DRAFT

Initial Study and Mitigated Negative Declaration

for the

Live Oak Boat Ramp Sediment and Invasive Species Removal Project

October 2020

Lead Agency:

Sutter Butte Flood Control Agency
1445 Butte House Road, Suite B
Yuba City, California 95993

Prepared by:

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DRAFT MITIGATED NEDATIVE DECLARATION
LIVE OAK BOAT RAMP SEDIMENT AND INVASIVE SPECIES REMOVAL

Lead Agency: Sutter Butte Flood Control Agency (SBFCA)

Project Proponent: SBFCA

Project Location: The Live Oak Boat Ramp Sediment and Invasive Species Removal Project is located at the eastern terminus of Pennington Road east of the City of Live Oak, California. The approximately 8.22-acre Project site is located within and adjacent to the Feather River at the Live Oak Boat Ramp facility.

This corresponds to the unsectioned Rancho Boga Land grant (Mount Diablo Base and Meridian) of the "Gridley, California" 7.5-minute quadrangle. The approximate center of the Study Area is located at latitude 39.273783˚ and longitude -121.631017˚ within the Honcut Headwaters – Lower Feather Watershed.

Project Description: The Project involves dredging to remove sediment that has accumulated in portions of the Feather River. The dredging operation would be staged from the existing Live Oak Recreational Park Boat Ramp facility and adjacent lands. Dredging would remove approximately ±1.5 acres of invasive water primrose and ±3,400 cubic yards (cy) of sediment from the Live Oak Recreational Park Boat Ramp facility. Dredged spoils would be dewatered at the boat ramp and spoils would be disposed of at the Gridley WWTP emergency ponds or at the Ostrom Road or Neal Road landfills.

Public Review Period: October 20, 2020 – November 19, 2020

Mitigation Measures Incorporated into the Project to Avoid Significant Effects

Biological Resources

BIO-1: Best Management Practices. The Project shall implement erosion control measures and best management practices (BMPs) to reduce the potential for sediment or pollutants at the Project site. Measures may include:

- Erosion control measures shall be placed between Waters of the U.S., and the outer edge of the staging and dewatering areas, within an area identified with highly visible markers (e.g., construction fencing, flagging, silt barriers) prior to commencement of construction activities. Such identification and erosion control measures shall be properly maintained until construction is completed and the soils have been stabilized.

- Fiber rolls used for erosion control shall be certified by the California Department of Food and Agriculture as weed free.
- Seed mixtures applied for erosion control shall not contain California Invasive Plant Council designated invasive species (http://cal-ipc.org/) and will be composed of native species appropriate for the site.
- Trash generated onsite shall be promptly and properly removed from the site.
- Any fueling in the upland portion of the Project site shall use appropriate secondary containment techniques to prevent spills.
- A qualified biologist shall conduct a mandatory Worker Environmental Awareness Program for all contractors, work crews, and any onsite personnel on the potential for special-status species to occur on the Project site. The training shall provide an overview of habitat and characteristics of the species, the need to avoid certain areas, and the possible penalties for non-compliance.
- A qualified biologist/biological monitor shall be onsite during daily construction activities to ensure compliance with the anticipated terms and conditions of the Project regulatory permits and CEQA compliance document. If appropriate, the approved biologist shall train an individual to act as the onsite construction monitor for periods when there is a low risk of effect to special-status species.

BIO-2: Preconstruction Floristic Surveys. Preconstruction floristic surveys shall be conducted for any areas of proposed ground disturbance (i.e., grading or earth work) in the Project site with the potential to support special-status plants. The area of ground disturbance and a 25-foot buffer would be surveyed by a qualified botanist during the appropriate blooming period prior to the start of Project activity. If no special-status plants are found during the preconstruction surveys, no further measures are necessary. If surveys identify any special-status plants, the Project construction manager shall identify them with flagging and avoid them with a 25-foot no-disturbance buffer during Project activities. If this avoidance is not feasible, the Project proponent shall consult with CDFW to determine whether alternative avoidance measures that are equally protective are possible.

BIO-3: Special-Status Fish. To avoid and minimize potential adverse effects to listed and special-status fish species, designated critical habitat, and essential fish habitat implement the following:

- Implement dredging operations during a limited work window (likely June 15 through October 15) to avoid the most sensitive life stages of ESA-listed anadromous fish species.
- Deploy measures, as practicable, to reduce sediment resuspension such as a turbidity curtain, if feasible, given the flow volume and velocity in the Project site.
- Employ a fish biologist to be onsite as needed to monitor dredging and check spoils (i.e., sediment and vegetation).

- Where mechanical dredging is used, attempt to exclude fish and other aquatic organisms from the area using block nets, to the extent feasible for the Project site.
- Through the CWA Section 404 process, request the USACE initiate ESA Section 7 Consultation with NMFS on the project effects to ESA-listed anadromous fish species, designated critical habitat, and essential fish habitat.
- Consult with CDFW and if necessary, secure an Incidental Take Permit 2081, pursuant to Section 2080 of the California Fish and Game Code.

BIO-4: Nesting Birds. To protect nesting birds, no Project activity shall begin from February 1 through August 31 unless the following surveys are completed by a qualified wildlife biologist. Separate surveys and avoidance requirements are listed below for all nesting birds, raptors, including bald eagle, burrowing owl, and Swainson's hawk.

- All Nesting Birds – Within 14 days prior to construction (or less if recommended by CDFW), survey for nesting activity of birds within each Project work area and a 100-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
- Raptors (including bald eagle) – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 500-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
- Swainson's hawk – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 0.25-mile radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

BIO-5: Yellow-Billed Cuckoo. To protect potentially nesting yellow-billed cuckoo, the following is required.

- If it is anticipated that construction related disturbances within 500 feet of suitable habitat cannot be avoided during the nesting season (June 1 to September 30), protocol surveys for yellow-billed cuckoo shall be conducted. Surveys will follow the latest version of *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo*.

- Biologists will coordinate with the USFWS and CDFW prior to conducting surveys to determine if the proposed survey area has been recently surveyed, define the parameters of the survey area, and discuss the survey methodology. Survey methods and results will be reported to the USFWS and CDFW at the conclusion of the surveys.
- If cuckoos are detected during surveys, the general location of the detection or the nest will be mapped by the biologists and SBFCA will establish a 500 foot, or other distance as approved by the USFWS and CDFW, no-disturbance buffer between construction activities and the area identified. The no-disturbance buffer will be maintained until it has been determined by a qualified biologist that young have fledged or the nest is no longer active.

BIO-6: **Ringtail Nest Survey.** If the Project requires the removal of upland trees, a qualified biologist shall survey all trees proposed for removal to determine their potential to provide suitable ringtail nest sites (e.g., trees with cavities). If potential nest trees are found, an avoidance area, determined by the survey biologist, shall be fenced and/or flagged around the tree as close to construction limits as possible.

BIO-7: **Roosting Bat Survey.** If the Project requires the removal of upland trees, a qualified biologist shall conduct a preconstruction roosting bat survey for all suitable roosting habitat (e.g., manmade structures, trees) prior to construction activities. If suitable roosting habitat is identified, a qualified biologist shall conduct an evening bat emergence survey that may include acoustic monitoring to determine whether or not bats are present. If roosting bats are found, consultation with CDFW prior to initiation of construction activities shall be required and implementation of CDFW recommendations shall be required. If bats are not found during the preconstruction surveys, no further measures are necessary.

BIO-8: **Waters of the U.S.** To avoid or minimize anticipated short-term adverse effects to Waters of the U.S., the Project shall implement the following:

- If backwater from dewatered dredged spoils has potential to discharge to wetlands or Waters of the U.S., then a Nationwide Permit 16 (Backwater) under Section 404 of the federal CWA shall be obtained from USACE. The impacts from such actions are expected to be temporary and solely associated with the dewatering activities. Therefore, no net loss of aquatic resources is likely to occur as a result of the Project and no mitigation is required.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA, as issued by RWQCB, shall be obtained for Section 404 permit actions.
- A Waste Discharge Requirement for dredge and fill in Waters of the State under the Porter-Cologne Water Quality Control Act as issued by RWQCB shall be obtained for impacts to waters of the State.

BIO 9: **Riparian Habitat.** Riparian habitat is protected under the California Fish and Game Code. The Project does not expect to require vegetation clearing. Nevertheless, to minimize the potential for impacts to riparian habitat, the following measures are recommended:

- The river channels shall be accessed via areas where no permanent impacts to riparian vegetation will be required.
- A Streambed Alteration Agreement (SAA), pursuant to Section 1602 of the California Fish and Game Code, must be obtained for any activity that will impact the Feather River and riparian habitats. Minimization measures will be developed during consultation with CDFW as part of the SAA agreement process to ensure protections for affected fish and wildlife resources.

Cultural Resources

CUL-1: Archaeological Monitoring

- All terrestrial ground-disturbing activity associated with Project construction shall be monitored by a qualified professional archaeologist that meets or works under the direct supervision of someone who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology.
- The archaeological monitor shall provide a pre-work orientation session to all construction personnel. This includes instructing the Project superintendent and key members of dredging operations for Project construction to be alert for the possibility of destruction of buried cultural resource materials. The training shall instruct all personnel to recognize signs of historic and pre-contact use, and to report any such finds (or suspected finds) to the archaeological monitor immediately, so damage to such resources may be prevented.
- Archaeological monitoring will not occur for equipment set-up or tear-down that does not disturb the ground surface more than six inches in depth; hydro seeding; paving; placement of imported fill/gravel/rock; restoration; or backfilling of previously excavated areas. Excavated sediment from the inundated river channel, which was redeposited from upstream by the 2017 Oroville Dam Spillway incident, will not be subjected to monitoring or screening.
- At the conclusion of monitoring activities, the archaeological monitor shall submit to the USACE and SBFCA a brief Summary Monitoring Report for the Project, which incorporates all previously unknown discoveries and presents the methods and results of all monitoring activities. The draft report shall be submitted to the USACE and SBFCA within 12 months of the completion of all Project activities.
- All site records, reports, photographs, and other documentation generated for this Project using public funding shall be maintained on file with the CHRIS and made available to professionals meeting the standards of the OHP. Information derived from these documents may be further disseminated at professional archaeological conferences or meetings, or to the interested public (with confidentiality maintained).

CUL-2: Post-Review Discoveries

- If the monitoring archaeologist determines that the find is not a cultural resource (such as water-worn cobbles or accumulations of natural materials), then no additional action is necessary. Should tribal representatives desire to take possession of those materials, they may do so as long as the possession is documented by the archaeological monitor and as long as removal has been approved in writing by the property owner; however, taking possession does not obligate SBFCA or the USACE to provide fiduciary support for storing, processing, or reburying materials that are not cultural resources. Until a determination is made by the monitoring archaeologist about whether or not the find is subject to further consideration under CEQA, tribal representatives shall not remove or take possession of materials or objects observed. The final disposition of archaeological and historical resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission.

- If the find is determined by the monitoring archaeologist to be redeposited material that lacks primary context, is discovered only in the dredged soils, spoil piles, or stockpiles, or is otherwise not in its original context or place of deposition and does not contain human remains, then this discovery is not potentially eligible for the NRHP or California Register of Historical Resources CRHR. The archaeological monitor will assign a temporary field number, take a photograph, record its location with a Global Positioning System receiver, and describe the constituents in field notes. If the redeposited find is associated with European or non-Native American culture, the find may be left in place or discarded in order to not interfere with Project activities. If the find is associated with Native American culture, following consultation with the lead agencies, should tribal representatives desire to take possession of those materials or act in any manner consistent with the tribal cultural resources treatment plan, they may do so as long as the possession is documented by the archaeological monitor and as long as permission has been granted in writing by the property owner. However, taking possession does not obligate SBFCA or the USACE to provide fiduciary support for storing, processing, or reburying materials that are not eligible for the NRHP or CRHR. If the find was made in spoil piles and stockpiles, the material may be reused by the Project and will not be subject to screening; however, tribal representatives may take possession of any items found in spoils as long as doing so does not interfere with the Project activities.

- If a tribal representative disagrees with the determination by the monitoring archaeologist that a discovery is either not a cultural resource or represents a redeposit, then no material collection may occur by any party, and the Tribal Historic Preservation Officer (THPO) of the dissenting tribe shall notify the USACE and SBFCA within 48 hours of discovery. All timelines specified in 36 CFR 800.13(b) shall be applied in the event of an archaeological discovery. The USACE will have 48 hours to review information submitted by the THPO and communicate its decision to the THPO and State Historic Preservation Officer, in accordance with 36 CFR 800.13(b). If the contractor denies the request to stop work at that location during the appeal process (see above), and if the USACE determines that the find does represent an historic property, then the USACE and SBFCA will take into consideration the post-discovery impacts to the resource when determining the scope of the effort required to resolve any adverse effect.

- If the find is determined by the monitoring archaeologist to be in original context (in original place of deposition) and does not contain human remains, and that it constitutes a resource that could not have been discovered prior to dredging operations, then the USACE and SBFCA shall consult on appropriate treatment, in consultation with tribal representatives.

CUL-3: Protocols for Discovery of Human Remains

- If it is determined that human remains are found, or remains that are potentially human, then the treatment shall conform to the requirements of State law under California Health and Safety Code Section 7050.5 and PRC Section 5097.98.
- For the purposes of this Project, the definitions of remains subject to State law (Section 5097.98) shall apply. This definition states: "(d)(1) Human remains of a Native American may be an inhumation or cremation, and in any state of decomposition or skeletal completeness. (2) Any items associated with the human remains that are placed or buried with the Native American human remains are to be treated in the same manner as the remains, but do not by themselves constitute human remains."

Geology and Soils

GEO-1: Discovery of Unknown Paleontological Resources

- If any paleontological or other geologically sensitive resources are identified during any phase of Project development, the construction manager shall cease operation at the site of the discovery and immediately notify SBFCA. SBFCA shall retain a qualified paleontologist to provide an evaluation of the find and to prescribe mitigation measures to reduce impacts to a less-than-significant level. In considering any suggested mitigation proposed by the consulting paleontologist, the SBFCA shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, Project design, costs, land use assumptions, and other considerations. If avoidance is unnecessary or infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the Project site while mitigation for paleontological resources is carried out.

Tribal Cultural Resources

TCR-1: Tribal Monitoring

- All vegetation removal, soil excavation, and activity that has the potential to disturb more than six inches of original ground should be monitored by a qualified tribal monitor representing a consulting tribe. The monitor must be given a minimum of 48 hours' notice of the opportunity to be present during these activities and to coordinate closely with the archaeological monitor, to observe work activities, and assist in ensuring that sensitive tribal resources are not impacted. The monitor must be given a reasonable opportunity to inspect soil and other material as work proceeds to assist in determining if resources significant to the tribes are present. If potential tribal resources are discovered, a reasonable work pause or redirection of work by the contractor may be requested. If the tribe cannot recommend a monitor or if the tribal monitor does not report at the scheduled time, then all work will continue as long as the specified notice was provided. Tribal monitoring will not occur for equipment set-up or tear-down that does not disturb the ground surface more than six inches in depth; hydroseeding; paving; placement of imported fill/gravel/rock; restoration; or backfilling of previously excavated areas. Excavated sediment from the river channel, which was redeposited from upstream by the 2017 Oroville Dam incident, will not be subjected to screening. However, any potential TCRs observed in any location will be subject to the decision process in mitigation measure **CUL-2** and subsequent consultation between the monitoring tribe and the lead agencies to evaluate and, if necessary, treat the discovery to the satisfaction of the lead agencies. If the discovery includes human remains, then the procedures in mitigation measure **CUL-3** shall apply.

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ACRONYMS AND ABBREVIATIONS

AG	Agriculture
AG-20/PR	Agriculture 20/ Park and Recreation
BMPs	best management practices
BWD	Butte Water District
CAA	Clean Air Act
CalEEMod	California Emissions Estimator Model
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAL FIRE	California Department of Forestry and Fire Protection
CARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGS	California Geological Society
CH_4	Methane
CO_2	Carbon Dioxide
CWA	Clean Water Act
DMR	Division of Mine Reclamation
DOC	California Department of Conservation
DOF	California Department of Finance
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
ECHO	Enforcement and Compliance History Online
EIR	Environmental Impact Report
ESA	Endangered Species Act
F-B-X 10 AC. MIN	Farm-Building site – 10 acre minimum
FRAQMD	Feather River Air Quality Management District

ACRONYMS AND ABBREVIATIONS

GHG	Greenhouse gas
IS	Initial Study
lbs	pounds
Ldn/CNEL	average daily noise levels/community noise equivalent level
Leq	average hourly noise level
LOS	level of service
LOUSD	Live Oak Unified School District
mgd	Million gallons per day
MSL	mean sea level
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
MND	Mitigated Negative Declaration
MRZ	Mineral Resource Zones
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NIOSH	National Institute for Occupational Safety and Health
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OS	Open Space
PM_{10}	coarse particulate matter
$PM_{2.5}$	fine particulate matter
PRC	Public Resources Code
REC	Recreation
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Area Council of Governments
SBFCA	Sutter Butte Flood Control Agency
SCFD	Sutter County Fire Department
SCSO	Sutter County Sheriff’s Office
SO_2	sulfur dioxide
SVAB	Sacramento Valley Air Basin
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
UAIC	United Auburn Indian Community
UCMP	California Museum of Paleontology
USACE	United States Army Corp of Engineers
USEPA	United States Environmental Protection Agency

ACRONYMS AND ABBREVIATIONS

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
VMT	vehicle miles traveled
WWTP	wastewater treatment plant
YSRWMA	Yuba-Sutter Regional Waste Management Authority

SECTION 1.0 BACKGROUND

1.1 Summary

Project Title:	Live Oak Boat Ramp Sediment and Invasive Species Removal Project
Lead Agency Name and Address:	Sutter Butte Flood Control Agency 1445 Butte House Road, Suite B Yuba City, California 95993
Contact Person and Phone Number:	Michael Bessette, (530) 755-9859
Project Location:	The Live Oak Boat Ramp Sediment and Invasive Species Removal Project is located at the eastern terminus of Pennington Road, east of the city of Live Oak, California. The Project site is in unincorporated Sutter County. The approximately 8.22-acre Project site is located within and adjacent to the Feather River at the Live Oak Boat Ramp facility. This corresponds to the unsectioned Rancho Boga Land grant (Mount Diablo Base and Meridian) of the "Gridley, California" 7.5-minute quadrangle. The approximate center of the Study Area is located at latitude 39.273783˚ and longitude -121.631017˚ within the Honcut Headwaters – Lower Feather Watershed. (Figure 1. *Project Location and Vicinity*).
General Plan Designation:	**Sutter County:** Agriculture 20/ Park and Recreation (AG-20/PR) for Boat Ramp facility. Open Space (OS) for area to be dredged.
Zoning:	**Sutter County:** Recreation (REC) for Boat Ramp facility. Agriculture (AG) for area to be dredged

1.2 Introduction

The Initial Study has been prepared to identify and assess the anticipated environmental impacts of the Live Oak Boat Ramp Sediment and Invasive Species Removal Project (Project or Proposed Project). The Sutter Butte Flood Control Agency (SBFCA) is the Lead Agency for this Initial Study.

