated pipe string (Figures 2 and 5). These temporary crossings may consist of the placement of steel trench plates or installation of temporary culverts at the ditch crossing locations. The pipe joints will be welded together, and welds will be coated and inspected to construct the pipeline pullback string. Once fabricated, the entire pipeline pullback string will measure approximately 3,700 linear feet. An initial hydrostatic test will be performed prior to pullback. After reaming operations and the initial hydrostatic test are complete, the pipeline pullback string will be pulled back through the bore hole from the east

to the west side of the river crossing. After completion of the pullback operations, the casing on the east side of the river crossing will remain in place and the casing on the west side of the river crossing will be removed. Cement slurry will be used to fill the annuli between the pipeline and the casing (east side) and between the pipeline and the bore hole (west side).

Once the pipeline pullback is complete, tie-in trenches will be excavated, and tie-in pipelines will be fabricated in preparation for connection of the newly installed river crossing. The anticipated length of trench-installed pipeline on the east side of the river crossing is approximately 90 feet. The anticipated length of trench-installed pipeline on the west side of the river crossing is approximately 150 feet. After construction of the tie-in pipeline fabrication, another hydrostatic test of the newly installed pipeline crossing will be performed in accordance with federal and state requirements. After completion of the hydrotest, natural gas will be purged from the existing pipeline with nitrogen or other inert gas. Once purged, the existing pipeline will be cut at the tie-in locations and the new pipeline crossing will be connected. New pipeline markers will be installed along the new pipeline crossing alignment and new cathodic protection test stations will be installed near the east bore pit location and the west tie-in location. The old pipeline river crossing will be capped on each end while it is left deactivated prior to decommissioning.

In addition to the pipeline replacement at the L-130 Sacramento River crossing, while the pipeline is out of service and purged of natural gas for completion of the tie-ins, a blowdown stack will be installed at the PG&E pipeline station located to the west of the west tie-in location. All work associated with installing the blowdown stack will occur inside an existing PG&E pipeline station and accessed from existing roads. An unused pipeline branch tee, with a short dead end and capped section of pipe, located in the agricultural field east of the eastern tie-in location will also be removed and replaced with a straight section of pipe (see Figure 2).

After completion of the pipeline installation work, all excavations will be backfilled with imported sand above the pipeline and the stockpiled native soils will be used to backfill each excavation. Each excavation location will be restored to pre-construction contours and in accordance with landowner access agreements in the west work area and the agricultural fields and in accordance with levee encroachment permits in the levee prism. The site of the HDD platform at the eastern drill site will be returned to original contours.

Terrestrial staging and laydown areas and excavation footprints associated with both pipeline replacement and pipeline decommissioning activities have been established within developed and disturbed lands whenever possible and within areas supporting upland habitat to minimize impact to waters and wetlands and sensitive habitat. Access to terrestrial work areas will be from existing roadways (Figure 2).

Six excavation areas will be required for completion of the pipeline replacement phase of the Project. These include HDD bore entry pits, pipeline tie in trenches, the blow down stack location in an existing PG&E station, and the branch tee removal location. These excavations are all located in terrestrial locations. Table 2-1 outlines the discrete excavation footprints at each described location. Figures 5A through 5F depict the excavation areas and other temporary disturbance associated with the pipeline replacement phase of the Project.

Table 2-1. Excavation Footprints Associated with the L-130 Replacement Activities

Excavation ID	Excavation	Excavation Dimensions (ft)	Approximate Area (ft ²)
Excavation A	HDD West Entry Bore Pit and West Side Tie-in Trench	20' X 135'	2,700
Excavation G	HDD East Entry Bore Pit and East Side Tie-In Trench	20' X 102'	2,040
Excavation J	Branch Tee Removal	15' X 15'	225
Excavation K	Eastern Sniff Bell Hole	15' X 15'	225
Excavation L	Installation of Blow Down Stack (Within Existing PG&E Station)	23' X 14' and 11' X 14'	470
Total Excavation Area			5,660
Note: Dimensions based on 60% Design Plans prepared by Longitude 123, Inc. dated 9-10-21 (Longitude 123, Inc., 2021).			

2.2.2 Pipeline Decommissioning

After replacement of the L-130 Sacramento River crossing, the old pipeline that was deactivated and capped, will be decommissioned. For purposes of decommissioning planning, the pipeline to be decommissioned has been divided into four logical segments based on the proposed final dispositions. Each segment is described in this section, sequentially from west to east and the sections are depicted on Figure 3.

Segment 1 begins at the replacement pipeline west tie-in location, just east of Beach Drive and continues through the vacant lot to the waterline on the west bank of the Sacramento River. There is a concrete valve box located on the pipeline alignment within the vacant lot. Two 10-inch pipelines extend east from the valve box, one owned by PG&E and the other owned by California Resources Corporation (CRC). All further references to the pipeline are specific to the PG&E owned pipeline that will be replaced and is planned for decommissioning. Approximately 465 feet of the existing L-130 pipeline from the tie-in location to the concrete valve box, will be filled with cement slurry and abandoned in place. The remaining approximately 65 feet of Segment 1 from the valve box to the Sacramento River will be removed. The concrete valve box will also be removed.

Segment 2 extends eastward from the end of Segment 1 on the west bank of the Sacramento River, approximately 2,470 feet beneath the River to the waterside slope of the levee on the east side of the Sacramento River. This pipeline crossing segment will be entirely removed.

Segment 3 extends from the end of Segment 2 on the waterside slope of the levee approximately 345 feet across the crown and down the landside slope of the levee, ending ten

feet east of the toe of the landside slope of the levee. This segment passes through a federal levee with State Route 160 on the crown of the levee. There is a concrete valve box located in this segment with the two 10-inch pipelines (PG&E owned and CRC-owned) entering from the River crossing. L-130 transitions to a 16-inch pipeline and extends underground east from the valve box, across the levee crown, passes through a 20-inch diameter steel casing underneath State Route 160, and extends underground down the landside slope of the levee. The 10-inch and 16-inch pipelines owned by PG&E in Segment 3 are planned for removal from the riverbank, through the levee crown and casing, to a point approximately 10 feet east of the toe of the levee's landside slope. The 20-inch casing and the concrete valve box will also be entirely removed from the levee. The open trench to remove the casing from State Route 160 will be hydraulically shored with vertical walls to minimize the extent of excavation within the roadway. Excavation and removal of the casing will occur in stages such that one lane of traffic may still pass during construction, and a traffic control plan will be prepared and implemented.

Segment 4 extends from the end of Segment 3 east of the toe of the landside levee slope through rural residential properties and an agricultural field and ends at the east tie in location. Approximately 538 feet of this segment will be filled with cement slurry and abandoned in place.

All pipeline segments will be cleaned and flushed prior to decommissioning and removal of the waterway crossing segments. Portions of the pipeline proposed for retirement in place will be filled with cement slurry.

Terrestrial staging and laydown areas and excavation footprints associated with both pipeline replacement and pipeline decommissioning activities have been established within developed and disturbed lands whenever possible and within areas supporting upland habitat to minimize impact to waters and wetlands. Access to terrestrial work areas will be from existing roadways (Figure 2 and 3).

Four new excavation areas will be required for completion of the decommissioning phase of the Project. The decommissioning phase of the Project will also require the re-excavation of a portion of the tie-in trench locations for pigging and flushing of the deactivated pipeline prior to decommissioning and removal (see Table 2-1 above). The new excavation areas include excavation for removal of the L-130 pipeline on the west bank of the Sacramento River, through the river crossing, on the east bank of the Sacramento River, and at the east side of the existing casing. Removal of the pipeline from the waterway crossings may require underwater excavation using a Toyo pump or hand jets depending on the site conditions; however, because of the shallow depth of burial and exposure along segments of pipeline proposed for removal within the Sacramento River, these areas of the underwater pipeline crossing are expected to easily lift from the waterway using a crane without underwater excavation, reducing the extent of underwater excavation needed. If in-water excavation is required, it will be limited to segments of the pipeline where the depth of burial prevents the crane from simply lifting the pipeline up through the sediment and will be performed with precision narrowly following the pipeline alignment and removing enough of the overburden that the pipeline can once again be lifted out of the waterway crossing. The excavation area within the Sacramento River as depicted in Figure 5 is considered the maximum underwater excavation footprint that could be necessary, and in-water excavation is anticipated to be less. Table 2-2 outlines the discrete excavation footprints associated with

decommissioning activities. Figure 5 depicts the excavation areas and other temporary disturbance associated with the pipeline decommissioning and removal Project.

Table 2-2. Excavation Footprints Associated with the L-130 Decommissioning Activities

Excavation ID	Excavation	Excavation Dimensions (ft)	Approximate Area (ft ²)
Excavation B	Bell hole (access for pigging and flushing)	15' X 15'	225
Excavation C	Sacramento River West Bank Pipeline Removal	Irregular Shape	4,063
Excavation D	Sacramento River Crossing Pipeline Removal	5' X 2,450'	12,250
Excavation E	Sacramento River East Bank (Levee) Pipeline Removal	Irregular shape	5,240
Excavation F	Excavation for Removal of Pipeline and Casing Under SR 160	10' X 118'	1,180
Excavation H	Bell hole (access for pigging and flushing)	15' X 15'	225
Total Excavation Area			23,183
Note: Dimensions based on 60% Design Plans prepared by Longitude 123, Inc. dated 9-10-21 (Longitude 123, Inc., 2021).			

A Turbidity Monitoring Plan will be developed for the project, which will include provisions for monitoring turbidity during underwater excavation and other project activities that have the potential to increase turbidity. Turbidity curtains may be used if turbidity monitoring indicates that turbidity levels would exceed regulatory thresholds and their use is feasible given the existing site conditions at the time of construction.

Once the pipelines have been pigged and flushed and filled with cement slurry, terrestrial segments will be excavated, cut into sections, and loaded onto truck for disposal. Concrete valve boxes will be demolished using an excavator-mounted hydraulic concrete breaker. Debris will be removed from the pit with a bucket and hauled offsite for disposal. The CRC-owned pipe will be left onsite and reburied during backfill operations.

Pipeline Segment 2 within the Sacramento River will be removed with a derrick barge-equipped with a crane and underwater excavation equipment. Divers will excavate the pipeline where necessary to expose it using a Toyo pump or hand jets, depending on existing site conditions. The Toyo pump excavation over deeply buried segments of pipeline will be precision excavations to remove overburden to the point where the crane can lift the pipeline from the waterway, and will be kept to the minimum possible for safe and successful removal of the

pipeline. The pipeline will be lifted to the deck of the barge and cut above the water surface. All recovered pipe will be cut into sections and loaded onto the materials barge for removal from the site and transfer to an approved recycling or disposal facility (as applicable). Underwater excavations would be allowed to backfill through natural hydrogeomorphic processes.

Pipeline replacement, decommissioning and removal activities will result in a total temporary disturbance footprint of approximately 10.94 acres and a total excavation footprint of approximately 0.65-acre (0.14-acre of excavation associated with pipeline replacement activities and 0.51-acre of excavation associated with decommissioning activities) (Figure 5). There are no permanent impacts or loss of habitat associated with this Project, all temporary impacts will be restored upon completion of Project activities.

Pipeline replacement is scheduled to begin in spring 2022 so that pipeline replacement and tie-in to the existing pipeline network will be completed prior to decommissioning and removal activities that are planned for the seasonal aquatic work window. Pipeline decommissioning and removal is planned for implementation during late summer/fall of 2022. In-water work associated with decommissioning activities will be limited to August 1 to October 31 to coincide with the period when special-status fish species are least likely to occur. Work activities will generally be conducted Monday through Saturday (occasionally Sunday) with approximately 10 to 12 hours per workday. Weekend work may occur, if necessary, to complete the Project within the defined seasonal constraints.

3.0 METHODOLOGY

3.1 LITERATURE REVIEW

Padre biologists reviewed available Project design information, Solano and Sacramento County soil survey maps, National Wetland Inventory (NWI) Maps, the U.S. Geological Survey (USGS) 7.5-minute topographic map for the Rio Vista quadrangle, and other environmental documents. The California Natural Diversity Database (CNDDDB) and California Department of Fish and Wildlife Biogeographic Information and Observation System (BIOS) were queried for records of special-status species reported within a five-mile radius surrounding the Project area (California Department of Fish and Wildlife [CDFW], 2020). A list of federally listed Threatened and Endangered species was obtained from the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), and is included under Appendix A (USFWS, 2020a, b; NMFS, 2020a). Special-status taxa that are known to exist or have the potential to exist on the Project area were also identified through a review of relevant literature (California Native Plant Society [CNPS], 2020; Zeiner et al., 1988; 1990a, b).

Padre biologists reviewed focused herpetological and botanical surveys for the Project, provided by PG&E (Swaim Biological, 2020; Nomad Ecology, 2020). Padre biologists also reviewed PG&E's Bay Area Operations and Maintenance Habitat Conservation Plan (BAHCP) (ICF, 2017) and Multiple Region Operations & Maintenance Habitat Conservation Plan (MRHCP) (ICF, 2020) for incorporation of Avoidance and Minimization Measures (AMMs) from the HCPs for protection of covered species potentially impacted by the Project. The Sacramento River is the dividing line between Solano and Sacramento Counties; therefore, the western portion of the Project area is within the BAHCP Area and the eastern portion of the Project area is within the MRHCP Area.

3.2 FIELD SURVEYS

Reconnaissance-level field surveys for the purposes of site characterization and preliminary aquatic resources delineation were conducted by Padre biologists on October 21 and 22, 2020. A biological resources study area (study area) was identified prior to beginning field surveys. The study area includes all temporary impact areas, staging areas, access routes, and the surrounding areas. Boundaries of the study area are depicted in Figures 4 and 5. Surveys of the study area were conducted to assess the potential for biological resources and to determine the likelihood of occurrence for special-status species and/or sensitive and regulated habitats on the site. Detection methods included direct observation with binoculars; examination and identification of tracks, scats, previous years nests, burrows/diggings, and carcasses/skeletal remains; and identification of vocalizations (calls and songs). No trapping or netting was performed during surveys. Plants not identified in the field were collected and returned to the lab for identification using standard taxonomic references, when possible (Baldwin et al., 2012). Prior to the field surveys, the CNDDDB/BIOS query was reviewed to identify occurrences of special-status plant and animal species in the Project vicinity (Appendix B). During the field surveys, vegetative cover types and significant habitat features, such as wetlands, potential nest trees, and potential dens or burrows, were noted. Lists of plants and wildlife associated with the various cover types were compiled and are included in Appendix C and Appendix D.

Additional focused herpetological and botanical surveys were conducted independently of the Project reconnaissance surveys. Swaim Biological Incorporated (SBI) biologists conducted a herpetological assessment of the Project area on April 7 and November 13, 2020. SBI biologists surveyed habitat conditions throughout the Project area and accessible adjacent areas on foot and from vehicles, including access routes, staging areas, and public roadways bordering and in the vicinity of the Project area to identify special-status reptile and amphibian species and/or suitable habitat. Results of these surveys are presented in the Herpetological Assessment for PG&E's Sacramento River Pipeline Replacement Project: R-1402 – Rio Vista Technical Memorandum (Swaim Biological Inc., 2020).

In addition, protocol-level rare plant surveys were conducted by Nomad Ecology. These surveys were conducted during the months of June, July, and August of 2020 and were focused on target special-status plant species potentially occurring within the study area. Table 3-1 details the dates and targeted species for these surveys.

Table 3-1. 2020 Survey Effort Details for Target Plant Species

Survey Dates	Target Species
June 13, 2020	Delta tule pea (<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>) Mason's lilaeopsis (<i>Lilaeopsis masonii</i>) Delta mudwort (<i>Limosella australis</i>) Suisun Marsh aster (<i>Symphiotrichum lentum</i>)
June 16, 2020	
July 24, 2020	Bolander's water-hemlock (<i>Cicuta maculata</i> var. <i>bolanderi</i>)
August 26, 2020	woolly rose-mallow (<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>)

The purpose of these surveys was to conduct an inventory of vascular plants of the Project area to document occurrences of rare, threatened or endangered species and other special-status plants, as well as sensitive natural communities. Results of these surveys are presented in the Botanical Resource Survey Report Line 130 River Crossing Pipeline Relocation Project Solano and Sacramento Counties, California (Nomad Ecology, 2020).

The focused herpetological and botanical survey reports were reviewed by Padre biologists to inform reconnaissance level survey efforts. Results of these surveys are incorporated into this Biological Resources Technical Report and were used to support the Project impact analysis.

4.0 ENVIRONMENTAL SETTING

4.1 GEOLOGY/GEOMORPHOLOGY

The Project area west of the Sacramento River is located within the Sodic Claypan Terraces subsection of the Great Valley ecological section of California (Miles and Goudey, 1997). The Sodic Claypan Terraces subsection occurs on a late Quaternary alluvial plain on the lower west side of Sacramento Valley. The geomorphology of this subsection is nearly level to gently sloping late Pleistocene and recent alluvial fans from the southern end of the northern California Coast Ranges. The subsection elevation range is from about 20 to about 120 feet above mean sea level (amsl). Fluvial erosion and deposition are the main geomorphic processes.

The portion of the Project area east of the Sacramento River is located within the Delta subsection of the Great Valley ecological section of California (Miles and Goudey, 1997). The Delta subsection occurs in a low area, near sea-level, at the confluence of the Sacramento and San Joaquin Rivers. Organic fill is a distinctive feature of the subsection. This subsection contains Quaternary sediments covered by organic deposits. The geomorphology of this subsection is practically level plain, except for the levees of the Sacramento and San Joaquin Rivers. Many artificial levees have been constructed to prevent flooding of land committed to agriculture. The subsection elevation range is from a few feet on levees of the Sacramento and San Joaquin Rivers to sea-level, or lower, on the rest of the plain. Decomposition of the organic deposits and consequential land subsidence is the main geomorphic process. Fluvial erosion and deposition are the main geomorphic processes on and adjacent to levees.

Five soil types have been mapped by the Natural Resources Conservation Service (NRCS) and are distributed across the site, as described in Section 4.3 below.

The Project is located within the Sacramento Valley subregion of the Great Valley California floristic region (Baldwin et al., 2012). The western portion of the site is located within a vacant industrial area just south of residential Rio Vista. The eastern portion of the site is located predominantly within agricultural crop land; however, the Project study area includes a highly disturbed vacant lot on the east bank of the Sacramento River. A federal levee and State Route 160 also occur within the study area on the east bank of the Sacramento River.

4.2 CLIMATE

The Project area is situated in Climate Zone 14, which includes northern California's inland areas with some ocean influence (Clark, 1985). The site has a climate that is moderated by the Pacific Ocean and is characterized by warmer winters and cooler summers than neighboring inland climates. The gap in northern California's Coast Range created by the San Francisco Bay allows marine air to penetrate further inland than in other areas similarly removed from the ocean. Most of the rainfall occurs during the period from November through April.

In nearby Antioch, 12 miles to the south, the average maximum temperature for the 40-year period between 1981 and 2021 was 73.2°F, with a range of 53.9° in January to 91.4° in July. The average minimum temperature was 49.8° with a range of 38.7° in January and 59.3° in July. The average annual precipitation is 13.22 inches with a range of 0.00 inch in July to 2.66 inches

in January. No precipitation falls as snow within this area of California (Western Regional Climate Center, 2020).

4.3 SOILS

The soils in the Sodic Claypan Terraces subsection are mostly moderately well and somewhat poorly drained, with some well and poorly drained soils. Soil temperature regimes are thermic. Soil moisture regimes are mostly xeric and some aquic. A thermic soil temperature regime refers to soils with a mean annual temperature that is 15° Celsius (C) or higher but lower than 22°C, and the difference between mean summer and mean winter soil temperatures is more than 5°C at a depth of 50 centimeters (cm) from the soil surface or at a densic, lithic, or paralithic contact, whichever is shallower. A xeric soil moisture regime refers to soil moisture that is dry in all parts for 45 or more consecutive days in the four months following summer solstice and moist in all parts for 45 or more consecutive days in the four months following winter solstice in six or more out of 10 years. An aquic moisture regime refers to soil that is free of dissolved oxygen due to saturation in groundwater. There are no criteria for how long the soil must be saturated and it is implicit that soil temperatures must be above 5°C.

Based on a review and analysis of the U.S. Department of Agriculture's Web Soil Survey for Solano and Sacramento counties (NRCS, 2020), the Project area is underlain by Tujunga fine sand (map unit symbol Tu), Xeropsamments, one to 15 percent slopes (map unit symbol 244), Scribner clay loam, partially drained, zero to two percent slopes (map unit symbol 222), Sailboat silt loam, partially drained, zero to two percent slopes (map unit symbol 206), and Columbia silt loam, drained, two to five percent slopes (map unit symbol 123). These soil mapping units are described below in Table 4-1.

Table 4-1. Soil Mapping Units and Characteristics at the PG&E R-1402 L-130 Sacramento River Crossing Pipeline Replacement Project area

Soil Mapping Unit (Taxonomic Class)	Location	Munsell Soil Color (by horizon)	Drainage Class ¹	PERM ²	AWC ³	Runoff ⁴	ERD ⁵	Hydric
Tujunga fine sand (Tu)	West work area	0-12" 10YR 6/2 dry 10YR 4/2 wet 12-45" 10YR 5/4 dry 10YR 3/3 wet	1	6	2	2	1	No
Xeropsamments, 1 to 15 percent slopes (244)	East work area (east bank of Sacramento River)	0-2" 10YR 4/4 dry 10YR 3/2 wet 2-10" 10YR 5/4 dry 10YR 3/4 wet 10-49" 10YR 6/4 dry 10YR 4/4 wet	1-4	-	-	-	1	No
Scribner clay loam, partially drained, 0 to 2 percent slopes (222)	Eastern drill pad pipe staging area	0-4" 10YR 5/1 dry 10YR 3/1 wet 4-12" 10YR 5/2 dry 10YR 3/1 wet 12-21" 10YR 5/1 dry 10YR 3/1 wet	6	3	4	4	-	Yes
Sailboat silt loam, partially drained, 0 to 2 percent slopes (206)	Middle of pipe staging area	0-6" 10YR 6/4 dry 10YR 4/4 wet 6-16" 10YR 6/4 dry 10YR 4/4 wet 16-28" 10YR 7/4 dry 10YR 5/4 wet	5	1-4	5	1	-	Yes
Columbia silt loam, drained, 2 to 5 percent slopes (123)	Eastern end of pipe staging area	0-11" 10YR 6/4 dry 10YR 4/3 wet 11-18" 10YR 6/4 dry 10YR 4/3 wet 18-24" 10YR 6/3 dry 10YR 4/3 wet	5	4-5	4	3	-	Yes

¹Drainage Class

1. Excessively drained
2. Somewhat excessively drained
3. Well drained

²PERM (Permeability)

- 1 Very slow (< 0.06 inch)
- 2 Slow (0.06 to 0.2 inch)
- 3 Moderately slow (0.2 to 0.6 inch)
- 4 Moderate (0.6 to 2 inches)

³AWC (Available Water Capacity)

- 1 Very low (0 to 2.5 inches)
- 2 Low (2.5 to 5 inches)
- 3 Moderate (5 to 7.5 inches)
- 4 High (7.5 to 10 inches)

⁴Surface Runoff

- 1 Negligible
- 2 Very low
- 3 Low
- 4 Medium

⁵ERD (Effective Rooting Depth)

- 1 Very deep (> 60 inches)
- 2 Deep (40 to 60 inches)
- 3 Moderately deep (20 to 40 inches)

Soil Mapping Unit (Taxonomic Class)		Location	Munsell Soil Color (by horizon)	Drainage Class ¹	PERM ²	AWC ³	Runoff ⁴	ERD ⁵	Hydric
4.	Moderately well drained	5	Moderately rapid (2 to 6 inches)	5	Very High (> 10 inches)	5	High	4	Shallow (10 to 20 inches)
5.	Somewhat poorly drained	6	Rapid (6 to 20 inches)			6	Very high	5	Very shallow (< 10 inches)
6.	Poorly drained	7	Very rapid (>20 inches)						
7.	Very poorly drained								

4.4 WATER QUALITY

Water quality and temperatures are important factors in determining habitat suitability for special-status fish species, particularly salmonids. The primary water quality concern for fish during in-water excavation is turbidity. Some fish survive better in turbid water while others, particularly visual predators, do better in clear water (Nobriga, 2008). Nobriga (2008) reported that in the Delta, turbid habitats have higher proportions of native fishes, while clear water habitats have higher abundance of submerged aquatic vegetation and nonnative centrarchid fishes like largemouth bass, which are efficient predators on small nearshore fish. Bell (1991) noted that salmon suffer more physical distress in turbid water than other species. Carp and bullhead can thrive in waters rendered quite turbid by decaying vegetation and other organic material.

The U.S. Fish and Wildlife Service (2010a) note that the delta smelt evolved in naturally turbid environments in the Delta, and rely on certain background levels at different life stages. Feyrer et al. (2007) reported that Delta smelt are positively associated with highly turbid water, which is required for feeding and predator avoidance. Baskerville-Bridges et al. (2004) found that delta smelt increased feeding activity with increased levels of turbidity in a laboratory setting. Turbidity levels exceeding 10 NTU are thought to cue the delta smelt to upstream spawning migration at the high discharge “first-flush” events in fall and winter (Grimaldo, et al., 2009). Feyrer et al. (2007) and CSTAR (2012) suggest that water quality changes, particularly the reduction in turbidity in the Delta, may be an important factor in the decline of the species. The authors noted that delta smelt habitat quality has not declined as substantially in the lower San Joaquin River as in the Sacramento River, and that the region upstream from the confluence of the rivers has remained relatively stable.

Harvey and White (2008) reported an overall reduced benthic feeding and drift feeding in juvenile cutthroat trout and coho salmon in an artificial stream as turbidity increased from 0 to 400 NTU. No change in feeding was observed at the 50 NTU level, but declined by 15 percent in coho and 7 percent in cutthroat at 100 NTU. At 200 NTU, feeding declined precipitously by 92 percent in coho and 43 percent in cutthroat. Neither species fed at 400 NTU. Drift feeding was more adversely affected with increasing turbidities as salmonids rely on sight. Turbidity in the range of 50 to 100 NTU did not severely inhibit benthic feeding by juvenile salmonids, which was consistent with data reported by Gregory and Northcote (1993) for juvenile Chinook salmon at turbidities of 35, 70, and 150 NTU in aquaria studies. Chronic turbidity levels of 25-50 NTU are physiologically damaging to salmonids and turbidity levels over 50 NTU result in decreased feeding in salmonids (Sigler et al., 1984).

In estuarine areas, turbidity is greatest while tides are going in and out because the increased flows have more energy to scour and resuspend sediments. Similarly, higher flows associated with increased river stages also results in higher turbidity because of the high flow energies suspending sediments. Kimmerer (2004) reported on the importance of tidal and wind-driven resuspension on turbidity levels. Suspended sediments in most of the San Francisco Bay (SFB) Estuary were greater in summer than winter likely because of wind-driven resuspension. However, levels were higher in the western Sacramento-San Joaquin Delta (Delta) and Suisun Bay in winter, probably because of riverine input (Kimmerer, 2004).