This document has been prepared to satisfy the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] § 21000 et seq.) and State CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.). CEQA requires that all State and local government agencies consider the environmental consequences of projects over which they have discretionary authority before acting on those projects. A CEQA Initial Study is generally used to determine which CEQA document is appropriate for a project (Negative Declaration, Mitigated Negative Declaration [MND], or Environmental Impact Report [EIR]).

1.3 Project Location

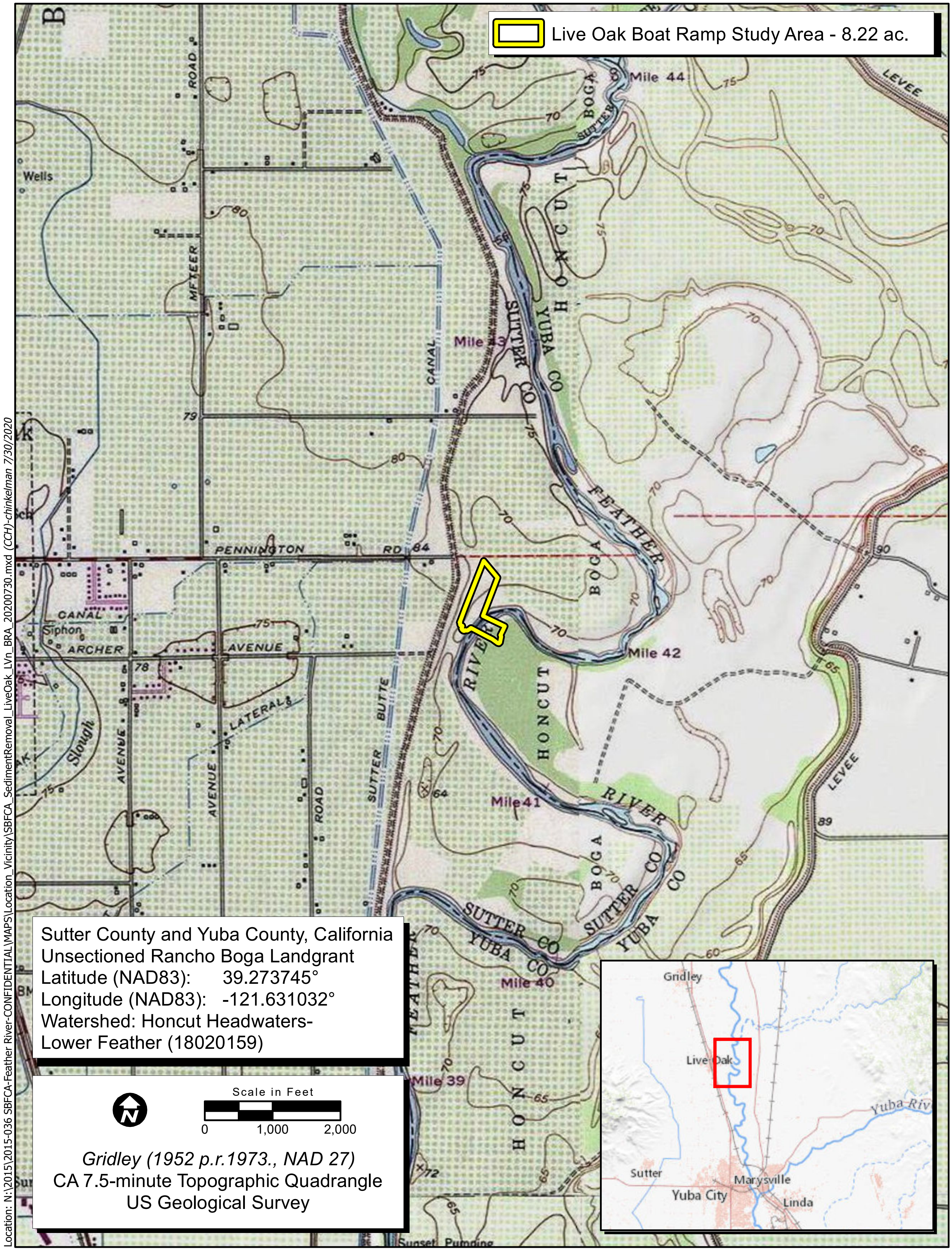
The Live Oak Boat Ramp Sediment and Invasive Species Removal Project is located in unincorporated Sutter County at the eastern terminus of Pennington Road east of the city of Live Oak, California. The approximately 8.22-acre Project site is located within and adjacent to the Feather River at the Live Oak Park and Recreation Area (see Figure 1. *Project Location and Vicinity*).

This corresponds to the unsectioned Rancho Boga Land grant (Mount Diablo Base and Meridian) of the "Gridley, California" 7.5-minute quadrangle. The approximate center of the Study Area is located at latitude 39.273783˚ and longitude -121.631017˚ within the Honcut Headwaters – Lower Feather Watershed. The Live Oak Boat Ramp elevation varies from approximately 70 feet above mean sea level (MSL) at the boat ramp parking area to 50 feet above MSL at the primrose dredging area.

1.4 Environmental Setting and Surrounding Land Uses

The Project site consists of the area to be dredged and a staging area. The Project site is located along the banks of the Feather River, a principal tributary of the Sacramento River, in the Southern Sacramento Valley. The area is primarily characterized by agricultural land, ruderal grassland, open space, and limited riparian vegetation. It is surrounded by rural agricultural lands and open space, with some rural residencies to the west of the site on the outskirts of the city of Live Oak (see Figure 2. *Surrounding Uses*).

The Project site has been historically situated at the interface between habitats of riparian forest and floodplain. The natural levee along the river consisted primarily of deciduous species, and the lower terraces of the multitiered riparian zone were comprised of willows and Fremont's cottonwood. On the floodplains adjoining the levee, the overstory included cottonwood, valley oak, California sycamore, and Oregon ash, with a sub canopy including white alder, box elder, buckeye (*Aesculus glabra*), big leaf maple, and elderberry. Today, there is a mix of native and introduced species, mostly within the herbaceous understory of the Project site, which includes such species as horsetails, mugwort, curly dock, and the invasive giant reed. Forested and shrub wetlands occur along the Feather River, which is comparable to that of the non-wetland riparian areas, but the vegetation occurs in areas that are inundated or saturated with surface or groundwater to support vegetation adapted to such conditions (U.S. Army Corps of Engineers [USACE] 2013).



Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Project Location and Vicinity

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

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Scale in Feet
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Figure 2. Surrounding Uses

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

SECTION 2.0 PROJECT DESCRIPTION

2.1 Project Characteristics

The Live Oak Ramp Sediment and Invasive Species Removal Project has been initiated for sediment management as part of restoration, protection and development of river parkways in accordance with the California River Parkways Grant Program. The removal, transport, and placement of dredge sediments are the primary components of the dredging process. These actions may be logically divided into two distinct components common to all dredging operations: 1) the excavation and removal of sediments from water bodies (i.e., dredging), and 2) the disposal and/or reuse of these dredged materials in another location (i.e., placement).

The Project site consists of approximately 8.22 acres at the Live Oak Recreational Park Boat Ramp facility along the western side of the Feather River. Sediment buildup in portions of the Feather River, exacerbated by the Oroville Dam Spillway incident of 2017, has created dangerous conditions for recreational users, made some boat launch facilities nearly unusable, and has hampered public safety as it has affected emergency vessel launching capabilities. The Project has received funding from the California Natural Resource Agency through Proposition 68 to remove sediment for safety and to restore recreation access to the Feather River.

The dredging operation would be staged from the existing Boat Ramp facility and adjacent lands (see Figure 3. *Project Site and Components*). Dredging would remove approximately 1.5 acres of invasive water primrose and approximately 3,400 cubic yards (cy) of sediment from the Boat Ramp facility.

Restoring river access and fish passage conditions at the boat ramp will also have regional economic benefits, as guided and private fishing (heavily curtailed by river and launch conditions) brings commerce to local restaurants, hotels, and other businesses. The Proposed Project will improve access to the Feather River by removing excess sediment that has accumulated on the site.

2.2 Project Dredging and Primrose Removal

Dredging operations will consist of the removal of sediment and primrose from the Project site during which the parking lot and boat ramp will be closed to the public.

The primrose removal consists of a primrose-only removal area and an overlap area where the primrose will first be removed and then more sediment underneath will be removed. Where the primrose is rooted in the sediment, approximately 10 to 12 inches of soil would be removed to ensure that the primrose roots have been adequately eliminated. The spoils will then be moved upland on the site and upon drying, be moved to either the Gridley Wastewater Treatment Plant (WWTP) emergency storage ponds or Ostrom Road or Neal Road landfills.

Where the primrose has spread out and is floating on the water in mats, it will be removed and disposed of as vegetative waste at the nearest green waste facility or an existing agricultural waste pile operated by Sutter County located adjacent to the Live Oak Park and Recreation Area.

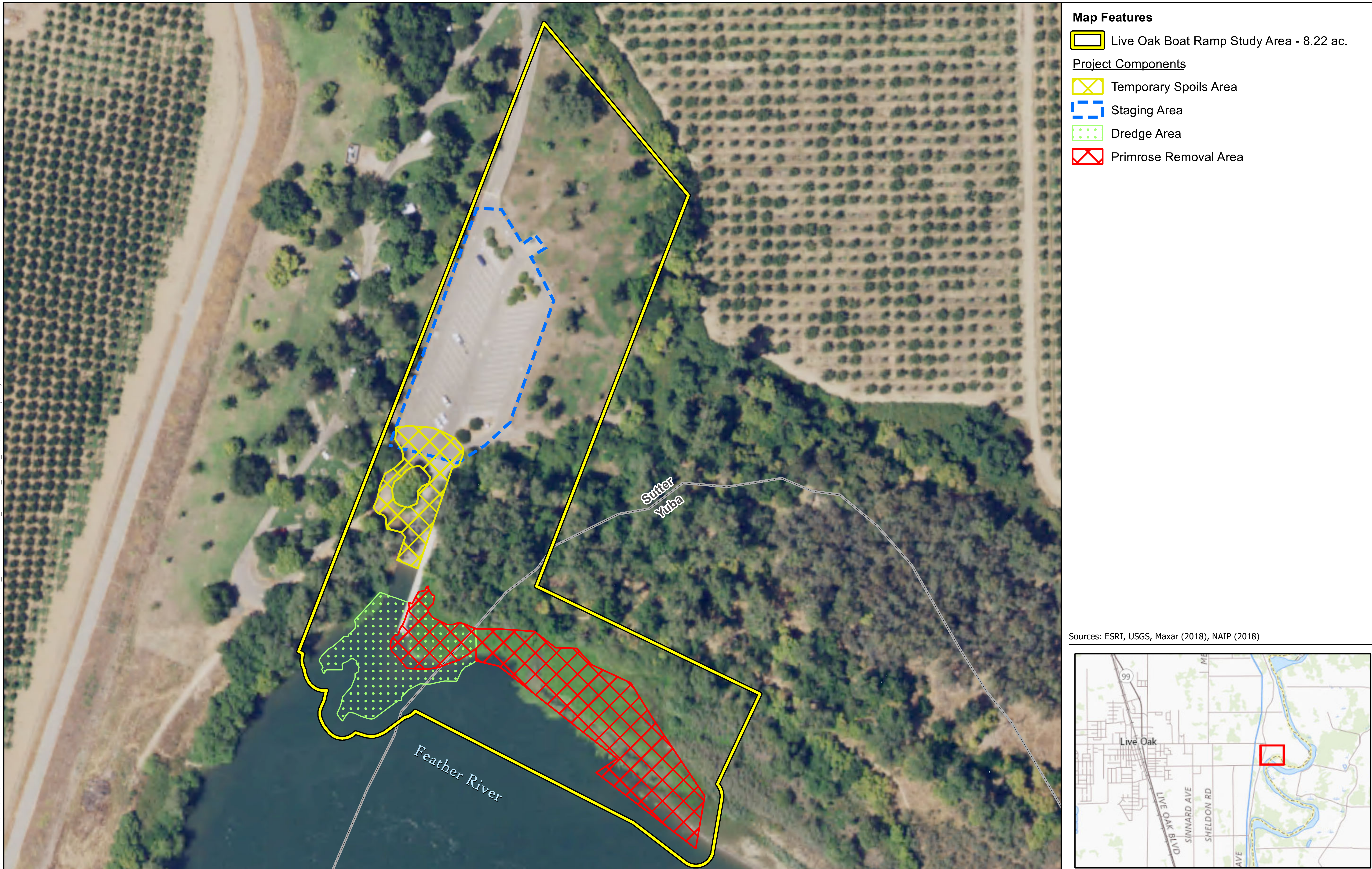
All dredged soils from the dredging operation would be placed on the boat ramp, dewatered as necessary, and the soil disposed of by either relocating the dredged material to the Gridley WWTP emergency overflow ponds for fill and embankment enhancement or transported to the Ostrom Road or Neal Road landfills to be used as cover material.

Dredging operations are anticipated to require two to five workers onsite during the operation. The operation is anticipated to start in the summer of 2021 and last approximately five days. Hours of dredging operation are anticipated to be from sunrise to sunset.

Typical mechanical dredging equipment such as a digging bucket or flat-cut bucket excavator, dump trucks, and backhoe loaders will be used during dredging operations. All operations will occur within the existing project site parking lot, boat ramp or directly adjacent to the shoreline. Any dredging/primrose removal that cannot be completed from the boat ramp by the excavator will require movement of the excavator along the shoreline. The excavator will not penetrate the vegetation or riparian areas along the shore but will stay within the riverbank as much as possible. For any areas that the dredging equipment may be required to enter the river water, water quality protection methods such as sedimentation curtains or wattles will be used. The dredged soil will be placed on the boat ramp for de-watering and will be moved into dump truck for transportation to the disposal site once the soil is dry enough for transportation. As with the excavation operation, water quality protection methods will be used at the de-watering site to reduce the potential water quality impacts.

Dump trucks vary by size and capacity. In the U.S., most standard dump trucks have one front steering axle and one (4×2 four-wheeler) or two (6×4 six-wheeler) rear axles that typically have dual wheels on each side. As a rule, a typical dump truck will hold approximately 12 to 16 cy of material. However, this is limited by the weight of the material being transported. Soil weighs 1,700 to 2,400 pounds (lbs) per cy, while stone weighs 2,500 to 3,000 lbs per cy. In general, the maximum quantity per truckload is 12 cy of stone or 14 cy of topsoil. Moisture content of the soils/stone can greatly affect the weight; generally, dryer materials are lighter in weight. For the purpose of this analysis, it is assumed that the dredged material will be dry, allowing for a capacity of 14 yards of material per truck. Using this assumption, the dredged material to be disposed of offsite would require approximately 243 truckloads to transport the 3,400 cy of dredged soils or an average of 48 truckloads per day over the five-day dredging operation.

This material will be disposed of at one or a combination of two options: the Gridley WWTP emergency storage ponds or Ostrom Road or Neal Road landfills discussed below.



Map Date: 8/10/2020

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Scale in Feet
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Figure 3. Project Site and Components

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

2.2.1 *Potential Disposal Sites*

Gridley WWTP Emergency Ponds

The WWTP emergency storage ponds are located approximately five miles north of the Project site (see Figure 4. *Potential Disposal Locations*). The WWTP including the emergency storage ponds were permitted by the California Regional Water Quality Control Board (RWQCB) Order No. R5-2006-0127. The emergency storage ponds consist of three separate ponds of 6.3 acres, 5.6 acres, and 4.3 acres, each surrounded by eight to 10 foot berms. The emergency storage ponds are adjacent to, and just west of, the Feather River. The emergency storage ponds provide approximately 100 acre-feet of capacity, or 26.5 million gallons. This provides enough storage for 15.6 days at an average flow of 1.7 million gallons per day (mgd) or 6.3 days at a peak flow of 4.2 mgd (RWQCB 2006). These ponds are rarely used and only used in an emergency situation where the treatment ponds and/or the four percolation ponds cannot contain the city's wastewater flows.

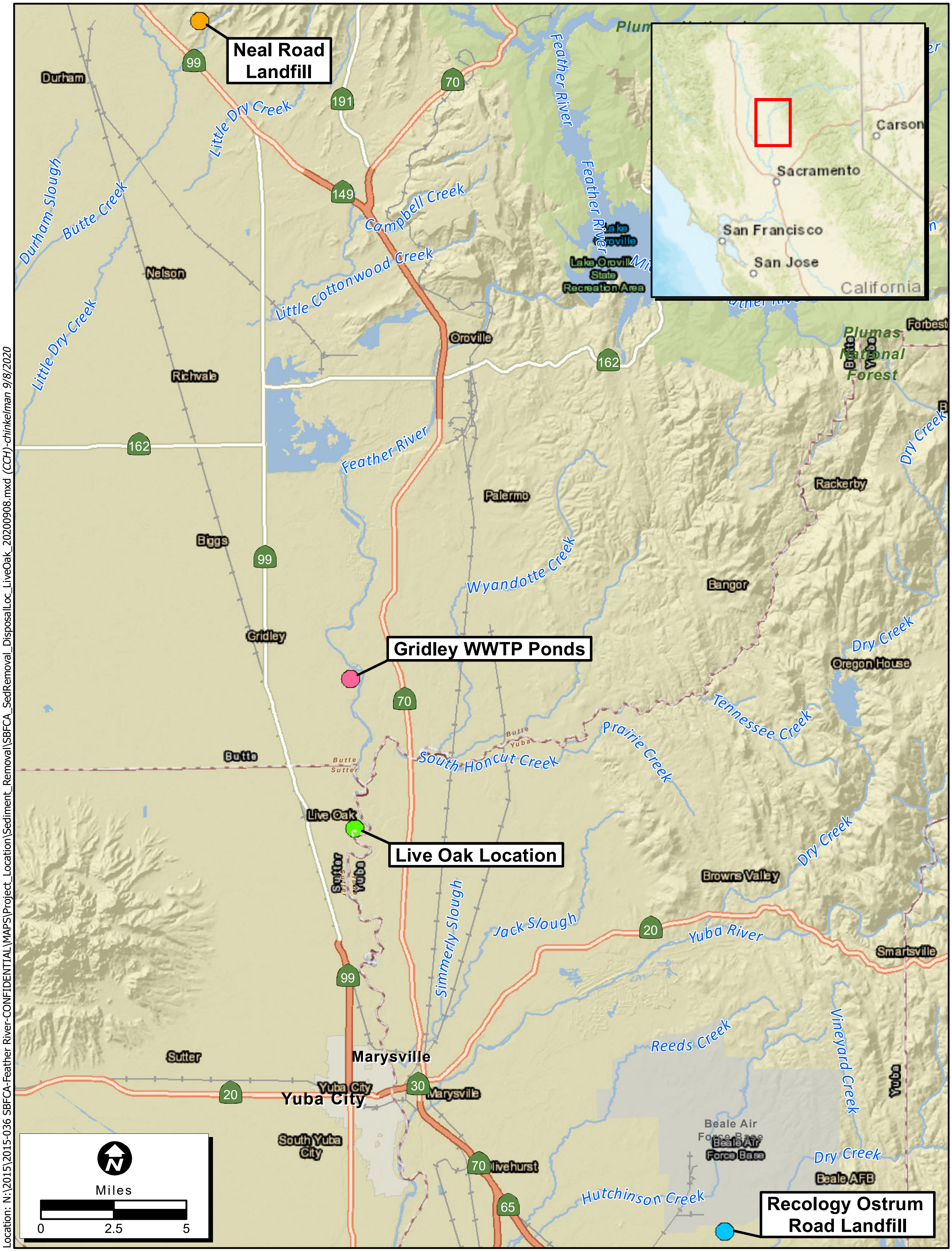
Any soil placed at the emergency ponds will be required to be analyzed for potential soil contaminates and must be considered "clean" prior to disposal at the ponds. If the soil from the Proposed Project is disposed of at the Gridley WWTP emergency ponds, this material will be placed either directly on the existing berms or within a pond basin as a part of ongoing maintenance activities at the ponds. No offsite storage of the soil would be required. No increase of pond storage or change in the use of the ponds would occur as a result of the use of the Project's dredged soils at the ponds.

Neal Road Recycling and Waste Facility

The Neal Road facility is located at 1023 Neal Road in Butte County, approximately 27 miles northeast of the Proposed Project site. The 140-acre landfill has a maximum capacity of almost 21 million cy and a cease operation date of January 1, 2048. The landfill is a Class II and III landfill and permitted to accept sludge, mixed municipal solid waste, industrial waste, contaminated soil, construction/demolition waste, ash, asbestos, and agricultural waste (California Department of Resources Recycling and Recovery [CalRecycle] 2020a). For soil disposal, the landfill requires sampling of the soil and a sample rate based on the amount of material to be disposed of at the landfill.

Recology Ostrom Road Landfill

The Ostrom Road Landfill is located at 5900 Ostrom Road in Yuba County, approximately 19 miles southeast of the Proposed Project site. The 261-acre landfill has a maximum capacity of almost 43.5 million cy and a cease operation date of December 31, 2066. The landfill is a Class II and III landfill and permitted to accept sludge, mixed municipal solid waste, industrial waste, contaminated soil, construction/demolition waste, ash, asbestos, and agricultural waste (CalRecycle 2020a). For soil disposal, the landfill requires sampling of the soil and a sample rate based on the amount of material to be disposed of at the landfill. If the soil contamination exceeds the various thresholds provided in the Recology Sampling Requirements and Acceptance Criteria document (Recology 2017), cleaning of the soil prior to disposal is required. Proof of the contamination level, if any, of the soil must be provided to the landfill prior to disposal.



Map Date: 9/8/2020

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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ENVIRONMENTAL CONSULTANTS

Figure 4. Potential Disposal Locations

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

2.3 Regulatory Requirements, Permits, and Approvals

The following approvals and regulatory permits would be required for implementation of the Proposed Project.

2.3.1 *Lead Agency Approval*

As the lead agency, SBFCA has the ultimate authority for Project approval or denial. The Proposed Project may require the following discretionary approvals and permits by the SBFCA for actions proposed as part of the Project:

- Adoption of the Initial Study/Mitigated Negative Declaration

In addition to the above SBFCA actions, the Project may require approvals, permits, and entitlements from other public agencies for which this Initial Study may be used, including, without limitation, the following:

- California Department of Fish and Wildlife (CDFW), Region 2
- California Department of Transportation (Caltrans), District 3
- California Regional Water Quality Control Board (RWQCB), Region 5
- Feather River Air Quality Management District (FRAQMD)
- National Marine Fisheries Service (NMFS)
- United States Army Corp of Engineers (USACE)
- United States Fish and Wildlife Service (USFWS)

2.4 Relationship of Project to Other Plans and Projects

2.4.1 *Sutter County General Plan*

The Sutter County 2030 General Plan provides the vision for the county through 2030 and beyond, and a strategy to make that vision a reality. California law requires that general plans address seven topics or "elements" consisting of land use, circulation, housing, open space, conservation, safety, and noise. Sutter County has chosen to include additional elements addressing agricultural resources, economic development, infrastructure, and public service. The General Plan provides an overall framework for development of the county and protection of its natural and cultural resources. The goals and policies contained in the General Plan are applicable throughout the county, except to the extent that County authority is preempted by cities within their corporate limits.

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SECTION 3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

3.1 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Public Services
☐ Agriculture and Forestry Resources	☐ Hazards/Hazardous Materials	☐ Recreation
☐ Air Quality	☐ Hydrology/Water Quality	☐ Transportation
☒ Biological Resources	☐ Land Use and Planning	☐ Tribal Cultural Resources
☒ Cultural Resources	☐ Mineral Resources	☐ Utilities and Service Systems
☐ Energy	☐ Noise	☐ Wildfire
☒ Geology and Soils	☐ Population and Housing	☒ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	☐
I find that although the Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	☒
I find that the Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	☐
I find that the Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	☐
I find that although the Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Project, nothing further is required.	☐

10/8/2020

Michael Bessette, P.E.
SBFCA Executive Director

Date

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SECTION 4.0 ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

The Proposed Project is set within the Live Oak Park and Recreation Area. This park includes a campground and boat ramp and dock. The campground has 21 paved camping stalls with picnic tables and barbeque. The park also has a large grassy area and an abundance of trees. The park is located adjacent to the Feather River and is surrounded by orchards.

Views available from the Project site include the views of the river and surrounding orchards. Distant views are limited due to the surrounding vegetation.

4.1.1.1 Regional Setting

Sutter County is characterized by relatively flat terrain with generally expansive viewsheds and valley elevations ranging from 35 to 80 feet above MSL. The one prominent topographic feature within the county is the Sutter Buttes (32,000 acres), a remnant volcano with a peak elevation approximately 2,000 feet above the surrounding valley floor. Juxtaposed to the vast open farmland, the Sutter Buttes create a dramatic landmark that is visible throughout the county (Sutter County 2008).

Sutter County General Plan Policy ER 7.1 requires the protection of "unique scenic resources including Sutter Buttes, wildlife and habitat areas, the Sacramento, Feather, and Bear Rivers, and other significant resources" (Sutter County 2011a). The General Plan Background Report identifies views of Sutter Buttes, Feather River, Sacramento River, Bear River, and the valley's orchards as scenic resources within the county, which contribute to the county's character (Sutter County 2008). This Project is not located within the Sutter Buttes Overlay Zone and is not located in the immediate vicinity of the Bear River or Sacramento River.

State Scenic Highways

The intent of the California Scenic Highway Program is to protect and enhance the scenic beauty of California's highways and adjacent corridors. A highway can be designated as scenic based on how much natural beauty can be seen by users of the highway, the quality of the scenic landscape, and if development impacts the enjoyment of the view. No officially designated scenic highways are located within the vicinity of the Project site (Caltrans 2020a).

4.1.1.2 Visual Character of the Project Site

As shown on Figure 3, the Project site consists of areas of proposed sediment and primrose removal and an existing parking lot to be used as a staging area. As shown on Figures 5a and 5b, the sediment and primrose removal areas are currently covered with primrose and surrounded by waters of the Feather River as well as a boat dock and ramp, and ground vegetation and trees on the adjacent bank. The staging area is a typical paved parking lot.

Figure 5a. View of Project Site – Boat Ramp Sediment Removal Area

Figure 5b. View of Project Site – Primrose Removal Area

4.1.2 Aesthetics (I) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

The Feather River is identified as a scenic resource in the Sutter County's General Plan Background Report. During sediment and primrose removal operations there will be vehicles and equipment located within the Project site, on the Feather River. However, these will be temporary and will cease once removal operations are completed. Once removal operations are completed, the removal site would return to the natural condition of the river. As such, the Project would not affect the viewshed or scenic vista of the site. Therefore, The Proposed Project would have a less-than-significant impact on scenic vistas.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

The Proposed Project is not located within the vicinity of an officially designated scenic highway. No impact would occur.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	In a non-urbanized area substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐

During sediment and primrose removal operations there will be vehicles and equipment located within the Project site. However, these uses will be temporary and will cease once removal operations are completed. After completion, the removal site would return to the natural condition of the river. As such, the Proposed Project would not result in the degradation of the visual character of the site or impact public views of the site and its surroundings. The Project would have a less than significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

The Proposed Project is for the removal of sediment and invasive primrose. This removal would require equipment used in dredging operation such as a dredging crane, front loader, and dump trucks. However, these uses would be temporary and will cease once removal operations are completed. All dredging work would be performed during normal daylight construction hours, thereby eliminating any need for temporary light sources necessary for nighttime work. No permanent structures would be built as a part of the Project and as such, the Project would not provide any new light or glare sources. Therefore, the Proposed Project would have no impact for the potential to create light or glare that would adversely affect day or nighttime views.

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

The California Department of Conservation (DOC) manages the Farmland Mapping and Monitoring Program, which identifies and maps significant farmland. Farmland is classified using a system of five categories including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. The classification of farmland as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance is based on the suitability of soils for agricultural production, as determined by a soil survey conducted by the Natural Resources Conservation Service (NRCS). The DOC manages an interactive website, the California Important Farmland Finder, which can be used to identify the farmland classification of a specific area. This website program identifies the lands in the Project vicinity as being Urban or Built-Up Land (DOC 2020).

PRC Section 12220(g) defines forest land as “land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.”

PRC Section 4526 defines timberland as “land, … which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis.”

None of the Project site is within an area that could be considered to contain forest land. Additionally, this area is not zoned by Sutter County for forestland protection or timber production.

4.2.2 Agriculture and Forestry Resources (II) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

According to the DOC (2020), the site is identified as Urban or Built-Up Land. As such, the Proposed Project would not have the potential to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance into non-agricultural use. There would be no impact in this subject area.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

The Project is located with an existing recreational area. The removal of sediment and primrose from the area would not have any effect on Williamson Act lands. The Project would have no impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒

No land zoned as forest lands exist on any of the three Project sites or within the vicinity of the Project. The Project would have no impact in this area.

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

The Project would not result in a loss or conversion of forest land as none exist in the area. The Project would have no impact in this area.

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

The Project would remove existing sediment and invasive primrose within the boundaries of the Feather River. The Project would improve recreational uses of the Live Oak Park and Recreational Area. This removal work would not affect agricultural or forest land. Therefore, the Proposed Project would have no impact in this area.

4.3 Air Quality

4.3.1 Environmental Setting

The California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (USEPA) focus on the following criteria pollutants to determine air quality: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. In Sutter County, the majority of criteria pollutant emissions come from mobile sources.

Toxic Air Contaminants (TAC) are separated into categories of carcinogens and noncarcinogens. Carcinogens, such as diesel particulate matter (DPM), are considered dangerous at any level of exposure. Noncarcinogens, however, have a minimum threshold for dangerous exposure. Common sources of TAC include, but are not limited to, gas stations, dry cleaners, diesel generators, ships, trains, construction equipment, and motor vehicles.

4.3.1.1 Topography and Air Quality

The Project site is located in the northern portion of Sutter County, which is within the Sacramento Valley Air Basin (SVAB). The SVAB also comprises all of Butte, Colusa, Placer, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba counties and the eastern portion of Solano County.

Ambient air quality is commonly characterized by climate conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The air basin is subject to a combination of topographical and climatic factors that influence the potential for high levels of regional and local air pollutants.

The SVAB is relatively flat, bordered by mountains to the east, west, and north and by the San Joaquin Valley to the south. Air flows into the SVAB through the Carquinez Strait, moving across the Sacramento Delta, and bringing with it pollutants from the heavily populated San Francisco Bay Area. The climate is characterized by hot, dry summers and cool, rainy winters. Characteristics of SVAB winter weather are periods of dense and persistent low-level fog, which are most prevalent between storm systems. From May to October, the region's intense heat and sunlight lead to high ozone pollutant concentrations. Summer inversions are strong and frequent but are less troublesome than those that occur in the fall. Autumn inversions, formed by warm air subsiding in a region of high pressure, have accompanying light winds that do not provide adequate dispersion of air pollutants.

4.3.2 Air Quality (III) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒

As part of its enforcement responsibilities, the USEPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under State law, the California Clean Air Act (CCAA) requires an air quality attainment plan be prepared for areas designated as nonattainment with regard to the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The Project site is located within the SVAB, which is under the jurisdiction of the Feather River Air Quality Management District (FRAQMD). The FRAQMD is required, pursuant to the federal CAA, to reduce emissions of criteria pollutants for which the SVAB is in nonattainment. The FRAQMD is the agency responsible for enforcing many federal and State air quality requirements and for establishing air quality rules and regulations. The FRAQMD attains and maintains air quality conditions in Sutter County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. As part of this effort, the FRAQMD has developed input to the SIP, which is required under the federal Clean Air Act (CAA) for areas that are out of attainment for air quality standards. The SIP includes the FRAQMD's plans and control measures for attaining the ozone national ambient air quality standards. Pollutant control strategies are based on the latest scientific and technical information and planning assumptions, updated emission inventory methodologies for various source categories, and the latest population growth projections and associated vehicle miles traveled projections for the region. FRAQMD's latest population growth forecasts were defined in consultation with local governments and with reference to local general plans. A project conforms with the FRAQMD attainment plans if it complies with all applicable district rules and regulations, complies with all control measures from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). A project is nonconforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan. Consistency with growth forecasts can be established by demonstrating that a project is consistent with the land use plan that was used to generate the growth forecast. The source of data forming the basis for the projections of air pollutant emissions in Sutter County is the Sutter County General Plan. An example of a nonconforming project would be one that increases the gross number of dwelling units, increases the number of trips, and/or increases the overall vehicle miles traveled in an affected area relative to the applicable land use plan.

The Proposed Project would be required to comply with all applicable FRAQMD rules and regulations. Further, as demonstrated in Table 4.3-1, the Proposed Project would not surpass any of the FRAQMD's significance thresholds for individual pollutants. Additionally, the Project is proposing the removal of sediment and invasive species in portions of the Feather River. It would not increase the number of homes, jobs, or provide additional infrastructure in the area. Furthermore, the Project construction would not contribute to emissions once dredging is complete.

The Project would not conflict or obstruct with the implementation of any air quality plan. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds would not be considered cumulatively considerable.

4.3.2.1 Project Implementation Emissions

Emissions generated during Project implementation were calculated using the CARB-approved California Emissions Estimator Model (CalEEMod) version 2016.3.2 computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. See Appendix A for more information regarding the construction assumptions, including construction equipment and duration, used in this analysis.

Predicted maximum daily and annual emissions that would be generated during Project implementation are summarized in Table 4.3-1. Project emissions would be short term and of temporary duration, lasting only as long as Project implementation would occur, and are therefore compared with the FRAQMD's construction-related thresholds. While emissions would be temporary, they would be considered a significant air quality impact if the volume of pollutants generated exceeds the FRAQMD's thresholds of significance.

As shown in Table 4.3-1, emissions generated during Project dredging operations would not exceed the FRAQMD's thresholds of significance. Therefore, criteria pollutant emissions generated during Project dredging and primrose removal would not result in a cumulatively considerable net increase of any criteria pollutant. A less-than-significant impact would occur as a result of the sediment and primrose removal of the Proposed Project.

Table 4.3-1. Construction Related Emissions

Construction Year	Pollutants		
	Reactive Organic Gases (ROG)	NOx	PM10
Daily Emissions (pounds per day)			
Construction 2021	1.65 pounds/day	20.83 pounds/day	0.59 pounds per day
FRAQMD Significance Threshold	25 pounds per day	25 pounds per day	80 pounds per day
Exceeds the FRAQMD Significance Threshold	No	**No**	**No**
Annual Emissions (tons per year)			
Construction 2021	0.12 tons per year	1.87 tons per year	0.03 tons per year
FRAQMD Significance Threshold	*4.5 tons per year*	*4.5 tons per year*	*N/A*
Exceeds the FRAQMD Significance Threshold	**No**	**No**	**No**

Source: California Emissions Estimator Model (CalEEMod) version 2016.3.2; EMFAC2017. Refer to Appendix A for Model Data Outputs.
Notes: NOx and ROG construction emissions many be averaged over the life of a project but may not exceed 4.5 tons per year.

Post-Implementation Emissions

The Proposed Project involves the removal of sediment and invasive species from the Feather River. It would not include the addition of new permanent stationary or mobile sources of emissions to the Project site. Therefore, operational emissions would have no impact on long-term air quality impacts.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. The nearest sensitive receptors to the Project site are residences located approximately 700 feet away.

4.3.2.2 Project Implementation-Generated Air Contaminants

Dredging-related activities would result in temporary, short-term Proposed Project-generated emissions of diesel particulate matter (DPM), reactive organic gases (ROG), NO_x, CO, and PM_{10} from the exhaust of off-road, heavy-duty diesel equipment for the dredging, soil hauling, truck traffic and other miscellaneous activities. However, as shown in Table 4.3-1 the Project would not exceed FRAQMD's emission thresholds. The portion of the SVAB that encompasses the Project area is designated as a nonattainment area for the State standards for O_3, and PM_{10}. Thus, existing levels in the SVAB are at unhealthy levels during certain periods.

The health effects associated with O_3 are generally associated with reduced lung function. Because the Project would not involve activities that would result in O_3 precursor emissions (ROG or NO_3) in excess of the FRAQMD thresholds, the Project is not anticipated to substantially contribute to regional O_3 concentrations and the associated health impacts.

CO tends to be a localized impact associated with congested intersections. In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions. The Project would not involve activities that would result in substantial amounts of CO emissions. Thus, the Project's CO emissions would not contribute to the health effects associated with this pollutant.

Particulate matter (PM_{10} and $PM_{2.5}$) contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing. For construction activity, DPM is the primary TAC of concern. Particulate exhaust emissions from diesel-fueled engines (i.e., DPM) were identified as a TAC by the CARB in 1998. The potential cancer risk from the inhalation of DPM, as discussed below, outweighs the potential for all other health impacts (i.e., non-cancer chronic risk, short-term acute risk) and health impacts from other TACs. Based on the emission modeling conducted, the maximum onsite construction-related daily emissions of exhaust $PM_{2.5}$, considered a surrogate for DPM, would be 0.33 pound per day during construction activities (see Appendix A). ($PM_{2.5}$ exhaust is considered a surrogate for DPM because more than 90 percent of DPM is less than one microgram in diameter and therefore is a subset of particulate matter under 2.5 microns in diameter (i.e., $PM_{2.5}$). Most $PM_{2.5}$ derives from combustion, such as use of gasoline and diesel fuels by motor vehicles.) As with O_3, the Project would not generate emissions of PM that would exceed the FRAQMD's thresholds. Additionally, the Project would be required to comply with FRAQMD Rule 3.16, which limits the amount of fugitive dust generated during construction. Accordingly, the Project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause any increase in related regional health effects for these pollutants.

In summary, construction-related TAC emissions would not expose sensitive receptors to substantial amounts of air toxics. Thus, the Project would not result in a potentially significant contribution to regional or localized concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants. As such, the impact would be less than significant.

4.3.2.3 Post-Implementation Air Contaminants

Operation of the Proposed Project would not result in the development of any substantial sources of air toxics. There are no stationary sources associated with the operations of the Project. Nor would the Project attract mobile sources that spend long periods queuing and idling at the site. Therefore, the Project would not be a source of TACs.