Based on turbidity data available from the USGS station Sacramento River at Rio Vista reviewed from the most recent five-year period of record (2015-2019), turbidity levels between

the months of August and October, are relatively low when compared to winter months when background turbidity is higher because of riverine input. For the five-year period of record, turbidity between August and October ranged from 2-27 NTU but was higher in winter months and increased to 250-300 NTU associated with high flow periods during discrete events (USGS, 2020). Increases in turbidity associated with in-water excavation are expected to result in a turbidity plume in the area immediately surrounding the excavation, but typically settle out of the water column within a short distance downstream. Based on previous experience with similar projects, the increase in turbidity resulting from in-water excavation remain within the normal range for the highly variable turbidity levels that naturally occur in the Delta.

Water temperature in this portion of the Sacramento River is often too high to support salmonids during the late summer months, with water temperatures regularly exceeding 70° Fahrenheit (F) (21° Celsius [C]). Typically, salmonids prefer cool streams and rivers with a maximum temperature of 68° F (20°C). Optimal thermal conditions for Chinook salmon adult migration is 50° to 68° F (10 to 20°C) and optimal thermal conditions for Chinook salmon juvenile rearing is 55° to 68° F (13 to 20°C), with lethal thermal conditions occurring at temperatures greater than 75° F (24°C) (McCullough, 1999). High water temperatures result in reduced levels of dissolved oxygen, which can impact growth and development of all life stages of salmonids. Salmon have been documented to have an avoidance response to unfavorable dissolved oxygen levels (Carter, 2005). Typical salmonid behavioral response when temperatures become too high is to move upstream to locations where conditions are more favorable.

A review of real time temperature data from the past 10 years at USGS station Sacramento River at Rio Vista (station number 11455420), located approximately 200 feet upstream of the Project area in the Sacramento River indicates that water temperatures above 70°F are typical between June and September, and occasionally can remain above 70°F as late as October (USGS, 2020).

Higher water temperatures routinely observed at the Rio Vista station upstream of the Project area during summer months indicate inhospitable habitat conditions for salmonid species and a low likelihood of occurrence of salmonids at the Project location during summer months. High water temperatures in late summer and early fall further supports the seasonal aquatic work window of August 1 to October 31, identified for avoidance of listed fish species with seasonal spawning migrations.

4.5 HABITAT DESCRIPTIONS AND VEGETATION

The study area is located south of the City of Rio Vista, the Sacramento River and Brannan Island. The surrounding area consists of annual grasslands, freshwater emergent wetlands (in-channel), agricultural land, developed land and rural residential development. A small rural residential development is located on the west side of the Sacramento River. On the east side the land is predominantly agricultural row crops.

Seven vegetation communities were identified onsite during field surveys (Figure 4). In the western portion of the study area, non-native grasslands were present adjacent to Beach Drive. Communities with a significant amount of human disturbance were also present on the west side of the Sacramento River in the forms of Ruderal and Urban Mix communities. Along the west bank of the Sacramento River, Central Coast riparian scrub was present in a thin band near the shoreline. There is a narrow band of emergent hydrophytic vegetation growing along the west

bank of the Sacramento River that is classified as Coastal and Valley freshwater marsh. The Sacramento River is classified as riverine. On the east bank of the river, the vegetation has been greatly altered and is classified as ruderal. The eastern portion of the study area, east of Highway 160, is predominantly active agricultural fields. Between some of the fields are agricultural ditches containing hydrophytic vegetation. These ditches can be classified as Coastal and Valley freshwater marsh. Vegetation communities were determined based on species composition and the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986), but were modified as needed to accurately describe the existing habitat observed onsite. The Botanical Resources Survey Report (Nomad Ecology, 2020) vegetation community mapping was used as a basis for vegetation community classification and mapping for this report. Comprehensive plant species lists, compiled from all survey efforts, are included in Appendix C. Vegetation Communities mapped within the study area are shown on Figure 4. Below is a brief description of the seven vegetation communities mapped within the study area.

4.5.1 Agriculture

This community is not described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* because it is not a natural community. This cover type consists of land currently used in crop cultivation that is routinely disturbed by agricultural practices. This cover type is limited to portions of the study area east of Highway 160.

4.5.2 Central Coast Riparian Scrub

This cover type is described as a streamside thicket with a variable canopy cover of woody vegetation, typically dominated by a willow species (*Salix* sp.). It can occur at the mouths and along the banks of most perennial and some intermittent waterways of the South Coast Mountain Range. Within the study area, this community was present on the west bank of the Sacramento River and in one of the larger agricultural ditches in the eastern portion of the Project area. On the west bank of the Sacramento River, this community was characterized by the presence of Himalayan blackberry (*Rubus armeniacus*), edible fig (*Ficus carica*), scarlet sesban (*Sesbania punicea*), white alder (*Alnus rhombifolia*), Oregon ash (*Fraxinus latifolia*), and California button willow (*Cephalanthus occidentalis*).

In one of the agricultural ditches in the eastern portion of the study area, there is a dense but narrow thicket of arroyo willow (*Salix lasiolepis*) that is also classified as part of the Central Coast riparian scrub cover type.

4.5.3 Coastal and Valley Freshwater Marsh

This cover type is characterized by a dominance of perennial, emergent, herbaceous vegetation. It can be found in areas with pooled freshwater, typically with little flow, and typically permanently flooded. These conditions can form along the edges of water bodies, channels and mouth margins of rivers, ditch margins, lagoons, ponds, and reservoir margins.

Within the study area, this vegetation community was found along some of the agricultural ditches on the east side of the Sacramento River. Within some of the ditches, standing water was present and cattail (*Typha* sp.) have formed dense stands in association with duckweed (*Lemna minuta*), water smartweed (*Persicaria amphibia*), and tall cyperus (*Cyperus eragrostis*).

4.5.4 Non-Native Grassland

Non-native grasses that were introduced during European settlement of the Central Valley dominate the grasslands in the Project area. Typical species include non-native grasses such as soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), hare barley (*Hordeum murinum* ssp. *leporinum*), Italian ryegrass (*Lolium multiflorum*), and wild oat (*Avena fatua*). Native grasses occur amongst the non-native grasses, including blue wild ryegrass (*Elymus glaucus*). Several non-native herbaceous plant species occur within this cover type including red-stemmed filaree (*Erodium cicutarium*), common mallow (*Malva neglecta*), and Italian thistle (*Carduus pycnocephalus*), as well as native herbaceous plant species including rancher's fireweed (*Amsinckia menziesii* var. *intermedia*).

Within the study area, this cover type was located on the upland portions of the west bank of the Sacramento River and within the vacant lot adjacent to Beach Road. Dominant grasses in this community included slender wild oat (*Avena barbata*), wild oat, and ripgut brome. Some of the forbs that were common within the Project area include telegraph weed (*Heterotheca grandiflora*), yellow star-thistle (*Centaurea solstitialis*), and western ragweed (*Ambrosia psilostachya*). Other species found within this community in the western portion of the study area included blue gum (*Eucalyptus globulus*), Gooding's black willow (*Salix goodingii*), almond (*Prunus dulcis*), and giant reed (*Arundo donax*).

4.5.5 Riverine

This community is not described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* because it is an open water aquatic community with limited vegetation. Within the study area, the Sacramento River traverses the Project area, and is a perennial and navigable waterway. Throughout most of this mapped feature, there is no emergent vegetation present; however, on the west bank of the Sacramento River there is a dense to sparse stand of hardstem bullrush (*Schoenoplectus acutus* var. *occidentalis*) where pioneer floating species like floating water primrose (*Ludwigia peploides*) and water hyacinth (*Eichhornia crassipes*) will occasionally float by or be lodged on a piece of vegetation.

4.5.6 Ruderal

This community is not described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* because it is not a natural community and is typically associated with human disturbance. In the study area, ruderal vegetation was present at various locations including patches of high disturbance on the west side of the Sacramento River and in a large area on the east bank of the Sacramento River. The species composition and cover density of this community varied within the study area. The most prominent patch of ruderal cover, present on the east side of the Sacramento River, was in an open dirt parking lot that supported very dense stands of giant reed. As a canopy in this community tall stands of blue gum and red gum (*Eucalyptus camaldulensis*) were present.

4.5.7 Urban Mix

This community is not described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* because it is not a natural community and is associated with human disturbance. Within the study area, this cover type was characterized primarily by paved or gravel roadways and rural residential areas that contain ornamental plantings. Notable vegetation that

was mapped as part of the urban mix cover type are the large eucalyptus trees present on the east side of the Sacramento River and along the western reaches of the agricultural fields.

4.6 WATERS AND WETLANDS

The Project area was examined for evidence of regulated habitats, such as waters and wetlands, under regulatory authority of the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. A Preliminary Aquatic Resource Delineation was conducted in October 2020 for the Project. The Preliminary Aquatic Resource Delineation identified and delineated the geographic extent of Federal jurisdictional waters of the U.S. and wetlands and aquatic features under state jurisdiction (Padre, 2021).

During field survey efforts conducted in October 2020, Padre identified a total of 13.12 acres of Federal jurisdictional waters and wetlands, 13.12 acres of waters of the State, and 13.12 acres of stream features within the 33.72-acre study area. Activities within these delineated areas are regulated by the Federal government and/or the State of California (Figure 5).

In addition to federally jurisdictional waters of the U.S. and wetlands, several excavated ditches were mapped as aquatic resources, but determined to be non-jurisdictional under federal and state jurisdiction because they are irrigation ditches excavated on dry land and operated and maintained for the purposes of crop land irrigation (Figure 5) (Padre, 2021).

The Sacramento River is a Navigable Waterway under Section 10 of the Rivers and Harbors Act of 1899 and a Water of the U.S. under Section 404 of the Clean Water Act (CWA) and is subject to Corps jurisdiction. Adjacent lands meeting the three-parameter definition of a federal wetland are also Corps jurisdictional under Section 404 of the CWA. The Sacramento River and adjacent wetlands also meet the definition of waters of the State defined within the Porter-Cologne Water Quality Control Act to include any surface water or groundwater, including saline waters, within the boundaries of the State, and are regulated by the Regional Water Quality Control Board (RWQCB). The bed, bank, and riparian cover of the Sacramento River is also regulated under Sections 1600-1617 of the California Fish and Game Code administered by the CDFW, and jurisdiction extends to the top of bank or limits of riparian vegetation, whichever is greater.

Within the study area there are wetlands and other waters present that are subject to federal and state jurisdiction. The different wetland types are defined both by their abiotic features such as water regime and topography as well as biotic factors like vegetation communities. The one wetland type found within the study area was a tidal emergent wetland. Other Waters of the U.S. present in the study area are classified as tidal riverine waters (Sacramento River). Wetland types were determined by their abiotic and biotic factors and the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, 1979). Below is a brief description of the wetland type and of the other waters present in the study area.

4.6.1 Tidal Riverine Waters (Waters of the U.S.)

Riverine waters are defined as aquatic resource features that are confined within a channel and lack a dominance of trees, shrubs, persistent emergent herbs, mosses, or lichens. Wetlands that occur on a river's floodplain are classified separately from the riverine system due to the presence of vegetation cover (Cowardin, 1979). Within the riverine system classification

there are four subsystems. These are tidal, lower perennial, upper perennial, and intermittent. Within the study area, the Sacramento River is a tidal channel. This subsystem is characterized by its fluctuating water velocity caused by the ebb and flow of the tide. Tidal riverine waters typically have a muddy streambed with patches of sand. The existence of a floodplain is common in tidal riverine systems.

In tidal systems, the limits of Corps jurisdiction on waters of the U.S. are defined by the high tide line (limits of Clean Water Act Section 404 jurisdiction) and mean high water line (limits of Rivers and Harbors Act Section 10 jurisdiction). See the Preliminary Federal Aquatic Resources Delineation Map (Figure 5) for the location of the high tide line (HTL) on the Sacramento River within the study area, and the extent of federal jurisdiction. A total of 12.88 acres of tidal riverine waters occur within the study area.

4.6.2 Tidal Emergent Wetland (Wetland)

Emergent wetlands have a dominance of erect, rooted, herbaceous hydrophytes, typically perennial species, that are present for much of the growing season in most years. Emergent wetlands can occur in all systems except marine and are divided into two subclasses, persistent and nonpersistent. Within the study area, emergent wetlands occur within the riverine system and is considered persistent because the herbaceous species present are visible above the soil or water surface year-round.

Within the study area emergent wetland features occur below the high tide line on the west side of the Sacramento River. Dominant species include hardstem bullrush and cattail. A total of 0.24- acres of emergent wetland occur within the study area (Figure 5).

4.7 WILDLIFE

Wildlife observed within the Project area was characteristic of the region and of the riverine and agricultural habitats that occur onsite. A comprehensive list of wildlife species observed during the surveys are included in Appendix D. Special-status wildlife species (i.e., endangered, threatened, rare, or other special-status species) occurring, or potentially occurring, within the Project area and near vicinity are discussed in Section 4.8 below.

The vegetation communities on the site and surrounding area provide habitat for resident and migratory wildlife species. The composition, density, distribution, and physical characteristics of vegetative communities determine the diversity and abundance of wildlife species residing in the Project area. Wildlife species observed and expected within the vegetative cover types present in the Project area are discussed below.

The open agricultural landscape found in the eastern reaches of the Project area provides forage and cover for passerine birds and small mammals, such as white-crowned sparrow (*Zonotrichia leucophrys*), California ground squirrel (*Spermophilus beecheyi*), and California vole (*Microtus californicus*). These species, in turn, provide a portion of the prey base that attracts raptors such as red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus hudsonius*), and Swainson's hawk (*Buteo swainsoni*) as well as mammalian predators like coyote (*Canis latrans*). Agricultural production can increase insect populations that can also be prey for Swainson's hawk and egrets (*Ardea* sp).

The Sacramento River, which bisects the Project area, provides habitat for a wide variety of aquatic and terrestrial species that are closely tied to aquatic environment. A range of fish species utilize the Sacramento River at the Project area including striped bass (*Morone saxatilis*), American shad (*Alisa sapidissima*), green sturgeon (*Acipenser medirostris*), salmonid species (*Oncorhynchus* sp.), and delta smelt (*Hypomesus transpacificus*). Terrestrial species that are closely tied to the water and prey upon fish species can include belted kingfisher (*Megaceryle alcyon*), Caspian tern (*Hydroprogne caspia*), double-crested cormorant (*Phalacrocorax auritus*), and North American river otter (*Lontra canadensis*).

Within the Project area, there is a wide array of potential nesting habitat that can be utilized by bird species. Along the Sacramento River, there is sparse to dense riparian tree cover. Large eucalyptus (*Eucalyptus* sp.) trees occur at locations along the west bank of the Sacramento River and in linear rows along the perimeter of some of the agricultural fields that could provide nesting habitat for large broad-winged raptors like red-tailed hawk and Swainson's hawk. There are also several agricultural ditches that cross the east side of the Project area that support vegetation characteristic of freshwater marshes like cattail or are lined with Himalayan blackberry. These locations can provide nesting habitat for marsh wrens (*Cistothorus palustris*), song sparrows (*Melospoza melodia*), red-winged blackbird (*Agelaius phoeniceus*), and tricolored blackbird (*Agelaius tricolor*).

4.8 SPECIAL-STATUS SPECIES

For the purposes of this Report, a special-status species is a plant or animal species that is:

- Listed as endangered, threatened, or a candidate species under the federal Endangered Species Act (FESA);
- Listed as endangered, threatened, or a candidate species under the California Endangered Species Act (CESA);
- Listed as a fully protected species or species of special concern by the California Department of Fish and Wildlife (CDFW);
- A plant species that is on the California Native Plant Society's (CNPS) Rare Plant Ranking System as List 1 or 2; and/or
- Considered rare, threatened, or endangered under CEQA Guidelines 15380(d) as the species' survival and reproduction in the wild are in immediate jeopardy, present in such small numbers throughout all or a significant portion of its range that it may become endangered, or likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

In addition, species protected by specific federal or state regulation or local ordinances are considered special-status species.

Based on the literature review and species lists obtained from USFWS (IPaC Trust Resource Report) (San Francisco Bay-Delta Office Consultation code: 08FBDT00-2020-SLI-0240; Sacramento Office Consultation code: 08ESMF00-2020-SLI-2747) and from NMFS (NMFS, 2020a) for the Rio Vista quadrangle, a list of special-status species that have been reported within a five-mile radius surrounding the Project area has been compiled. Special-status species included on the USFWS and NMFS species lists or with CNDDDB occurrences within five

miles of the site are evaluated for potential occurrence in Table 4-2. Table 4-2 also includes rationale for why certain species were excluded from further analysis in this document. Special-status species occurring within five miles of the Project are depicted in Figure 6.

An analysis of the likelihood of occurrence for each species was conducted based on species ranges, previous observations, contemporary sightings, and presence of suitable habitat elements. The Project may be located outside of the known range of some species, or within the geographic range for a certain species, but suitable habitat, such as vernal pools, is absent onsite. For this analysis, potential special-status species that occur in the general area of the Project, and for which the Project may provide habitat, are discussed in greater detail in Sections 4.8.1 and 4.8.2 below.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
PLANTS				
<i>Carex comosa</i>	Bristly sedge	2B.1	Marshes and swamps, coastal prairie, valley and foothill grassland along lake margins and wetlands.	Absent. No suitable habitat is present onsite. Nearest recent occurrence (CNDDDB Occ. #4) is from 1988, is approximately 5.6 miles southeast of the Project area. Species not observed during protocol-level rare plant surveys and is presumed to be absent (Nomad Ecology, 2020).
<i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's water-hemlock	2B.1	Coastal fresh or brackish marshes and swamps from 0 to 650 feet in elevation. Blooms from July to September.	Absent. Potentially suitable habitat present in wetland portions of the Project area. Nearest occurrence (CNDDDB Occ. #14) is from 1998 and is approximately 8.5 miles northwest of the Project area. This was a target species in the protocol-level rare plant surveys completed for the Project, was not observed during surveys, and is presumed to be absent (Nomad Ecology, 2020).
<i>Extriplex joaquinana</i>	San Joaquin spearscale	1B.2	Alkaline environments, chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands. Blooms from April to October. 1 to 2,740 ft.	Absent. Historic suitable habitat is disturbed on site. Nearest occurrence (CNDDDB Occ. #22) is from 1891, is mapped in Rio Vista. CNDDDB reports that the population is presumed to be extant ; however, based on the location and age of the occurrence, development has likely removed the population. Species not observed during protocol-level rare plant surveys and is presumed to be absent (Nomad Ecology, 2020).

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	Woolly rose-mallow	1B.2	Marshes and swamps with low peat islands in sloughs or riprap levees.	Absent. Historic suitable habitat is disturbed on site. Nearest recent occurrence (CNDDDB Occ. #36) and is from 1974 and mapped on the west side of the Sacramento River in the Project area. This was a target species in the protocol-level rare plant surveys completed for the Project, was not observed during surveys, and is presumed to be absent (Nomad Ecology, 2020).
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	1B.2	Freshwater and brackish marshes. Found with <i>Typha</i> and <i>Juncus</i> spp. along marsh edges.	Absent. Suitable habitat is located along the shoreline of the Project area. Nearest recent occurrence (CNDDDB Occ. #3) is approximately 3 miles upstream from the Project area on the east side of the Sacramento River. This was a target species in the protocol-level rare plant surveys completed for the Project, was not observed during surveys, and is presumed to be absent (Nomad Ecology, 2020).
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	1B.1	Marshes and swamps, riparian scrub in tidal zones with muddy or silty soils.	Present. This was a target species in the protocol-level rare plant surveys completed for the Project and was observed within the study area on the west bank of the Sacramento River during June 2020 botanical surveys (Nomad Ecology, 2020).
<i>Limosella australis</i>	Delta mudwort	2B.1	Riparian scrub, marshes and swamps usually on mud banks in marshy or scrub riparian associations, often with <i>Lilaeopsis masonii</i>	Absent. Suitable habitat is present along the west bank of the Sacramento River. Nearest occurrence (CNDDDB Occ. #21) is approximately 0.8 miles downstream of the Project area on the east side of the Sacramento River. This was a target species in the protocol-level rare plant surveys completed for the Project, was not observed during surveys, and is presumed to be absent (Nomad Ecology, 2020).

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Oenothera deltoides</i> ssp. <i>howellii</i>	Antioch Dunes evening-primrose	FE, SE, 1B.1	Interior dunes, remnant river bluffs and sand dunes east of Antioch.	Absent. No suitable habitat is present on site. Nearest occurrence (CNDDDB Occ. #5) is from 2011 and is a transplanted population approximately 1.7 miles downstream of the Project area on the east side of the Sacramento River within the Brannan Island State Recreation Area.
<i>Plagiobothrys hystriculus</i>	Bearded Popcorn flower	1B.1	Vernal pools, vernal swales, valley and foothill grasslands.	Absent. No suitable habitat is present on site. Nearest occurrence (CNDDDB Occ. #8) is from 2005 and is approximately 6.0 miles northwest of the Project area within the Montezuma Hills.
<i>Potamogeton zosteriformis</i>	Eel-grass pondweed	2B.2	Marshes, swamps, ponds, lakes, and streams.	Absent. Habitat at the Project area is poor quality for this species. Nearest occurrence (CNDDDB Occ. #7) is from 1949 and is approximately 4.5 miles southeast of the Project area on the perimeter of Webb Tract. Species not observed during protocol-level rare plant surveys and is presumed to be absent (Nomad Ecology, 2020).
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	1B.2	Marshes, swamps in standing or slow-moving freshwater	Absent. Suitable habitat is present on site; however, species was not observed during field surveys. Nearest occurrence (CNDDDB Occ. #84) is from 2009 and is approximately 2.1 miles northeast of the Project area on the western end of Ida Island. Species not observed during protocol-level rare plant surveys and is presumed to be absent (Nomad Ecology, 2020).

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Symphyotrichum lentum</i>	Suisun marsh aster	1B.2	Marshes and swamps most often seen along sloughs with <i>Phragmites</i> spp., <i>Scirpus</i> spp., <i>Typha</i> spp.	Present. This was a target species in the protocol-level rare plant surveys completed for the Project and was observed within the study area on the west bank of the Sacramento River during June 2020 botanical surveys (Nomad Ecology, 2020). Padre biologists also noted individuals not mapped during protocol-level rare plant surveys, also on the west bank of the Sacramento River.
INVERTEBRATES				
<i>Apodemia mormo langei</i>	Lange's metalmark butterfly	FE	Stabilized dunes along the San Joaquin River. Primary host plant for feeding is <i>Eriogonum nudum</i> var. <i>auriculatum</i> .	Absent. No suitable habitat is present onsite or adjacent to the Project area. Host plant does not occur on site. Nearest occurrence (CNDDB Occ. #1) is from 2008 and approximately 3.8 miles southwest on a dune restoration site north of Antioch. Nearest natural occurrence of host plant was reported at the Solano Land Trust Vallejo Swett Ranch approximately 28 miles west of the Project area (CalFlora, 2020).
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	FE	Inhabit static pools located in swales formed by old, braided alluvium; filled by winter/spring rains and last until June. Inhabits large cold water pools.	Absent. No suitable habitat is present onsite or adjacent to the Project area for this species. Nearest recent occurrence (CNDDB Occ. #37) is from 2011 is approximately 10.4 miles southwest of the Project area at a restoration vernal pool preserve within the Montezuma wetlands.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT	Endemic to the grasslands of the central valley, central coast mountains and south coast mountains, in astatic rain-filled pools. Regionally inhabits small, clear-water sandstone depression pools and grassed swale, earth slump or basalt-flow depression pools.	Absent. No suitable habitat is present onsite or adjacent to the Project area for this species. Nearest recent occurrence (CNDDDB Occ. #667) is from 2011 is approximately 10.4 miles southwest of the Project area at a restoration vernal pool preserve within the Montezuma wetlands.
<i>Callophrys mossii bayensis</i>	San Bruno elfin butterfly	FE	Coastal grassland and low scrub of north-facing slopes within the fog belt where host plant, <i>Sedum spathulifolium</i> (stonecrop) grows.	Absent. No suitable habitat is present onsite or adjacent to the Project area for this species. Nearest recent occurrence (CNDDDB Occ. #4) is from 2016 is more than 50 miles southwest of the Project area.
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT	Occurrences of the VELB are primarily in the vicinity of moist valley oak woodlands associated with riparian corridors in the lower Sacramento River and upper San Joaquin River drainages (U.S. Fish and Wildlife Service, 1984). Elderberry plants are obligate hosts for the VELB, providing a source of food and brood wood.	Absent. No blue elderberry shrubs were observed within 165 feet of the Project area during biological surveys. Nearest recent occurrence (CNDDDB Occ. #230) is from 2013 is approximately 22 miles southeast of the Project area.
<i>Elaphrus viridis</i>	Delta green ground beetle	FT	DGGB is associated with the outer edges of vernal pools or vernal lakes. In dry season can be found in soil cracks at edge of vernal pools. Only known from occurrences within or immediately adjacent to Jepson Prairie.	Absent. No suitable habitat is present onsite or adjacent to the Project area for this species. Nearest recent occurrence (CNDDDB Occ. #4) is from 2002 and is greater than 10 miles northwest of the Project area near Jepson Prairie Preserve.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Lepidurus packardii</i>	Vernal pool tadpole shrimp	FE	Found in seasonally ponded habitats including vernal pools, swales, and ephemeral drainages. May occur in stock ponds, reservoirs, and ditches that provide suitable hydrologic conditions.	Absent. No suitable habitat is present onsite or adjacent to the Project area for this species. Nearest recent occurrence (CNDDDB Occ. #161) is from 2019 is approximately 10.4 miles southwest of the Project area at a restoration vernal pool preserve within the Montezuma wetlands.
FISH				
<i>Acipenser medirostris</i>	Green sturgeon – Southern DPS	FT, CSC	Anadromous fish species found in near shore marine and estuarine environments from Alaska to Baja California, Mexico. Juveniles have been collected in the San Francisco Bay up to the lower reaches of the Sacramento and San Joaquin Rivers. Green sturgeon depend on large rivers to spawn, typically in deep pools in large turbulent mainstem rivers. Spawning is documented in Sacramento River, but little is known about specific spawning locations.	High. Suitable habitat occurs at the Project area. Juvenile and adult green sturgeon have been recorded migrating up the Sacramento River; however, the Project area is outside of the species' known spawning range. Green sturgeon have been detected using biotelemetry near the Rio Vista Bridge receiver, less than one mile upstream of the Project area, in September 2019. In addition, juvenile green sturgeon have been captured annually between 2015 and 2019 at the Sherman Island sampling station, approximately 8.5 miles downstream from the Project area (CDFW, 2019).
<i>Acipenser transmontanus</i>	White Sturgeon	CSC	Spend most of their time in estuary habitat and migrate up the Sacramento and San Joaquin Rivers to spawn.	High. This species has been documented in the Sacramento River in the vicinity of the Project; however, site does not provide suitable spawning habitat. Juvenile white sturgeon were collected in March and April 2019 at stations along the Sacramento River, upstream and downstream of the Project area (stations 704, 707 and 711) (IEP, 2020).