Naturally Occurring Asbestos

Another potential air quality issue associated with construction-related activities is the airborne entrainment of asbestos due to the disturbance of naturally occurring asbestos-containing soils. The proposed Project is not located within an area designated by the State of California as likely to contain naturally occurring asbestos (DOC 2000c). As a result, construction-related activities would not be anticipated to result in increased exposure of sensitive land uses to asbestos.

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or "hot spots," are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. It has long been recognized that CO hot spots are caused by vehicular emissions, primarily when idling at congested intersections.

However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. In 1993, much of the state was designated nonattainment under the CAAQS and NAAQS for CO. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams per mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration across the entire state is now designated as attainment. Detailed modeling of Project-specific CO hot spots is not necessary and thus this potential impact is addressed qualitatively.

A CO hot spot would occur if an exceedance of the State one-hour standard of 20 parts per million (ppm) or the eight-hour standard of nine ppm were to occur. A study conducted in Los Angeles County by the South Coast Air Quality Management District (SCAQMD) is helpful in showing the amount of traffic necessary to result in a CO hot spot. The SCAQMD analysis prepared for CO attainment in the SCAQMD's *1992 Federal Attainment Plan for Carbon Monoxide* in Los Angeles County and a Modeling and Attainment Demonstration prepared by the SCAQMD as part of the 2003 Air Quality Management Plan can be used to demonstrate the potential for CO exceedances of these standards. The SCAQMD conducted a CO hot spot analysis as part of the 1992 CO Federal Attainment Plan at four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. Despite this level of traffic, the CO analysis concluded that there was no violation of CO standards (SCAQMD 1992). To establish a more accurate record of baseline CO concentrations, a CO hot spot analysis was conducted in 2003 at the same four busy intersections in Los Angeles at the peak morning and afternoon time periods. This hot spot analysis did not predict any violation of CO standards. The highest one-hour concentration was measured at 4.6 ppm at Wilshire Boulevard and Veteran Avenue and the highest eight-hour concentration was measured at 8.4 ppm at Long Beach Boulevard and Imperial Highway.

Similar considerations are also employed by other air districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD) concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical and/or horizontal air does not mix in order to generate a significant CO impact.

The Proposed Project would not generate any new traffic trips and average daily trips would be the same with and without Project implementation. Because the proposed Project would not increase traffic volumes at any intersection to more than 100,000 vehicles per day, or even 44,000, there is no likelihood of the Project traffic exceeding CO values.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☒

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Project Implementation

During dredging, the Proposed Project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the site. However, these emissions are short term in nature and will rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the construction area. As such, no impact would occur.

Post-Implementation

Land uses that are associated with odors include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The Proposed Project would not include any of the land uses that have been identified as odor sources. Thus, there would be no impact associated with operational odors.

4.4 Biological Resources

ECORP Consulting, Inc. conducted a Biological Resources Assessment (BRA) (ECORP 2020a) and an Aquatic Resources Delineation (ARD) (ECORP 2020b) for the Proposed Project. The information provided in this section was taken from the BRA and ARD. The purpose of the BRA and ARD was to collect information on the biological resources present within the Project site such as potential habitat for sensitive plant, animals and aquatic resources present sufficient to support CEQA. These documents are included as Appendix B of this IS/MND.

4.4.1 Environmental Setting

The Study Area for the BRA includes the Feather River, the Live Oak Boat Ramp, and surrounding lands on the west bank of the Feather River, as identified on Figure 3. The developed portions of the boat ramp include a paved roadway, parking area, the boat ramp, and landscaped picnic/day-use areas. The undeveloped areas around the boat ramp include riverbank riparian habitat.

4.4.1.1 Land Cover Types and Vegetation Communities

Vegetation communities or land cover types found within the Project site include riparian woodland and paved/developed. Riparian woodland is found along the riverbanks and in unimproved areas around the boat ramp and day use facilities of the site. The riparian woodland vegetation is made up of a closed canopy of mature trees including Fremont's cottonwood (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*), with scattered valley oak (*Quercus lobata*), and box elder (*Acer negundo*). Other plants found in the understory included sandbar willow (*Salix exigua*) and other willow species, Himalayan blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*).

Paved, developed portions of the site are characterized by existing paved roads and parking areas, compacted dirt/gravel parking areas, and pedestrian paths to the Feather River. The majority of the dirt/gravel roads and paths were unvegetated.

4.4.1.2 Soils

As discussed in Section 4.7 Geology and Soils, the Project site consists of three soil units or types:

- 118 – Columbia fine sandy loam, channeled, 0 to 2 percent slopes
- 121 – Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes
- 138 – Columbia fine sandy loam, 0 to 1 percent slopes, occasionally flooded

All of these soil units contain hydric components and are considered hydric (NRCS 2020).

4.4.1.3 Aquatic Resources

A total of 2.385 acres of aquatic resources have been mapped within the Project site. A discussion of the aquatic resources is presented below, and the aquatic resources delineation maps for the Project site are presented on Figure 6. *Aquatic Resources Delineation*.

Water Primrose Marsh

The water primrose marsh is an area adjacent to the Feather River and above the ordinary high-water mark/existing water level. This marsh is in a portion of the riverbank that is subject to heavy sediment deposition. At the time of the April 2020 field survey, the Feather River water elevation was several feet below that of the marsh. The marsh is dominated entirely by water primrose.

4.4.1.4 Other Waters/Non-Wetland Waters

Feather River

The Feather River is perennial and exhibits bed and bank. Flows and water levels are regulated upstream at Oroville Dam. The limits of the river, for purposes of this study, were delineated at the water's edge on the day of the field survey (April 8, 2020), or based on aerial photograph interpretation (Google Earth imagery date: May 17, 2018) and were not based on a specific elevation or gage data. Levees line the Feather River.

4.4.1.5 Wildlife

The Project site supports a variety of common wildlife species. A detailed list of wildlife species observed in the vicinity of the Project site during the April 2020 site visit is included as Attachment C of the BRA.

4.4.2 Evaluation of Potentially Occurring Special-Status Species

According to the BRA, based on species occurrence information from the California Natural Diversity Database (CNDDB), the literature review, and observations in the field, a list of special-status plant and animal species that have the potential to occur within the Project site was generated. Twenty-one wildlife species and 10 plant species were noted that are considered to have the potential to occur on the Project site. These species are listed in Table 4.4-1 and discussed further below. Species that were considered to be absent from the Project site due to lack of suitable habitat, or because the known distribution of the species does not include the Project site vicinity, are not discussed further in this document.

Sample Points	Type	Latitude	Longitude
1	Waters Point	39.273400	-121.631554
2	Upland Point	39.273404	-121.631514
3	Waters Point	39.273397	-121.631736

Map Features

Live Oak Boat Ramp Study Area - 8.22 ac.

Reference Coordinates

Feature Type

Upland Point

Waters Point

Aquatic Resources Delineation[1]*

Wetland

Water Primrose Marsh

Non-Wetland Aquatic Resources

Feather River OHWM

Aquatic Resources	Total (acres)
Wetlands	***0.479***
Water Primrose Marsh	0.479
Non-wetland Aquatic Resources	***1.906***
Feather River OHWM	1.906
Total (acres)	**2.385**

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Sources: ESRI, USGS, Maxar (2018)

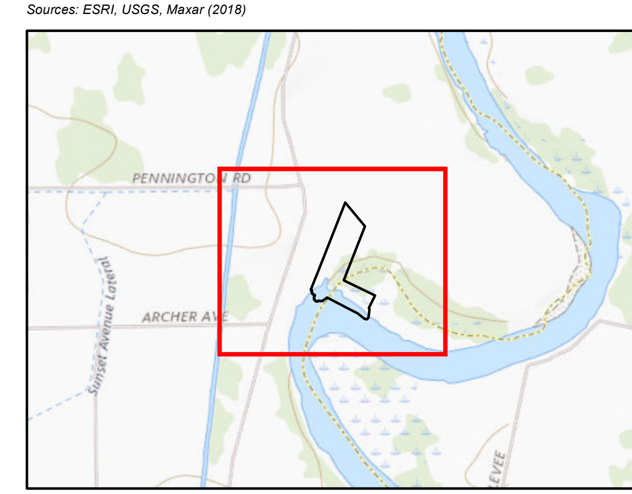

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Jurisdictional_Delineation\USACE_Delineation\Sediment_Removal\SBFCA_SedimentRemoval_LiveOak_ARD_20200731.mxd(CCH) -chinkelman 7/31/2020

Map Date: 7/31/2020

Scale in Feet
0 200

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 6. Aquatic Resources Delineation

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

A complete list of special-status species known to exist in the region and the results of the database queries are included in the BRA (see Appendix B).

Table 4.4-1. Potentially Occurring Special-Status Species

Common Name (*Scientific Name*)	Status[1] FESA	Status[1] CESA/ NPPA	Status[1] Other	Habitat Description	Survey Period	Potential To Occur Onsite
Plants						
Mexican mosquito fern (*Azolla microphylla*)	–	–	4.2	Marshes and swamps, ponds or slow-moving bodies of water (98'–328').	August	Low potential to occur. Marginally suitable habitat within Study Area.
Red-stemmed cryptantha *(Cryptantha rostellata)*	–	–	4.2	Often roadsides and gravelly, volcanic openings within cismontane woodland and valley and foothill grassland (131' – 2,624').	April-June	Low potential to occur. Marginally suitable habitat within Study Area.
Shield-bracted monkeyflower (*Erythranthe glaucescens*)	–	–	4.3	Serpentinite seeps and sometimes streambanks within chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (197' – 4,068').	February-August	Low potential to occur. Marginally suitable habitat within Study Area.
Woolly rose-mallow *(Hibiscus lasiocarpos* var. *occidentalis)*	–	–	1B.2	Marshes and freshwater swamps. Often in riprap on sides of levees (0'–394').	June–September	Potential to occur. Suitable habitat present within the Study Area.
Colusa layia *(Layia septentrionalis)*	–	–	1B.2	Sandy or serpentinite soils in chaparral, cismontane woodland, and valley and foothill grasslands (328'–3,593').	April–May	Low potential to occur. Marginally suitable habitat within Study Area.
Ahart's paronychia *(Paronychia ahartii)*	–	–	1B.1	Cismontane woodland, valley and foothill grassland, and vernal pools (98'–1673').	February-June	Low potential to occur. Marginally suitable habitat present within the Study Area.
Wine-colored tufa moss *(Plagiobryoides vinosula)*	–	–	4.2	Usually in granitic rock or granitic soil along seeps and streams, sometimes in clay in cismontane woodland, Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, and riparian woodland (98'–5,692').	–	Low potential to occur. Marginally suitable habitat within Study Area.
Hartweg's golden sunburst *(Pseudobahia bahiifolia)*	FE	CE	1B.1	Clay, often acidic soils in cismontane woodland, valley and foothill grasslands (49'–492').	March–April	Low potential to occur. Marginally suitable habitat within Study Area.

Table 4.4-1. Potentially Occurring Special-Status Species

Common Name (*Scientific Name*)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Sanford's arrowhead *(Sagittaria sanfordii)*	–	–	1B.2	Shallow marshes and freshwater swamps (0'–2,133').	May–October	Low potential to occur. Marginally suitable habitat within Study Area.
Brazilian watermeal *(Wolffia brasiliensis)*	–	–	2B.3	Assorted shallow freshwater marshes and swamps (66'–328').	April–December	Low potential to occur. Marginally suitable habitat within Study Area.
Fish						
Pacific lamprey (*Lampetra tridentata*)	–	–	SSC	Anadromous; undammed streams rivers, streams, and creeks with gravel spawning substrates.	N/A	Present [2]
River lamprey (*L. ayresi*)	–	–	SSC	Anadromous; undammed streams rivers, streams, and creeks with gravel spawning substrates.	N/A	Present [2]
Sacramento hitch (*Lavinia exilicauda*)	–	–	SSC	Low-velocity habitats of warm water rivers and lakes	N/A	Present [2]
Sacramento splittail (*Pogonichthys macrolepidotus*)	–	–	SSC	Estuarine environments, rivers, sloughs, and alkaline lakes.	N/A	Low potential to occur. Historically present prior to substantial hydrologic alterations
Hardhead (*Mylopharodon conocephalus*)	–	–	SSC	Relatively undisturbed streams at low to mid elevations in the Sacramento-San Joaquin and Russian River drainages. In the San Joaquin River, scattered populations found in tributary streams, but only rarely in the valley reaches of the San Joaquin River.	N/A	Present [2]
Chinook salmon (Central Valley fall-run/late fall-run Evolutionarily Significant Unit [ESU]) (*Oncorhynchus tshawytscha*)	SC	--	SSC	Anadromous; undammed cold water rivers and streams having riffles with large gravel substrates and relatively deep pools.	N/A	Present [2]
Chinook salmon (Central Valley spring-run ESU)	FT	T	-	Anadromous; undammed cold water rivers and streams having riffles with large gravel substrates and relatively deep pools.	N/A	Present [2]

Table 4.4-1. Potentially Occurring Special-Status Species

Common Name (*Scientific Name*)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Steelhead (Central Valley Distinct Population Segments [DPS]) (*Oncorhynchus mykiss*)	FT	-	-	Anadromous; undammed cold water rivers and streams having riffles with gravel substrates and relatively deep pools.	N/A	Present [2]
Green Sturgeon (Southern DPS) (*Acipenser medirostris*)	FT	-	-	Anadromous; undammed cold water rivers having relatively deep pools with large substrates.	N/A	Low potential to occur. There is little past or current evidence of occurrence or spawning in the Feather Rivers.
Riffle sculpin (*Cottus gulosus*)	-	-	SSC	Riffles or pools of cold headwater streams having coarse substrates and adequate cover.	N/A	Present [2]
Reptiles						
Northwestern pond turtle (*Actinemys marmorata*)	-	-	SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches.	April-September	Potential to occur. Suitable habitat within the Study Area.
Birds						
Yellow-billed cuckoo (*Coccyzus americanus*)	FT	CE	BCC	Breeds in California, Arizona, Utah, Colorado, and Wyoming. In California, they nest along the upper Sacramento River and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other known nesting locations include Feather River (Butte, Yuba, Sutter counties), Prado Flood Control Basin (San Bernardino and Riverside Co.), Amargosa River and Owens Valley (Inyo Co.), Santa Clara River (Los Angeles Co.), Mojave River and Colorado River (San Bernardino Co.). Nests in riparian woodland. Winters in South America.	June 15-August 15	Potential-suitable nesting habitat is present and within 500 feet of the Study Area.
Bald eagle (Haliaeetus leucocephalus)	De-listed	CE	CFP, BCC	Typically nests in forested areas near large bodies of water in the northern half of California; nest in trees and rarely on cliffs; wintering habitat includes forest and woodland communities near water bodies (e.g. rivers, lakes), wetlands, flooded agricultural fields, open grasslands	February – September (nesting); October-March (wintering)	Low potential to occur. Suitable nesting habitat is present but the area is small and people are constantly present.

Table 4.4-1. Potentially Occurring Special-Status Species						
Common Name (*Scientific Name*)	**Status[1]**			**Habitat Description**	**Survey Period**	**Potential To Occur Onsite**
	FESA	**CESA/ NPPA**	**Other**			
White-tailed kite (*Elanus leucurus*)	-	-	CFP	Nesting occurs within trees in low elevation grassland, agricultural, wetland, oak woodland, riparian, savannah, and urban habitats.	March-August	Potential to occur. Suitable habitat within the Study Area.
Swainson's hawk (*Buteo swainsoni*)	-	CT	BCC	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures	March-August	Potential to occur. Suitable nesting habitat within the Study Area.
Nuttall's woodpecker *(Dryobates nuttallii)*	-	-	BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands.	April-July	Potential to occur. Suitable nesting habitat within the Study Area.
Yellow-billed magpie (*Pica nuttallii*)	-	-	BCC	Endemic to California; found in the Central Valley and coast range south of San Francisco Bay and north of Los Angeles County; nesting habitat includes oak savannah with large in large expanses of open ground; also found in urban parklike settings.	April-June	Potential to occur. Suitable nesting habitat within the Study Area.
Oak titmouse (*Baeolophus inornatus*)			BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree)	March-July	Potential to occur. Suitable nesting habitat within the Study Area.
Wrentit *(Chamaea fasciata)*	-	-	BCC	Coastal sage scrub, northern coastal scrub, chaparral, dense understory of riparian woodlands, riparian scrub, coyote brush and blackberry thickets, and dense thickets in suburban parks and gardens.	March-August	Potential to occur. Suitable nesting habitat within the Study Area.
Song sparrow "Modesto" *(Melospiza melodia heermanni)*	-	-	BCC, SSC	Resident in central and southwest California, including Central Valley; nests in marsh, scrub habitat	April-June	Potential to occur. Suitable nesting habitat within the Study Area.

Table 4.4-1. Potentially Occurring Special-Status Species

Common Name (*Scientific Name*)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
San Clemente spotted towhee (*Pipilo maculatus clementae*)	-	-	BCC, SSC	Resident on Santa Catalina and Santa Rosa Islands; extirpated on San Clemente Island, California. Breeds in dense, broadleaf shrubby brush, thickets, and tangles in chaparral, oak woodland, island woodland, and Bishop pine forest.	Year round resident; breeding season is April-July	Absent. This subspecies is not found in the region.
Tricolored blackbird (*Agelaius tricolor*)	-	CT	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta counties south to San Bernardino, Riverside and San Diego counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields.	March-August	Absent. No suitable habitat within the Study Area.
Mammals						
Ringtail (*Bassariscus astutus*)	-	-	FP	Most often found in riparian corridors in forested, shrubby habitats. Dens in rock outcrops, hollow trees and snags at low to middle elevations. Its range includes the North and South Coast Ranges, Sierra Nevada, Cascades, and the mountainous areas of the Mojave Desert.	Any season	Potential to occur. Suitable habitat with the Study Area.
Western red bat (Lasiurus blossevillii)	-	-	SSC	Roosts in foliage of trees or shrubs; Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (Western Bat Working Group 2017).	April-September	Potential to occur. Suitable habitat within the Study Area.

Table 4.4-1. Potentially Occurring Special-Status Species						
	Status[1]					
Common Name (*Scientific Name*)	FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite

Source: ECORP 2020a

[1]Status Codes

FESA	Federal Endangered Species Act
CESA	California Endangered Species Act
FE	ESA listed, Endangered.
FT	ESA listed, Threatened.
FC	Candidate for ESA listing as Threatened or Endangered.
FP	CDFW Fully Protected
WL	CDFW Watch List
CE	CESA or NPPA listed, Endangered.
CT	CESA or NPPA listed, Threatened.
CR	CESA or NPPA listed, Rare.
CC	Candidate for CESA listing as Threatened or Endangered
CFP	California Fish and Game Code Fully Protected Species (§ 3511-birds, § 4700-mammals, § 5050-reptiles/amphibians).
CH	Critical habitat for the species is mapped within the Study Area.
SSC	CDFW Species of Special Concern
BCC	USFWS Bird of Conservation Concern
1B	CRPR /Rare or Endangered in California and elsewhere.
2B	CRPR /Rare or Endangered in California, more common elsewhere.
4	CRPR /Plants of Limited Distribution - A Watch List.
0.1	Threat Rank/Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat)
0.2	Threat Rank/Moderately threatened in California (20-80 percent occurrences threatened / moderate degree and immediacy of threat)
0.3	Threat Rank/Not very threatened in California (<20 percent of occurrences threatened / low degree and immediacy of threat or no current threats known)

[2]Source: San Joaquin River Restoration Program 2014.

[3]For complete List Special Status Species list see *Appendix B.*

4.4.2.1 Evaluation of Special-Status Plants

As discussed in the BRA, a total of 29 special-status plant species were identified as having the potential to occur within Project site. The BRA determined 10 special-status plant species have potential to occur within the Project site and are presented below.

Mexican Mosquito Fern

Mexican mosquito fern (*Azolla microphylla*) is not listed pursuant to either the federal or California ESAs, but is designated as a California Rare Plant Rank (CRPR) 4.2 species. This species is an herbaceous annual/perennial that occurs in marshes and swamps (e.g., ponds and slow-moving water). Mexican mosquito fern blooms in August and is known to occur at elevations ranging from 98 to 328 feet above MSL. The current range for Mexican mosquito fern in California includes Butte, Colusa, Glenn, Inyo, Kern, Lake, Modoc, Nevada, Plumas, San Bernardino, Santa Clara, San Diego, and Tulare counties.

While there are no CNDDB documented occurrences of Mexican mosquito fern within 10 miles of the Project site, the water primrose marsh within the Project site provides marginally suitable habitat for this species. Mexican mosquito fern has low potential to occur onsite.

Red-Stemmed Cryptantha

Red-stemmed cryptantha (*Cryptantha rostellata*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs on gravelly, volcanic openings as well as roadsides, in cismontane woodland and valley and foothill grassland. Red-stemmed cryptantha blooms between April and June and is known to occur at elevations ranging from 131 to 2,625 feet above MSL. The current range of this species includes Butte, Colusa, Glenn, Mariposa, Napa, Shasta, Siskiyou, Sutter, Tehama, and Trinity counties.

While there are no CNDDB documented occurrences of red-stemmed cryptantha within five miles of the Project site, the ruderal vegetation and riparian woodland within the Project site provides marginally suitable habitat for this species. Red-stemmed cryptantha has low potential to occur onsite.

Shield-Bracted Monkeyflower

Shield-bracted monkeyflower (*Erythranthe glaucescens*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 4.3 species. This species is an herbaceous annual that occurs in serpentine seeps and sometimes streambanks of chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. Shield-bracted monkeyflower blooms from February through August and is known to occur at elevations ranging from 196 to 4,069 feet above MSL. The current range of this species includes Butte, Colusa, Lake, Nevada, Shasta, and Tehama counties.

While there are no CNDDB documented occurrences of shield-bracted monkeyflower within five miles of the Project site, the streambank within the Project site provides marginally suitable habitat for this species. Shield-bracted monkeyflower has low potential to occur onsite.

Woolly Rose-Mallow

Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis)* is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a rhizomatous, herbaceous perennial that occurs in marshes and freshwater swamps, and often in riprap on sides of levees. Rose-mallow blooms from June through September and is known to occur at elevations ranging from sea level to 394 feet above MSL. Rose-mallow is endemic to California; the current range of this species in California includes Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo counties.

While there are no CNDDB documented occurrences of wooly rose-mallow within five miles of the Project site, the marsh and streambanks within the Project site provide suitable habitat for this species. Woolly rose-mallow has potential to occur onsite.

Colusa Layia

Colusa layia (*Layia septentrionalis*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in sandy or serpentinite soils in chaparral, cismontane woodland, and valley and foothill grasslands. Colusa layia blooms from April to May and is known to occur at elevations ranging from 328 to 3,593 feet above MSL.

Colusa layia is endemic to California; the current range of this species includes Butte, Colusa, Glenn, Lake, Mendocino, Napa, Sonoma, Sutter, Tehama, and Yolo counties.

While there are no CNDDB documented occurrences of Colusa layia within five miles of the Project site, the ruderal vegetation within the Project site provides marginally suitable habitat for this species. Colusa layia has low potential to occur onsite.

Ahart's Paronychia

Ahart's paronychia (*Paronychia ahartii*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. Ahart's paronychia is an annual herb that occurs in cismontane woodland, valley foothill and grassland, and vernal pools. Ahart's paronychia blooms from February through June, and is known to occur at elevations ranging from 98 to 1,673 feet above MSL. Ahart's paronychia is endemic to California; the current range for this species is Butte, Shasta and Tehama counties.

While there are no CNDDB documented occurrences of Ahart's paronychia within five miles of the Project site, ruderal vegetation within the Project site provides marginally suitable habitat for this species. Ahart's paronychia has low potential to occur onsite.

Wine-Colored Tufa Moss

Wine-colored tufa moss (*Plagiobryoides vinosula*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is a moss that occurs usually in granitic rock or granitic soil along seeps and streams (or sometimes in clay) within cismontane woodland, Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, or riparian woodland. Wine-colored tufa moss is known to occur at 98 to 5,692 feet above MSL. The current range of this species is Butte, Fresno, Inyo, Kern, Lake, Monterey, San Bernardino, San Diego, and Tulare counties.

While there are no CNDDB documented occurrences of wine-colored tufa moss within five miles of the Project site, the riparian woodland within the Project site provides marginally suitable habitat for this species. Wine-colored tufa moss has low potential to occur onsite.

Hartweg's Golden Sunburst

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is listed as endangered pursuant to both the federal and California ESAs, and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs on clay soils that are often acidic in cismontane woodlands, and valley and foothill grasslands. Hartweg's golden sunburst blooms from March to April and is known to occur at elevations ranging from 49 to 492 feet above MSL. Hartweg's golden sunburst is endemic to California; the current range of this species includes Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties. This species is believed to be extirpated from Yuba County.

There is one documented CNDDB documented occurrence of Hartweg's golden sunburst within five miles of the Project site, the ruderal vegetation within the Project site provides marginally suitable habitat for this species. Hartweg's golden sunburst has low potential to occur onsite.

Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is not listed pursuant to the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial rhizomatous herb that occurs in shallow, freshwater marshes and swamps. Sanford's arrowhead blooms from May through October, and is known to occur at elevations ranging from sea level to 2,133 feet above MSL. Sanford's arrowhead is endemic to California; the current range of this species includes Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Marin, Napa, Orange, Placer, Sacramento, San Bernardino, San Joaquin, Shasta, Solano, Tehama, Tulare, Ventura, and Yuba counties; it is believed to be extirpated from both Orange and Ventura counties.

While there are no CNDDB documented occurrences of Sanford's arrowhead within five miles of the Project site, the marsh within the Project site provides marginally suitable habitat for this species. Ahart's paronychia has low potential to occur onsite.

Brazilian Watermeal

Brazilian watermeal (*Wolffia brasiliensis*) is not listed pursuant to either the federal or California ESA, but is designated as a CRPR 2B.3 species. This species is an herbaceous perennial that occurs in assorted shallow freshwater marshes and swamps. Brazilian watermeal blooms from April through December and is known to occur at elevations ranging from 66 to 328 feet above MSL. The current range for Brazilian watermeal in California includes Butte, Glenn, Sutter and Yuba counties.

While there are no CNDDB documented occurrences of Brazilian watermeal within five miles of the Project site, the marsh within the Project site provides marginally suitable habitat for this species. Brazilian watermeal has low potential to occur onsite.

4.4.2.2 Evaluation of Special-Status Fish

The lower Feather River in the Project site provides migration, spawning, and rearing habitat for a diverse assemblage of native and non-native fish species, including both resident and anadromous (i.e., ocean migrating) species. At least 31 fish species, including 13 native and 18 non-native species, have been documented in the lower Feather River in the study. The BRA determined nine special-status fish species have potential to occur within the Project site and are presented below These species are described below.

Chinook Salmon

Two separate evolutionarily significant units (ESUs) of Chinook salmon occur in the study area: (1) an experimental population of Central Valley spring-run ESU, and (2) Central Valley fall-run ESU. Each of these ESUs is discussed below.

Central Valley Spring-run ESU Chinook Salmon

The Central Valley spring-run ESU Chinook salmon (spring-run ESU) was listed as a threatened species under the federal ESA on September 16, 1999 (50 CFR 50394) and under the California ESA in February 1999. The spring-run ESU includes all spawning populations in the Sacramento River and its tributaries, including the Feather River, and one artificial propagation program, the Feather River Hatchery spring-run Chinook program. Annual estimates of spring-run ESU escapement for the Feather River basin ranged from approximately 146 (1967) to 8,662 (2003) and was last estimated to be 2,110 in 2018.

The majority of spring-run Chinook salmon enters freshwater to spawn as three-year-old fish. Upstream migrations of adult spring-run Chinook salmon begin in late January and continue through September. These sexually immature fish hold in deep, cold freshwater pools of rivers to mature for several months prior to spawning and generally enter their natal streams from mid-February through July. Spawning typically occurs from mid-August to early October, with peak spawning occurring in September. Embryo survival is dependent upon water temperatures between five to 13 degrees Celsius (°C) and high dissolved oxygen saturation. Embryos hatch in approximately 40 to 60 days, depending on water temperature, and remain in gravel as alevins for four to six weeks before emerging as fry from November through March. Juveniles typically reside in freshwater for 12 to 16 months and emigrate as yearlings from October through March, with peak emigration occurring from November to December.

The Feather River supports a population of Central Valley spring-run ESU Chinook salmon. Therefore, this ESU has potential to occur in the Project site during the adult immigration and juvenile emigration periods.

Central Valley Fall-run/Late Fall-run ESU Chinook Salmon

The Central Valley fall-run ESU, a federal Species of Concern (SSC) and California SSC, is currently the only run of Chinook salmon occurring naturally in the San Joaquin River basin and is the largest run in the Sacramento River basin. Annual estimates of fall-run escapement for the Feather River basin ranged from approximately 6,126 fish in 1990 to 203,515 fish in 2001 and was last estimated at 73,150 fish in 2018.

Adult fall-run Chinook salmon migrate into the San Joaquin and Sacramento river systems from September through January, with peak immigration occurring in October and November. Spawning typically occurs from October through December, and fry typically begin to emerge in late December and January. Fall-run Chinook salmon may emigrate as post-emergent fry, juveniles, or as smolts after rearing in their natal streams for up to six months.

The Feather River supports a population of Central Valley fall-run ESU Chinook salmon and, therefore, this ESU has potential to occur in the Project site during the adult immigration and juvenile emigration periods.

California Central Valley DPS Steelhead

California Central Valley DPS steelhead, the anadromous form of rainbow trout, were listed as threatened under the federal ESA on March 19, 1998 (63 Federal Register [FR] 13347). This DPS includes steelhead populations in the Sacramento River and San Joaquin River, inclusive and downstream of the Merced River. The listing was updated to include Coleman National Fish Hatchery and Feather River Hatchery steelhead populations on January 5, 2006 (71 FR 834).

Adult steelhead, typically averaging 600 to 800 millimeters in length, generally leave the ocean and begin upstream migration through the Delta to spawning reaches in the upper Sacramento and San Joaquin rivers and tributaries from August through March, with peak immigration occurring in January and February. Spawning generally occurs from January through April. Redds are typically dug by female fish in water depths of 10 to 150 centimeters (cm) and where water velocities over redds range from 20 to 155 cm per second. Juvenile steelhead rear in their natal streams for one to three years prior to emigrating from the river. Emigration of one- to three-year old sub-adults primarily occurs from January through June. Unlike Chinook salmon, steelhead are iteroparous (i.e., able to spawn repeatedly) and may spawn for up to four consecutive years before dying; however, it is rare for steelhead to spawn more than twice and the majority of repeat spawners are females. Although one-time spawners comprise the majority, repeat spawners are relatively numerous (i.e., 17.2 percent) in California streams. Thus, kelts (post-spawning adults) may be present in the in the Project site shortly after spawning (i.e., January through mid-April).

The lower Feather River supports a population of California Central Valley DPS steelhead and, therefore, the DPS has the potential to occur in the Project site during the adult and juvenile migration periods.

Green Sturgeon

On April 7, 2006, NMFS proposed the Southern DPS of green sturgeon, which includes all fish populations south of the Eel River, California, as threatened under the federal ESA (71 FR 17757). The agency determined that the Northern DPS, which includes all populations north of the Eel River (inclusive), do not warrant listing. The designation of the Southern DPS was based on information demonstrating: (1) the majority of spawning adults are concentrated into one spawning river (i.e., the Sacramento River), (2) existence of continued threats that had not been adequately addressed since the previous green sturgeon status review, (3) downward trends in juvenile abundance, and (4) habitat loss in the upper Sacramento and Feather rivers. The Final Rule establishing take prohibitions for the Southern DPS was promulgated on June 2, 2010 (75 FR 30714).

Although little is known about the spawning habits of green sturgeon in the Sacramento-San Joaquin system, spawning times are thought to be similar to those documented for the Klamath River. There are three general phases in green sturgeon life history: 1) freshwater stage (<three years old), 2) coastal migrants (three to13 years old for females; three to nine years old for males); and 3) adults (>13 years old for females, >nine years old for males). Adults typically migrate into fresh water beginning in late February; spawning occurs from March to July, with peak activity from April to June. Emigration typically occurs after a period of over-summering followed by out-migration in the fall/winter period coinciding with increases in flow.

Based on information from catches of green sturgeon eggs, larvae, and juveniles, and additional data derived from monitoring studies of white sturgeon, it appears that green sturgeon in the Sacramento River spawn from above Hamilton City to above Red Bluff Diversion Dam, maybe as far upstream as Keswick Dam. Juvenile green sturgeon are believed to reside in freshwater habitats from one to three years, before emigrating to the Delta under winter high-flow events. However, the timing of emigration is unknown. Following emigration from the upper Sacramento River, juvenile green sturgeon are widely distributed throughout the Delta.

Although adult green sturgeon have been documented occasionally in the Feather River, the numbers are low, sporadic, and there is limited evidence of historic or current spawning. However, green sturgeon eggs were collected in the Feather River in June 2011, indicating potentially successful spawning in this system. Based on this information, there is a low potential for green sturgeon to occur in the Project site.

Pacific Lamprey

Pacific lamprey (*Lampetra tridentata*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC due to declining abundance throughout its range in California. The reason for this decline is believed to be a secondary effect of the reduction in abundance of anadromous salmonids, the primary prey of Pacific lamprey.

Lampreys are eel-like, jawless fishes with a cartilaginous skeleton and disc-shaped, sucker-like mouths. Pacific lamprey are predatory and anadromous, although landlocked (i.e., potamodromous) populations exist in some inland water bodies. The adult predatory, ocean-residing stage typically lives for three to four years and these fish rarely stray far from the mouths of their natal streams. Adult fish ranging from 30-76 cm total length (TL) typically move upstream to spawning streams from March to late June. After males and females excavate a redd, the female attaches to the substrate and releases 20,200 to 200,000 eggs that are fertilized by males. The majority of adult fish die following spawning, although a small proportion may survive to spawn the following year at a larger size. The fertilized eggs hatch after approximately 19 days at 15°C. The larval ammocoetes remain in the gravel for a short period before emerging and being swept downstream, where they burrow into soft sediments and filter organic material from the substrates. Following a five- to seven-year residence period in freshwater, the ammocoetes undergo metamorphosis to an adult, predatory stage that is tolerant of saltwater and subsequently migrate downstream under high winter flows to the ocean.

This species has been documented in the Feather River near the Project site and, thus, is considered present.

River Lamprey

The river lamprey is a California SSC. The abundance of this species in California is believed to be declining, primarily due to degradation and fragmentation of suitable spawning and rearing habitats and declines in salmonid prey species.

The river lamprey is relatively small (averaging 17 cm) and highly predaceous. They are anadromous and will attack fish in both fresh and salt water. The river lamprey is distributed in streams and rivers along the eastern Pacific Ocean from Juneau, Alaska, to San Francisco Bay. It may have its greatest abundance in the Sacramento–San Joaquin River system, although it is not commonly observed in large numbers. A great deal of what is known about the river lamprey is from information on populations in British Columbia. There, adults migrate from the Pacific Ocean into rivers and streams in the fall and spawn from February through May. Adults will excavate a saucer-shaped depression in sand or gravel riffles where the eggs are deposited. After spawning, the adults perish. Ammocoetes remain in backwaters for several years, where they feed on algae and microorganisms. The metamorphosis from juvenile to adulthood begins in July and is complete by the following April. Following completion of metamorphosis, river lamprey congregate immediately upriver from salt water and emigrate into the ocean in late spring.

This species has been documented in the Feather River near the Project site and, thus, is considered present.

Sacramento Hitch

Sacramento hitch (*Lavinia exilicauda*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC due to long-term declines in abundance and distribution. Major factors that may threaten the abundance and distribution of Sacramento hitch include major dams, water quality degradation associated with agricultural activities, alteration of the Sacramento-San Joaquin River Estuary, and invasive species.

Sacramento hitch are relatively large (i.e., up to 35 cm TL), deep-bodied cyprinids that occur in warm low-elevation water bodies, including clear streams, turbid sloughs, lakes, and reservoirs. They have wide environmental tolerances, capable of withstanding short-term temperatures of nearly 38°C and salinities as high as nine parts per trillion. Sacramento hitch are omnivorous, feeding on zooplankton, filamentous algae, and aquatic and terrestrial insects. Females typically mature in years two or three, while males mature in years one, two, or three. Spawning typically occurs in riffles of streams and in sloughs after spring rains increase flows and temperatures reach 14 to 18°C. Sacramento hitch are broadcast spawners that occur in groups with vigorous splashing. A spawning female releases 9,000 to 63,000 eggs into the water column, which are fertilized by one to five males immediately after their release. Fertilized eggs swell to approximately four times their initial size after settling into the substrate. Larvae hatch in three to seven days at 15 to 22°C and become free-swimming within three to four days.

This species has been documented in the Feather River near the Project site and, thus, is considered present.

Sacramento Splittail

Sacramento splittail (*Pogonichthys macrolepidotus*) is not listed pursuant to either federal ESA or California ESA; however, it was previously listed as a threatened species by the USFWS in 1999 and was subsequently delisted in 2003 in light of new information regarding the biology and status of the species (Moyle et al. 2004). It is currently designated by CDFW as a SSC due to declining abundance and distribution. Major factors that may threaten the abundance and distribution of Sacramento splittail include major dams, water quality degradation associated with agricultural activities, alteration of the Sacramento-San Joaquin River Estuary, and invasive species.