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Entosphenus tridentata</i>	Pacific lamprey	CSC	The adults live at least one to two years in the ocean and then return to fresh water to spawn. Require gravel for spawning.	Moderate. Pacific lamprey are known to occur in major river systems on the west coast, including the Sacramento and San Joaquin Rivers. The species could be found in the vicinity of the Project area; however, habitat onsite is not suitable for spawning.
<i>Hypomesus transpacificus</i>	Delta smelt	FT, SE	Endemic to the upper Sacramento/San Joaquin Delta, it mainly inhabits the freshwater-saltwater mixing zone of the estuary, except during its spawning season, when it moves into freshwater during the early spring months from March until May.	High. Suitable habitat occurs at the Project area; however, CDFW 20-millimeter (mm) surveys did not document juvenile delta smelt at the nearest sampling stations upstream and downstream of L-130 Project area (stations 707 and 711) between 2018 and 2020 (IEP, 2020). IEP/CDFW annual surveys of lower Sacramento River between Sherman Island and Rio Vista documented high density of subadults and juveniles between 1995 and 2004. Overall decline since 2004 (CNDDDB, 2020). The nearest, most recent documented occurrence of delta smelt is in March and July 2018 at stations 706 and 704, respectively, approximately 8.3 miles downstream near Sherman Island (IEP, 2020).
<i>Lampetra ayresi</i>	River lamprey	CSC	Lower Sacramento, San Joaquin, and Russian Rivers. Spawning may occur in gravelly riffles in permanent streams with sandy backwaters for ammocoetes.	Moderate. River lamprey is known to occur in the San Francisco Bay-Delta; however, detailed information on their distribution is lacking. Appears to be concentrated only in particular rivers, and only in the lower portions of large rivers. Nearest occurrences are reported north of the City of Sacramento in the Sacramento-Lower Thomas and Stone Corral Watersheds (CalFish, 2020). There is potential that this species could migrate through the Project area; however, habitat onsite is not suitable for spawning.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Mylopharodon conocephalus</i>	Hardhead	CSC	Sacramento, San Joaquin, and Russian River habitats, side pools, and creeks/tributaries where clear, deep pools with sand-gravel-boulder bottoms occur with slow water velocity. Spawn where substrates include sand, gravel, and decomposed granite.	Moderate. This species could be found during seasonal migrations to upstream spawning tributaries. Nearest occurrence (CNDDDB Occ. #16) is from 2007 in the Calaveras River just east of N. Shelton Rd., approximately 33 miles upstream of the confluence with the San Joaquin River and greater than 50 miles from the site.
<i>Oncorhynchus mykiss irideus</i> pop. 11	Central Valley DPS steelhead	FT	Sacramento and San Joaquin River systems, Sacramento-San Joaquin Delta, and San Francisco Bay	High. The species could be found in the vicinity of the Project area seasonally during migration to spawning habitat upstream of the site; however, habitat onsite is not suitable for spawning. Additionally, steelhead have not been captured during recent 20-mm surveys (2018 through 2020) at stations upstream or downstream of the Project area (stations 707 and 711) (IEP, 2020). CNDDDB occurrence #27 from 2012 occurs in the Sacramento River at the Project location.
<i>Oncorhynchus tshawytscha</i>	Central Valley spring-run chinook salmon ESU	FT, ST	Sacramento River, Sacramento-San Joaquin Delta, and San Francisco Bay	High. The species could be found in the vicinity of the Project area seasonally during migration to spawning habitat upstream of the site. CDFW spring 20-mm net surveys captured chinook salmon near Decker Island (station 707) and downstream near Sherman Island (704).
	Central Valley fall-run chinook salmon ESU	CSC	Sacramento River, Sacramento-San Joaquin Delta, and San Francisco Bay	High. The species could be found in the vicinity of the Project area seasonally during migration to spawning habitat upstream of the site. CDFW spring 20-mm net surveys did not capture chinook salmon near the Project area. The nearest occurrence of fall run chinook salmon were recorded in October 2019 in Honker Bay during CDFW fall mid-water trawling surveys (IEP, 2020).

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Oncorhynchus tshawytscha</i>	Sacramento winter-run chinook salmon ESU	FE, SE	Sacramento River, Sacramento-San Joaquin Delta, and San Francisco Bay	High. The species is known to occur in the Sacramento River and is likely to occur during migration to spawning habitat upstream of the site. Habitat onsite is not suitable for spawning.
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	CSC	Commonly occur in Sacramento River, Sacramento-San Joaquin Delta. Occasionally will migrate out to, and San Francisco and Pablo Bay during high flow years.	High. The species is known to occur in the Sacramento River and is likely to occur during migration and spawning. The nearest recent occurrence was recorded within the San Joaquin River delta during CDFW 20-mm net surveys in May and June 2020.
<i>Spirinchus thaleichthys</i>	Longfin smelt	FC, ST, CSC	Occupies a variety of coastal waters including estuaries, bays, and rivers. During breeding, this species spawns in freshwater tributaries near the ocean.	High. Suitable habitat occurs at the Project area. Nearest occurrences were recorded throughout CDFW Sacramento River sampling stations upstream and downstream of the Project area (stations 704, 706, 707 and 724) during March 2020, 20-mm net surveys (IEP, 2020). CNDDDB occurrence #17 from 2012 occurs in the Sacramento River at the Project location.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
AMPHIBIANS				
<i>Ambystoma californiense</i>	California tiger salamander	FT, ST	Needs underground refuges, especially ground squirrel burrows during summer and vernal pools or other seasonal water sources for breeding in winter.	Low. No suitable breeding or refuge habitat is present onsite or within dispersal distance of the Project area (3 miles). Annual grasslands west of Beach Drive and extending west to Montezuma Hills are modeled upland habitat for CTS in the BAHCP (ICF, 2017). CTS is unlikely to occur in west work area due to lack of potentially suitable breeding habitat within dispersal distance to the site. The east work area does not provide suitable aquatic or upland habitat for CTS (SBI, 2020). Nearest recent occurrences (CNDDDB Occ. #1037 and #1180) are from 2007 and 2009, respectively, and are approximately 8.5 miles west of the Project area within the Montezuma hills wind turbine area.
<i>Rana draytonii</i>	California red-legged frog	FT, CSC	Found in marshes, lakes, reservoirs, ponds, slow parts of streams, and other usually permanent water in lowlands, foothill woodlands and grasslands. Require areas with extensive emergent vegetation. High value habitats are deep-water ponds with dense stands of overhanging willows and a fringe of cattails.	Absent. Project area is known to be outside of species current range and determined to be absent from the Project area (SBI, 2020). Nearest recent occurrence (CNDDDB Occ. #306) is from 2005 is approximately 23 miles west. No modeled habitat on or near site in BAHCP or MRHCP (ICF, 2017; ICF, 2020).

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
REPTILES				
<i>Emys marmorata</i>	Western pond turtle	CSC	Ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Needs basking sites and suitable upland habitat (sandy banks or grassy open fields) for egg laying.	Present. Suitable aquatic and breeding habitat occurs at the Project area in Sacramento River, Tomato Slough, and surrounding upland areas. Species was recorded within the Army Reserve Center Site which overlaps with the HDD work area on the west bank of the Sacramento River (SBI, 2020). Species considered to be present or likely to occur in both west and east work areas (SBI, 2020).

<i>Thamnophis gigas</i>	Giant gartersnake	FT, ST	Freshwater marshes and streams. Has adapted to drainage canals and irrigation ditches.	Low to Moderate. There is moderate aquatic habitat with emergent vegetation that occurs within irrigation ditches and within Tomato Slough adjacent to the east work areas; however, the Slough does not appear to hold water permanently until south of the compressor station outside of the work area. In addition, the adjacent upland areas do not provide suitable habitat requirements of basking areas for thermoregulation, summer shelter, or upland refugia component for overwintering hibernacula. Adjacent agricultural land along east Project area consists of alfalfa fields. GGS has low potential to occur in portion of site east of Hwy 160 (SBI, 2020). The east work area located between Highway 160 and the Sacramento River overlaps with modeled GGS habitat in PG&E's MRHCP (ICF, 2020). This area contained freshwater and vegetative cover, which are important components of GGS suitable habitat, but lacks small mammal burrows, and the overall habitat quality is marginal (SBI, 2020). The Sacramento River along the western Project work areas does not provide suitable aquatic habitat because GGS generally considered to be absent from large rivers (SBI, 2020). The nearest observation is located about 3.7 miles southeast of the Project area on the south side of Twitchell Island along the San Joaquin River where snakes were observed basking in 2016 (CNDDDB Occ. #407). Another occurrence is located approximately four miles south of the project where an adult was observed along the Horseshoe Bend between Sherman Island and Decker Island in 1998 (CNDDDB Occ. #150).
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Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
BIRDS				
<i>Athene cunicularia</i>	Burrowing owl	CSC	Open, dry annual or perennial grasslands, deserts, and scrublands; Breeding is dependent on California ground squirrel burrows.	Low. Suitable foraging and over-wintering habitat occurs within the terrestrial areas of the Project area; however, the Project area lacks small mammal burrow colonies required for suitable nesting habitat. Minimal small mammal burrows were observed along the banks of an agricultural ditch in the eastern portion of the Project area that may be suitable if renovated, though they had no sign of owl use. Nearest recent occurrence (CNDDDB Occ. #370) is from 2000 approximately 3 miles west within agricultural fields near Emigh Road.
<i>Buteo swainsoni</i>	Swainson's hawk	ST, BCC	Breeds in stands with few trees in juniper-sage flats, riparian areas and in oak savannah. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	High. This species is likely to nest and forage within 0.5-mile of the Project area. Suitable nest trees occur on Project area. Nesting sites were documented in 2017 (Occ.# 1674) and 2003 (CNDDDB Occ. # 2742) on Brannan Island Recreational Area near agricultural fields approximately 1.5 miles south of the site.
<i>Circus hudsonius</i>	Northern harrier	CSC	Forages and nests in freshwater and brackish marshes and their adjacent grasslands.	Present. Species was observed during surveys foraging in fields adjacent to the site. Suitable nesting habitat does not occur onsite due to the level of disturbance and lack of vegetation in terrestrial habitat within the study area, but suitable nesting habitat occurs in surrounding area adjacent to the Project area.
<i>Elanus leucurus</i>	White-tailed kite	FP	Rolling foothills / valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Forages over grasslands, marshes, and oak savannas close to isolated, dense-topped trees for nesting and perching.	High. Species is known to occur in the area. Suitable foraging and nesting habitat is present in the terrestrial portions of the site.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ₁	Habitat	Probability of Occurrence
<i>Falco peregrinus anatum</i>	American peregrine falcon	FP	Nests consists of a scrape or a depression or ledge in an open cliff sites, banks, dunes, mounds, or man-made structures near wetlands, lakes, rivers or other water.	High. This species has the potential to nest and forage within 0.5-mile of the Project area. Nesting sites were documented in 2015 on a drawbridge over the Sacramento River with one mile of the Project area.
<i>Melospiza melodia</i>	Song sparrow ("Modesto" population)	CSC	Marsh and riparian scrub; Resident of the north-central portion of the Central Valley.	High. This species is known to occur within the vicinity of the Project area. Nearest recent occurrence (CNDDDB Occ. #63) is located at the confluence of Steamboat Slough and Cache Slough, 2 miles northeast of the Project area.
<i>Rallus obsoletus obsoletus</i>	California Ridgway's rail	FE, SE	Require tidal sloughs that have direct tidal circulation, predominant cover of pickleweed with stands of Pacific cordgrass (<i>Spartina foliosa</i>) at lower elevations, high marsh cover consisting of tall stands of pickleweed, gumplant, and wrack, and abundant invertebrate populations.	Absent. Suitable habitat is not present within the Project area. California Ridgway rails occur in salt marsh habitat in San Pablo Bay and Suisun Marsh approximately 20 miles southwest of the Project area.

Table 4-2. Special-Status Species Occurring Within Five Miles of the Site and Considered for Potential Occurrence in the Vicinity of the PG&E L-130 Sacramento River Crossing Pipeline Replacement Project

Scientific Name	Common Name	Status ¹	Habitat	Probability of Occurrence
MAMMALS				
<i>Lasiurus blossevillei</i>	Western red bat	CSC	Roosts primarily in trees and prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Moderate. Suitable roosting habitat in eucalyptus trees near Project area. Nearest occurrence (CNDDDB Occ. #65) is a 1999 occurrence located on Brannan Island less than one mile from the Project area's east work area. The project does not involve the removal of trees that provide suitable habitat.
¹ Status: FE = Federal Endangered FC = Federal Candidate SE = California State Endangered ST = California State Threatened FP = CDFW Fully Protected CSC = California Species of Special Concern BCC = USFWS Bird of Conservation Concern			CRPR 1B.1 = Threatened in California and elsewhere, seriously threatened in California CRPR 1B.2 = Threatened in California and elsewhere, moderately threatened in California CRPR 2B = Plants rare, threatened, or endangered in California but more common elsewhere	

4.8.1 Special-Status Plants

Focused botanical resource surveys were conducted by Nomad Ecology on June 13 and 16, July 24, and August 26, 2020 (Nomad Ecology, 2020). The timing of these surveys corresponds to the blooming window for special-status plants that have the potential to occur in the Project area (Table 4-3). During these surveys, botanists from Nomad Ecology identified Mason's lilaeopsis (*Lilaeopsis masonii*), a state-listed Rare species and a CNPS List 1B.1 species, as well as Suisun marsh aster (*Symphotrichum lentum*), a CNPS List 1B.2 species, within their study area on the west side of the Sacramento River.

Table 4-3. Blooming Period for Special-Status Plant Species

Common Name	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Bolander's water-hemlock							July to Sept					
Wooly rose-mallow						June to Oct						
Delta tule pea					May to July							
Mason's lilaeopsis				April to Nov								
Delta mudword			Mar to Sept									
Suisun marsh aster					May to Nov							

Padre conducted surveys of the Project area on October 21 and 22, 2020. During these surveys, botanists with Padre confirmed the location of the Mason's lilaeopsis and Suisun marsh aster on the west bank of the Sacramento River and mapped one additional occurrence of Suisun Marsh aster further north on the west bank of the Sacramento River. Based upon vegetation communities observed in the Project area and focused botanical surveys conducted by Nomad Ecology, six special-status plant species have the potential to be found in the Project area. The six special-status plant species that have the potential to occur or are known to occur at the Project area are described below.

4.8.1.1 Bolander's water-hemlock (*Cicuta maculata* var. *bolanderi*)

Bolander's water-hemlock is a CNPS List 2B.1 species. This perennial herbaceous species is associated with coastal fresh and brackish marshes and swamps in the San Francisco Bay Area although it can be found outside of California as well. It can be found at elevations ranging from 0 to 650 feet. This species blooms from July to September. The Project area offers potentially suitable habitat for this species within some of the agricultural ditches or along protected portions of the Sacramento River's banks. The nearest occurrence documented (CNDDDB Occ. #14) is from 1998 and is approximately 8.5 miles northwest of the Project area. Although this species has the potential to occur in the Project area, it was not observed during

protocol-level rare plant surveys (Nomad Ecology, 2020) and is not likely to occur within the study area.

4.8.1.2 Woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*)

Woolly rose-mallow is a CNPS List 1B.2 species. It is a perennial herbaceous species that blooms from June through September. It occurs in freshwater marsh habitat at elevations up to 400 feet. The Project area offers potentially suitable habitat for this species in the riprap that lines the east bank of the Sacramento River and along portions of the west bank. The nearest occurrence (CNDDDB Occ. #36) is from 1974 and was mapped on the west side of the Sacramento River within the Project area. Habitat in this area has been highly disturbed and altered and large portions of the west bank of the Sacramento River at the Project area have been heavily eroded. This species was not observed during protocol-level rare plant surveys (Nomad Ecology, 2020) and is not likely to occur within the study area.

4.8.1.3 Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)

Delta tule pea is a Federal species of concern and a CNPS List 1B.2 species. This is a perennial herbaceous species that blooms May through July. It is associated with both brackish marshes and freshwater marshes throughout the Delta and Central Valley. Delta tule pea is found with other marsh species including cattail, Suisun marsh aster, California rose, and various species of rush and bulrush on the margins of sloughs and within tidal wetlands. Suitable habitat is located along the shoreline of the Sacramento River at the Project area. The nearest recent occurrence (CNDDDB Occ. #3) is approximately three miles upstream from the Project area on the east side of the Sacramento River. This species was not observed during protocol-level rare plant surveys (Nomad Ecology, 2020) and is not likely to occur within the study area.

4.8.1.4 Mason's lilaeopsis (*Lilaeopsis masonii*)

Mason's lilaeopsis is a state-listed Rare species, and a CNPS List 1B.1 species. This species is associated with tidally influenced marsh habitats, mudflats, and levee banks in the Delta. This is a perennial herbaceous species that blooms April through November. Suitable habitat occurs within the Project area. During surveys June 2020 surveys, a single population of approximately 400 individual of Mason's lilaeopsis was recorded within the Project area on the west bank of the Sacramento River. The population was found in low-lying areas of the boat ramp, regularly submerged parts of the dock, and the tidal areas on the western shore north of the dock with very few other species. The elevation of the population was at water level, approximately 0 feet in elevation. Co-occurring species included valley sedge (*Carex barbarae*), Suisun marsh aster, rough bugleweed (*Lycopus asper*), California tule pea (*Lathyrus jepsonii* var. *californicus*), mugwort (*Artemisia douglasiana*), Oregon ash (*Fraxinus latifolia*), and Himalayan blackberry (Nomad Ecology, 2020). This species occurs within the study area but outside the Project impact footprint (Figure 5B).

4.8.1.5 Delta mudwort (*Limosella australis*)

Delta mudwort is a CNPS List 2B.1 species. It is a stoloniferous, aquatic, perennial herb in the Scrophulariaceae (snapdragon) family, and is restricted to muddy, intertidal flats and banks in brackish marshes, freshwater marshes, and riparian scrub in the Sacramento-San Joaquin Delta. It is found in association with other rare plants, especially Mason's lilaeopsis, delta tule pea, and Suisun Marsh aster. It blooms in May through August. The nearest occurrence (CNDDDB

Occ. #21) is approximately 0.8 miles downstream of the Project area on the east bank of the Sacramento River. This species was not observed during protocol-level rare plant surveys (Nomad Ecology, 2020) and is not likely to occur within the study area.

4.8.1.6 Suisun Marsh aster (*Symphotrichum lentum*)

Suisun Marsh aster is a CNPS List 1B.2 species. Suisun Marsh aster is a rhizomatous, perennial herbaceous species that typically occurs in brackish marshes, but can also occur in freshwater marshes at elevations up to 10 feet. This species blooms May through November. During surveys conducted in June 2020, a single population of approximately five individual plants of Suisun Marsh aster was recorded within the Project area on the west bank of the Sacramento River (Nomad Ecology, 2020). This population was found growing on the banks of the Sacramento River, out of abandoned pier pilings at approximately 3 feet (1 meter) elevation with co-occurring species of Oregon ash, Himalayan blackberry, Mason's lilaeopsis, valley sedge, rough bugleweed (*Lycopus asper*), California tule pea (*Lathyrus jepsonii* var. *californicus*), and mugwort (*Artemisia douglasiana*) (Nomad Ecology, 2020). This population occurs within the study area but outside the Project impact footprint. Padre biologists observed an additional occurrence of Suisun Marsh aster on the west bank further north than the population identified by Nomad Ecology. This occurrence consisted of one individual plant that occurs within the Project impact footprint. Occurrences of Suisun Marsh aster within the study area are included on Figure 5B.

4.8.2 Special-Status Wildlife

This section includes a discussion of special-status wildlife species that are known to occur or have potential to occur at the Project area based on habitat availability and known locations of species within the vicinity of the Project area. Certain species, such as vernal pool invertebrate and amphibian species listed in Table 4-2 above, may occur within the quadrangle and/or within five miles of the Project area; however, based upon a thorough analysis of the Project area, these species were determined to be absent due to a lack of suitable habitat and, therefore, are not included in this section. Other species may have been eliminated from consideration because the Project area is beyond the recorded geographic and/or elevational range for these species.

4.8.2.1 Green sturgeon (*Acipenser medirostris*)

The green sturgeon is a federally listed Threatened species in the southern range or distinct population segment (DPS). It is also a California Species of Special Concern and a NMFS Species of Concern. Green sturgeon is an anadromous species, but little is known about its biology because they are much less abundant than white sturgeon and regarded as inferior quality for consumption (Moyle, 2002). Juvenile green sturgeon have been collected in the San Francisco Bay up to the lower reaches of the Sacramento and San Joaquin rivers; however, spawning occurs in cool sections of the upper Sacramento River where there are deep, turbulent flows and clean, hard substrates. In the autumn, the post-spawning adults move back down the river and re-enter the ocean. After hatching, larvae and juveniles migrate downstream toward the Sacramento-San Joaquin Delta and estuary where they spend a few years maturing before the move out to the ocean. Green sturgeon can utilize high tide habitat; therefore, it could benefit the species to start or work during low tide. Green sturgeon have been detected using biotelemetry by the Rio Vista Bridge receiver in September 2019, less than one mile upstream of the Project

area. In addition, juvenile green sturgeon were captured annually between 2015 and 2019 at the Sherman Island sampling station, approximately 8.5 miles downstream from the Project area (CDFW, 2019). Green sturgeon have a high potential to occur in the Project area; however, the site does not provide spawning habitat. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between May and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted immediately following the HDD pipeline replacement, and during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

Table 4-4. Migration and Spawning Periods of Special-Status Fish Species within the Project Area

Species	Status	Occurrence Migration/ Spawning	Migrating/Spawning Seasons												
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Anadromous Species															
Central Valley (CV) Fall-run Chinook Salmon	CSC	High/None						M	M	M	O	PS	PS	S	
CV Spring-run Chinook Salmon	CSC/FT	High/None			M	M	PM	PM	M	S	PS	S			
Sacramento Winter-run Chinook Salmon	SE/FE	High/None	PM	PM	PM	O	O	PS	PS	S				M	
CV Steelhead	SE/FT	High/None	PO	PO	PO	S						M	M	M	O
Green Sturgeon	FT	Low/None			M	M	O	O	S						
White Sturgeon	CSC	Moderate/None	M	S	PS	PS	PS	PS							M
River Lamprey	CSC	Moderate/None	S	S	S	S							M	M	M
Pacific Lamprey	CSC	Moderate/None			PS	PS	PS	PS							
Resident Species															
Delta Smelt	FT, SE	Moderate/Low	M	S	S	S	PS	PS	S					M	M
Longfin Smelt	ST, FC	Moderate/Low	S	PS	PS	PS	S							O	O
Sacramento splittail	CSC	Moderate/Low	PS	PS	PS	S	S	S	S					M	M
Status: SE = State Endangered ST = State Threatened CSC = California Species of Special Concern FE = Federally Endangered FT = Federally Threatened			M	Migration period (Potential occurrence in Project area)											
			PM	Peak migration period											
			S	Spawning period (Upstream of Project area)											
			PS	Peak spawning period											
			O	Overlap of migration and spawning periods											
			PO	Peak Overlap of migration and spawning periods											
Sources: NMFS, 2014; Moyle, 2002; Goals Project, 2000. Yoshiyama et al. 1998.															

4.8.2.2 White sturgeon (*Acipenser transmontanus*)

The white sturgeon is a California Species of Special Concern. White sturgeon have a marine distribution spanning from the Gulf of Alaska south to Mexico but a spawning distribution ranging only north of the San Joaquin River (McCabe and Tracy, 1994, and Jackson et al., 2016). Currently, spawning populations are known to occur in the San Joaquin, Sacramento, Fraser, and Columbia Rivers. In California, primary abundance is in the San Francisco Bay, with spawning occurring mainly in the Sacramento and Feather Rivers (Klimley et al., 2015). White sturgeon spend most of their lives in estuaries of large rivers, only moving into freshwater to spawn (Moyle, 2002). Sturgeon migrate upstream when they are ready to spawn in response to flow increases. Male white sturgeon are at least 10 to 12 years old before sexual maturity (Moyle, 2002). Spawning takes place between late February and early June when water temperatures range from 46 to 66 degrees Fahrenheit. Juvenile white sturgeon were collected in March and April 2019 at stations upstream and downstream of the Project area within the Sacramento River, (stations 704, 707 and 711) (IEP, 2020). White sturgeon have a high potential to occur in the Project area; however, the site does not provide suitable spawning habitat. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between March and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted immediately following the HDD pipeline replacement, and during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.3 Central Valley steelhead (*Oncorhynchus mykiss irideus*)

Central Valley steelhead is a federally listed Threatened species. Steelhead have been separated into 14 ESUs. The California Central Valley evolutionary significant unit (ESU) and the Central California Coast ESU could occur in the San Francisco Bay-Delta and in the vicinity of the Project. Steelhead are an anadromous form of the rainbow trout native to the Pacific Ocean and coastal drainages. Steelhead and rainbow trout did not arise from two distinct evolutionary lines (Behnke, 1992). General factors influencing steelhead abundance include reduction in spawning, incubation, and rearing success due to barriers to passage, diversions, flow fluctuations, sub-optimal water temperature, and sedimentation of spawning habitat. Steelhead live the majority of their life cycle in the Pacific Ocean then migrate upstream to spawn between October and January. Spawning typically occurs between December and April. Steelhead are iteroparous and do not die after spawning and thus may spawn again the following year. Most naturally produced Central Valley steelhead rear in freshwater for 1 to 3 years before emigrating to the ocean. Steelhead eggs hatch in about 30 days at 51 degrees Fahrenheit (Leitritz and Lewis 1980). Studies of Central Valley steelhead have shown that the population is polymorphic, where two-year-old non-anadromous males are breeding with anadromous females. The polymorphism in the Central Valley population is due to the extreme variation in rainfall and climate which can

result in flashfloods and/or droughts lasting years. The species flexibility has allowed it to persist in the Central Valley through the additions of dams and reduction of accessible spawning grounds.

Like Chinook salmon, steelhead were likely more widely distributed within the Sacramento River and its tributaries, but the construction of dams has restricted upstream migration. However, the mainstem of the Sacramento River and other low gradient portions of the river provide migration and juvenile rearing habitat, including in the vicinity of the study area. Steelhead have not been recorded during recent spring 20-millimeter (mm) surveys (2018 through 2020) at stations upstream or downstream of the Project area (stations 707 and 711) (IEP, 2020). Steelhead are unlikely to occur in the Project area location during the summer months when in-water work will occur due high water temperature and low dissolved oxygen. It is likely smolts or non-anadromous individuals would be located upstream of the site where the water temperature is cooler and within habitat providing vegetation and/or structure for individuals to seek refuge or riffles to provide increased dissolved oxygen.

The in-water work associated with decommissioning and removal of the pipeline will occur during the delta species in-water work window (August 1 to October 31) which corresponds to the warmest water temperatures of the year at the Project location and, therefore, the least favorable conditions for fish, particularly salmonids. Water temperatures in the Project area from August through October range between 65 and 75 degrees Fahrenheit and average around 72 degrees Fahrenheit (USGS, 2020), exceeding thermal tolerances for salmonids and reducing the habitat suitability due to the reduction of dissolved oxygen. Steelhead will likely have an avoidance response and will stay upstream of the Project where conditions are cooler and more favorable. Adults migrating from the ocean will stay in nearshore waters until water temperatures become cooler before they start their journey upstream, typically beginning in October.

The HDD pipeline replacement is planned to occur between March and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.4 Chinook salmon (*Oncorhynchus tshawyscha*)

The Chinook salmon is an anadromous species spending most of its adult life in the ocean and then returning to freshwater streams to spawn. They spend 3 to 6 years maturing in the ocean before they migrate upstream to spawn. Adult Chinook salmon die after spawning. Juveniles spend from several months to over a year rearing in their natal streams before emigrating to the ocean. Preferred spawning grounds for Chinook salmon are in gravel areas of large rivers and tributaries (Goals Project, 2000). Chinook salmon have been separated into 17 distinct groups or ESU based on similarity in life history, location, and genetic markers and the Project is located within the Lower Sacramento Hydrologic Unit (18020109) identified within the Pacific Coast Salmon Fisheries Management Plan (NMFS, 2020b). The Central Valley spring-, and fall-run, and Sacramento River winter-run ESU's have the potential to occur in and around the Project area

during their migration to upstream spawning habitat and for juvenile rearing when habitat conditions are suitable.

Central Valley Spring-Run Chinook Salmon

The Central Valley spring-run Chinook salmon is a federally Threatened species and California Threatened species. Central Valley spring-run Chinook salmon migration period occurs from March through July with a peak in May and June. The spawning period is late August through late October (Goals Project, 2000). The juvenile downstream emergence period is between November and March with a 3 to 15-month freshwater residency period between November and January (Year-2), concluding with an estuarine emigration period between November and June.

Spring-run Chinook Salmon were historically the most abundant race in the Central Valley. Now only remnant runs remain in Butte, Mill, Deer, Antelope, and Beegum Creeks, tributaries to the Sacramento River. In the mainstem Sacramento River and the Feather River, early-running Chinook Salmon occur, but there has been significant hybridization with fall run. Spring-run chinook are in higher abundance in waters between Knights Landing and Chipps Island between February and May and a low abundance in the region July through November (NMFS, 2014). Juvenile chinook have been captured during trawl surveys in the southern Sacramento River and Delta primarily between November through early May; however, by the time yearly spring-run Chinook salmon reach Chipps Island they cannot be distinguished from fall-run yearlings (NMFS, 2014). In addition, CDFW Spring 20-mm net surveys have captured chinook salmon near Decker Island (station 707) and Sherman Island (704) approximately 3.5 miles downstream from the Project area in the Sacramento River.

The in-water work associated with decommissioning and removal of the pipeline will occur during the delta species in-water work window (August 1 to October 31), which corresponds to the warmest water temperatures of the year at the Project location, typically exceeding thermal tolerances for salmonids. Water temperatures in the Project area from August through October range between 65 and 75 degrees Fahrenheit and average around 72 degrees Fahrenheit (USGS, 2020), exceeding thermal tolerances for salmonids and reducing the habitat suitability due to the reduction of dissolved oxygen. Chinook smolts will likely have an avoidance response and will stay upstream of the Project where conditions are cooler and more favorable. Fall run Chinook adults migrating from the ocean will stay in nearshore waters until water temperatures become cooler before they start their journey upstream, typically beginning in October. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between March and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

Central Valley Fall-Run Chinook Salmon

The Central Valley fall-run Chinook salmon are a California Species of Special Concern. The migration period for fall and late-fall run Chinook salmon is August through April with peaks in September through October and December, respectively. Their spawning period is late September through late April with peaks in late October and early February, respectively (Goals Project, 2000). The juvenile downstream emergence period is between December and June with freshwater residency periods of 4 to 7 months between December and June for fall-run and seven to 13 months between April of year 1 and April of year-2 for late fall-run. The residency periods end with an estuarine emigration period between March and July for fall-run and between October and May for late fall-run (Goals Project, 2000).

Fall-run Chinook Salmon are currently the most abundant of the Central Valley races, contributing to large commercial and recreational fisheries in the ocean and popular sport fisheries in the freshwater streams. Fall-run Chinook Salmon are raised at five major Central Valley hatcheries which release more than 32 million smolts each year. CDFW Spring 20-mm net surveys did not capture chinook salmon near the Project area. The nearest occurrence of fall run chinook salmon were recorded in October 2019 in Honker Bay during CDFW Fall mid-water trawling surveys (IEP, 2020).

The in-water work associated with decommissioning and removal of the pipeline will occur during the delta species in-water work window (August 1 to October 31) which corresponds to the warmest water temperatures of the year at the Project location and, therefore, the least favorable conditions for fish, particularly salmonids. Water temperatures in the Project area from August through October range between 65 and 75 degrees Fahrenheit and average around 72 degrees Fahrenheit (USGS, 2020), exceeding thermal tolerances for salmonids and reducing the habitat suitability due to the reduction of dissolved oxygen. Chinook smolts will likely have an avoidance response and will stay upstream of the Project where conditions are cooler and more favorable. Fall run Chinook adults migrating from the ocean will stay in nearshore waters until water temperatures become cooler before they start their journey upstream, typically beginning in October. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between March and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

Sacramento Winter-Run Chinook Salmon

Sacramento River winter-run chinook salmon is a federally and state-listed Endangered species. Winter-run chinook salmon are anadromous species spending most of its adult life in the ocean and then returning to freshwater streams to spawn. Preferred spawning grounds for winter-run chinook salmon are in large rivers and tributaries (the Sacramento and San Joaquin rivers and tributaries) with deep water and large gravel (Goals Project, 2000). The migration period for

winter-run chinook salmon is December through July with a peak in March. Spawning period is late April through early August with a peak in early June (Goals Project, 2000). The juvenile downstream emergence period is between July and October with a five to ten month freshwater residency period between July and April, concluding with an estuarine emigration period between November and May.

Sacramento winter-run chinook salmon spawn in the upper reaches of the Sacramento River in waters between the Keswick Dam and the Anderson-Cottonwood Irrigation District (ACID) Dam. Winter-run chinook salmon are immature when upstream migration begins and need to hold in suitable habitat for several months prior to migrating to spawning grounds. The maximum suitable water temperature reporting for holding winter-run chinook is 59° to 60° F (15° to 16° C). Water temperature in the lower Sacramento River near the Project area generally begins to exceed 60° F in April and averages 72° F during the in-water work window (August through October); therefore, it is unlikely that suitable holding habitat or rearing habitat exists within the lower Sacramento River, particularly in summer months, and this area is primarily used as a migration corridor (NMFS, 2014; USGS, 2020). The Delta Juvenile Fish Monitoring Program has reported that Sacramento winter-run chinook are in higher abundance in waters between Sherwood Harbor and Chipps Island between February and April and are not expected to occur in the region June through October (NMFS, 2014). Juvenile Sacramento winter-run chinook have been captured during trawl surveys in southern Sacramento River and delta primarily between November through early May (NMFS, 2014). See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between March and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.5 Pacific lamprey (*Entosphenus tridentatus*)

Pacific lamprey is a California species of special concern that is found in many California streams entering the Pacific Ocean, unless blocked by barriers or low flows. The adults often start their spawning migration from the ocean into freshwater in the fall and can be seen moving upstream throughout the winter and early spring except during high water. In some rivers these migrations continue into late spring. Pacific lampreys construct nests for spawning. They dig shallow depressions in stream riffles by moving stones with their suction mouth. The eggs are deposited in the crevices of the rocky nest area, after which the adults die. The eggs hatch and the young lampreys burrow into the stream bottom, where they remain in a larval stage for three or four years. During this time, they feed on material they filter from the water and gradually change into miniature adults. At a length of about six inches, they move into the stream and migrate to the ocean (Moyle et al., 2015).

Pacific lamprey are known to occur in the San Francisco Bay-Delta including the Sacramento River. They could occur in the Project area during migration to spawning habitat;

however, the site does not provide suitable spawning habitat. Species spawning season is from March through June, which is before planned in-water construction would occur. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between May and July in order to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.6 Delta Smelt (*Hypomesus transpacificus*)

The delta smelt is a federally Threatened and State Endangered species endemic to the Bay-Delta estuary. Critical habitat for delta smelt includes Suisun, Grizzly, and Honker bays, Goodyear, Suisun, Cutoff, First Mallard, and Montezuma sloughs, and the Sacramento-San Joaquin Delta (USFWS, 1996). Decline in populations are primarily attributed to habitat loss, high diversions of freshwater, reduced water flow, and reduced quality and quantity of suitable nursery habitat. Other contributing factors may include the presence of toxic compounds in the water, competition and predation by nonnative species, reduced food supply, disease, high outflows, and low spawning stock (Goals Project, 2000). Adult delta smelt inhabit open water areas where they feed on small zooplankton. They spawn in freshwater from late winter to early summer (primarily February through April) and usually die shortly afterward. Adhesive eggs sink and attach to substrates such as cattails, bullrush, tree roots, and submerged branches. They hatch after two weeks and larvae begin to feed on zooplankton within a few days.

Delta smelt spawning occurs primarily in shallow freshwater or slightly brackish water upstream of the mixing zone in backwater sloughs and channel edge waters (Wang, 1991). Delta smelt are known to spawn in the lower reaches of the Sacramento and San Joaquin rivers as well as various sites within the Delta in shallow waters and dead-end sloughs. Important spawning habitat includes Barker, Lindsey, Cache, Prospect, Georgiana, Beaver, Hog, and Sycamore sloughs, the Sacramento River, and tributaries of northern Suisun Bay (USFWS, 1997). The center of spawning occurs around Bradford Island in the Delta and in the Sacramento River just below Rio Vista, (Wang, 1991). Spawning varies from year to year but is generally between December and July. Rearing habitat includes an area eastward from Carquinez Straits, including Suisun, Grizzly, and Honker bays, Montezuma Slough. The nearest spawning grounds for delta smelt are located approximately three miles downstream the Sacramento River at the confluence with Three Mile Slough near Bradford Island (Wang, 1991) and approximately three miles upstream at Cache Slough. An adequate river flow is necessary to transport larvae from upstream spawning areas to rearing habitat within the delta. Suitable transport conditions may be required from February to August.

The L-130 site occurs within the Central Zone of the range of the delta smelt, which includes the legal delta and the entire designated critical habitat for delta smelt (USFWS, 2006a). Much of the Project area consists of deep water, riverine habitats and with low-quality areas of

shaded riverine aquatic cover along the banks. The riverbanks within the Project area consist of steep bluffs on the west bank and invasive *Arundo sp.* stands and do not provide suitable shallow water or dead-end sloughs preferred for Delta smelt spawning or brackish shallow water habitat in the low salinity zone preferred for Delta smelt rearing and maturation.

A delta smelt 20- mm net surveys conducted by CDFW in the Delta, Sacramento and San Joaquin rivers, and their tributaries sampled for juvenile delta smelt in the Project area as part of the IEP. IEP stations 707 and 711 are closest to the Project area; however, no juvenile delta smelt have been captured in surveys at these stations in the last five years (IEP, 2020). The nearest, most recent documented occurrence of delta smelt is in March and July 2018 at stations 706 and 704, respectively, approximately 8.3 miles downstream near Sherman Island (IEP, 2020). Delta smelt larvae are not common in the Project area due to the depth, current speeds, and lack of vegetated cover within the River at the pipeline crossing location. Consequently, the site does not provide suitable spawning or rearing habitat and primarily functions as a migratory corridor for delta smelt between upstream spawning habitat and downstream rearing habitat.

The HDD pipeline replacement is planned to occur between May and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of both anadromous and resident special-status fish species seasonal migrations and spawning periods, including the delta smelt. The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.7 River lamprey (*Lampetra ayresi*)

River lamprey is a California species of special concern. Habitat requirements of spawning adults and ammocoetes have not been studied in California. Presumably, the adults need clean, gravelly riffles in permanent streams for spawning, while the ammocoetes require sandy backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 77°F (25°C). In California, they have been recorded only from the lower Sacramento and San Joaquin Rivers (and tributaries including Stanislaus and Tuolumne Rivers) and from the Russian River. In the Sacramento River, river lamprey have been captured as far upstream as the Red Bluff Diversion Dam (USFWS, 2004). The river lamprey has become uncommon in California, and it is likely that the populations are declining because the Sacramento, San Joaquin, and Russian rivers and their tributaries have been severely altered by dams, diversions, pollution, and other factors (Moyle et al., 2015).

River lamprey has the potential to occur in the study area during migration but would not spawn in this area due to the lack of suitable spawning habitat. The species migration and spawning season is from October through April, which is outside the planned in-water construction window. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between May and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta

aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes). The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.8 Sacramento splittail (*Pogonichthys macrolepidotus*).

The Sacramento splittail is a federally Threatened species and a California species of special concern. The Sacramento splittail is endemic to lakes and rivers of the Central Valley but can tolerate moderate levels of salinity. The loss of floodplain and wetlands used for spawning, rearing, barriers within the migration areas, and foraging habitat is the primary reason for splittail decline (Goals Project, 2000). High flows and floodplain inundation are key factors in increasing splittail abundance. Sacramento splittail are most common in the brackish waters of Suisun Bay, Suisun Marsh, and the Sacramento-San Joaquin Delta; however, in wet years they occur within San Pablo and San Francisco Bays (Goals Project, 2000). Upstream spawning migration occurs from November through May and spawning occurs from April to July (see Table 4-4). Preferred spawning substrate consists of freshwater areas that support submerged vegetation within inundated floodplains. Flooded banks and inundated areas used for spawning are also preferred habitat for rearing and foraging. After spawning, most juveniles move downstream into shallow, productive bay and estuarine water in response to increased water flows (Moyle, 2002). Non-breeding splittail are found in temperatures up to 75°F (Young and Cech, 1996); however, juveniles and adults have optimal growth at 68°F, with negative physical responses above 84°F (California Department of Water Resources [CDWR] and U.S. Department of Interior Bureau of Reclamation [USDIBR], 2017; Young and Cech, 1995).

Splittail are known to occur in both the Sacramento and San Joaquin Rivers, and spawning can range from the lower Sacramento and San Joaquin Rivers down to Montezuma Slough (Wang, 1986). They are likely distributed much more widely in small creeks and marshes throughout the lower portions of the Estuary than known occurrences indicate (USFWS, 2010b). The Sacramento River within the Project area is a deep large waterway with an abrupt eroded bank on the west side and federal levee on the east side and does not provide suitable shallow water or inundated floodplain habitat for this species. See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between May and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes), including Sacramento splittail. The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.9 Longfin smelt (*Spirinchus thaleichthys*)

Longfin smelt is a Federal candidate species and State Threatened species. It is native to the Delta and was once abundant. The decline in longfin smelt abundance is primarily associated with the diversion of freshwater from the Delta. Another contributing factor is reproductive failure during drought years. Consecutive drought years leading to reproductive failure could result in

the extirpation of longfin smelt because of their two-year life cycle (Goals Project 2000). Longfin smelt occur in the Sacramento-San Joaquin Delta but can range as far as the South San Francisco Bay and the open ocean. They are most abundant in Suisun Bay and San Pablo Bay. Adult longfin smelt, like the delta smelt, inhabit open water areas of the Delta and feed on zooplankton. They tolerate a wide range of salinity conditions. Longfin smelt migrate upstream to spawn in freshwater between November and May with a peak in spawning from February through April. The species is thought to spawn over sandy or gravelly substrate with rock or plant material to attach their adhesive eggs to when deposited (Moyle, 2002). The abundance of longfin smelt increases with the amount of freshwater outflow. Longfin smelt have a low tolerance to warm waters, with adults rarely found in water warmer than 64° F and young-of-the-year rarely found in water above 73° F (Hobbs and Moyle, 2015). Warm water and decrease in flows associated with drought conditions make this species sensitive to drought. Loss of estuarine wetland and slough habitat as juvenile rearing habitat is also a threat to the species (Garwood, 2017).

The nearest recent occurrence of longfin smelt were recorded at several of the CDFW Sacramento River sampling stations upstream and downstream of the Project area (stations 704, 706, 707 and 724) during March 2020, 20-mm net surveys (IEP, 2020). See Table 4-4 for migration and spawning periods for special-status fish species that may occur in the Project area.

The HDD pipeline replacement is planned to occur between May and July to precede the decommissioning work, which is scheduled to occur later in the year during the aquatic work window. No in-water construction will occur during HDD replacement of the pipeline. All in-water work associated with pipeline decommissioning and removal will be conducted during the delta aquatic work window of August 1 to October 31, which is a combined species work window for avoidance and minimization of special-status fish species seasonal migrations and spawning periods (resident fishes and anadromous fishes), including longfin smelt. The work window may be modified based on conditions of permits issued by regulatory agencies.

4.8.2.10 Western pond turtle (*Emys marmorata*)

Western pond turtle (WPT) is a California species of special concern. The WPT occurs in open water habitats throughout much of California, although at much lower numbers and fewer localities than historical populations, especially in urban areas. WPT prefer slack or slow water habitats with dense stands of submergent or emergent vegetation for food and cover, and with abundant basking habitat. WPT are a semi-aquatic species inhabiting streams, marshes, ponds, and irrigation ditches within woodland, grassland, and open forest communities, but they require upland sites for nesting and over-wintering. Presence of nearby nesting sites and lack of exotic predators are also good habitat components (Bury, 1986).

Focused herpetological habitat assessment surveys conducted by SBI in April and November 2020, found that the Sacramento River and associated sloughs provide highly suitable habitat for the WPT. There are over 30 extant CNDDDB records within 10 miles of the study area, with the nearest CNDDDB record in the CNDDDB being 2.5 miles away at Seven Mile Slough. The Draft Environmental Impact Report for the Rio Vista Army Reserve Center Redevelopment Plan reports indicated the presence of the western pond turtle within the Plan area which in part coincides with the Western HDD work area (SBI, 2020). There is a high likelihood that the species could occur within the western work area due to the presence of suitable basking and foraging habitat along the River and sandy soils and sunny, open spaces suitable for nesting on the west

bank (SBI, 2020). In addition, the Sacramento River and Tomato Slough are immediately adjacent to the portions of the eastern Project area and potentially support populations of the western pond turtle. Suitable nesting habitat is also present in eastern Project areas (SBI, 2020). Project implementation has the potential for short-term temporary impacts on WPT habitat. WPT is not a covered species under the BAHCP or the MRHCP.

4.8.2.11 Giant gartersnake (*Thamnophis gigas*)

Giant gartersnake (GGS) is a State and federally listed Threatened species found in emergent marsh habitats associated with waterways during spring and summer and hibernates in adjacent upland habitat during the winter. Due to extensive habitat loss, giant gartersnakes now inhabit remaining wetlands as well as highly modified habitats, such as agricultural areas. Active rice fields and their associated irrigations systems serve as an alternative habitat that is commonly used by giant gartersnake (SBI, 2020). These fields provide the habitat components typically required by giant gartersnake. Recorded occurrences in the Sacramento-San Joaquin Delta included sightings at Liberty Island and Decker Island in Solano County, Sherman Island in Sacramento County, Jersey Island in Contra Costa County, and the San Joaquin River near Medford Island in San Joaquin County (CNDDDB, 2020a). Essential components of giant gartersnake habitat include:

- A fresh-water aquatic component with adequate water from early spring through fall to provide foraging habitat and cover;
- Emergent herbaceous wetland vegetation to provide foraging habitat, cover, and basking areas;
- An upland component near the aquatic habitat that can be used for thermoregulation, cover, and retreat; and
- An upland refugia component at higher elevation sites that will serve as winter hibernacula and provide cover and refuge from flood waters (Hansen and Brode, 1980; USFWS, 1997).

The nearest GGS observation is located about 3.7 miles southeast of the Project area on the south side of Twitchell Island along the San Joaquin River where snakes were observed basking in 2016 (Occ #407). Another occurrence is located approximately four miles south of the Project area where an adult was observed along the Horseshoe Bend between Sherman Island and Decker Island in 1998 (Occ #150).

Focused herpetological habitat assessment surveys conducted by SBI in April and November 2020, found that the west work area does not provide any aquatic habitat, aside from the adjacent river channel and marina. The river does not provide suitable aquatic habitat for giant gartersnake because it is a large waterway and GGS require slow moving or static water as a necessary component of suitable aquatic habitat (USFWS, 2017). Although recent survey data indicates that the species is present in large waterway open water habitat along a section of the San Joaquin River near its junction with False River (Stillwater Sciences, 2017), that occurrence location is relatively shallow, with sandbars, and supports submergent and emergent vegetation unlike the Project area, which is a large waterway routinely dredged to maintain depth in the ship channel and does not provide habitat features necessary to support giant gartersnake (SBI, 2020)

Records from Solano County are also scarce, and giant gartersnakes may be extirpated from the County (SBI, 2020). GGS is unlikely to occur in the western work area (SBI, 2020).

On the east side of the Sacramento River, the levee work area located between Highway 160 and the Sacramento River overlaps with modeled GGS habitat in PG&E's MRHCP (ICF, 2019; SBI, 2020). This area supports components of suitable GGS habitat; however, the Sacramento River is relatively deep in this section due to dredging to maintain the ship channel. Vegetation cover occurs on the east bank, but upland areas between Highway 160 and the Sacramento River lack small mammal burrows due to the sandy nature of the substrate. Upland habitat is also subject to strong tidal influences and wakes from boating traffic, and the overall habitat quality was marginal. Although GGS occurrence in this area cannot be entirely ruled out, their presence is unlikely (SBI, 2020).

On the east side of the Sacramento River, the East HDD work area and pipe staging area traverse several shallow irrigation features that carry water for limited periods during irrigation events. The adjacent agricultural fields are cultivated with alfalfa and are not generally flooded long enough to provide suitable giant gartersnake habitat. Tomato Slough, just east of the pipe staging area is a more permanent water feature and provides marginal aquatic giant gartersnake habitat; however, field surveys indicate that permanent water is only present south of the compressor station and farm road crossing outside of the Project area boundaries. The northern area of the slough appears to only carry water during irrigation events and was dry and choked with vegetation during the November survey (SBI, 2020). In addition, areas of the Slough nearest the workspace are lined with trees that provide a canopy which limits the number of basking sites along the banks. The east work areas east of Highway 160 are hydrologically connected to a known occurrence (CNDDDB Occ. #150) and there may be a low to moderate potential for individuals to disperse near the Project area; therefore, GGS is considered to have a low potential to occur within areas of the Project area east of Highway 160, with moderate potential in the areas closest to Tomato Slough (SBI, 2020).

Project implementation has the potential for short-term temporary impacts on GGS. GGS is a covered species under the MRHCP. AMMs from the PG&E MRHCP will be implemented for avoidance and minimization of impact to GGS.

4.8.2.12 Swainson's Hawk (*Buteo swainsoni*)

Swainson's Hawk is a California Threatened species and a Bird of Conservation Concern. This species breeds in open habitats in western North America from Alaska south to Mexico. In California, it breeds mainly in the Central Valley, Klamath Basin, Northeastern Plateau, and Mojave Desert (CDFG, 1994). It winters primarily on the pampas of southern South America, Mexico, though a few overwinter in California, the southwestern U.S., and Florida. It is absent from most of its former range in California, where its population declined by more than 90 percent during the 1900's (CDFG, 1994).

Throughout its range in California's Central Valley, it usually arrives in March and April and leaves in September or October; however, there is a small population of Swainson's hawk that over-winters in the Sacramento-San Joaquin River Delta (Herzog, 1996). Loss of habitat is the major threat to this species in California. Residential and commercial development continues to replace Swainson's hawk habitat. Pesticides and herbicides are also a major threat, particularly

on their wintering grounds. They are also sensitive to disturbance while nesting and may abandon nests if disturbed before the eggs hatch (CDFG, 2006).

This species forages in grassland or areas of sparse trees or shrubs, and often forages in agricultural areas in the Central Valley. It nests in the scattered trees within these habitats such as those along waterways. During the breeding season, it feeds primarily on small mammals and reptiles. During other seasons, large insects (especially grasshoppers) are the bulk of its diet.

The riparian habitat along waterways near the Project area offers suitable nesting trees for Swainson's hawks and adjacent agricultural land provides optimal foraging habitat. Surveys for decommissioning and removal of the pipeline were conducted outside of breeding season; however, there are known occurrences of Swainson's hawk within 0.5-mile of the Project area. Nesting sites were documented in 2017 and 2003 on Brennan Island near the agricultural fields. The HDD pipeline replacement portion of the Project is planned to begin during Swainson's hawk nesting season.

4.8.2.13 Northern Harrier (*Circus hudsonius*)

Northern harrier is a California Species of Special Concern. The Northern harrier inhabits meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands; seldom found in wooded areas. It forages mostly on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects, and, rarely on fish. Breeding occurs between April and September, with peak nesting in June and July. Destruction of wetland habitat, native grassland, and wet meadows, and the burning and plowing of nesting areas during early stages of the breeding cycle, are major reasons for the decline of this species (Remsen, 1978). Northern harrier was observed foraging within open farmlands adjacent to the Project area. There are no recorded occurrences in the CNDDDB within 5 miles of the site; however, the species is known to occur in the region and was observed during field surveys. Nesting and foraging habitat within the Project area is limited because terrestrial areas within the site are subject to high level of agricultural disturbance; however, suitable nesting and foraging habitat occurs in adjacent lands.

4.8.2.14 White-tailed kite (*Elanus leucurus*)

White-tailed kite is a California Fully Protected species. It is a small raptor with a total length of about 12 inches and is often identified from a distance by its hovering or "kiting" behavior while hunting. White-tailed kites predate mostly on voles and other diurnal mammals, but will occasionally prey on birds, insects, reptiles, and amphibians. It typically forages over open grasslands and emergent wetlands. White-tailed kites nest in dense foliage in treetops near grassy foothills, marshes, riparian woodland, savanna, and partially cleared fields. Preferred nesting trees include oak, willow, sycamores, or other tree stands. White-tailed kites range from western California and southwestern Oregon to southeastern Arizona, and along the Gulf Coast from Texas to Florida, and peninsular Florida (Wheeler and Clark, 1995). Although white-tailed kite was not observed during field surveys, it is known to occur in the area. Suitable foraging habitat is present throughout the terrestrial portions of the Project area. Nesting habitat is limited onsite due to the extent of human disturbance within the Project area; however, trees along the agricultural lands and along Tomato Slough adjacent to the Project area provide suitable nesting and foraging habitat.