Sacramento splittail relatively large (i.e., 40 cm TL) and long-lived (i.e., seven to 10 years) warm water fish typically found at water temperatures ranging from five to 24°C. When acclimated to elevated temperatures, splittail can tolerate temperatures up to 33°C. Adult splittail typically reach sexual maturity in their second year. Upon reaching maturity, adult splittail migrate upstream from November through February. Adults spawn on floodplains or flooded edge habitats in March and April at water temperatures between 14 and 19 degrees Fahrenheit and then move back downstream. Eggs acquire adhesive properties following exposure to water and adhere to vegetation or other benthic substrates. Fertilized eggs generally hatch in three to five days and larvae begin feeding on plankton soon thereafter. Juvenile splittail inhabit shallow, low-velocity habitats with abundant vegetation as they migrate downstream to the Delta. Emigration through the lower Sacramento River occurs from February through August, with peak emigration occurring from March through June. Splittail are benthic foragers that feed primarily on aquatic invertebrates, although detritus may make up a substantial proportion of their diet.

This species has been documented in the Feather River near the Project site and, thus, is considered present.

Hardhead

Hardhead (*Mylopharodon conocephalus*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC due to declining numbers and small, isolated populations. Primary threats to the species include dams and diversions, water quality degradation associated with agricultural activities, and invasive species. This species has been documented in the Feather River near the Project site and, thus, is considered present.

Hardhead occur in relatively undisturbed clear and cool (i.e., up to 20°C maximum summer temperature) low- to mid-elevation streams below approximately 1,500 meters. Hardhead are primarily bottom-feeding fish that forage on aquatic invertebrates and aquatic vegetation, but will also prey on drifting invertebrates, plankton, and algae and terrestrial insects. Hardhead reach maturity at age two and spawn primarily in April and May. Adult fish migrate into smaller tributary streams and aggregate in pools, returning to their home pools in larger rivers after spawning. Females produce over 20,000 eggs, which are deposited in sand or gravel substrates in riffles, runs, or heads of pools. After hatching, larval fish are believed to remain in near-shore areas with dense cover, gradually moving downstream and into deeper habitats with increased growth.

This species has been documented in the Feather River near the Project site and, thus, is considered present.

Riffle Sculpin

Riffle sculpin is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC. The primary threats to riffle sculpin include increasing isolation between populations, thereby increasing vulnerability to local extirpation, and habitat changes that may reduce flows or increase water temperatures.

Riffle sculpin are common in many clear and cold (i.e., maximum temperature <26°C) perennial streams predominated by riffle habitats with rock or gravel substrates and relatively high dissolved oxygen concentrations. They are benthic dwellers that typically co-occur with rainbow trout, but occupy different microhabitats and, therefore, interactions between the two species are not common. Riffle sculpin are opportunistic feeders that prey upon benthic macroinvertebrates, amphipods, and other small fish. Riffle sculpin typically have a four-year life span and reach sexual maturity at the end of their second year. Spawning typically occurs from late February through April in nests on the underside of rocks in riffles, or in cavities of submerged logs. Embryos hatch in 11to 24 days at temperatures of 10 to 15°C, and adult males guard the embryos and fry during this period.

This species has been documented in the Feather River near the Project site and, thus, is considered present.

4.4.2.3 Evaluation of Special-Status Reptiles

A total of two special-status reptile species were identified as having the potential to occur within the Project site based on the BRA. The BRA determined only the northwestern pond turtle has the potential to occur within the Project site.

Northwestern Pond Turtle

The northwestern pond turtle (*Actinemys marmorata*) is not listed pursuant to either the federal or California ESAs; however, it is designated as a CDFW SSC. Northwestern pond turtles occur in a variety of fresh and brackish water habitats including marshes, lakes, ponds, and slow-moving streams. This species is primarily aquatic; however, they typically leave aquatic habitats in the fall to reproduce and to overwinter. Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops is optimal for basking and thermoregulation. Although adults are habitat generalists, hatchlings and juveniles and hatchlings require shallow edgewater with relatively dense submergent or short emergent vegetation in which to forage. Western pond turtles are typically active between March and November. Mating generally occurs during late April and early May and eggs are deposited between late April and early August. Eggs are deposited within excavated nests in upland areas, with substrates that typically have high clay or silt fractions. The majority of nesting sites are located within 650 feet (200 meters) of the aquatic sites; however, nests have been documented as far as 1,310 feet (400 meters) from the aquatic habitat.

While there are no CNDDB documented occurrences of northwestern pond turtle within five miles of the Project site, the river within the Project site provides suitable habitat for this species. Northwestern pond turtle has potential to occur onsite.

4.4.2.4 Evaluation of Special-Status Birds

A total of 19 special-status bird species were identified as having the potential to occur within Project site based on the BRA. Upon further analysis and after the reconnaissance site visit, the BRA determined that 10 of the 19 special-status bird species have potential to occur within the Project site. These species are presented below.

Yellow-Billed Cuckoo

The yellow-billed cuckoo (*Coccyzus americanus*) is listed as an endangered species pursuant to the California ESA and threatened under the federal ESA. The federal listing pertains to the western DPS, whose breeding range is west of the Rocky Mountains. In California, breeding populations can be found on the Feather River from Oroville to Verona in Butte, Yuba, and Sutter counties; the Owens Valley in Inyo County; the Santa Clara River in Los Angeles County; the Mojave River in San Bernardino County; and the Colorado River in San Bernardino and Imperial counties. The western DPS breeds in riparian vegetation communities. Along the Sacramento River, nesting habitat included depositional point bars with young stands of low woody vegetation. In southern California, breeding habitat includes desert riparian woodlands (Sonoran Zones) comprised of dense willow (*Salix* spp.), Fremont cottonwood (*Populus fremontii*), and mesquite (*Prosopis* spp.).

This migratory species arrives from its wintering grounds in South America during June and departs from California during September. The incubation period is 11 to 12 days, and nestlings typically leave the nest after five to eight days. Western yellow-billed cuckoos feed upon large insects such as caterpillars, katydids, crickets, and grasshoppers, and occasionally frogs, lizards, bird eggs and young, and fruit and seeds. The recommended survey protocol includes multiple visits between June 15 and August 15.

While there are no CNDDB documented occurrences of yellow-billed cuckoo within five miles of the Project site, the riparian woodland within and adjacent to the Project site provides suitable habitat for this species. Yellow-billed cuckoo has potential to occur onsite.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) has been delisted under the federal ESA but remains listed as endangered under the California ESA. It is fully protected pursuant to the California Fish and Game Code Section 3511 and the federal Bald and Golden Eagle Protection Act. It is a Bureau of Land Management sensitive species, a U.S. Forest Service sensitive species, and is considered a USFWS bird of conservation concern (BCC). Bald eagles breed at lower elevations in the northern Sierra Nevada and North Coast ranges. Bald eagles breed in forested areas adjacent to large waterbodies. Tree species used for nesting is quite variable and includes conifers (dominant where available), oaks, hickories, cottonwoods and aspens.

Nest trees are generally the largest tree available in a suitable area. Breeding activity occurs during late February through September, with peaks in activity from March to June.

There is one documented CNDDB occurrence of this species located within five miles of the Project site. The riparian woodland within the Project site provide marginal habitat for this species. Bald eagle has low potential to occur within the Project site.

White-Tailed-Kite

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either the California or federal ESAs; however, the species is fully protected pursuant to Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast, and all areas up to the Sierra Nevada foothills and southeastern deserts (Dunk 2020). In northern California, white-tailed kite nesting occurs from March through early August, with nesting activity peaking from March through June.

Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands.

While there are no CNDDB documented occurrences of white-tailed kite within five miles of the Project site, the riparian woodland within the Project site provides suitable habitat for this species. White-tailed kite has potential to occur onsite.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and is protected pursuant to the California ESA. This species nests in North America (Canada, western U.S., and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta. In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus species*). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, disking, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

There are six documented CNDDB occurrence of this species located within five miles of the Project site. The riparian woodland within the Project site provides suitable habitat for this species. Swainson's hawk has potential to occur within the Project site.

Nuttall's Woodpecker

The Nuttall's woodpecker (*Dryobates nuttallii*) is not listed and protected under either the California or federal ESAs but is considered a USFWS BCC. They are resident from Siskiyou County south to Baja California. Nuttall's woodpeckers nest in tree cavities primarily within oak woodlands, but also can be found in riparian woodlands. Breeding occurs during April through July.

While there are no CNDDB documented occurrences of Nuttall's woodpecker within five miles of the Project site, the riparian woodland within the Project site provides suitable habitat for this species. Nuttall's woodpecker has potential to occur onsite.

Yellow-Billed Magpie

The yellow-billed magpie (*Pica nuttalli*) is not listed pursuant to either the California or federal ESAs but is considered a USFWS BCC. This endemic species is a yearlong resident of the Central Valley and Coast Ranges from San Francisco Bay to Santa Barbara County. Yellow-billed magpies build large, bulky nests in trees in a variety of open woodland habitats, typically near grassland, pastures or cropland. Nest building begins in late January to mid-February, which may take up to six to eight weeks to complete, with eggs laid during April to May, and fledging during May to June. The young leave the nest at about 30 days after hatching. Yellow-billed magpies are highly susceptible to West Nile Virus, which may have been the cause of death to thousands of magpies during 2004 to 2006.

While there are no CNDDB documented occurrences of yellow-billed magpie within five miles of the Project site, the riparian woodland within the Project site provides suitable habitat for this species. Yellow-billed magpie has potential to occur onsite.

Oak Titmouse

Oak titmouse (*Baeolophus inornatus*) are not listed and protected under either the California or federal ESAs but are considered a USFWS BCC. Oak titmouse breeding range includes southwestern Oregon south through California's Coast, Transverse, and Peninsular ranges, western foothills of the Sierra Nevada, and into Baja California; they are absent from the humid northwestern coastal region and the San Joaquin Valley. They are found in dry oak or oak-pine woodlands but may also use scrub oaks or other brush near woodlands. Nesting occurs during March through July.

While there are no CNDDB documented occurrences of oak titmouse within five miles of the Project site, the riparian woodland within the Project site provides suitable habitat for this species. Oak titmouse has potential to occur onsite.

Wrentit

The wrentit (*Chamaea fasciata*) is not listed in accordance with either the California or federal ESAs but is designated as a BCC by the USFWS. Wrentit are a sedentary resident along the west coast of North America from the Columbia River south to Baja California. Wrentit are found in coastal sage scrub, northern coastal scrub, and coastal hard and montane chaparral and breed in the dense understory of valley oak riparian, Douglas-fir and redwood forests, early-successional forests, riparian scrub, coyote bush and blackberry thickets, suburban parks, and larger gardens. Nesting occurs during March through August.

While there are no CNDDB documented occurrences of wrentit within five miles of the Project site, the riparian woodland within the Project site provides suitable habitat for this species. Wrentit has potential to occur onsite.

Song Sparrow "Modesto"

The song sparrow (*Melospiza melodia*) is considered one of the most polytypic songbirds in North America. The subspecies *Melospiza melodia heermanni* includes as synonyms *M. m. mailliardi* (the "Modesto song sparrow") and *M. m. cooperi*. The "Modesto song sparrow" is not listed and protected pursuant to either the California or federal ESAs but is considered a CDFW SSC. The subspecies *M. m. heermanni* can be found in central and southwestern California to northwestern Baja California. Song sparrows in this group may have slight morphological differences but they are genetically indistinguishable from each other. The Modesto song sparrow occurs in the Central Valley from Colusa County south to Stanislaus County, and east of the Suisun Marshes. Nesting habitat includes riparian thickets and freshwater marsh communities, with nesting occurring from April through June.

While there are no CNDDB documented occurrences of song sparrow within five miles of the Project site, the thickets of the riparian woodland within the Project site provides suitable habitat for this species. Song sparrow has potential to occur onsite.

4.4.2.5 Evaluation of Special-Status Mammals

A total of seven special-status mammal species were identified as having the potential to occur within Project site based on the BRA. However, upon further analysis and after the reconnaissance site visit, only the ringtail and western red bat were determined to have potential to occur within the Project site. These two species are presented below.

Ringtail

Ringtail is not listed pursuant to the federal or California ESAs, but is designated as Fully Protected in California by CDFW. This is a smallish, somewhat cat-like procyonid, related to the widespread raccoon (*Procyon lotor*) and neotropical white-nosed coati (*Nasua narica*). Ringtails are mesocarnivores of riparian areas, especially those with abundant rocky outcrops, in low- to middle elevation drainages in blue oak woodlands, foothill pine/oak forests, chaparral, ponderosa pine woodlands, black oak woodlands, riparian deciduous forests, and mixed coniferous forest. Highly nocturnal, ringtails consume small rodents, snakes, birds and their eggs, invertebrates, and some fruits, nuts, and carrion.

The thickets of the riparian woodland within the Project site provides suitable habitat for this species. Ringtail has potential to occur onsite.

Western Red Bat

The western red bat (*Lasiurus blossevillii*) is not listed pursuant to either the California or federal ESAs; however, this species is considered a SSC by CDFW. The western red bat is easily distinguished from other western bat species by its distinctive red coloration. This species is broadly distributed, its range extending from southern British Columbia in Canada through Argentina and Chile in South America, and including much of the western U.S. This solitary species day roosts primarily in the foliage of trees or shrubs in edge habitats bordering streams or open fields, in orchards, and occasionally urban areas. They may be associated with intact riparian habitat, especially with willows, cottonwoods, and sycamores. This species may occasionally utilize caves for roosting as well. They feed on a variety of insects, and generally begin to forage one to two hours after sunset. This species is considered highly migratory; however, the timing of migration and the summer ranges of males and females may be different. Winter behavior of this species is poorly understood.

While there are no CNDDB documented occurrences of western red bat within five miles of the Project site, the thickets of the riparian woodland within the Project site provides suitable habitat for this species. Western red bat has potential to occur onsite.

4.4.3 Sensitive Natural Communities

Four sensitive natural communities: Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, Great Valley Oak Riparian, and Northern Hardpan Vernal Pool were identified as having potential to occur within the Project site based on the BRA. The site visit preformed as a part of the BRA, determined that there is no vernal pool habitat present within the Project site. The riparian woodland within the Project site may meet the characteristics of one of the riparian sensitive natural communities; however, the riparian woodland within the Project site is limited to a small strip along the riverbank adjacent to the Live Oak Boat Ramp facilities.

4.4.4 Wildlife Movement/Corridors and Nursery Sites

The Feather River provides an important aquatic and terrestrial wildlife movement corridor. The river is both important migratory habitat for a diversity of native and non-native fish species, including both resident and anadromous (i.e., ocean migrating) species. Adjacent riparian woodlands and open spaces, though limited in extent, support riparian wildlife and wildlife movements through the upland portions of the Project site.

The Project site does not include a known nursery site; however, a Great egret (*Ardea alba*) rookery was observed on the opposite shore of the Feather River during the site reconnaissance visit (approximately 500 feet from the Project).

4.4.5 Biological Resources (IV) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (USFWS)?	☐	☒	☐	☐

The Project would result in temporary dredging-related impacts to the upland and aquatic resources that provide habitat for special-status species within the Project site. Potential impacts to upland habitats include temporary disturbance associated with staging, dewatering, and disposal of dredged spoils. The Project would result in aquatic impacts from dredging operations within the Feather River and the water primrose marsh. As such, the Project would potentially have a substantial adverse effect, either directly or through habitat modifications, on special status species identified by CDFW, USFWS, and NMFS and on critical habitat and essential fish habitat as identified by NMFS. Impacts by species or habitat group are summarized below.

Impacts to Special-Status Plants

There is potential for one special-status plant species, and low potential for nine special-status plant species to occur within the Project site. Upland staging and dewatering areas would generate a temporary disturbance but would not result in permanent habitat modifications. For species with potential to occur in the water primrose marsh, dredging could impact these species, if present. Implementation of mitigation measures **BIO-1** and **BIO-2** would reduce potential impacts to special-status plants to a less-than-significant level.

Impacts to Special-Status Fish Species, Critical Habitat, and Essential Fish Habitat

Nine special-status-fish species including three federally threatened species have potential to occur in the Project site. Direct impacts to special-status fish species could occur as a result of dredging operations through noise, scraping bottom substrates and causing downstream turbidity. Implementation of the mitigation measure **BIO-3** would reduce potential impacts to special-status fish to a less-than-significant level.

The Project site includes designated critical habitat for three federally threatened fish species: Chinook salmon, steelhead, and green sturgeon and is essential fish habitat for Chinook salmon and steelhead. Dredging operations would temporarily disturb designated critical habitat and essential fish habitat by scraping bottom substrates and causing turbidity downstream. These temporary effects would not affect the integrity of the physical and biological factors contributing to the critical habitat designation or result in permanent impacts or loss of essential fish habitat.

Impacts to Northwestern Pond Turtles

Northwestern pond turtles may occur in the upland, water primrose marsh and river portions of the Project site. This species may inadvertently be captured by dredging equipment most likely resulting in direct mortality. More likely, noise and disturbance associated with setting up the dredging operation and installing best management practices (BMPs) for water quality would deter and displace turtles from the work area. This could increase or decrease susceptibility to predation, particularly for hatchlings, depending on how predators behave in response to the dredging operation. Overall, the effects are expected to be temporary and minimized by the implementation of mitigation measures of **BIO-1** and **BIO-3** and reduce this potential impact to a less-than-significant level.

Impacts to Special-Status Birds

One federal and State listed and two State-listed bird species have the potential to occur in the Project site. In addition, there is potential for six special-status bird species in the Project site. Upland staging and dewatering areas would generate a temporary disturbance that would likely displace nesting birds from the Project site for the duration of Project operations but would not result in permanent habitat modifications. If special-status birds initiate nesting prior to the start of construction, direct effects would be avoided by implementation of mitigation measures **BIO-4** and **BIO-5**. Implementation of these mitigation measures, which require pre-construction surveys, establishment of buffers and monitoring at nest sites until young of the year have fledged, would reduce this potential impact to a less-than-significant level.

Impacts to Special-Status Mammals

There are two special-status mammals with potential to occur in the Project site. The Project is not anticipated to require the removal of upland vegetation, including trees, and is therefore not expected to result in adverse effects of habitat modification for special-status mammals. However, if the Project requires removal of trees, mitigation may be required. As such, implementation of mitigation measures **BIO-6** and **BIO-7** would reduce the potential for impacts to special-status mammals by the removal of trees or buildings to a less-than-significant level.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or USFWS?	☐	☒	☐	☐

The Project site supports riparian woodland habitat along the Feather River. Construction staging and dewatering dredged spoils would occur in upland, developed or disturbed areas of the Project site. No vegetation clearing or tree removal within riparian habitats is expected to be required; therefore, the Project would not result in permanent adverse effects to riparian habitats. Implementation of mitigation measures **BIO-1** and **BIO-9** would further reduce the potential for temporary impacts to riparian habitats. The Project would have a less-than-significant impact in the area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐

The Project would result in dredging of sediment and invasive species (water primrose). Additionally, the Project includes dredging in the Feather River. Project implementation would temporarily disturb Waters of the U.S., including wetlands, through proposed dredging and invasive species removal. However, implementation of mitigation measure **BIO-8** would reduce these potential impacts to a less-than-significant level.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐

The Feather River is an important migratory corridor for native fish. Project dredging activities have the potential to interfere with natural movements of resident and migratory fish species. Implementation of mitigation measures **BIO-1**, **BIO-3** and **BIO-9** would reduce the potential impacts to natural movements for resident and migratory fish species to a less than significant level.