4.8.2.15 American Peregrine Falcon (*Falco peregrinus*)

American peregrine falcon has been state and federally delisted but is still a CDFW Fully Protected species as well as a Bird of Conservation Concern. Peregrine falcon is an uncommon breeding resident, and uncommon as a migrant in the Project area. In its natural habitat, it breeds in woodland, forest, and coastal habitats, near wetlands, lakes, rivers. Nests are scrapes or depressions on high cliffs, ledge, banks, dunes, mounds, and will sometimes use trees, or old raptor nests, but has adapted to frequently use bridges and other man-made structures in urban areas. Nests are situated in areas inaccessible to land predators, and usually near large prey population like coastal areas or wetlands with large breeding populations of birds. In winter, peregrine falcons are found throughout the Central Valley of California. Riparian areas and coastal and inland wetlands are important habitats yearlong, especially in non-breeding seasons. Breeding activity begins as early as February with pair bonding and territory reestablishment. The young fledge in June and July, but usually remain in the territory until late August. This species has the potential to nest and forage within 0.5-mile of the Project area. Peregrine falcons are known to nest on many bridges and buildings in the Bay Area and nesting sites were documented in 2015 on a drawbridge over the Sacramento River within one mile of the Project area.

4.8.2.16 Song Sparrow ("Modesto" population) (*Melospiza melodia*)

The Modesto population of the song sparrow is endemic to California, where it resides only in the north-central portion of the Central Valley. Highest densities occur in the Butte Sink area of the Sacramento Valley and in the Sacramento-San Joaquin Delta. Song sparrows breed from mid-March to early August and are resident species of the Sacramento Valley and Delta. Song sparrows are frequently seen within mature riparian corridors, such as the Cosumnes and Stanislaus Rivers, and less frequently within irrigation canals and levees. The Modesto population of song sparrow has an affinity for emergent freshwater marshes dominated by bullrush and cattails as well as riparian willow (*Salix* sp.) thickets. Song sparrows also nest in riparian forests of valley oak (*Quercus lobata*) with a sufficient understory of blackberry, along vegetated irrigation canals and levees (Shuford et al., 2008); however, nest appear to be more successful in early succession riparian wetland communities, such as restoration sites. The nearest recent occurrence (CNDDB Occ. #63) is located at the confluence of Steamboat Slough and Cache Slough, approximately two miles northeast of the Project area. The likelihood that a "Modesto" song sparrow could occur is high due to the presence of suitable foraging and nesting habitat.

4.8.2.17 Western red bat (*Lasiurus blossevillii*)

Western red bat is a CDFW California Species of Special Concern. The western red bat is locally common in some areas of California from Shasta County to the Mexican border and west of the Sierra Nevada. It winters in the western lowlands and coastal regions south of San Francisco Bay. It roosts in forest and woodland habitats from sea level to mixed conifer forest, but feeds over a variety of habitats including grasslands, shrublands. It roosts in trees and shrubs, primarily cottonwood and sycamore trees, adjacent to streams, fields, or urban areas. It makes relatively short migrations between summer and winter ranges, which occur between March through May in spring and September and October in autumn. The western red bat feeds on a variety of insects, but principal prey includes moths, crickets, beetles, and cicadas. Females bear two or three young per year from May through July. There is one recorded occurrence of this species within one mile of the east work area (CDFW, 2020). The occurrence was reported in

1999 and was documented during acoustic surveys in the adjacent agricultural fields. Potential roosting habitat occurs in the Eucalyptus groves within the western and eastern study areas and the River and wetland areas provide potential foraging habitat for the species. Neither the eucalyptus stands nor any other trees on the Project area will be disturbed as part of the proposed Project; therefore, any potential roosting habitat will not be impacted.

4.9 WILDLIFE CORRIDORS

Wildlife migration corridors are generally defined as connections between fragmented habitat patches that allow for physical and genetic exchange between otherwise isolated wildlife populations. Migration corridors may be local, such as those between foraging and nesting or denning areas, or they may be regional in extent. Migration corridors are not unidirectional access routes; however, reference is usually made to source and receiver areas in discussions of wildlife movement networks. "Habitat linkages" are migration corridors that contain contiguous strips of native vegetation between source and receiver areas. Habitat linkages provide cover and forage sufficient for temporary inhabitation by a variety of ground-dwelling animal species. Wildlife migration corridors are essential to the regional fitness of an area as they provide avenues of genetic exchange and allow animals to access alternative territories as fluctuating dispersal pressures dictate.

Waterways, particularly areas with contiguous riparian vegetation offer migration corridors for mammals, reptiles, and birds; however, the riparian corridor along the Sacramento River is discontinuous at the Project area. Mammals and reptiles present within the area likely use the upland agricultural and range lands as well as riparian cover as a travel corridor regardless of the season. The east side of the Project area is on Brannan Island, which limits the suitability as a migration corridor for terrestrial wildlife on the east side of the Sacramento River. Birds such as warblers, hummingbirds, etc. migrate to higher elevations in the spring and lower elevations in the fall and the riparian habitat within the Project area offers shelter, forage, and water for migrating species traversing to the Sierra Nevada Range to nest. Resident species may make local migrations for foraging and/or nesting habitat along the river. Additionally, the Sacramento River provides seasonal migration habitat for anadromous and other native fish species moving upstream to spawning grounds and provide connections for resident fish species to other aquatic habitats within the watershed.

5.0 REGULATORY SETTING

5.1 FEDERAL

5.1.1 Special-Status Species

The federal Endangered Species Act (FESA), administered by the USFWS and the NMFS (collectively referred hereafter as the “Services”), provides protection to species listed as Threatened (FT) or Endangered (FE), or proposed for listing as Threatened (PFT) or Endangered (PFE). The Services maintain lists of species that are neither formally listed nor proposed but could be listed in the future. These federal candidate species (FC) include taxa for which substantial information on biological vulnerability and potential threats exists and are maintained to support the appropriateness of proposing to list the taxa as an endangered or threatened species.

Additionally, the FESA can protect a DPS of a species. The “Distinct Population Segment” is the smallest division of a taxonomic species that can be protected under the FESA. Three elements are considered in determining whether DPS is a factor as endangered or threatened under FESA. These elements are *discreteness* of the population segment in relation to the remainder of the species, the *significance* of the population segment to the species, and the population segment’s *conservation status* in relation to FESA’s standards for listing. If a DPS is determined to be discrete and significant, its evaluation for endangered or threatened status will be based on FESA’s definitions of those terms and a review of the factors included in section 4(a) of the FESA.

With respect to salmonid DPS, the NMFS has developed a policy that applies only to species of salmonids native to the Pacific. Under the policy, Pacific salmon is considered a DPS if it represents an evolutionarily significant unit (ESU) of a biological species (NOAA, 1996). A species must meet two criteria to be considered a separate ESU: it must be substantially reproductively isolated from other conspecific population units; and it must represent an important component in the evolutionary legacy of the species.

Projects that will result in the “take” of a federally listed or proposed species (as defined by FESA Section 9) are required to consult with the Services. The objective of consultation is to determine whether the project will jeopardize the continued existence of a listed or proposed species, and to determine what mitigation measures will be required to avoid jeopardy. Consultations are conducted under Sections 7 or 10 of FESA depending on the involvement by the federal government.

Under Section 7, the Services are authorized to issue Incidental Take Permits (ITP) for the take of a listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency. A Biological Assessment is usually required as part of the Section 7 consultation to provide sufficient information for the Services to fully determine the project’s potential effect on listed species. The Services must make one of three possible findings for each species potentially affected:

No effect: The proposed action will not affect the listed species or critical habitat;

Not likely to adversely affect: Effects of the proposed action on the listed species are expected to be discountable (extremely unlikely to occur), insignificant (minimal impact without take), or beneficial; and

Likely to adversely affect: An adverse effect may occur as a direct or indirect result of the proposed action, and the effect is not discountable, insignificant, or beneficial.

Section 10 consultation is conducted when there is no federal involvement in a project except compliance with FESA.

The USFWS administers the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) and the Bald and Golden Eagle Protection Act (16 USC 668-688). The MBTA prevents the removal of trees, shrubs, and other structures containing active nests of migratory bird species that may result in the loss of eggs or nestlings. Adherence to construction windows either before the initiation of breeding activities or after young birds have fledged is a typical step to protect migratory birds and comply with the MBTA. The Bald Eagle and Golden Eagle Protection Act prohibits the taking or possession of bald and golden eagles, their eggs, or their nests without a permit from the USFWS.

5.1.2 Waters and Wetlands

The Corps and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredge and fill material into jurisdictional “waters of the United States” (WoUS) and wetlands under Section 404 of the Clean Water Act.

The Corps is responsible for the issuance of permits for the placement of dredged or fill material into WoUS pursuant to Section 404 of the Clean Water Act (33 USC 1344). As defined by the Corps at 33 CFR 328.3(a)(3), WoUS are those waters that are used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; tributaries and impoundments to such waters; interstate waters including interstate wetlands; and, territorial seas.

The Corps asserts jurisdiction over traditional navigable waters (TNW) and adjacent wetlands. Under Corps and EPA regulations, wetlands are defined as: “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

In non-tidal waters, the lateral extent of Corps jurisdiction is determined by the OHWM which is defined as the: “...*line on the shore established by the fluctuations of water and indicated by physical characteristics such as 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.*” (33 CFR 328[e]).

In tidal areas, the Corps’ jurisdiction under Section 404 extends to the high tide line (HTL), which, in the absence of actual data, is defined as: “...*a line of oil or scum along shore objects, a more or less continuous deposit of fine shells or debris on the foreshore or berm, other physical*

markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide.”

Wetlands could also be regulated as waters of the U.S. if they were adjacent to jurisdictional waters (other than waters that are themselves wetlands). The Corps’ regulation concerning wetlands adjacent to jurisdictional waters is defined at 33 CFR 328.4(c)(4).

On June 29, 2015, the Corps and EPA issued new definitions for waters/wetlands (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, 2015), intended to become effective on August 28, 2015. These regulatory definitions are known as the 2015 Clean Water Rule but were never fully implemented because of legal challenges.

In December 2018 the ACOE and EPA proposed a revised definition of waters of the U.S. that was published in the Federal Register in early 2019, and subsequently repealed the 2015 Clean Water Rule reverting regulation back to the 1986 regulations and subsequent guidance for Approved Jurisdictional Determinations. On January 23, 2020, the ACOE and EPA finalized the Navigable Waters Protection Rule to define Waters of the U.S. and streamline the definition so that it includes four categories of jurisdictional waters, provides clear exclusions for features not regulated, and defines terms in the regulatory text. The Navigable Waters Protection Rule fulfills Executive Order 13788 and became effective on June 23, 2020.

The four clear categories of waters that are considered waters of the U.S. under the Navigable Waters Protection Rule include the following:

- Territorial seas and TNW;
- Perennial and intermittent tributaries that contribute surface flow, directly or through non-jurisdictional surface water features, to a TNW in a typical year;
- Lakes, ponds, and impoundments of jurisdictional waters; and
- Adjacent wetlands (wetlands that are physically touching, separated by natural feature, or separated by artificial feature with direct hydrologic surface water connection).

The Navigable Waters Protection Rule also outlines what aquatic features are not waters of the U.S. The most notable of these are groundwater, ephemeral features, many farm and roadside ditches, artificial lakes and ponds or water filled depressions excavated in upland, stormwater control and groundwater recharge features.

5.1.3 Section 10 of the Rivers and Harbors Act of 1899 (33USC 403)

In addition to Section 404, the Corps regulates activities affecting “navigable waters of the United States” under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). Navigable waters are defined as “...those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce (33 CFR 322.2[a]).”

Structures or work under or over a navigable WoUS is considered to have an impact on the navigable capacity of the waterbody (33 CFR 322.3[a]). The Sacramento River, including the reach at the pipeline crossing location, is identified as a Section 10 waterway from the Bay-Delta

north through the Central Valley to the Keswick Dam (near Redding). Corps jurisdiction in Section 10 waterways is Mean High Water.

5.1.4 Section 14 of the Rivers and Harbors Act of 1899 (33USC 408)

The Corps Civil Works Program is responsible for reviewing all Projects approvals that alter or occupy Civil Works projects. Section 408 provides that the Corps may grant permission for another party to alter a Civil Works project upon a determination that the alternative proposed will not be injurious to the public interest and will not impair the usefulness of the Civil Works project. There is a federal levee on the east bank of the Sacramento River. A Section 408 review and permission will be required for the Project.

5.2 STATE

5.2.1 Special-Status Species

The CDFW administers several laws and programs designed to protect the state's fish and wildlife resources. Principal of these is the California Endangered Species Act of 1984 (CESA) (Fish and Game Code Section 2050), which regulates the listing and take of state endangered (SE) and threatened species (ST). Under Section 2081 of CESA, CDFW may authorize an incidental take permit allowing the otherwise unlawful take of a SE or ST species.

CDFW maintains lists of Candidate-Endangered species (SCE) and Candidate-Threatened species (SCT). These candidate species are afforded the same level of protection as listed species. CDFW designates Species of Special Concern (SSC) that are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species but may be added to official lists in the future. The SSC list is intended by CDFW as a management tool for consideration in future land use decisions.

Other state laws also protect wildlife and plants. Section 3511 of the California Fish and Game Code (F&G Code), for example, designates species that are afforded "Fully Protected" (FP) status. F&G Code Sections 4700 and 5515 assign the same status to specified mammals and fish. These statutes generally provide that specifically identified birds, mammals, and fish "or parts thereof may not be taken or possessed at any time and no provision of [the Fish and Game] code or any other law shall be construed to authorize the issuance of permits or licenses to take any Fully Protected [bird, mammal, or fish] and no permits or licenses heretofore issued shall have any force or effect" for any such purpose. For Fully Protected fish and mammals, the only exception to the take prohibition is that the Fish and Game Commission may authorize the collecting of such species "for necessary scientific research" (F&G Code, Sections 4700, 5515). With a proper permit, Fully Protected species may also be captured live and relocated "for the protection of livestock" (Section 3511). Section 3503.5 protects birds-of-prey (Falconiformes and Strigiformes), their eggs, and their nests. That statute provides that, "[I]t is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

CDFW manages the California Native Plant Protection Act (CNPPA) of 1977 (F&G Code Section 1900, et seq.), which was enacted to identify, designate, and protect rare plants. In

accordance with CDFW guidelines, all California Rare Plant Rank (CRPR) 1 (A and B), Rank 2 (A and B), Rank 3, and some Rank 4 plants are considered “rare” under the Act, and meet the definition of Rare or Endangered under the CEQA Guidelines §15125 and/or §15380. Potential impacts to these species are considered during CEQA review of a proposed project. The CNPPA allows landowners, under most circumstances involving new development, to take rare plant species, provided that the owners first notify CDFW and give the agency at least 10 days to come and retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed (F&G Code Section 1913 exempts from “take” prohibition “the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way”).

5.2.2 Waters and Wetlands

Pursuant to Section 1602 of the Fish and Game Code, a Lake or Streambed Alteration Agreement (LSAA) between the CDFW and state or local governmental agency, public utility, or private citizen is required before the initiation of a construction project that will: (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of a river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. Therefore, the CDFW claims jurisdiction over the bed, bank, and channel of drainage features with regard to activities regulated under Section 1602 of the California Fish and Game Code. The CDFW has adopted the same wetland definition as the USFWS, classified by the presence of only one parameter; however, CDFW does not specifically regulate wetlands.

The Porter-Cologne Water Quality Control Act (CA Water Code §§ 13000-13999.10) mandates that waters of the State of California shall be protected. Current policy in California is that activities that may affect waters of the State shall be regulated to attain the highest quality. Waters of the State include any surface water or groundwater, including saline waters, within the boundaries of the state. The Porter-Cologne Act establishes that the state assumes responsibility for implementing portions of the federal CWA, rather than operating separate state and Federal water pollution control programs in California. Consequently, the state is involved in activities such as setting water quality standards, issuing discharge permits, and operating grant programs. Pursuant to Section 401 of the Clean Water Act, the Corps cannot issue a federal permit until the State of California first issues a water quality certification to ensure that a project will comply with state water quality standards. The authority to issue water quality certifications in the Project area is vested with the Central Valley Regional Water Quality Control Board (CVRWQCB).

In April 2019, the State Water Resources Control Board adopted the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material (Procedures), for inclusion in the Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures consist of four major elements: 1) a wetland definition; 2) wetland delineation procedures; 3) a wetland jurisdictional framework; and 4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Procedures took effect in May 2020.

The new Procedures also include a State wetland definition. A State wetland is defined in the new Procedures as an aquatic feature that “...*under normal circumstances has continuous or recurrent saturation of the upper substrate caused by groundwater, shallow surface water, or*

both; duration of saturation sufficient to cause anaerobic conditions in the upper substrate; and, vegetation that is dominated by hydrophytes or lacks vegetation.”

If an aquatic feature meets the definition of a wetland it may be considered a water of the State.

5.3 LOCAL AND REGIONAL PLANS

5.3.1 Sacramento County General Plan

The unincorporated lands of Sacramento County fall under the jurisdiction of the County. The Conservation Element of the Sacramento County General Plan contain goals and policies pertaining to biological resources of Sacramento County (Sacramento County, 2017). Goals and policies that are relevant to biological resources are included in this Section.

5.3.1.1 Habitat Mitigation

Goals: 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:

- vernal pools,
- Wetlands,
- Riparian,
- Native vegetative habitat, and
- Special-status species habitat.

5.3.1.2 Habitat Preserve and Management

Goals: 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-63.** Vernal pools, wetlands, and streams within identified preserves shall not be drained, excavated, or filled for the purpose of converting the land to another use. If fill or modification is required for Drainage Master Plans, stormwater quality or levee maintenance, creation or restoration of an equal amount must occur within the boundaries of the preserve to achieve no net loss consistent with policy CO-58.

5.3.1.3 Protection of Special-status Species Habitat

Goal: 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.

5.3.2 Solano County General Plan

At the local level, Solano County has developed a number of policies to protect and enhance the County's natural habitats and diverse plant and animal communities (Solano County, 2008).

- **RS.P-1:** Protect and enhance the County's natural habitats and diverse plant and animal communities, particularly occurrences of special-status species, wetlands, sensitive natural communities, and habitat connections.
- **RS.P-2:** Manage the habitat found in natural areas and ensure its ecological health and ability to sustain diverse flora and fauna.
- **RS.P-3:** Focus conservation and protection efforts on high-priority habitat areas.
- **RS.P-5:** Protect and enhance wildlife movement corridors to ensure the health and long-term survival of local animal and plant populations. Preserve contiguous habitat areas to increase habitat value and to lower land management costs.

6.0 SIGNIFICANCE CRITERIA

The impact of the Project on biological resources was evaluated in terms of mandatory findings of significance at Section 15065 of CEQA and Appendix G of the State CEQA Guidelines (Governor's Office of Planning and Research, 2018). The various components of the Project were considered in association with site conditions and were evaluated against CEQA criteria and County General Plan policies pertaining to biological issues. In accordance with these CEQA Guidelines, a project will normally result in a significant impact if any of the following conditions would result from project implementation:

- 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, USFWS, or NMFS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulation, or by the CDFW, USFWS, or NMFS;
- 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;
- 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 site;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and,
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Additionally, the CEQA Guidelines Initial Study Land Use and Planning checklist notes that conflicts with applicable land use plans, policies, or regulations of an agency with jurisdiction over the project should be considered during a project's environmental review.

7.0 PROJECT IMPACT ANALYSIS

Effects on biological resources in the Project area will be entirely temporary. There will be a temporary loss of potential fish and wildlife habitat during replacement, decommissioning, and removal of pipeline segments. General construction will temporarily alter the natural movement and behavior of wildlife in the Project area. Construction may also result in indirect impacts that affect the quality of habitat in the Project area.

7.1 IMPACT CATEGORIES

Short-term and long-term impacts are analyzed for the proposed Project. Each impact statement is classified as to the level of significance, based on the significance thresholds from Section 6.0, and the availability of measures to feasibly mitigate project effects. Impact categories include:

- **Significant Unavoidable Impact** is an adverse effect that cannot be mitigated. This category of impact is one for which a solution has not been formulated, either because of the limits of technical and/or scientific knowledge, or unfeasibility from a technical, economic, and/or political perspective. Under CEQA, a Significant Unavoidable impact would require a “finding of overriding consideration” by the Lead Agency to approve the project;
- **Significant Mitigable Impact** is an adverse environmental effect that can be mitigated to less than significant levels. Measures have been identified that can feasibly be implemented and will avoid the impact altogether by not taking a certain action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implementation; rectify the impact by repairing, rehabilitating, or restoring the affected environment; or compensate for the impact by replacing or providing substitute resources or environments;
- **Less than Significant Impact** is an adverse environmental effect that is less than significant or has no identified impact. These impacts, while adverse, are not of a sufficient magnitude, intensity, or duration to disrupt the environment, and have no serious consequences. As a result, no mitigation is required; and
- **Beneficial Impacts** is an environment effect of the project that benefits or improves the environment and no mitigation is required.

7.2 IMPACTS TO BIOLOGICAL RESOURCES

Effects on biological resources include primarily temporary impacts associated with excavation for HDD pipeline replacement (pipeline replacement phase of the Project), pigging and flushing of the existing pipeline, installation of concrete slurry into sections of pipeline designated to be retired in place, and excavation and removal of segments of pipeline designated for removal (decommissioning phase of the Project). There will be no permanent impact to habitat as part of the Project. Temporary impacts associated with the Project include habitat disturbance, localized turbidity, and vegetation removal. Indirect impacts include invasion of non-native plants into natural areas, noise disturbances, and temporary declines in air and water quality. Removal of retired pipeline facilities from the waterway crossings may also result in a benefit to the

watershed. Final decommissioning and removal of the pipeline crossing from the Sacramento River will eliminate exposed pipeline. Removal of the pipeline and associated debris from the riverbed will result in restored underwater habitat at these locations once the Project is complete.

PG&E has agency approved Habitat Conservation Plans (HCPs) that provide a comprehensive framework to conserve and protect federally listed species in support of a federal incidental take permit for the covered species for PG&E Operations and Maintenance (O&M) activities in the San Joaquin Valley Region, Bay Area Region, and Multiple Regions (Sacramento Valley and Foothills, North Coast, and Central Coast) (Jones & Stokes, 2007; ICF, 2017; ICF, 2020). The L-130 River Crossing Pipeline Replacement Project is located in both Sacramento and Solano Counties which spans two Habitat Conservation Plan Areas: Project activities in Sacramento County are covered in the Multi-Region Habitat Conservation Plan (MRHCP) and Solano County is covered in the Bay Area Habitat Conservation Plan (BAHCP). The PG&E MRHCP and BAHCP were developed in collaboration with the USFWS were implemented in 2017 and 2020, respectively. Both the BAHCP and MRHCP are model-based HCPs, that incorporate the use of modeled habitat developed in collaboration with the USFWS for covered species. Modeled habitat is used as a tool to facilitate automatic screening of an impact area to determine covered species occupancy and apply take coverage of the appropriate HCP.

Listed fish species that occur in the Sacramento River in the Project area are not HCP covered species and the need to conduct in-water work for successful completion of the Project will have the potential to impact non-covered listed fish species; therefore, covered activities associated with this Project are not entirely covered by the HCPs. However, for consistency with the agency-approved PG&E HCPs, Field Protocols (FPs) and AMMs outlined for species protection in the HCPs will be implemented by this Project because they are effective in reducing impacts to covered species. Although the Project activities located in Solano County are within the BAHCP Area, there is no modeled habitat and no likelihood of occurrence of BAHCP covered species within the Project area; therefore, FPs and AMMs from the BAHCP will not be implemented by the Project. Consistent with implementation practices of the MRHCP, standard Field Protocols will be implemented, where practicable, for all PG&E O&M Projects. These measures are considered to be practicable where physically possible and not conflicting with other regulatory obligations or safety considerations. Additional relevant species-specific AMMs from MRHCP are also included as part of the Project and are described individually below. The AMMs are outlined in Table 7-1 and their implementation was considered when analyzing the potential impacts of the Project.

Table 7-1. PG&E MRHCP Field Protocols and Avoidance and Minimization Measures to be Implemented as part of the Project

Field Protocols / AMMs.	Measure Description
FP-01	Conduct annual training on habitat conservation plan requirements for employees and contractors performing covered activities in the Plan Area that are applicable to their job duties and work. Tailboard and site-specific training will also be conducted prior to commencing work.
FP-02	Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
FP-03	Use existing access and ROW roads. Minimize the development of new access and ROW roads, including clearing and blading for temporary vehicle access in areas of natural vegetation.
FP-04	Route off-road access paths and site work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).
FP-06	Minimize potential for covered species to become trapped, injured, or killed in pipes, culverts, or under materials or equipment. Inspect pipes and culverts wide enough to be entered by a covered species that could inhabit the area where pipes are stored for wildlife species prior to moving pipes and culverts. Contact a biologist if a covered species or other federally-listed species is suspected or discovered.
FP-07	Vehicle speeds on unpaved roads will not exceed 15 miles per hour.
FP-08	Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.
FP-10	Minimize the covered activity footprint and minimize the amount of time spent at a work site to reduce the potential for take of species.
FP-11	Utilize standard erosion and sediment control BMPs (pursuant to the most current version of PG&E's <i>Stormwater Field Manual for Construction Best Management Practices</i>) to prevent construction site runoff into waterways.
FP-12	Stockpile soil within established work site boundaries and locate stockpiles so as not to enter water bodies, stormwater inlets, other standing bodies of water. Cover stockpiled soil prior to precipitation events.
FP-13	Fit open trenches or steep-walled holes with escape ramps of plywood boards or sloped earthen ramps at each end if left open overnight. Field crews will search open trenches or steep-walled holes every morning prior to initiating daily activities to ensure wildlife is not trapped. Field crews will not handle covered species. If any covered wildlife species is found, work will stop and a biologist will be notified. A biologist with appropriate take permits will relocate the species to adjacent habitat or the species will be allowed to naturally disperse, as determined by a biologist.
FP-14	If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial "weed free" seed mix. (Except in suitable habitat for Mount Hermon June beetle, Ohlone tiger beetle and Zyante band-winged grasshopper.)
FP-15	Prohibit vehicular and equipment refueling within 250 feet of the edge of wetlands, streams, or waterways. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. Maintain spill prevention and cleanup equipment in refueling areas.
FP-16	Maintain a buffer of 250 feet from the edge of wetlands, ponds, or riparian areas. If maintaining the buffer is not practicable because the covered activity footprint is within the buffered area, other

Table 7-1. PG&E MRHCP Field Protocols and Avoidance and Minimization Measures to be Implemented as part of the Project

Field Protocols / AMMs.	Measure Description
	measures as prescribed by the biologist or the HCP administrator to minimize impacts such as flagging access routes or paths, requiring foot access, restricting work until the dry season, or requiring a biological monitor during the activity.
FP-17	Directionally fall trees away from an exclusion zone, if an exclusion zone has been defined. If this is not practicable, remove the tree in sections. Avoid damage to adjacent trees to the extent practicable. Avoid removal of snags and conifers with basal hollows, crown deformities, and/or limbs more than 6 inches in diameter.
FP-18	Nests with eggs and/or chicks will be avoided: contact a biologist or the Avian Protection Program Manager for further guidance. Work will be stopped until the crew can obtain clarification from a biologist or the Avian Protection Program Manager on how to proceed.
FP-19	Inspect and maintain exclusion fencing installed to exclude species from work areas.
GGs-1	Conduct work during the active season (May 1–October 1) to the extent practicable. A biologist will conduct a survey and identify where exclusion fencing is needed. If needed, a solid exclusion fence will be installed around the perimeter of work sites and will be inspected weekly. Burrows and other refuge habitat will be avoided to the extent practicable. If work will be conducted during the inactive period (October 2–April 30) then PG&E will conduct preparation work during the snake's active period to make construction areas ready for work during the inactive season. Preparation work includes, at a minimum, adding baserock to access roads and work sites, grading access roads and work sites, and installing work zone exclusion fencing. If giant gartersnakes are encountered during construction activities, snakes will be allowed to move away from construction or a biologist will follow USFWS handling protocols and move snakes to the nearest appropriate habitat out of harm's way.
Wetland-2	Identify wetlands, ponds, and riparian areas and establish and maintain a buffer of 50 feet around wetlands, ponds, and riparian areas. If maintaining the buffer is not practicable because the work sites are within any part of the buffered area, the field crew will implement other measures as prescribed by the biologist to minimize habitat impacts. These measures may include flagging access, requiring foot access, restricting work until the dry season, or requiring a biological monitor during the activity. Activities must maintain the hydrology necessary to support the wetland, pond, or riparian area (inclusive of downstream).

The following analysis provides an assessment of potential impacts from the proposed Project activities and includes the appropriate PG&E MRHCPs FPs and AMMs, Project-specific applicant proposed AMMs, and/or prescribed mitigation measures to reduce impacts to special-status species or other biological resources to a level of less than significant.

IMPACT BIO-1: Construction of the pipeline maintenance projects may result in impacts to special-status plant species.

DISCUSSION: There are known occurrences of special-status plant species on the west bank of the Sacramento River, including Mason's lilaeopsis and Suisun marsh aster. Other special-status species, such as delta tule pea, Bolander's water hemlock, and woolly rose-mallow have not been previously documented in the Project area but have the potential to

occur in wetlands in the delta. The known occurrences of special-status plant species in the Project area were reported from protocol-level rare plant surveys conducted by Nomad Ecology in support of the Project (Nomad Ecology, 2020) and biological reconnaissance surveys conducted by Padre biologists.

Temporary impact to terrestrial areas that provide suitable habitat for special-status species is relatively small (0.005-acre). Decommissioning and removal of the pipeline from the west bank of the Sacramento River will impact Suisun marsh aster, a CRPR Rank 1B.2 plant. Surveys conducted for the Project in 2020 identified one individual plant occurrence on the west bank within the excavation footprint required for decommissioning and removal of the pipeline (Figure 5B). Populations of Mason's lilaeopsis and Suisun marsh aster located further south on the west bank will not be impacted by the Project.

All of the special-status plant species known or potentially occurring within this area are California Rare Plant Rank (CRPR) species. There are no state or federally listed threatened or endangered plant species likely to occur in the Project area. Impacts to special-status plant species ranked CRPR 1B or 2B are considered potentially significant impacts because they meet the CEQA definition of rare or endangered (see Section 15380 of the State CEQA Guidelines).

IMPACT CATEGORY: Potentially Significant Impact with Mitigation Required.

RECOMMENDED MITIGATION MEASURE – MM BIO-1: The following recommended mitigation measures would reduce project impacts to special-status plants in the Project area to less than significant.

- a. Prior to the start of construction, a qualified botanist shall survey the Project impact area on the west bank of the Sacramento River to document the current status and size of the population for the purposes of documenting baseline conditions prior to the start of construction.
- b. If a special-status plant population is found, it shall be flagged for avoidance, if feasible.
- c. If temporary impacts cannot be avoided, impact to special-status plant populations shall be restored upon project completion to pre-existing condition. A Site Restoration Plan shall be prepared that provides for plant salvage and transplantation and/or seed collection and replanting, as appropriate, and establish performance criteria and monitoring to ensure restoration to pre-project conditions.

BIO-1 IMPACT CATEGORY: Less than Significant with implementation MM BIO-1.

IMPACT BIO-2: The in-water work associated with decommissioning and removal of the L-130 pipeline from the waterways could impact special-status fish species, if present, in the Project area during decommissioning activities. In-water work will temporarily increase turbidity to the aquatic environment immediately surrounding the pipeline removal location. Increases in turbidity can result in physical effects that adversely affect habitat and temporary suspension of sediments, organic matter, or contaminated constituents contained within the sediments could be introduced into the water column. Large-scale increases of organic matter within a water column, usually associated with fine sediments,

such as silts and clays, can increase dissolved nutrient concentrations, resulting in increased algal blooms or decrease dissolved oxygen when the suspended sediments are anoxic or have a high chemical oxygen demand. The use of a turbidity curtain, if determined to be necessary, may be deployed at the in-water work sites to minimize the effects of increased turbidity to surrounding areas.

In-water work and the installation of a turbidity curtain, if determined to be necessary, could temporarily prevent fish movement and preclude fish use of the aquatic habitat at the discrete in-water work location for a short period of time. The use of a turbidity curtain, if determined to be necessary, may be deployed at discrete in-water work sites to minimize the effects of increased turbidity to surrounding areas.

A Turbidity Monitoring Plan will be developed for the project, which will include provisions for monitoring turbidity during underwater excavation and other project activities that have the potential to increase turbidity. Turbidity curtains may be used if turbidity monitoring indicates that turbidity levels would exceed permitted thresholds, and site conditions, such as strong currents, at the time of construction do not make their use infeasible; however, given the tidal influence and strong currents typical of the lower Sacramento River, the feasibility of turbidity curtain use may be limited to specific locations where turbidity curtain use is practical.

PROJECT-SPECIFIC APPLICANT PROPOSED AMMs: The applicant has proposed Project-specific AMMs to reduce the potential for impact to special-status fish species and has incorporated them into the Project design. The following measures will be implemented during construction activities involving work in or on the banks of the Sacramento River.

- a. An environmental training program will be developed and presented by a qualified biologist. All contractors and employees involved with the Project will be required to attend the training program. At a minimum, the program will cover special-status species that could occur on the site, their distribution, identification characteristics, sensitivity to human activities, legal protection, penalties for violation of state and federal laws, reporting requirements, and required Project avoidance, minimization, and mitigation measures.
- b. Construction activities in surface water or on the banks of the waterways will be conducted within the agency approved aquatic work windows for avoidance of listed fish species (August 1 to October 31). This coincides with the timeframe when the aquatic work area is least likely to support special-status fish species based on water temperature, dissolve oxygen, and seasonal migration and spawning.
- c. A qualified biological monitor will be present to monitor project activities during all in-water work and initial ground disturbance that has the potential to impact special-status species.
- d. A Turbidity Monitoring Plan will be implemented during all in-water work to ensure that turbidity levels upstream and downstream of the Project area are compliant with regulatory requirements.

- e. Turbidity curtains, if determined to be necessary and feasible, will be installed around the in-water work area prior to any work in surface waters. The feasibility of use of turbidity curtain will be determined based on site specific conditions at the time of construction (water depth, tidal action, currents, etc.) and the need for use of a turbidity curtain will be based on the results of the turbidity monitoring program.

BIO-2 IMPACT CATEGORY: Less than Significant with implementation of Applicant Proposed AMMs.

IMPACT BIO-3: Construction activities within and adjacent to the Sacramento River, Tomato Slough, and unnamed irrigation ditches could potentially impact aquatic species such as western pond turtle.

DISCUSSION: Based on the review of pertinent literature, the proximity to known occurrences, and focused herpetological habitat assessment surveys, WPT has a high potential for occurrence, particularly on the Sacramento River, in the west work area, and adjacent to Tomato Slough near the eastern limits of the Project area. There are documented occurrences of WPT in the Rio Vista Army Reserve Center, which partially coincides with the west work area. Focused herpetological habitat assessment surveys concluded that suitable basking and nesting habitat occurs in the west work area and in the east Project area, near Tomato Slough and that there is a high likelihood of occurrence of WPT in these locations and potential for occurrence throughout the Project area. Implementation of the Project will result in short-term temporary impacts to WPT and may impact nests or females attempting to nest (SBI, 2020). However, no permanent impact or loss of habitat will occur as a result of the Project.

APPLICANT PROPOSED AMMs: The applicant has proposed the following AMMs in combination with the Field Protocols identified in Table 7-1 to reduce the potential for impact to WPT to reduce project impact to less than significant levels:

- a. A qualified biologist will conduct pre-construction surveys for WPT and their nests 48 hours prior to ground disturbance to ensure that individuals are not present in the work area.
- b. Prior to ground disturbance activities, a barrier, such as wildlife exclusion fencing, will be placed around the excavation area to prevent WPT from moving into work areas.
- c. A qualified biological monitor will be present to monitor project activities during all in-water work and initial ground disturbance that has the potential to impact special-status species. If WPT is observed within the work area during construction, the biologist will relocate WPTs the shortest distance possible to a location that contains suitable habitat and will not be affected by activities.

BIO-3 IMPACT CATEGORY: Less than Significant with implementation of Applicant proposed AMMs and standard MRHCP Field Protocols.

IMPACT BIO-4: Construction activities within and adjacent to the Sacramento River, Tomato Slough, and unnamed irrigation ditches could potentially impact aquatic species such as giant gartersnake.

DISCUSSION: Based on the review of pertinent literature, the proximity to known occurrences, and focused herpetological habitat assessment surveys, GGS is unlikely to occur in the west work area. The east bank of the Sacramento River is modeled GGS habitat in the MRHCP and although GGS cannot be ruled out in this area, occurrence is unlikely (SBI, 2020). The Project area east of Highway 160 is hydrologically connected to a known occurrence of GGS and is considered to have a low potential for occurrence, with higher potential in areas nearest to Tomato Slough (SBI, 2020). Implementation of the Project may result in short-term temporary impacts to the GGS but not result in permanent impacts or loss of habitat. Implementation of AMMs from the MRHCP will further reduce the potential for impact to GGS.

MRHCP SPECIES-SPECIFIC AMMs: Consistent with the PG&E MRHCP, the following measures will be implemented during construction activities for protection of GGS. These measures in combination with the Field Protocols identified in Table 7-1 will reduce Project impacts to less than significant levels:

MRHCP GGS-1: Conduct work during the active season (May 1 to October 1) to the extent practicable. A biologist will conduct a survey and identify where exclusion fencing is needed. If needed, a solid exclusion fence will be installed around the perimeter of work sites and will be inspected weekly. Burrows and other refuge habitat will be avoided to the extent practicable.

If work will be conducted during the inactive period (October 2 to April 30) then PG&E will conduct preparation work during the snake's active period to make construction areas ready for work during the inactive season. Preparation work can include, at a minimum, adding baserock to access roads and work sites, grading access roads and work sites, and installing work zone exclusion fencing.

If giant gartersnakes are encountered during construction activities, snakes will be allowed to move away from construction or a biologist will follow USFWS handling protocols and move snakes to the nearest appropriate habitat out of harm's way.

BIO-4 IMPACT CATEGORY: Less than Significant with implementation of MRHCP GGS-1 and standard MRHCP Field Protocols.

IMPACT BIO-5: Vegetation removal and construction activities associated with pipeline replacement or pipeline decommissioning and removal could impact nesting Swainson's hawk.

DISCUSSION: The State-threatened Swainson's hawk occurs in the Project vicinity and could nest in proximity to construction areas. There are known nesting occurrences of Swainson's hawk within 0.5-mile of the Project area (on Brennan Island near the agricultural fields) and it is likely that active nests could occur in proximity to construction activities. Terrestrial impact is limited to annual grassland and ruderal habitat in the west work area and agricultural fields in the east work area, both of which provide suitable foraging habitat; however, terrestrial impacts will be short term and temporary and would

not result in permanent impacts or loss of foraging habitat. Additionally, no trees that provide suitable nesting habitat will be removed.

Because Swainson's hawk is a State-listed species, and there are known nesting occurrences in the vicinity of the Project area, there is the potential that construction near Swainson's hawk nesting areas could disrupt breeding activities.

The following mitigation measure would reduce impacts to nesting Swainson's hawk resulting from Project construction.

RECOMMENDED MITIGATION MEASURE - MM BIO-5. The following measures are required to reduce Project impacts to nesting occurrences of Swainson's hawk to less than significant levels:

- a. For construction work beginning outside Swainson's hawk nesting season (September 15 to March 1), impacts to Swainson's hawks would be avoided and no additional mitigation would be required.
- b. For Project activities within Swainson's hawk nesting season (March 1 to September 15), a qualified biologist shall conduct pre-construction Swainson's hawk surveys. If active Swainson's hawk nests are identified near the Project area, based on nest protection buffers outlined in PG&E's Nesting Bird Management Plan the following will be required:
 - i. Postpone Project activities within 0.25-mile of the nest until after the young have fledged and are no longer dependent on the nest tree.
 - ii. If it is not possible to postpone Project activities that may cause nest abandonment or forced fledging within the nest protection buffer, construction may proceed with CDFW approval and monitoring of the nest by a qualified raptor biologist during construction. If signs of distress are observed, the monitoring biologist will have the authority to stop construction work. If the nest is abandoned due to project-related disturbance, but the nestlings are still alive, the Project proponent is required to fund the recovery and hacking, that is the controlled release of captive reared young, of the nestlings.

BIO-5 IMPACT CATEGORY: Less than Significant with implementation of MM BIO-2.

IMPACT BIO-6. Vegetation removal or ground-clearing activities could impact bird species protected under the Migratory Bird Treaty Act (MBTA) or raptors or other special-status bird species such as northern harrier, white-tailed kite, American peregrine falcon, osprey, and song sparrow (Modesto population).

DISCUSSION: Vegetation present within the biological study area could provide nesting habitat for bird species protected by the MBTA or raptors and other special-status bird species. Vegetation removal or ground-clearing activities could potentially impact nesting birds that are protected under the federal MBTA of 1918 (16 USC 703-711) and Fish and Game codes (Sections 3503, 3503.5, and 3800). The laws and regulations prohibit the take, possession, or destruction of birds, their nests, or eggs. Disturbance that causes nest abandonment and/or loss of reproductive effort could be considered a "take".

PROJECT-SPECIFIC APPLICANT PROPOSED AMMs: The applicant has proposed Project-specific AMMs to reduce the potential for impact to raptors and other special-status bird species to reduce project impact to less than significant levels:

- a. Schedule vegetation removal and ground-clearing activities prior to the initiation of nesting activity (March) or after fledging (August).
- b. Conduct pre-construction surveys between March 1 and August 1 in potential nesting habitat within 350 feet of the Project area to identify nest sites. If an active raptor or passerine bird nest is identified, an appropriate species-specific nest protection buffer will be identified based on PG&E's Nesting Bird Management Plan and site-specific conditions. Construction activities will be prohibited within the established buffer zones until the young have fledged. Preparation of a pre-construction nesting survey report will be prepared and submitted to CDFW and the California State Lands Commission (CEQA Lead Agency) that outlines surveys conducted, nest locations identified, and recommended nest protection buffers.

BIO-6 IMPACT CATEGORY: Less than Significant with implementation of Applicant proposed AMMs.

IMPACT BIO-7: The Project will result in temporary impacts to aquatic resources (waters of the U.S. and wetlands) regulated by the Corps under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The Project will also result in temporary impacts to aquatic resources regulated by the Central Valley RWQCB under Section 401 of the Clean Water Act and CDFW under Section 1600 of the California Fish and Game Code.

DISCUSSION: A Preliminary Aquatic Resource Delineation has been conducted for the Project to determine the geographic extent of federal and state regulatory jurisdiction (Padre, 2021). Up to 0.30 acres of temporary disturbance to federally jurisdictional waters and wetlands may occur because of the proposed removal of the decommissioned pipeline from the Sacramento River. Up to 0.30 acres of waters of the State and CDFW stream features may also be temporarily impacted by the Project. Figure 5 depicts temporary impacts to aquatic resources.

RECOMMENDED MITIGATION MEASURE – MM BIO-7:

- PG&E shall obtain all necessary permits for impacts to jurisdictional aquatic resources from the Corps, CVRWQCB, and CDFW prior to Project implementation. The Project must comply with all permit conditions.
- Standard best management practices, such as the use of silt fencing and straw wattle, will be implemented within the disturbance footprints at each terrestrial excavation location to minimize erosion, increased turbidity, and sedimentation to the waters and wetlands.
- After decommissioning and removal activities are complete, the shoreline and levee disturbance areas will be restored to pre-project contours and condition. Levee disturbance areas will be restored consistent with Central Valley Flood Protection Board and Local Maintaining Agency requirements and encroachment permits issued

for the Project. Wetland impact areas on the shoreline of the Sacramento River will be restored to pre-existing condition. A Site Restoration Plan will be developed that will include the restoration of emergent wetland habitat removed for completion of the Project. The Site Restoration Plan will be submitted to the California State Lands Commission for approval prior to the start of construction.

BIO-7 IMPACT CATEGORY: Less than Significant with implementation of MM BIO-7.

8.0 REFERENCES

8.1 LITERATURE

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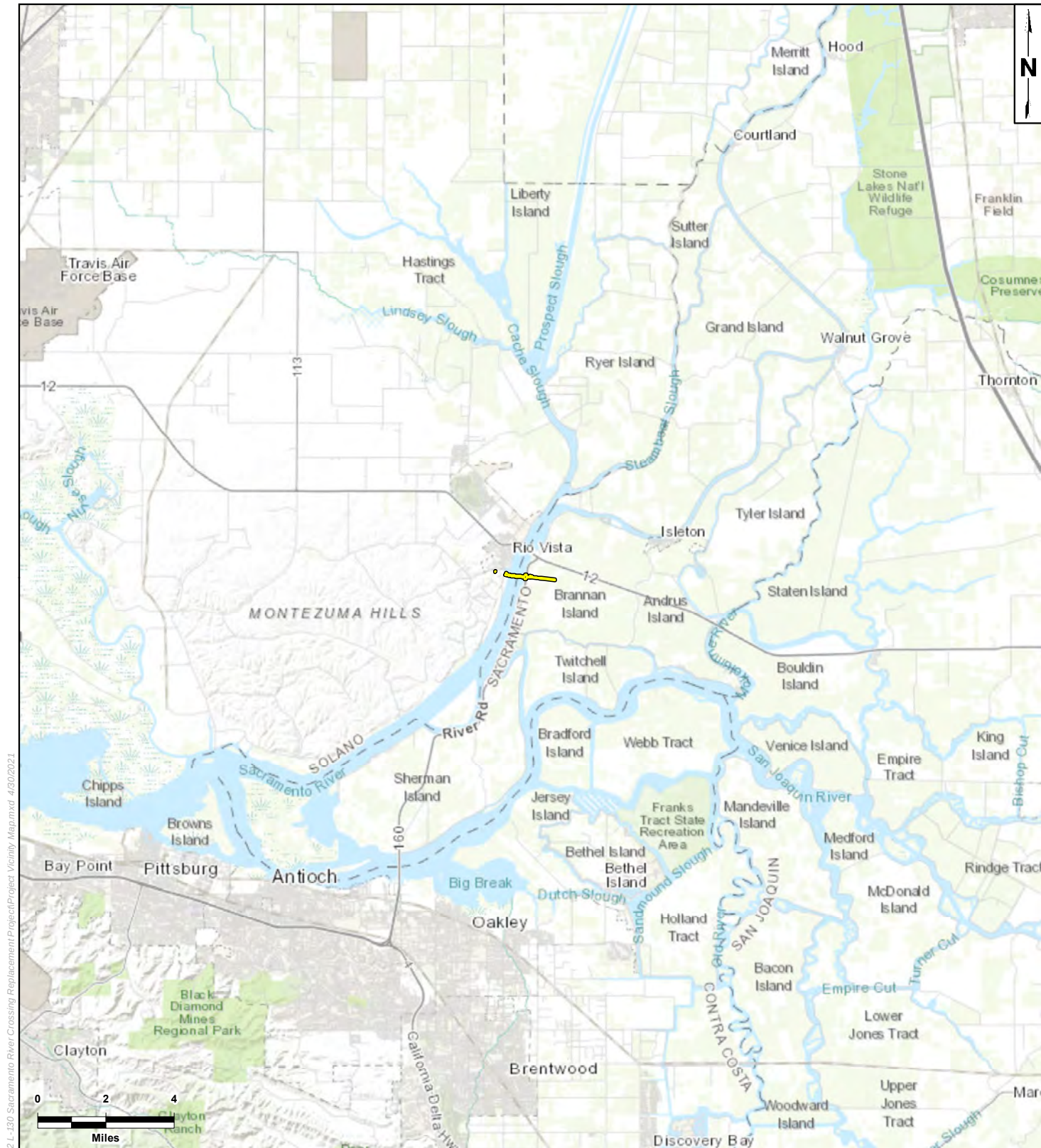
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FIGURES



LEGEND:

 Project Location

Source: Esri Online Topo Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

MAP EXTENT:



padre
associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E R-1402- L-130
SACRAMENTO RIVER CROSSING REPLACEMENT PROJECT
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
April 2021

PROJECT VICINITY MAP

FIGURE

1

Z:\GIS\Projects\GIS Maps\Map Project\PG&E R-1402 L-130 Sacramento River Crossing Replacement Project\HDD Project Overview.mxd 4/6/2021



Source: Longitude 123

Notes: This map was created for informational and display purposes only.

padre
associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
April 2021

HDD PROJECT OVERVIEW

FIGURE
2

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Source: Longitude 123
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E L-130 SACRAMENTO RIVER CROSSING REPLACEMENT/DECOMMISSIONING SACRAMENTO AND SOLANO COUNTIES, CA	
PROJECT NUMBER: 2002-5361	DATE: September 2021

DECOMMISSIONING PROJECT OVERVIEW

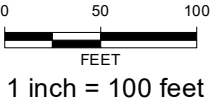
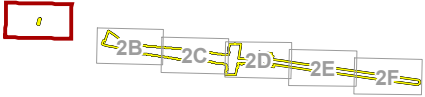
FIGURE
3



LEGEND:

- + Control Point
- Study Area Boundary (33.72 ac)
- Vegetation Communities**
- Urban Mix

MAP EXTENT:



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E L-130 SACRAMENTO RIVER CROSSING REPLACEMENT/DECOMMISSIONING SACRAMENTO AND SOLANO COUNTIES, CA	
PROJECT NUMBER: 2002-5361	DATE: August 2021

**VEGETATION
COMMUNITY MAP**

**FIGURE
4A**



LEGEND:

- +

 Control Point

Study Area Boundary (33.72 ac)
- Vegetation Communities**

Central Coast Riparian Scrub

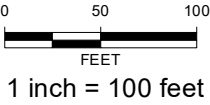
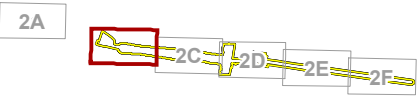
Coastal and Valley Freshwater Marsh

Non-Native Grassland
- Riverine

Ruderal

Urban Mix

MAP EXTENT:



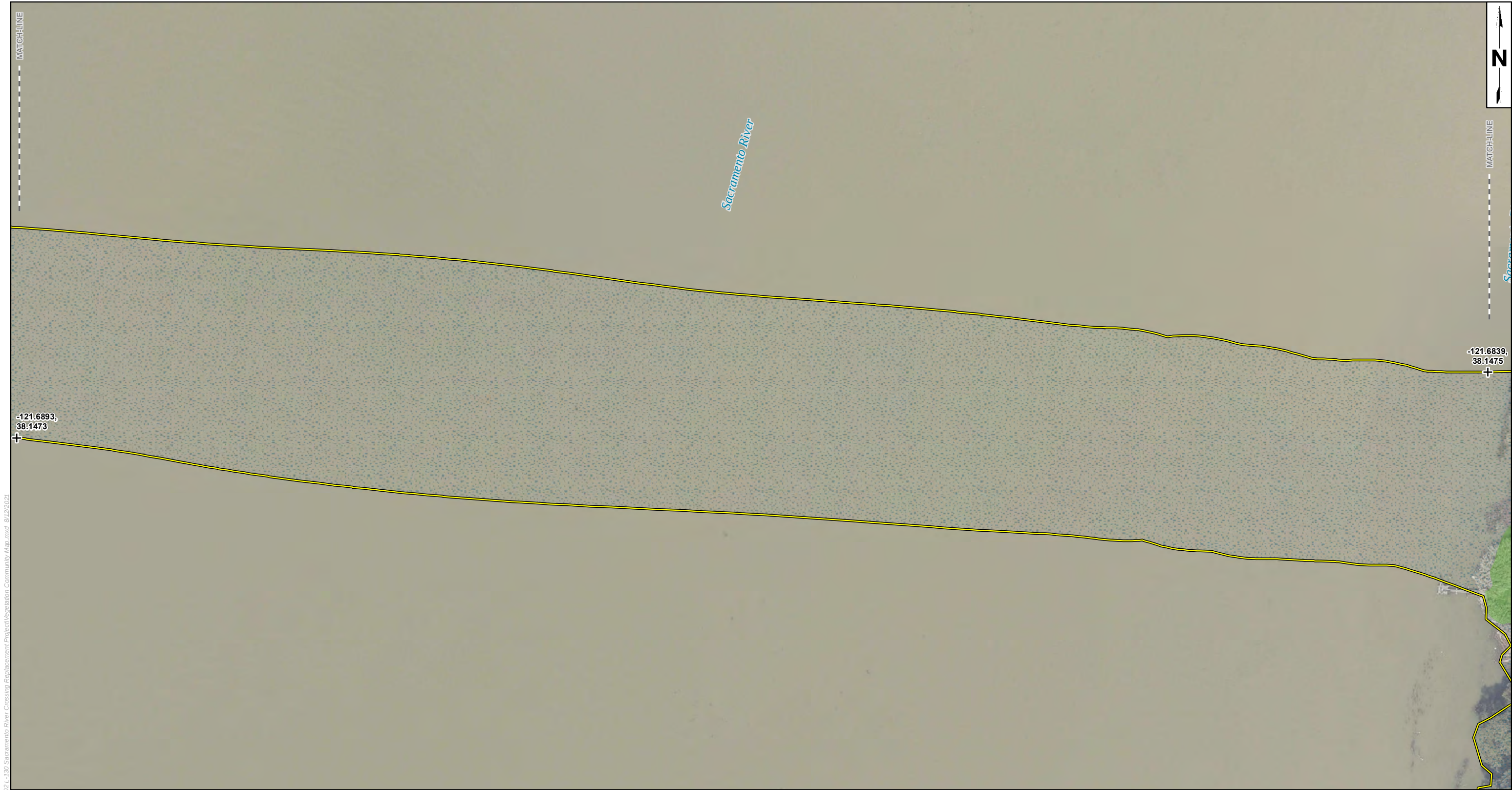
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Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