The forested uplands and open space lands within the Project site provide some limited migratory opportunities for wildlife. Establishment of the staging areas, dewatering the dredged spoils, and operation of equipment is likely to temporarily disturb and displace most wildlife from the site. Some wildlife such as birds or nocturnal species are likely to continue to use the habitats opportunistically for the duration of dredging operations. Once dredging operations are complete, wildlife movements are expected to resume.

As discussed previously, the Project site does not include a known nursery site; however, a great egret rookery was observed on the opposite shore during the site reconnaissance visit. The Project would have no direct impact on the rookery, which is outside the Project limits by approximately 500 feet. Project related noise would create temporary disturbance that could discourage nesting in the rookery for the duration of construction but would not result in permanent habitat modifications. Potential impacts to the rookery would be reduced by implementation of mitigation measure **BIO-1**.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

The Project does not conflict with a local policy or ordinance protecting biological resources. The Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

The Study Area is not covered by any local, regional, or State conservation plan. Therefore, the Project would not conflict with a local, regional, or State conservation plan.

4.4.6 Mitigation Measures

BIO-1: Best Management Practices. The Project shall implement erosion control measures and best management practices (BMPs) to reduce the potential for sediment or pollutants at the Project site. Measures may include:

- Erosion control measures shall be placed between Waters of the U.S., and the outer edge of the staging and dewatering areas, within an area identified with highly visible markers (e.g., construction fencing, flagging, silt barriers) prior to commencement of construction activities. Such identification and erosion control measures shall be properly maintained until construction is completed and the soils have been stabilized.
- Fiber rolls used for erosion control shall be certified by the California Department of Food and Agriculture as weed free.

- Seed mixtures applied for erosion control shall not contain California Invasive Plant Council designated invasive species (http://cal-ipc.org/) and will be composed of native species appropriate for the site.
- Trash generated onsite shall be promptly and properly removed from the site.
- Any fueling in the upland portion of the Project site shall use appropriate secondary containment techniques to prevent spills.
- A qualified biologist shall conduct a mandatory Worker Environmental Awareness Program for all contractors, work crews, and any onsite personnel on the potential for special-status species to occur on the Project site. The training shall provide an overview of habitat and characteristics of the species, the need to avoid certain areas, and the possible penalties for non-compliance.
- A qualified biologist/biological monitor shall be onsite during daily construction activities to ensure compliance with the anticipated terms and conditions of the Project regulatory permits and CEQA compliance document. If appropriate, the approved biologist shall train an individual to act as the onsite construction monitor for periods when there is a low risk of effect to special-status species.

Timing/Implementation: *Prior to and during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-2: Preconstruction Floristic Surveys. Preconstruction floristic surveys shall be conducted for any areas of proposed ground disturbance (i.e., grading or earth work) in the Project site with the potential to support special-status plants. The area of ground disturbance and a 25-foot buffer would be surveyed by a qualified botanist during the appropriate blooming period prior to the start of Project activity. If no special-status plants are found during the preconstruction surveys, no further measures are necessary. If surveys identify any special-status plants, the Project construction manager shall identify them with flagging and avoid them with a 25-foot no-disturbance buffer during Project activities. If this avoidance is not feasible, the Project proponent shall consult with CDFW to determine whether alternative avoidance measures that are equally protective are possible.

Timing/Implementation: *Prior to and during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-3: Special-Status Fish. To avoid and minimize potential adverse effects to listed and special-status fish species, designated critical habitat, and essential fish habitat implement the following:

- Implement dredging operations during a limited work window (likely June 15 through October 15) to avoid the most sensitive life stages of ESA-listed anadromous fish species.

- Deploy measures, as practicable, to reduce sediment resuspension such as a turbidity curtain, if feasible, given the flow volume and velocity in the Project site.
- Employ a fish biologist to be onsite as needed to monitor dredging and check spoils (i.e., sediment and vegetation).
- Where mechanical dredging is used, attempt to exclude fish and other aquatic organisms from the area using block nets, to the extent feasible for the Project site.
- Through the CWA Section 404 process, request the USACE initiate ESA Section 7 Consultation with NMFS on the project effects to ESA-listed anadromous fish species, designated critical habitat, and essential fish habitat.
- Consult with CDFW and if necessary, secure an Incidental Take Permit 2081, pursuant to Section 2080 of the California Fish and Game Code.

Timing/Implementation: *Prior to and during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-4: Nesting Birds. To protect nesting birds, no Project activity shall begin from February 1 through August 31 unless the following surveys are completed by a qualified wildlife biologist. Separate surveys and avoidance requirements are listed below for all nesting birds, raptors, including bald eagle, burrowing owl, and Swainson's hawk.

- All Nesting Birds – Within 14 days prior to construction (or less if recommended by CDFW), survey for nesting activity of birds within each Project work area and a 100-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
- Raptors (including bald eagle) – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 500-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
- Swainson’s hawk – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 0.25-mile radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

Timing/Implementation: *Prior to and during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-5: Yellow-Billed Cuckoo. To protect potentially nesting yellow-billed cuckoo, the following is required.

- If it is anticipated that construction related disturbances within 500 feet of suitable habitat cannot be avoided during the nesting season (June 1 to September 30), protocol surveys for yellow-billed cuckoo shall be conducted. Surveys will follow the latest version of *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo*.
- Biologists will coordinate with the USFWS and CDFW prior to conducting surveys to determine if the proposed survey area has been recently surveyed, define the parameters of the survey area, and discuss the survey methodology. Survey methods and results will be reported to the USFWS and CDFW at the conclusion of the surveys.
- If cuckoos are detected during surveys, the general location of the detection or the nest will be mapped by the biologists and SBFCA will establish a 500 foot, or other distance as approved by the USFWS and CDFW, no-disturbance buffer between construction activities and the area identified. The no-disturbance buffer will be maintained until it has been determined by a qualified biologist that young have fledged or the nest is no longer active.

Timing/Implementation: *Prior to and during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-6: Ringtail Nest Survey. If the Project requires the removal of upland trees, a qualified biologist shall survey all trees proposed for removal to determine their potential to provide suitable ringtail nest sites (e.g., trees with cavities). If potential nest trees are found, an avoidance area, determined by the survey biologist, shall be fenced and/or flagged around the tree as close to construction limits as possible.

Timing/Implementation: *Prior to the removal of trees during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-7: Roosting Bat Survey. If the Project requires the removal of upland trees, a qualified biologist shall conduct a preconstruction roosting bat survey for all suitable roosting habitat (e.g., manmade structures, trees) prior to construction activities. If suitable roosting habitat is identified, a qualified biologist shall conduct an evening bat emergence survey that may include acoustic monitoring to determine whether or not bats are present. If roosting bats are found, consultation with CDFW prior to initiation of construction activities shall be required and implementation of CDFW recommendations shall be required. If bats are not found during the preconstruction surveys, no further measures are necessary.

Timing/Implementation: *Prior to the removal of trees during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO-8: Waters of the U.S. To avoid or minimize anticipated short-term adverse effects to Waters of the U.S., the Project shall implement the following:

- If backwater from dewatered dredged spoils has potential to discharge to wetlands or Waters of the U.S., then a Nationwide Permit 16 (Backwater) under Section 404 of the federal CWA shall be obtained from USACE. The impacts from such actions are expected to be temporary and solely associated with the dewatering activities. Therefore, no net loss of aquatic resources is likely to occur as a result of the Project and no mitigation is required.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA, as issued by RWQCB, shall be obtained for Section 404 permit actions.
- A Waste Discharge Requirement for dredge and fill in Waters of the State under the Porter-Cologne Water Quality Control Act as issued by RWQCB shall be obtained for impacts to waters of the State.

Timing/Implementation: *Prior to and during construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

BIO 9: Riparian Habitat. Riparian habitat is protected under the California Fish and Game Code. The Project does not expect to require vegetation clearing. Nevertheless, to minimize the potential for impacts to riparian habitat, the following measures are recommended:

- The river channels shall be accessed via areas where no permanent impacts to riparian vegetation will be required.
- A Streambed Alteration Agreement (SAA), pursuant to Section 1602 of the California Fish and Game Code, must be obtained for any activity that will impact the Feather River and riparian habitats. Minimization measures will be developed during consultation with CDFW as part of the SAA agreement process to ensure protections for affected fish and wildlife resources.

Timing/Implementation: *During construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

4.5 Cultural Resources

ECORP Consulting, Inc. prepared a cultural resources inventory (ECORP 2020c) for the Proposed Project to determine if cultural resources were present in the Project Area and to assess the sensitivity of the Project Area for undiscovered or buried cultural resources. The inventory consisted of: a records search with the California Historical Resources Information System (CHRIS) at the North Central Information Center (NCIC) and Northeast Information Center (NEIC); a search of the Sacred Lands File of a Native American Heritage

Commission (NAHC); a review of historic maps, photographs, records on file with the Office of Historic Preservation (OHP); ethnographic information; literature pertaining to the Project Area and surrounding region; a review of geological and soils data; and pedestrian survey by qualified professionals.

The information provided in this section is a non-confidential summary of the cultural resources inventory, because sections 6253, 6254, and 6254.10 of the California Code authorize State agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code § 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code § 54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 U.S. Code [USC] 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 304 of the National Historic Preservation Act, it is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the CHRIS maintained by the California Office of Historic Preservation (OHP) prohibit public dissemination of records search information. In compliance with these requirements, the results of the cultural resource investigation were prepared as a confidential document, which is not intended for public distribution in either paper or electronic format. As such, the Cultural Resources Inventory Report is not included as an appendix in this Initial Study. While information describing the various Cultural Resources time periods is included in the Initial Study discussion, all references to location of archaeological sites and artifacts have been removed for confidentiality and protection of these resources.

4.5.1 Environmental Setting

The Project Area is located along the banks of the Feather River, a principal tributary of the Sacramento River, located near the center of the southern Sacramento Valley, in the greater Sacramento River Watershed. The Sacramento Valley forms the northern third of California's Great Central Valley and is characterized by a nearly level alluvial plain that extends for about 150 miles from the base of the Klamath Mountains on the north to the confluence of the Sacramento and San Joaquin rivers on the south. The area is primarily characterized by agricultural land, ruderal grassland, open space, and limited riparian vegetation. It is surrounded by rural agricultural lands and open space, with some rural residencies to the west on the outskirts of the community of Live Oak.

The Feather River in the Project Area has been affected substantially by past hydraulic mining activities. Sediment buildup from debris in the river channel caused a decrease in the capacity of the river channel. This caused extensive flooding and sediment deposition on the urban and agricultural lands surrounding the Project Area. As a result, the channel banks currently consist of fine-grained slickens from hydraulic mining debris. Therefore, a moderate potential exists for buried pre-contact archaeological sites in the Project Area due to the presence of alluvium along the Feather River. Pre-contact archaeological sites are known to occur along waterways.

4.5.1.1 Pre-Contact History

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8,000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Groups from this time period included only small numbers of individuals who did not often stay in one place for extended periods.

Around 8,000 BP, there was a shift in focus from hunting towards a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5,000 years BP, is sometimes referred to as the Millingstone Horizon. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period. In sites dating to after about 5,000 BP, archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments. During this period, new peoples from the Great Basin began entering southern California. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. The Project area would encompass the area of the Valley Tradition class of the Middle Archaic Period in California pre-contact History. The Valley Tradition is represented at archaeological sites that show evidence of a diverse food supply and year-round occupation of one area. Sites from the later Middle Archaic Valley Tradition are well represented in the Sacramento Valley and Delta.

4.5.1.2 Ethnography

Ethnographically, the Project Area is in the territory occupied by the Penutian-speaking Nisenan. Nisenan were observed by early ethnographers to inhabit the drainages of the Yuba, Bear, and American rivers, and also the lower reaches of the Feather River, extending from the east banks of the Sacramento River on the west to the mid to high elevations of the western flank of the Sierra Nevada to the east. The territory extended from the area surrounding the current city of Oroville on the north to a few miles south of the American River in the south. The Sacramento River bounded the territory on the west, and in the east, it extended to a general area located within a few miles of Lake Tahoe. The descendants of traditional Nisenan, including the United Auburn Indian Community of Auburn Rancheria, continue to reside in the region. The ethnography of the Project area is discussed in more detail in the Tribal Cultural Resources section of this Initial Study.

4.5.1.3 Project Area History

Sutter County is one of the original 27 counties and was formed and named after John Sutter, a Swiss immigrant, in 1850. Yuba City was selected by Sutter County voters as the county seat in 1856. John Sutter is credited for naming the Yuba River because of the Native American village located near the confluence of the Yuba and Feather rivers called “Yubu.” Yuba City was laid out in 1849 and was named after the river.

The town of Live Oak was named after the dense forest of live oak trees that covered the area prior to development. The community was first settled by A.M. McGrew in 1869 when he purchased the land from squatters and constructed a house located at 9778 Larkin Road, which still stands today. The city further expanded during the 1870s when the California-Oregon Division of the Central Pacific Railroad was completed. The rail line running through Live Oak was built to connect Marysville to Portland Oregon and was completed in 1887. Proximity to the rail, with two daily passenger and freight train services each way, made the city more readily accessible for settlers and visitors. The rail also led to Live Oak's success in agriculture. The community's products, such as prunes, peaches, grapes, rice, almonds and particularly alfalfa, relied upon the rail for transporting.

State Highway 99 was constructed through Live Oak in 1915, following the Central Pacific Railroad lines. An unsuccessful attempt was made 11 years later to incorporate Live Oak as a city. Incorporation was finally accomplished on January 14, 1947, when the community's population was 1,200. The Live Oak historic commercial district is still located on Broadway between Elm Street and Pennington Road.

4.5.2 Regulatory Framework

4.5.2.1 Federal

National Historic Preservation Act

The National Historic Preservation Act (NHPA) requires that federal agencies take into account the effects of their undertakings in advance on the National Register of Historic Places (NRHP), which is the nation's master inventory of known historic resources. The NRHP is administered by the National Park Service (NPS) and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level.

Structures, sites, buildings, districts, and objects over 50 years of age can be listed in the NRHP as significant historic resources. However, properties under 50 years of age that are of exceptional importance or are contributors to a historic district can also be included in the NRHP.[1] The criteria for listing in the NRHP include resources that:

a) are associated with events that have made a significant contribution to the broad patterns of history;

b) are associated with the lives of persons significant in our past;

c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

[1] A [historic] district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development (NPS 1983).

d) have yielded or may likely yield information important in prehistory or history.

4.5.2.2 State

California Register of Historical Resources

The California Register of Historic Resources (CRHR) is used by state and local agencies, private groups, and citizens to identify, evaluate, register, and protect California's historical resources. The CRHR is the authoritative guide to the state's significant historical and archaeological resources. This program encourages public recognition and protection of resources of architectural, historical, archaeological, and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding, and affords certain protections under CEQA.

California Environmental Quality Act

Under CEQA, public agencies must consider the effects of their actions on both historical resources and unique archaeological resources. Pursuant to PRC § 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether proposed projects would have effects on unique archaeological resources.

"Historical resource" is a term with a defined statutory meaning (PRC § 21084.1). Under CEQA Guidelines Section 15064.5(a), historical resources include the following:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR (PRC § 5024.1).
- A resource included in a local register of historical resources, as defined in PRC § 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC § 5024.1(g), will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources (PRC Section 5024.1), including the following:

  a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
  b) Is associated with the lives of persons important in our past;

c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

d) Has yielded, or may be likely to yield, information important in prehistory or history.

The fact that a resource is not listed in, or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to PRC § 5020.1(k)), or identified in a historical resources survey (meeting the criteria in PRC § 5024.1(g)) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC §§ 5020.1(j) or 5024.1.

Historical resources are usually 45 years old or older and must meet at least one of the criteria for listing in the CRHR, described above (such as association with historical events, important people, or architectural significance), in addition to maintaining a sufficient level of integrity.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be historical resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC § 5024.1 and California Code of Regulations (CCR), Title 14, § 4850). Unless a resource listed in a survey has been demolished, lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not eligible for listing, a lead agency should consider the resource to be potentially eligible for the CRHR.

CEQA also requires lead agencies to determine if a proposed project would have a significant effect on unique archaeological resources. If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083.2 regarding unique archaeological resources. A unique archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

> "Unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> - Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
> - Has a special and particular quality such as being the oldest of its type or the best available example of its type.
> - Is directly associated with a scientifically recognized important prehistoric or historic event or person."

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (14 CCR Section 15064[c][4]).

If the project would result in a significant impact to a historical resource or unique archaeological resource, treatment options under PRC § 21083.2 include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a unique archaeological resource).

In addition to the mitigation provisions pertaining to accidental discovery of human remains, the CEQA Guidelines also require that a lead agency make provisions for the accidental discovery of historical or archaeological resources, generally. Pursuant to § 15064.5(f), these provisions should include "an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."

4.5.3 Methods

4.5.3.1 Records Search and Literature Review

Two records searches were conducted for this Project Area because, with the radius around the Project location, it covers two counties whose records are housed at separate information centers of the CHRIS. Staff at the NCIC conducted a Records Search of the Yuba County portions of the radius on March 25, 2020, and staff at the NEIC conducted a records search of the Sutter County portions of the radius on April 8, 2020. The purpose of the records search was to determine the extent of previous surveys within a 0.5-mile radius of the study area, and whether previously documented pre-contact or historic period archaeological sites, architectural resources, or traditional cultural properties exist within this area.

In addition to the official records and maps for archaeological sites and surveys reviewed during the records search at the NEIC and NCIC. In addition to the official records and maps for archaeological sites and surveys in Yuba and Sutter counties, the following historic references were also reviewed: Historic Property Data File for Yuba County and Sutter County (OHP 2012); *The National Register Information System* (National Park Service [NPS] 2020); *Office of Historic Preservation, California Historical Landmarks* (OHP 2020); *California Historical Landmarks* (OHP 1996 and updates); *California Points of Historical Interest* (OHP 1992 and updates); *Directory of Properties in the Historical Resources Inventory* (1999); *Caltrans Local Bridge Survey* (Caltrans 2019); *Caltrans State Bridge Survey* (Caltrans 2018); and *Historic Spots in California* (Kyle 2002). ECORP also conducted focused property- and site-specific archival research online, where primary sources such as historical newspaper articles, maps, and county recorders records were reviewed. These records included the 1880 U.S. census records, the Bureau of Land Management (BLM) General Land Office (GLO) survey plats at glorecords.blm.gov, and historical topographic maps.

In addition to the record search, ECORP contacted the California Native American Heritage Commission (NAHC) on March 24, 2020 to request a search of the Sacred Lands File for the Project Area to determine whether or not Sacred Lands have been recorded by California Native American tribes within the Project Area. Native American Sacred Lands may coincide with archaeological sites.

ECORP mailed letters to the Yuba Historical Society and to the Sutter County Museum on March 26, 2020 to solicit comments or obtain historical information that the repository might have regarding events, people, or resources of historical significance in the area.

4.5.3.2 Pedestrian Survey

On April 21, 2020, ECORP subjected the terrestrial Project area to an intensive pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983) using transects spaced 15 meters apart. ECORP expended one person-day in the field. At that time, the ground surface was examined for indications of surface or subsurface cultural resources. The general characteristics of the ground surface were inspected for indications of subsurface deposits that may be present on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations, artifact collections, or underwater archaeology were undertaken during the pedestrian survey.