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PROJECT NUMBER: 2002-5361	DATE: August 2021

**VEGETATION
COMMUNITY MAP**

**FIGURE
4B**



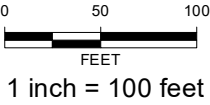
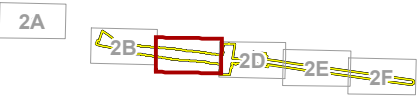
LEGEND:

- + Control Point

Study Area Boundary (33.72 ac)
- Vegetation Communities**

Riverine
- Ruderal

MAP EXTENT:



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E L-130 SACRAMENTO RIVER CROSSING REPLACEMENT/DECOMMISSIONING SACRAMENTO AND SOLANO COUNTIES, CA	
PROJECT NUMBER: 2002-5361	DATE: August 2021

**VEGETATION
COMMUNITY MAP**

**FIGURE
4C**



LEGEND:

- + Control Point**

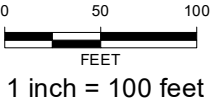
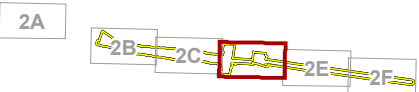
Study Area Boundary (33.72 ac)
- Vegetation Communities**

 - Agriculture
 - Ruderal
 - Coastal and Valley Freshwater Marsh
- Riverine

Ruderal

Urban Mix

MAP EXTENT:



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

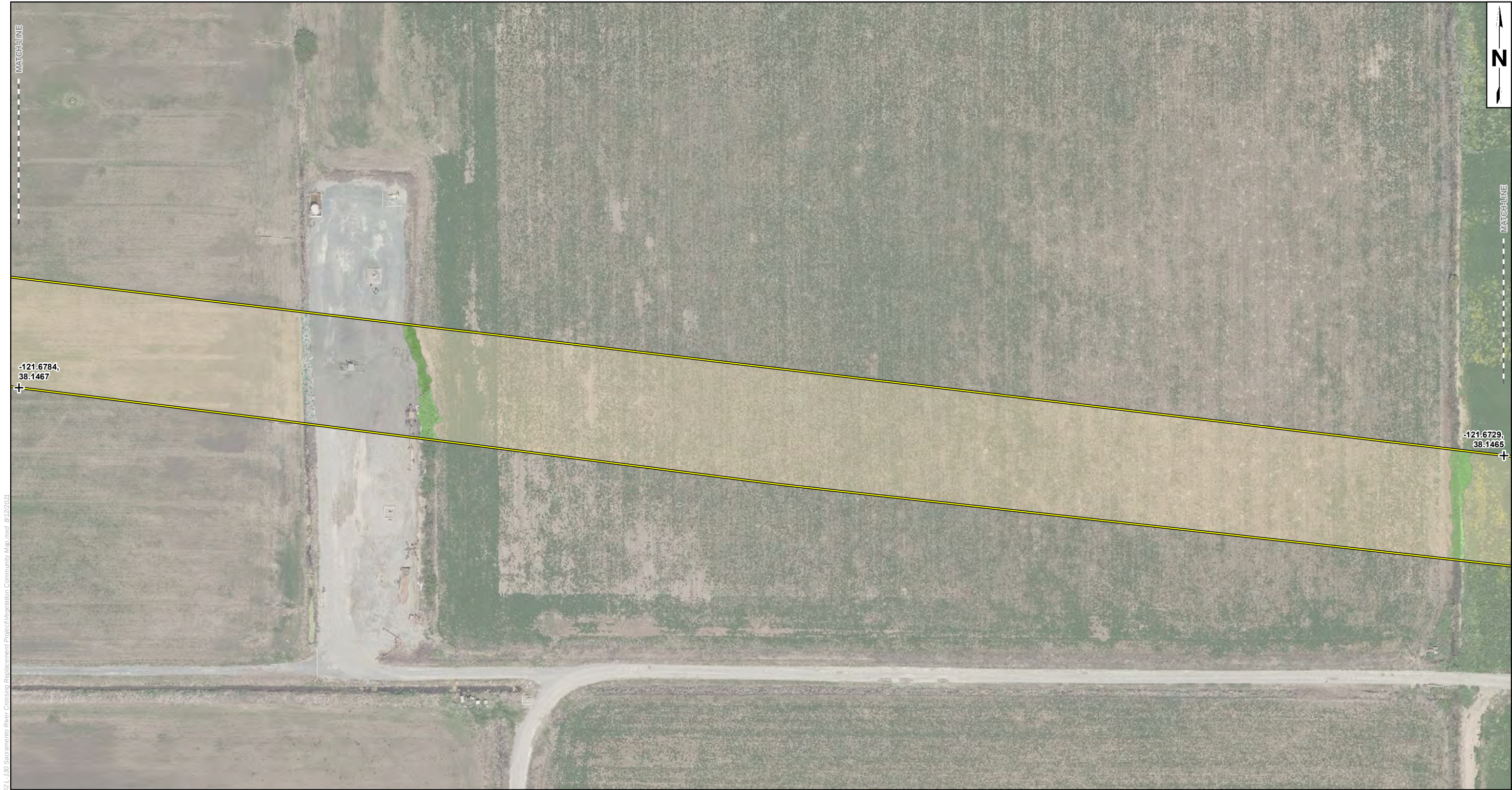


PROJECT NAME: PG&E L-130 SACRAMENTO RIVER CROSSING REPLACEMENT/DECOMMISSIONING SACRAMENTO AND SOLANO COUNTIES, CA	
PROJECT NUMBER: 2002-5361	DATE: August 2021

**VEGETATION
COMMUNITY MAP**

**FIGURE
4D**

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LEGEND:

+ Control Point

Study Area Boundary (33.72 ac)

Vegetation Communities

Agriculture

Central Coast Riparian Scrub

Coastal and Valley Freshwater Marsh

Ruderal

Urban Mix

MAP EXTENT:

2A 2B 2C 2D 2E 2F

0 50 100

FEET

1 inch = 100 feet

Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

padre
associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
August 2021

**VEGETATION
COMMUNITY MAP**

**FIGURE
4E**



LEGEND:

+ Control Point

Study Area Boundary (33.72 ac)

Vegetation Communities

Agriculture

Coastal and Valley Freshwater Marsh

Ruderal

Urban Mix

MAP EXTENT:

2A2B2C2D2E

0 50 100

FEET

1 inch = 100 feet

Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

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SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
August 2021

**VEGETATION
COMMUNITY MAP**

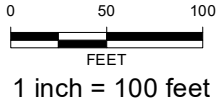
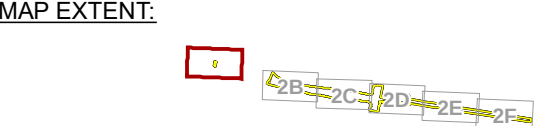
FIGURE
4F



Z:\GIS Projects\GIS Maps\Map Project\PG&E R-4402 L-130 Sacramento River Crossing Replacement Project\Impact Map.mxd 9/29/2021

TEMPORARY IMPACT TO AQUATIC RESOURCES									
Feature	Feature ID	Description	Temporary Disturbance Area		Temporary Excavation Area		Waters of US		Total Acreage
			(ft²)	Acres	(ft²)	Acres	Other Waters	Wetlands	
Ditch 2	D2	Excavated Agricultural Ditch	480	0.01	--	--	No	No	0.01
Ditch 3	D3	Excavated Agricultural Ditch	607	0.01	--	--	No	No	0.01
Ditch 4	D4	Excavated Agricultural Ditch	912	0.02	--	--	No	No	0.02
Ditch 5	D5	Excavated Agricultural Ditch	58	0.001	--	--	No	No	0.001
Sacramento River	R1	Tidal Riverine Water	553	0.01	12,215	0.28	Yes	No	0.29
Wetland 1	W1	Tidal Emergent Wetland	--	--	217	0.005	Yes	Yes	0.005
Total									0.35
Temporary impact areas include excavation footprint, access routes, and stockpile and staging areas. Excavation areas are already included within the Temporary Impact Area calculations. Quantification of excavation footprint further refine impacts into area and volume of "fill activity"									

- LEGEND:**
- + Control Point
 - Study Area Boundary (33.72 ac)
 - Temporary Impact Area (10.94 ac)
 - Excavation Area – L-130 Replacement Activities (0.14 ac)



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
September 2021

**BIOLOGICAL
RESOURCE IMPACT MAP**

**FIGURE
5A**



TEMPORARY IMPACT TO AQUATIC RESOURCES									
Feature	Feature ID	Description	Temporary Disturbance Area		Temporary Excavation Area		Waters of US		Total Acreage
			(ft²)	Acres	(ft²)	Acres	Other Waters	Wetlands	
Ditch 2	D2	Excavated Agricultural Ditch	480	0.01	--	--	No	No	0.01
Ditch 3	D3	Excavated Agricultural Ditch	607	0.01	--	--	No	No	0.01
Ditch 4	D4	Excavated Agricultural Ditch	912	0.02	--	--	No	No	0.02
Ditch 5	D5	Excavated Agricultural Ditch	58	0.001	--	--	No	No	0.001
Sacramento River	R1	Tidal Riverine Water	553	0.01	12,215	0.28	Yes	No	0.29
Wetland 1	W1	Tidal Emergent Wetland	--	--	217	0.005	Yes	Yes	0.005
Total									0.35
Temporary impact areas include excavation footprint, access routes, and stockpile and staging areas. Excavation areas are already included within the Temporary Impact Area calculations. Quantification of excavation footprint further refine impacts into area and volume of "fill activity"									

LEGEND:

- +

Control Point

●

Upland Sample Plot Location
- High Tide Line

L-130 10-inch Line
- Study Area Boundary (33.72 ac)

Temporary Impact Area (10.94 ac)

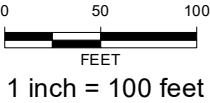
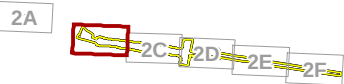
Excavation Area – L-130 Decommissioning Activities (0.52 ac)
- Excavation Area – L-130 Replacement Activities (0.14 ac)

Tidal Emergent Wetland

Tidal Riverine Water

- Special-Status Plants
- Mason's lillaeopsis (Nomad, 2020)
 - Suisun Marsh aster (Nomad, 2020)
 - Suisun Marsh aster (Padre, 2020)

MAP EXTENT:



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.



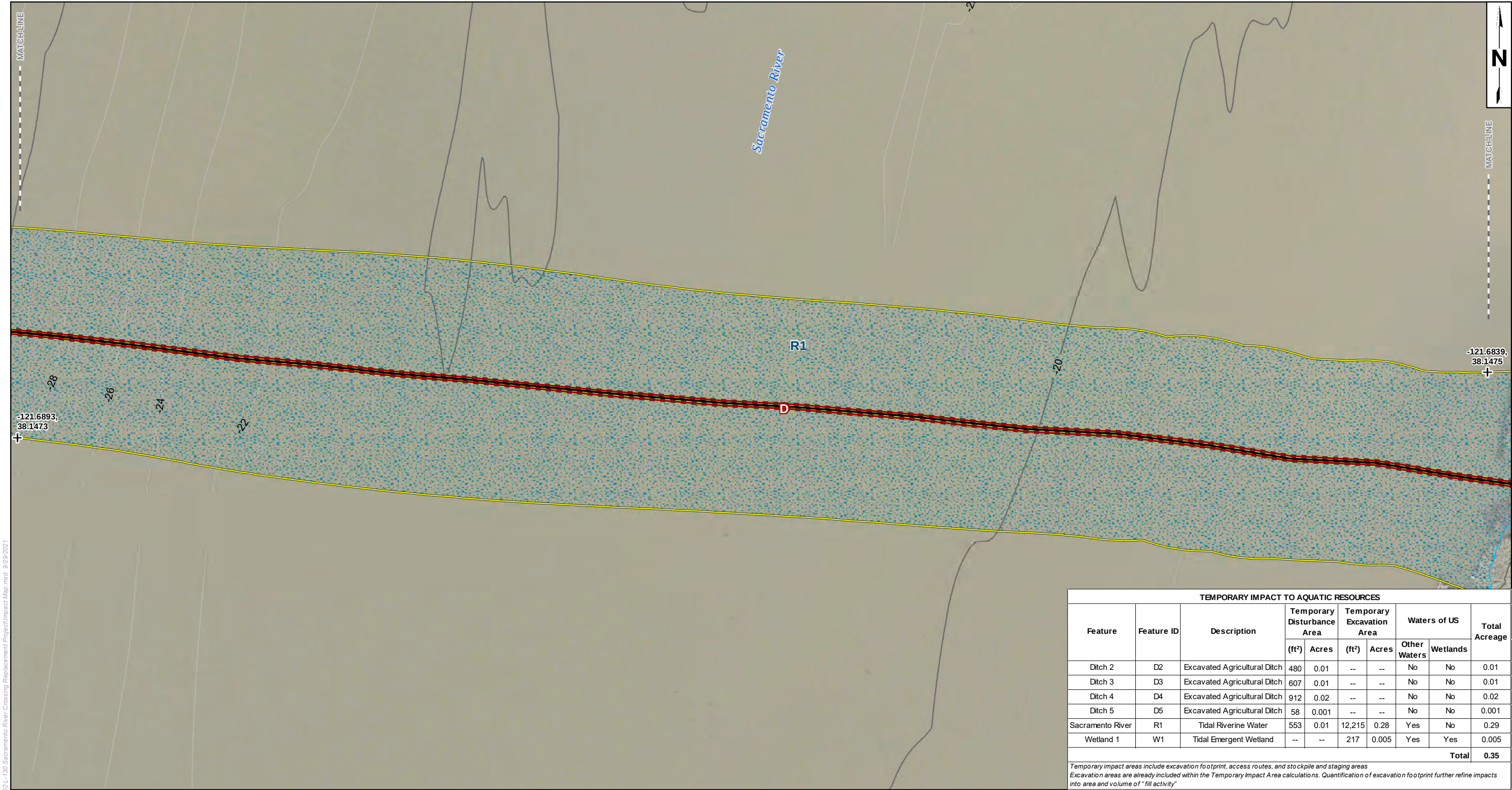
PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
September 2021

BIOLOGICAL
RESOURCE IMPACT MAP

FIGURE
5B



TEMPORARY IMPACT TO AQUATIC RESOURCES									
Feature	Feature ID	Description	Temporary Disturbance Area		Temporary Excavation Area		Waters of US		Total Acreage
			(ft²)	Acres	(ft²)	Acres	Other Waters	Wetlands	
Ditch 2	D2	Excavated Agricultural Ditch	480	0.01	--	--	No	No	0.01
Ditch 3	D3	Excavated Agricultural Ditch	607	0.01	--	--	No	No	0.01
Ditch 4	D4	Excavated Agricultural Ditch	912	0.02	--	--	No	No	0.02
Ditch 5	D5	Excavated Agricultural Ditch	58	0.001	--	--	No	No	0.001
Sacramento River	R1	Tidal Riverine Water	553	0.01	12,215	0.28	Yes	No	0.29
Wetland 1	W1	Tidal Emergent Wetland	--	--	217	0.005	Yes	Yes	0.005
Total									0.35
Temporary impact areas include excavation footprint, access routes, and stockpile and staging areas. Excavation areas are already included within the Temporary Impact Area calculations. Quantification of excavation footprint further refine impacts into area and volume of "fill activity"									

- LEGEND:
- +

Control Point

●

Upland Sample Plot Location

--

High Tide Line

—

L-130 10-inch Line

Study Area Boundary (33.72 ac)

Temporary Impact Area (10.94 ac)

Excavation Area – L-130 Decommissioning Activities (0.52 ac)

Tidal Riverine Water
- MAP EXTENT:
-
- Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.
-
- PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
September 2021
- BIOLOGICAL
RESOURCE IMPACT MAP
- FIGURE
5C



LEGEND:

+ Control Point

Wetland Sample Plot Location

High Tide Line

L-130 10-inch Line

Excavated Agricultural Ditch

Study Area Boundary (33.72 ac)

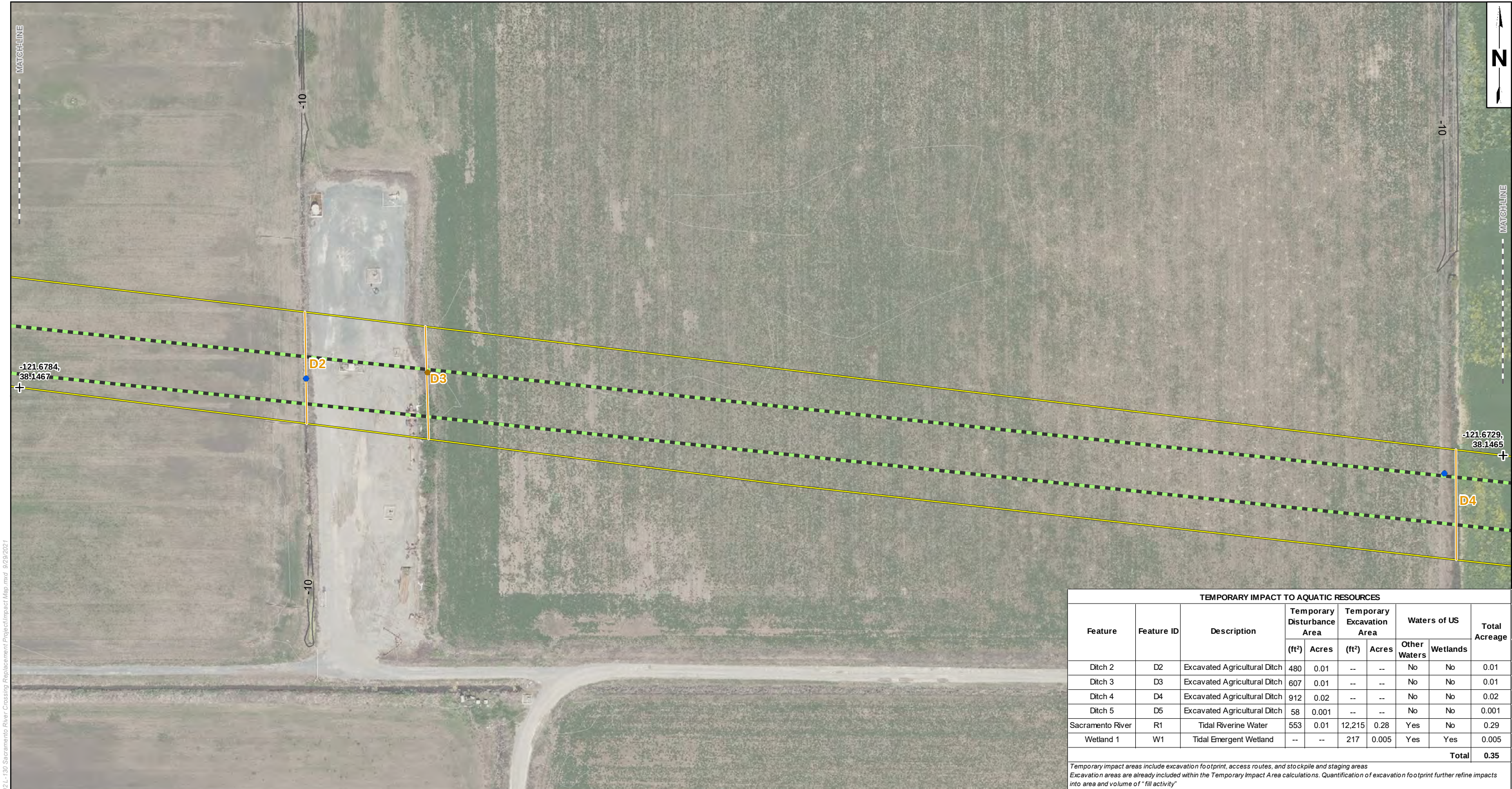
Temporary Impact Area (10.94 ac)

Excavation Area – L-130 Decommissioning Activities (0.52 ac)

Excavation Area – L-130 Replacement Activities (0.14 ac)

Tidal Riverine Water

MAP EXTENT:



TEMPORARY IMPACT TO AQUATIC RESOURCES									
Feature	Feature ID	Description	Temporary Disturbance Area		Temporary Excavation Area		Waters of US		Total Acreage
			(ft²)	Acres	(ft²)	Acres	Other Waters	Wetlands	
Ditch 2	D2	Excavated Agricultural Ditch	480	0.01	--	--	No	No	0.01
Ditch 3	D3	Excavated Agricultural Ditch	607	0.01	--	--	No	No	0.01
Ditch 4	D4	Excavated Agricultural Ditch	912	0.02	--	--	No	No	0.02
Ditch 5	D5	Excavated Agricultural Ditch	58	0.001	--	--	No	No	0.001
Sacramento River	R1	Tidal Riverine Water	553	0.01	12,215	0.28	Yes	No	0.29
Wetland 1	W1	Tidal Emergent Wetland	--	--	217	0.005	Yes	Yes	0.005
Total									0.35

Temporary impact areas include excavation footprint, access routes, and stockpile and staging areas
Excavation areas are already included within the Temporary Impact Area calculations. Quantification of excavation footprint further refine impacts into area and volume of "fill activity"

LEGEND:

- +

Control Point

●

Wetland Sample Plot Location

■

Study Area Boundary (33.72 ac)

●

Upland Sample Plot Location

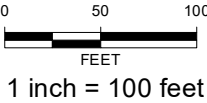
—

Excavated Agricultural Ditch

■

Temporary Impact Area (10.94 ac)

MAP EXTENT:



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
September 2021

BIOLOGICAL
RESOURCE IMPACT MAP

FIGURE
5E



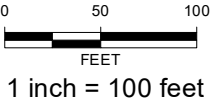
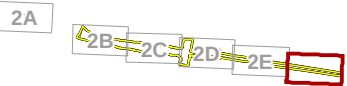
TEMPORARY IMPACT TO AQUATIC RESOURCES									
Feature	Feature ID	Description	Temporary Disturbance Area		Temporary Excavation Area		Waters of US		Total Acreage
			(ft²)	Acres	(ft²)	Acres	Other Waters	Wetlands	
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Ditch 3	D3	Excavated Agricultural Ditch	607	0.01	--	--	No	No	0.01
Ditch 4	D4	Excavated Agricultural Ditch	912	0.02	--	--	No	No	0.02
Ditch 5	D5	Excavated Agricultural Ditch	58	0.001	--	--	No	No	0.001
Sacramento River	R1	Tidal Riverine Water	553	0.01	12,215	0.28	Yes	No	0.29
Wetland 1	W1	Tidal Emergent Wetland	--	--	217	0.005	Yes	Yes	0.005
Total									0.35
Temporary impact areas include excavation footprint, access routes, and stockpile and staging areas. Excavation areas are already included within the Temporary Impact Area calculations. Quantification of excavation footprint further refine impacts into area and volume of "fill activity"									

LEGEND:

- +

Control Point
- Upland Sample Plot Location
- Excavated Agricultural Ditch
- Study Area Boundary (33.72 ac)
- Temporary Impact Area (10.94 ac)

MAP EXTENT:



Source: Esri Online Imagery Basemap
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME:
PG&E L-130 SACRAMENTO RIVER CROSSING
REPLACEMENT/DECOMMISSIONING
SACRAMENTO AND SOLANO COUNTIES, CA

PROJECT NUMBER:
2002-5361

DATE:
September 2021

BIOLOGICAL
RESOURCE IMPACT MAP

FIGURE
5F

Figure 6 – Special Status Species Occurrences:

CNDDDB Geospatial Data is Confidential - Figure available upon request.

Photograph A.
View of the top of
the west bank of
the Sacramento
River mapped as
the transition area
between the
Central Coast
riparian scrub and
non-native
grassland
vegetation
communities .
View south.
(photograph taken
10/21/20).



Photograph B.
View of western
bank of the
Sacramento River.
Populations of
special status
species Mason's
lilaeopsis and
Suisun Marsh
aster are located
on this bank to the
left of this
photograph. View
north. (photograph
taken 10/21/20).



Photograph C.
View of CNPS List
1B.2 species,
Suisun Marsh
aster found within
the study area.
(photograph taken
10/21/20).



Photograph D.
View of emergent
wetland vegetation
that occurs on the
west bank of the
Sacramento River.
View east
(photograph taken
10/21/20).



Photograph E.
View of highly disturbed non-native grassland located on the western side of the Project site. View west. (photograph taken 10/21/20).



Photograph F.
View of east bank of the Sacramento River. View west. (photograph taken 10/22/20).



Photograph G.
View of highly
disturbed work
area located on
the eastern side of
the Sacramento
River. Area was
mapped as part of
the ruderal
vegetation
community. View
south. (photograph
taken 10/22/20).



Photograph H.
View of east HDD
work area located
east side of
Highway 160 in an
agricultural field.
View southeast.
(photograph taken
10/22/20).



Photograph I. View of large eucalyptus trees suitable for Swainson's hawk nesting habitat present on the border of the agricultural fields east of Highway 160. View west. (photograph taken 10/22/20).



Photograph J. View of excavated agricultural ditch on the west side of the gravel pad located on the pipe staging area. This narrow ditch containing emergent wetland vegetation was mapped as a Coastal and Valley freshwater marsh vegetation community. View south. (photograph taken 10/22/20).



Photograph K.
View of northern
edge of the arroyo
willow thicket
located in dry
excavated ditch on
the east side of the
gravel pad located
on the pipe staging
area. This thicket
was mapped as
part of the Central
Coast riparian
scrub. View east.
(photograph taken
10/22/20).



Photograph L.
View of excavated
agricultural ditch
covered in a dense
Himalayan
blackberry briar
patch. View south.
(photograph taken
10/22/20).



Photograph M.
View of small
mammal burrow
located along the
pipe staging area.
(photograph taken
10/22/20).



Photograph N.
View of the far
eastern end of the
pipe staging area.
View west.
(photograph taken
10/22/20).



APPENDIX A

USFWS AND NMFS SPECIES LISTS



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:

August 28, 2020

Consultation Code: 08ESMF00-2020-SLI-2747

Event Code: 08ESMF00-2020-E-08421

Project Name: PG&E Line 130 Replacement Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/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, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) 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 Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

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>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

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 Tracking Number 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

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

San Francisco Bay-Delta Fish And Wildlife

650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

Project Summary

Consultation Code: 08ESMF00-2020-SLI-2747

Event Code: 08ESMF00-2020-E-08421

Project Name: PG&E Line 130 Replacement Project

Project Type: OIL OR GAS

Project Description: PG&E is planning the HDD replacement of the gas transmission Line 130 crossing of the Sacramento River in Sacramento County and Solano County, California. After completion of the HDD, PG&E will decommission and remove portions of the retired pipeline from the Sacramento River.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.14708821665285N121.68290346849858W>



Counties: Sacramento, CA | Solano, CA

Endangered Species Act Species

There is a total of 11 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 Fisheries¹, 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.

Birds

NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle <i>Elaphrus viridis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2319	Threatened
San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i> There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
Phone: (916) 930-5603 Fax: (916) 930-5654
[http://kim_squires@fws.gov](mailto:kim_squires@fws.gov)

In Reply Refer To:

August 28, 2020

Consultation Code: 08FBDT00-2020-SLI-0240

Event Code: 08FBDT00-2020-E-00570

Project Name: PG&E Line 130 Replacement Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/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>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

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 Tracking Number 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:

San Francisco Bay-Delta Fish And Wildlife

650 Capitol Mall

Suite 8-300

Sacramento, CA 95814

(916) 930-5603

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08FBDT00-2020-SLI-0240

Event Code: 08FBDT00-2020-E-00570

Project Name: PG&E Line 130 Replacement Project

Project Type: OIL OR GAS

Project Description: PG&E is planning the HDD replacement of the gas transmission Line 130 crossing of the Sacramento River in Sacramento County and Solano County, California. After completion of the HDD, PG&E will decommission and remove portions of the retired pipeline from the Sacramento River.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.14708821665285N121.68290346849858W>



Counties: Sacramento, CA | Solano, CA

Endangered Species Act Species

There is a total of 11 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 Fisheries¹, 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.

Birds

NAME	STATUS
California Clapper Rail <i>Rallus longirostris obsoletus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle <i>Elaphrus viridis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2319	Threatened
San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i> There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> https://ecos.fws.gov/ecp/species/321#crithab	Final

Sarah Powell

From: Sarah Powell
Sent: Friday, August 28, 2020 9:29 AM
To: nmfswcrca.specieslist@noaa.gov
Subject: PG&E Line 130 Sacramento River Crossing Pipeline Replacement Project

I would like to request an Official Species List for NMFS ESA Listed Species, Critical Habitat, and EFH within the Rio Vista, California USGS 7.5-minute Topographic Quadrangle for the Line 130 Sacramento River Crossing Pipeline Replacement Project. Following is the information requested by NMFS to generate an Official Species List:

Federal Agency:
U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street, Suite 1350
Sacramento, CA 95814-2922
Ph: (916) 557-6643

Applicant:
Sean Poirier, Senior Land Planner
Pacific Gas & Electric Company
Environmental Management- Gas Transmission
4040 West Lane, Building #9 (113C)
Stockton, CA 95204
seanpoirier@pge.com
(209) 942-1627

Environmental Consultant:
Sarah Powell, Senior Biologist
Padre Associates, Inc.
spowell@padreinc.com
(916) 333-5920 ext. 210

Following is the copy/pasted results of the informal search of NMFS database to generate a list of species that may be present in the Rio Vista, California Quadrangle.

Quad Name **Rio Vista**
Quad Number **38121-B6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -

SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - **X**
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -

Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

**See list at left and consult the NMFS Long Beach office
562-980-4000**

MMPA Cetaceans -
MMPA Pinnipeds -

Sarah Powell
Padre Associates, Inc.
350 University Avenue, Suite 250
Sacramento, CA 95825
Ph: 916-333-5920 ext. 210
Cell: 916-996-2994

Sarah Powell

From: NMFSWCRCA Specieslist - NOAA Service Account
<nmfswcrca.specieslist+canned.response@noaa.gov>
Sent: Friday, August 28, 2020 9:29 AM
To: Sarah Powell
Subject: Re: PG&E Line 130 Sacramento River Crossing Pipeline Replacement Project

Receipt of this message confirms that NMFS has received your email to nmfswcrca.specieslist@noaa.gov. If you are a federal agency (or representative) and have followed the steps outlined on the California Species List Tools web page (http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html), you have generated an official Endangered Species Act species list.

Messages sent to this email address are not responded to directly. For project specific questions, please contact your local NMFS office.

Northern California/Klamath (Arcata) 707-822-7201

North-Central Coast (Santa Rosa) 707-387-0737

Southern California (Long Beach) 562-980-4000

California Central Valley (Sacramento) 916-930-3600

APPENDIX B

CNDDDB QUERY RESULTS



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: BIOS selection

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Anthicus antiochensis</i> Antioch Dunes anthicid beetle	G1 S1	None None		20 20	6 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Anthicus sacramento</i> Sacramento anthicid beetle	G1 S1	None None	IUCN_EN-Endangered	15 30	13 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Apodemia mormo langei</i> Lange's metalmark butterfly	G5T1 S1	Endangered None		10 10	1 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Ardea herodias</i> great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	10 10	156 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Athene cunicularia</i> burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	10 200	1989 S:7	0	4	2	0	0	1	7	0	7	0	0
<i>Buteo swainsoni</i> Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	0 20	2535 S:11	0	0	1	0	0	10	4	7	11	0	0
<i>Carex comosa</i> bristly sedge	G5 S2	None None	Rare Plant Rank - 2B.1	-21 -21	29 S:1	0	0	1	0	0	0	1	0	1	0	0
<i>Coastal and Valley Freshwater Marsh</i> Coastal and Valley Freshwater Marsh	G3 S2.1	None None			60 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Emys marmorata</i> western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	0 5	1396 S:2	0	1	1	0	0	0	1	1	2	0	0
<i>Extriplex joaquinana</i> San Joaquin spearscale	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden		127 S:1	0	0	0	0	0	1	1	0	1	0	0



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Falco peregrinus anatum</i> American peregrine falcon	G4T4 S3S4	Delisted Delisted	CDF_S-Sensitive CDFW_FP-Fully Protected USFWS_BCC-Birds of Conservation Concern	10 10	58 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Hibiscus lasiocarpus var. occidentalis</i> woolly rose-mallow	G5T3 S3	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley		173 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Hypomesus transpacificus</i> Delta smelt	G1 S1	Threatened Endangered	AFS_TH-Threatened IUCN_EN-Endangered	0 0	27 S:2	0	0	0	1	0	1	0	2	2	0	0
<i>Lasiurus blossevillei</i> western red bat	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	20 20	128 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lasiurus cinereus</i> hoary bat	G5 S4	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	20 20	238 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lathyrus jepsonii var. jepsonii</i> Delta tule pea	G5T2 S2	None None	Rare Plant Rank - 1B.2 SB_BerrySB-Berry Seed Bank SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	0 2	133 S:3	0	0	1	1	0	1	1	2	3	0	0
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	G2 S2	None Rare	Rare Plant Rank - 1B.1	0 13	198 S:18	0	9	8	0	0	1	4	14	18	0	0
<i>Limosella australis</i> Delta mudwort	G4G5 S2	None None	Rare Plant Rank - 2B.1	0 17	59 S:5	1	2	1	0	0	1	3	2	5	0	0
<i>Linderiella occidentalis</i> California linderiella	G2G3 S2S3	None None	IUCN_NT-Near Threatened	80 80	508 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Melospiza melodia</i> song sparrow ("Modesto" population)	G5 S3?	None None	CDFW_SSC-Species of Special Concern	0 20	92 S:8	0	0	0	0	0	8	0	8	8	0	0



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Oenothera deltoides ssp. howellii</i> Antioch Dunes evening-primrose	G5T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	10 10	10 S:1	0	0	1	0	0	0	0	1	1	0	0
<i>Oncorhynchus mykiss irideus pop. 11</i> steelhead - Central Valley DPS	G5T2Q S2	Threatened None	AFS_TH-Threatened		31 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Plagiobothrys hystriculus</i> bearded popcornflower	G2 S2	None None	Rare Plant Rank - 1B.1	170 170	15 S:1	0	0	1	0	0	0	0	1	1	0	0
<i>Potamogeton zosteriformis</i> eel-grass pondweed	G5 S3	None None	Rare Plant Rank - 2B.2		20 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Riparia riparia</i> bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	5 5	298 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sagittaria sanfordii</i> Sanford's arrowhead	G3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 5	126 S:1	0	1	0	0	0	0	0	1	1	0	0
<i>Spirinchus thaleichthys</i> longfin smelt	G5 S1	Candidate Threatened		0 0	46 S:4	0	0	0	0	0	4	0	4	4	0	0
<i>Symphyotrichum lentum</i> Suisun Marsh aster	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	0 10	175 S:21	0	10	8	0	0	3	2	19	21	0	0
<i>Thamnophis gigas</i> giant gartersnake	G2 S2	Threatened Threatened	IUCN_VU-Vulnerable	0 0	366 S:2	0	1	1	0	0	0	1	1	2	0	0

APPENDIX C

PLANT SPECIES OBSERVED

Plant Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴	Source ⁵
EQUISETACEAE (Horsetail Family)						
Scouring rush	<i>Equisetum hyemale</i> ssp. affine	H	FACW	N		1, 2
AMARANTHACEAE (Amaranth Family)						
Tumbleweed	<i>Amaranthus albus</i>	H	FACU	I		1, 2
Procumbent pigweed	<i>Amaranthus blitoides</i>	H	FACU	N		2
Large-fruited amaranth	<i>Amaranthus deflexus</i>	H	NL	I		1, 2
APIACEAE (Carrot Family)						
Poison hemlock	<i>Conium maculatum</i>	H	FACW	I		1, 2
Queen Anne's lace	<i>Daucus carota</i>	H	UPL	I		2
Fennel	<i>Foeniculum vulgare</i>	H	NL	I		1, 2
Mason's lilaeopsis	<i>Lilaeopsis masonii</i>	H	OBL	N	SR, 1B.1	2
ARALIACEAE (Ginseng Family)						
Algerian ivy	<i>Hedera canariensis</i>	V	NL	I		1
English ivy	<i>Hedera helix</i>	V	FACU	I		1, 2
ASTERACEAE (Sunflower Family)						
Western ragweed	<i>Ambrosia psilostachya</i>	H	FACU	N		1, 2
Mugwort	<i>Artemisia douglasiana</i>	H	FAC	N		1, 2
Italian thistle	<i>Carduus pycnocephalus</i> ssp. <i>pycnocephalus</i>	H	NL	I		1, 2
Yellow star-thistle	<i>Centaurea solstitialis</i>	H	NL	I		1, 2
Common spikeweed	<i>Centromadia pungens</i> ssp. <i>pungens</i>	H	FAC	N		2
Skeleton weed	<i>Chondrilla juncea</i>	H	NL	I		2
Cardoon	<i>Cynara cardunculus</i>	H	NL	I		1, 2
Flax-leaved horseweed	<i>Erigeron bonariensis</i>	H	FACU	I		1, 2
Horseweed	<i>Erigeron canadensis</i>	H	FACU	N		1, 2
Western goldenrod	<i>Euthamia occidentalis</i>	H	FACW	N		2
Common sunflower	<i>Helianthus annuus</i>	H	FACU	N		1, 2
Bristly ox-tongue	<i>Helminthotheca echioides</i>	H	FAC	I		1, 2
Hayfield tarweed	<i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>	H	NL	N		1
Telegraph weed	<i>Heterotheca grandiflora</i>	H	NL	N		1, 2

Plant Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴	Source ⁵
Lettuce	<i>Lactuca saligna</i>	H	UPL	I		1, 2
Prickly lettuce	<i>Lactuca serriola</i>	H	FACU	I		1
Daggerleaf cottonrose	<i>Logfia gallica</i>	H	NL	I		2
Weedy cudweed	<i>Pseudognaphalium luteoalbum</i>	H	FAC	I		1, 2
Milk thistle	<i>Silybum marianum</i>	H	NL	I		2
Common sow thistle	<i>Sonchus oleraceus</i>	H	UPL	I		1, 2
Suisun marsh aster	<i>Symphyotrichum lentum</i>	H	OBL	N	1B.2	1, 2
Spiny cocklebur	<i>Xanthium spinosum</i>	H	FACU	I		1
Cocklebur	<i>Xanthium strumarium</i>	H	FAC	N		1, 2
BETULACEAE (Birch Family)						
White alder	<i>Alnus rhombifolia</i>	T	FACW	N		1, 2
BORAGINACEAE (Borage Family)						
Alkali heliotrope	<i>Heliotropium curassavicum</i> var. <i>oculatum</i>	H	FACU	N		1, 2
BRASSICACEAE (Mustard Family)						
Black mustard	<i>Brassica nigra</i>	H	NL	I		1, 2
Field mustard	<i>Brassica rapa</i>	H	FUPL	I		1, 2
Mediterranean mustard	<i>Hirschfeldia incana</i>	H	NL	I		1, 2
Perennial pepperweed	<i>Lepidium latifolium</i>	H	FAC	I		1, 2
Radish	<i>Raphanus sativus</i>	H	NL	I		1, 2
CHENOPODIACEAE (Goosefoot Family)						
Fat-hen	<i>Atriplex prostrata</i>	H	FACW	I		1
Lamb's quarters	<i>Chenopodium album</i>	H	FACU	I		1, 2
Russian thistle	<i>Salsola tragus</i>	H	FACU	I		1, 2
CONVOLVULACEAE (Morning-Glory Family)						
Bindweed	<i>Convolvulus arvensis</i>	H	NL	I		1, 2
EUPHORBIACEAE (Spurge Family)						
Spotted spurge	<i>Euphorbia maculata</i>	H	UPL	I		1, 2
Thyme leafed spurge	<i>Euphorbia serpillifolia</i> ssp. <i>serpillifolia</i>	H	NL	N		1, 2
FABACEAE (Legume Family)						

Plant Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴	Source ⁵
Spanish clover	<i>Acmispon americanus</i> var. <i>americanus</i>	H	UPL	N		1, 2
Deerweed	<i>Acmispon glaber</i>	S	NL	N		1, 2
California tule pea	<i>Lathyrus jepsonii</i> var. <i>californicus</i>	H	OBL	N		1, 2
Bird's-foot trefoil	<i>Lotus corniculatus</i>	H	FAC	I		1
Miniature lupine	<i>Lupinus bicolor</i>	H	NL	N		2
Alfalfa	<i>Medicago sativa</i>	H	UPL	I		1, 2
White sweetclover	<i>Melilotus albus</i>	H	NL	I		2
Scarlet sesban	<i>Sesbania punicea</i>	T	FACW	I		1, 2
FAGACEAE (Oak Family)						
Valley oak	<i>Quercus lobata</i>	T	FACU	N		1, 2
GERANIACEAE (Geranium Family)						
Long-beaked storksbill	<i>Erodium botrys</i>	H	FACU	I		1, 2
Storksbill	<i>Erodium brachycarpum</i>	H	NL	I		2
Greenstem filaree	<i>Erodium moschatum</i>	H	NL	I		2
JUGLANDACEAE (Walnut Family)						
Northern California black walnut (waif)	<i>Juglans hindsii</i>	T	FAC	N		1, 2
English walnut	<i>Juglans regia</i>	T	NL	I		2
LAMIACEAE (Mint Family)						
Rough bugleweed	<i>Lycopus asper</i>	H	OBL	N		1, 2
MALVACEAE (Mallow Family)						
Bull mallow	<i>Malva nicaeensis</i>	H	NL	I		1, 2
Cheeseweed	<i>Malva parviflora</i>	H	NL	I		1, 2
Alkali-mallow	<i>Malvella leprosa</i>	H	FACU	N		1, 2
MORACEAE (Mulberry Family)						
Edible fig	<i>Ficus carica</i>	T	FACU	I		1, 2
MYRTACEAE (Myrtle Family)						
Red gum	<i>Eucalyptus camaldulensis</i>	T	NL	I		1, 2
Blue gum	<i>Eucalyptus globulus</i>	T	NL	I		1, 2
OLEACEAE (Olive Family)						
Oregon ash	<i>Fraxinus latifolia</i>	T	FACW	N		1, 2

Plant Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴	Source ⁵
ONAGRACEAE (Evening Primrose Family)						
Panicled willow herb	<i>Epilobium brachycarpum</i>	H	NL	N		1, 2
Hairy willow herb	<i>Epilobium ciliatum</i>	H	FACW	N		1, 2
California water primrose	<i>Ludwigia peploides</i> ssp. <i>montevidensis</i>	H	OBL	I		2
PAPAVERACEAE (Poppy Family)						
California poppy	<i>Eschscholzia californica</i>	H	NL	N		2
PLANTAGINACEAE (Plantain Family)						
Cut-leaved plantain	<i>Plantago coronopus</i>	H	FAC	I		2
English plantain	<i>Plantago lanceolata</i>	H	FAC	I		1, 2
POLYGONACEAE (Buckwheat Family)						
Water smartweed	<i>Persicaria amphibia</i>	H	OBL	N		1, 2
Smartweed	<i>Persicaria punctata</i>	H	OBL	N		2
Common knotweed	<i>Polygonum aviculare</i> ssp. <i>depressum</i>	H	FAC	I		1, 2
Curly dock	<i>Rumex crispus</i>	H	FAC	I		1
Bitter dock	<i>Rumex obtusifolius</i>	H	FAC	I		1, 2
ROSACEAE (Rose Family)						
Almond	<i>Prunus dulcis</i>	T	NL	I		1, 2
Himalayan blackberry	<i>Rubus armeniacus</i>	V	FAC	I		1, 2
California blackberry	<i>Rubus ursinus</i>	V	FAC	N		1
RUBIACEAE (Madder Family)						
California button willow	<i>Cephalanthus occidentalis</i>	S	OBL	N		1, 2
SALICACEAE (Willow Family)						
Fremont cottonwood	<i>Populus fremontii</i> ssp. <i>fremontii</i>	T	NL	N		1, 2
Lombardy poplar	<i>Populus nigra</i>	T	NL	I		1, 2
Gooding's black willow	<i>Salix goodingii</i>	T	FACW	N		1, 2
Arroyo willow	<i>Salix lasiolepis</i>	T	FACW	N		1, 2
VERBENACEAE (Vervain Family)						
Swamp verbena	<i>Verbena hastata</i>	H	FAC	N		2
Shore vervain	<i>Verbena littoralis</i>	H	FACU	I		1, 2
VITACEAE (Grape Family)						

Plant Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴	Source ⁵
Wine grape	<i>Vitis vinifera</i>	V	NL	I		2
ZYGOPHYLLACEAE (Caltrop Family)						
Puncture vine	<i>Tribulus terrestris</i>	H	NL	I		2
ARACEAE (Arum Family)						
Duckweed	<i>Lemna minuta</i>	H	OBL	N		1, 2
ARECACEAE (Palm family)						
California fan palm	<i>Washingtonia filifera</i>	T	FAC	N		1, 2
CYPERACEAE (Sedge Family)						
Santa Barbara sedge	<i>Carex barbarae</i>	H	FAC	N		1, 2
Tall cyperus	<i>Cyperus eragrostis</i>	H	FACW	N		1, 2
Tule	<i>Schoenoplectus acutus</i> var. <i>occidentalis</i>	H	OBL	N		1, 2
HYDROCHARITACEAE (Waterweed Family)						
Brazilian waterweed	<i>Egeria densa</i>	H	OBL	I		1
JUNCACEAE (Rush Family)						
Pacific rush	<i>Juncus effusus</i> ssp. <i>pacificus</i>	H	FACW	N		1, 2
POACEAE (Grass Family)						
Giant reed	<i>Arundo donax</i>	G	FACW	I		1, 2
Slender wild oat	<i>Avena barbata</i>	G	NL	I		1, 2
Wild oat	<i>Avena fatua</i>	G	NL	I		1, 2
Weedy brome	<i>Bromus caroli-henrici</i>	G	NL	I		1
Ripgut grass	<i>Bromus diandrus</i>	G	NL	I		1, 2
Foxtail chess	<i>Bromus madritensis</i>	G	NL	I		1, 2
Bermuda grass	<i>Cynodon dactylon</i>	G	FACU	I		1, 2
Orchard grass	<i>Dactylis glomerata</i>	G	FACU	I		1, 2
Barnyard grass	<i>Echinochloa crus-galli</i>	G	FACW	I		2
Medusa head	<i>Elymus caput-medusae</i>	G	NL	I		1, 2
Beardless wild rye	<i>Elymus triticoides</i>	G	NL	N		2
Rye grass	<i>Festuca perennis</i>	G	FAC	I		1, 2
Hare barley	<i>Hordeum murinum</i> ssp. <i>leporinum</i>	G	FACU	I		1, 2
Barley	<i>Hordeum vulgare</i>	G	NL	I		1, 2

Plant Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴	Source ⁵
Dallis grass	<i>paspalum dilatatum</i>	G	FAC	I		1, 2
Rabbitfoot grass	<i>Polypogon monspeliensis</i>	G	FACW	I		2
Johnson grass	<i>Sorghum halepense</i>	G	FACU	I		1, 2
PONTEDERIACEAE (Pickerel-Weed Family)						
Water hyacinth	<i>Eichhornia crassipes</i>	H	OBL	I		1, 2
POTAMOGETONACEAE (Pondweed Family)						
Crisp-leaved pondweed	<i>Potamogeton crispus</i>	H	OBL	I		1, 2
TYPHACEAE (Cattail Family)						
Narrow-leaved cattail	<i>Typha angustifolia</i>	H	OBL	I		1, 2
Broad-leaved cattail	<i>Typha latifolia</i>	H	OBL	N		1, 2
Wetland Indicator Status²						
OBL = Obligate wetland species, occurs almost always in wetlands (>99% probability) FACW = Facultative wetland species, usually found in wetlands (67-99% probability) FAC = Facultative species, equally likely to occur in wetland and non-wetlands (34-66% probability) FACU = Facultative upland species, not usually found in wetlands (1-33% probability) UPL = Upland species, almost never found in wetlands (<1% probability) NI = No indicator has been assigned due to a lack of information to determine indicator status NL = Not listed, assumed upland species						
Sensitivity / Listing Status⁴						
FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate SE = California State Endangered ST = California State Threatened SR = State Rare		1B.1 = Threatened in California and elsewhere, seriously threatened in California 1B.2 = Threatened in California and elsewhere, moderately threatened in California 2B = Plants rare, threatened, or endangered in California but more common elsewhere 3 = Plants about which more information is needed 4 = Plants of limited distribution				
Growth Habit¹		Native Status³		Source⁵		
G = Grass H = Herb S = Shrub T = Tree V = Vine		N = Native I = Introduced		1 = Padre Associates, Inc 2 = Nomad Ecology		

APPENDIX D

WILDLIFE SPECIES OBSERVED

Wildlife Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/ Family	Scientific Name	Sensitivity / Listing Status ¹
AMPHIBIANS		
HYLIDAE (Tree Frogs)		
Pacific Treefrog	<i>Pseudacris sierra</i>	
REPTILES		
PHRYNOSOMATIDAE (spiny lizards)		
Western Fence Lizard	<i>Sceloporus occidentalis</i>	
BIRDS		
ANATIDAE (Ducks, Geese, and Swans)		
Canada Goose	<i>Branta canadensis</i>	M
COLUMBIDAE (Pigeons and Doves)		
Rock Pigeon	<i>Columba livia</i>	
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	M
TROCHILIDAE (Hummingbirds)		
Anna's Hummingbird	<i>Calypte anna</i>	M
CHARADRIIDAE (Lapwings and Plovers)		
Killdeer	<i>Charadrius vociferus</i>	M
LARIDAE (Gulls, Terns, and Skimmers)		
California Gull	<i>Larus californicus</i>	M, WL
Herring Gull	<i>Larus argentatus</i>	M
Caspian Tern	<i>Hydroprogne caspia</i>	M, BCC
PHALACROCORACIDAE (Cormorants)		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	M, WL
ARDEIDAE (Bitterns, Herons, and Allies)		M
Great Blue Heron	<i>Ardea herodias</i>	M
Great Egret	<i>Ardea alba</i>	M
ACCIPITRIDAE (Hawks, Kites, Eagles, and Allies)		
Northern Harrier	<i>Circus hudsonius</i>	M, CSC
Cooper's Hawk	<i>Accipiter cooperii</i>	M, WL
Red-tailed Hawk	<i>Buteo jamaicensis</i>	M
ALCEDINIDAE (Kingfishers)		
Belted Kingfisher	<i>Megaceryle alcyon</i>	M
PICIDAE (Woodpeckers and Allies)		
Northern Flicker	<i>Colaptes auratus</i>	M
FALCONIDAE (Caracaras and Falcons)		
American Kestrel	<i>Falco sparverius</i>	M
TYRANNIDAE (Tyrant Flycatchers)		
Black Phoebe	<i>Sayornis nigricans</i>	M
CORVIDAE (Jays and Crows)		
California Scrub-Jay	<i>Aphelocoma californica</i>	M
American Crow	<i>Corvus brachyrhynchos</i>	M
AEGITHALIDAE (Bushtits)		
Bushtit	<i>Psaltiriparus minimus</i>	M
TROGLODYTIDAE (Wrens)		
Marsh Wren	<i>Cistothorus palustris</i>	M
REGULIDAE (Kinglets)		
Ruby-crowned Kinglet	<i>Regulus calendula</i>	M

Wildlife Species Observed at the Line-130 Sacramento River Crossing Replacement Project Site

Common Name/ Family	Scientific Name	Sensitivity / Listing Status ¹
MIMIDAE (Mockingbirds and Thrashers)		
Northern Mockingbird	<i>Mimus polyglottos</i>	M
STURNIDAE (Starlings)		
European Starling	<i>Sturnus vulgaris</i>	
FRINGILLIDAE (Fringilline and Cardueline Finches and Allies)		
House Finch	<i>Haemorhous mexicanus</i>	M
Lesser Goldfinch	<i>Spinus psaltria</i>	M
American Goldfinch	<i>Spinus tristis</i>	M
EMBERIZIDAE (Emberizids)		
Song Sparrow	<i>Melospiza melodia</i>	M
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	M
ICTERIDAE (Blackbirds)		
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	M
Western Meadowlark	<i>Sturnella neglecta</i>	M
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	M
MAMMALS		
LEPORIDAE (Rabbits and Hares)		
Black-tailed Hare	<i>Lepus californicus</i>	
SCIURIDAE (Chipmunks, Squirrels, and Marmots)		
California Ground Squirrel	<i>Spermophilus beecheyi</i>	
CANIDAE (Foxes, Wolves, and Relatives)		
Feral Dog	<i>Canis familiaris</i>	
PROCYONIDAE (Raccoons and Relatives)		
Raccoon	<i>Procyon lotor</i>	
MUSTELIDAE (Weasels, Badgers, and Relatives)		
North American River Otter	<i>Lontra canadensis</i>	
Sensitivity / Listing Status¹		
M = Protected under the federal Migratory Bird Treaty Act (MBTA) FE = Federally Endangered FT = Federally Threatened FDL = Federally Delisted FSS = Forest Service Sensitive SE = California State Endangered		ST = California State Threatened CSC = California Species of Special Concern FP = California Fully Protected Species BCC = USFWS Birds of Conservation Concern WL = CDFW Watch List