4.5.3.3 Results

The records search did not identify any cultural resources within 0.5 mile of the Project Area. The nearest NRHP listed properties are 1.5 miles west of the Project Area. The nearest California Landmarks are located in Marysville, 11 miles south of the Project Area. The historic period maps and literature indicated that the Project Area was historically undeveloped riverside land which has been subject to various levels of inundation. The nearest native American Villages indicated in ethnographic literature was along the Feather River several miles south of the Project Area. A search of parcel data did not indicate any known or permitted buildings or structures within the Project Area.

A search of the Sacred Lands File by the NAHC indicated the presence of Sacred Sites within the Project Area. The search was conducted for an area much larger than the Project Area and included Yuba City. No responses to the letters sent to the Yuba Historical Society and to the Sutter County Museum have been received as of the preparation of this document.

Ultimately, no potential Historical Resources were identified within 0.5 mile of the Project Area through the records search or literature review.

During the pedestrian survey, the Project Area was fully accessible with the exception of inundated areas. The majority of the Project Area was almost fully exposed in an open grassy field with about 20-percent original ground visibility and very little overstory. The area near the boat ramp included areas of exposed sandy beach. No cultural resources were identified during the field survey.

4.5.4 Cultural Resources (V) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐

The cultural resources inventory completed for the Project Area identified that no historical resources were found on the Project site. However, there always remains the potential for ground-disturbing activities to expose previously unrecorded historic resources. As such, mitigation measures **CUL-1** and **CUL-2** are required to reduce potential historic resource impacts to the less-than-significant level.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

The Project area was investigated by a professional archaeologist, who concluded that there were no known unique archaeological resources within the Project area. However, a review of maps and records and the proximity of the Project Area to major water sources indicates that there exists a moderate potential for buried pre-contact resources. The presence of alluvium in and around the Project Area further suggests that there remains a potential for deeply buried pre-contact resources to be uncovered during ground disturbing activities. As such, while no known archaeological resources were found during the cultural resources inventory analysis, there always remains the potential for ground-disturbing activities to expose previously unrecorded archaeological resources. Mitigation measures **CUL-1** and **CUL-2** are required to reduce impacts to potential archaeological resources to the less-than-significant level.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

No known burial sites were identified during the field survey. A search of the Sacred Lands File by the NAHC failed to indicate the presence of Native American cultural resources in the Project area. Although Native American or other burial sites were not identified in the Project area, there is a possibility that unanticipated human remains will be encountered during ground-disturbing project-related activities.

Therefore, impacts to unknown human remains would be less than significant with incorporation of mitigation measure **CUL-3**.

4.5.5 Mitigation Measures

CUL-1: Archaeological Monitoring

- All terrestrial ground-disturbing activity associated with Project construction shall be monitored by a qualified professional archaeologist that meets or works under the direct supervision of someone who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology.
- The archaeological monitor shall provide a pre-work orientation session to all construction personnel. This includes instructing the Project superintendent and key members of dredging operations for Project construction to be alert for the possibility of destruction of buried cultural resource materials. The training shall instruct all personnel to recognize signs of historic and pre-contact use, and to report any such finds (or suspected finds) to the archaeological monitor immediately, so damage to such resources may be prevented.
- Archaeological monitoring will not occur for equipment set-up or tear-down that does not disturb the ground surface more than six inches in depth; hydro seeding; paving; placement of imported fill/gravel/rock; restoration; or backfilling of previously excavated areas. Excavated sediment from the inundated river channel, which was redeposited from upstream by the 2017 Oroville Dam Spillway incident, will not be subjected to monitoring or screening.
- At the conclusion of monitoring activities, the archaeological monitor shall submit to the USACE and SBFCA a brief Summary Monitoring Report for the Project, which incorporates all previously unknown discoveries and presents the methods and results of all monitoring activities. The draft report shall be submitted to the USACE and SBFCA within 12 months of the completion of all Project activities.
- All site records, reports, photographs, and other documentation generated for this Project using public funding shall be maintained on file with the CHRIS and made available to professionals meeting the standards of the OHP. Information derived from these documents may be further disseminated at professional archaeological conferences or meetings, or to the interested public (with confidentiality maintained).

Timing/Implementation: *During construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

CUL-2: Post-Review Discoveries

- If the monitoring archaeologist determines that the find is not a cultural resource (such as water-worn cobbles or accumulations of natural materials), then no additional action is necessary. Should tribal representatives desire to take possession of those materials, they may do so as long as the possession is documented by the archaeological monitor and as long as removal has been approved in writing by the property owner; however, taking possession does not obligate SBFCA or the USACE to provide fiduciary support for storing, processing, or reburying materials that are not cultural resources. Until a determination is made by the monitoring archaeologist about whether or not the find is subject to further consideration under CEQA, tribal representatives shall not remove or take possession of materials or objects observed. The final disposition of archaeological and historical resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission.

- If the find is determined by the monitoring archaeologist to be redeposited material that lacks primary context, is discovered only in the dredged soils, spoil piles, or stockpiles, or is otherwise not in its original context or place of deposition and does not contain human remains, then this discovery is not potentially eligible for the NRHP or California Register of Historical Resources CRHR. The archaeological monitor will assign a temporary field number, take a photograph, record its location with a Global Positioning System receiver, and describe the constituents in field notes. If the redeposited find is associated with European or non-Native American culture, the find may be left in place or discarded in order to not interfere with Project activities. If the find is associated with Native American culture, following consultation with the lead agencies, should tribal representatives desire to take possession of those materials or act in any manner consistent with the tribal cultural resources treatment plan, they may do so as long as the possession is documented by the archaeological monitor and as long as permission has been granted in writing by the property owner. However, taking possession does not obligate SBFCA or the USACE to provide fiduciary support for storing, processing, or reburying materials that are not eligible for the NRHP or CRHR. If the find was made in spoil piles and stockpiles, the material may be reused by the Project and will not be subject to screening; however, tribal representatives may take possession of any items found in spoils as long as doing so does not interfere with the Project activities.

- If a tribal representative disagrees with the determination by the monitoring archaeologist that a discovery is either not a cultural resource or represents a redeposit, then no material collection may occur by any party, and the Tribal Historic Preservation Officer (THPO) of the dissenting tribe shall notify the USACE and SBFCA within 48 hours of discovery. All timelines specified in 36 CFR 800.13(b) shall be applied in the event of an archaeological discovery. The USACE will have 48 hours to review information submitted by the THPO and communicate its decision to the THPO and State Historic Preservation Officer, in accordance with 36 CFR 800.13(b). If the contractor denies the request to stop work at that location during the appeal process (see above), and if the USACE determines that the find does represent an historic property, then the USACE and SBFCA will take into consideration the post-discovery impacts to the resource when determining the scope of the effort required to resolve any adverse effect.

- If the find is determined by the monitoring archaeologist to be in original context (in original place of deposition) and does not contain human remains, and that it constitutes a resource that could not have been discovered prior to dredging operations, then the USACE and SBFCA shall consult on appropriate treatment, in consultation with tribal representatives.

Timing/Implementation: *During construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

CUL-3: Protocols for Discovery of Human Remains

If it is determined that human remains are found, or remains that are potentially human, then the treatment shall conform to the requirements of State law under California Health and Safety Code Section 7050.5 and PRC Section 5097.98.

For the purposes of this Project, the definitions of remains subject to State law (Section 5097.98) shall apply. This definition states: "(d)(1) Human remains of a Native American may be an inhumation or cremation, and in any state of decomposition or skeletal completeness. (2) Any items associated with the human remains that are placed or buried with the Native American human remains are to be treated in the same manner as the remains, but do not by themselves constitute human remains."

Timing/Implementation: *During construction*

Monitoring/Enforcement: *SBFCA and Project construction lead*

4.6 Energy

4.6.1 Environmental Setting

4.6.1.1 Introduction

Energy consumption is analyzed in this Initial Study due to the potential direct and indirect environmental impacts associated with the Project. Such impacts include the depletion of nonrenewable resources (oil, natural gas, coal, etc.) and emissions of pollutants during dredging and primrose operations. The only energy source to be used during operations would be automotive fuel as no structures would be constructed as a part of the Project that would use electricity or natural gas. As such, only the use of automotive fuels is addressed in this section.

4.6.1.2 Automotive Fuel Consumption

Automotive fuel consumption in Sutter County from 2015 to 2019 is shown in Table 4.6-1. Fuel consumption has slightly decreased between 2015 and 2019.

Table 4.6-1. Automotive Fuel Consumption in Sutter County 2015-2019

Year	Fuel Consumption (Gallons)
2019	71,962,655
2018	72,983,195
2017	73,958,953
2016	74,565,605
2015	72,019,219

Source: CARB 2017

4.6.2 Energy (VI) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐

The impact analysis focuses on the sources of energy that is relevant to the Proposed Project: the equipment-fuel necessary for Project dredging, dewatering operations and hauling for offsite disposal. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, and unnecessary consumption of energy for a proposed land use project. For the purpose of this analysis, the amount of fuel necessary for Project implementation is calculated and compared to that consumed in Sutter County. The amount of total construction-related fuel use was estimated using ratios provided in the Climate Registry's General Reporting Protocol for the Voluntary Reporting Program, Version 2.1. Energy consumption associated with the Proposed Project is summarized in Table 4.6-2.

Table 4.6-2. Project Fuel Consumption

Fuel Consumption	Annual Consumption	Percentage Increase Countywide
Project Implementation	19,015 gallons	0.02 percent

Source: Climate Registry 2016
Notes: The Project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2019.

As shown, the Project's automotive/truck fuel consumption during the one-time construction period is estimated to be 19,015 gallons of fuel, which would increase the annual countywide automotive/truck fuel use in the county by 0.02 percent. As such, Project implementation would have a nominal effect on local and regional energy supplies. No unusual Project characteristics would necessitate the use of equipment that would be less energy efficient than at comparable construction sites in the region or the state. Project dredging operations contractors would purchase their own gasoline and diesel fuel from local suppliers and would judiciously use fuel supplies to minimize costs due to waste and subsequently maximize profits. Additionally, construction/dredging equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency combined with State regulations limiting engine idling times, would further reduce the amount of transportation fuel demand during Project implementation. For these reasons, it is expected that Project fuel consumption would not be any more inefficient, wasteful, or unnecessary than other similar development projects of this nature.

For these reasons, this impact would be less than significant.

	Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

This impact analysis focuses on fuel consumption during the one-time dredging period. As discussed above, Project implementation would have a nominal effect on local and regional energy supplies. Furthermore, the main goal of the Project is to remove sediment buildup that was exacerbated by the Oroville Dam Spillway failure. The buildup of sediment has created dangerous conditions for recreational users, made some boat launch facilities nearly unusable, and has hampered public safety as it has affected emergency vessel launching capabilities. For these reasons, this impact would be less than significant.

4.7 Geology and Soils

4.7.1 Environmental Setting

4.7.1.1 Geomorphic Setting

The Project site is located in the north-central portion of the Great Valley geomorphic province of California. The Great Valley province is an alluvial plain about 50 miles wide and 400 miles long in the central part of California. Its northern part is the Sacramento Valley, drained by the Sacramento River and its southern part is the San Joaquin Valley drained by the San Joaquin River. The Great Valley is a trough in which sediments have been deposited almost continuously since the Jurassic Period (about 160 million years ago). Great oil fields have been found in southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin. In the Sacramento Valley, the Sutter Buttes, the remnants of an isolated Pliocene volcano, rise above the valley floor (California Geological Survey [CGS] 2002).

4.7.1.2 Site Geology

The geology of the Sacramento Valley as a large, asymmetric, structural trough (syncline) formed by westward-tilting blocks of plutonic and metamorphic rocks on the eastern side, and highly folded and faulted blocks of metamorphic rocks (Franciscan) on the western side. This basin has been partially filled by a thick sequence (up to 12.4 miles [20 km] thick) of sedimentary rocks and alluvial deposits that range from late Jurassic to Historical in age. During the Pleistocene, erosion of the Sierra Nevada led to the deposition of large alluvial fans at the base of the foothills along the eastern side of the Sacramento Valley. Glacial conditions are generally credited for the deposition of these fans, while subsequent interglacial periods are marked by landscape stability, soil formation, and channel incision. Subsequent depositional cycles during the Holocene progressively buried downstream sections of many older alluvial fans and also led to the formation of inset stream terraces and nested alluvial fans along the foothills (Rosenthal and Willis 2017).

About 4,000 years ago, most of Sacramento Valley had large amounts of alluvium deposited across it, forming a continuous plain extending from southern Glenn County through Yolo County in the west, and from northern Butte County to Sutter County in the east. Along modern streams and rivers in the lower Sacramento Valley, these late Holocene deposits were in part eventually eroded and/or buried by the Latest Holocene and historic period soil deposits. These latest Holocene deposits often bury older archaeological deposits (Rosenthal and Willis 2017).

4.7.1.3 Site Soils

According to the NRCS Web Soil Survey website (NRCS 2020), the Project site is comprised of three soil types: Columbia fine sandy loam (138) 0 to 1 percent slopes and Columbia fine sandy loam (118) channeled, 0 to 2 percent slope, and Columbia fine sandy loam (121), frequently flooded, 0 to 2 percent slopes. Columbia soils consist of deep, moderately well-drained soils found on flood plains and natural levees, formed in alluvium from mixed rock sources.

Among many soil related attributes, the Web Soil Survey identifies drainage, flooding, erosion, runoff, and the linear extensibility potential for the Project soils. According to this survey, the Project is predominately underlain by soils that are somewhat poorly drained and have a slight erosion potential. The Project site soils have no frost action potential and a low linear extensibility (shrink-swell) (NRCS 2020).

Table 4.7-1. Project Area Soil Characteristics

Soil	Percentage of Site	Drainage	Flooding Frequency Class	Erosion Hazard[1]	Runoff Potential[2]	Linear Extensibility (Rating)[3]	Frost Action[4]
Columbia fine sandy loam, channeled, 0 to 2 percent slopes	66.7	Somewhat poorly drained	Frequent	Slight	A	1.5	None
Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes	0.1	Somewhat poorly drained	Frequent	Slight	A	1.5	None
Columbia fine sandy loam, 0 to 1 percent slopes, occasionally flooded	22.6	Somewhat poorly drained	Frequent	Slight	A	1.5	None
Water	10.6	Not rated	Not rated	Not rated	Not rated	Not rated	Not rated

Table 4.7-1. Project Area Soil Characteristics

Soil	Percentage of Site	Drainage	Flooding Frequency Class	Erosion Hazard[1]	Runoff Potential[2]	Linear Extensibility (Rating)[3]	Frost Action[4]

Source: NRCS 2020
Notes:
1. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and offsite damage are likely, and erosion-control measures are costly and generally impractical.
2. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation. Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. Group B. Soils having a moderate infiltration rate when thoroughly wet. Group C. Soils having a slow infiltration rate when thoroughly wet. Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.
3. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.
4. Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

4.7.1.4 Regional Seismicity and Fault Zones

In California, special definitions for active faults were devised to implement the Alquist-Priolo Earthquake Fault Zoning Act of 1972, which regulates development and construction in order to avoid the hazard of surface fault rupture. The State Mining and Geology Board established policies and criteria in accordance with the act, which defined an active fault as one which has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault was considered to be any fault that showed evidence of surface displacement during Quaternary time (last 1.6 million years). Because of the large number of potentially active faults in California, the State Geologist adopted additional definitions and criteria to limit zoning to only those faults with a relatively high potential for surface rupture. Thus, the term “sufficiently active” was defined as a fault for which there was evidence of Holocene surface displacement. This term was used in conjunction with the term “well-defined,” which relates to the ability to locate a Holocene fault as a surface or near-surface feature (CGS 2010).

Major faults within the region with the greatest potential to affect the Project sites include the Foothills Fault System, located approximately 20 miles east of the Project site, and the Great Valley Fault System, located approximately 12 miles west of the Project site (DOC 2020b). The Foothills Fault System consists of a series of northwest-trending faults. Of this system, the Bear Mountains Fault Zone is considered to be potentially active. The nearest fault to the Project site is the Swan Ravine Fault, approximately 14 miles east of the Project (DOC 2020b). This fault is a Quaternary (1.6 million to 700,000 years ago) and a Late Quaternary Age (70,000 to 11,700 years ago) fault (DOC 2020b).

The Great Valley Fault System consists of 14 recognized fault segments extending from Coalinga in the south to Rumsey Hills in the north. The Dunnigan Hills Fault is located approximately 35 miles west southwest of the Project site and is a Late Quaternary Age fault. The Willows Fault Zone is located approximately 17 miles west of the Project site is a Pre-Quaternary Age (older than 1.6 million years) fault (DOC 2020b).

4.7.1.5 Paleontological Resources

A paleontological records search was requested from the University of California Museum of Paleontology (UCMP) on June 30, 2020. The search included a review of the institution's paleontology specimen collection records for Sutter County, including the Project Area and vicinity. In addition, a query of the UCMP catalog records; a review of regional geologic maps from the CGS; a review of local soils data; and a review of existing literature on paleontological resources of Sutter County by ECORP. The purpose of the assessment was to determine the sensitivity of the Project Area, whether or not known occurrences of paleontological resources are present within or immediately adjacent to the Project Area, and whether or not implementation of the Project could result in significant impacts to paleontological resources. Paleontological resources include mineralized (fossilized) or unmineralized bones, teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains.

The results of the search of the UCMP indicated that 37 paleontological specimens were recorded from 14 identified localities and nine unidentified localities in Sutter County. Paleontological resources include fossilized remains of birds, mammals, reptiles, and amphibians. No paleontological resources have been previously recorded within or near the Proposed Project site (UCMP 2020).

4.7.2 Geology and Soils (VI) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒

i) The Proposed Project sites are not located within an Alquist-Priolo Earthquake Zone (CGS 2010, 2015). There would be no impact related to fault rupture.

ii) According to CGS's Earthquake Shaking Potential for California mapping, the Proposed Project sites are located in an area that is distant from known, active faults and will experience lower levels of ground shaking less frequently. In most earthquakes, only weaker masonry buildings would be damaged. However, very infrequent earthquakes could still cause strong shaking in the area (CGS 2016). The Proposed Project includes the removal of built-up sediment and invasive primrose. No new structures would be built as a result of the Project. As such, Project would not expose people or structures to potential substantial adverse effects related to strong ground shaking. The Project would have no impact int his area.

iii) Liquefaction occurs when loose sand and silt that is saturated with water behaves like a liquid when shaken by an earthquake. Liquefaction can result in the following types of seismic-related ground failure:

- Loss of bearing strength – soils liquefy and lose the ability to support structures
- Lateral spreading – soils slide down gentle slopes or toward stream banks
- Flow failures – soils move down steep slopes with large displacement
- Ground oscillation – surface soils, riding on a buried liquefied layer, are thrown back and forth by shaking
- Flotation – floating of light buried structures to the surface
- Settlement – settling of ground surface as soils reconsolidate
- Subsidence – compaction of soil and sediment

Three factors are required for liquefaction to occur: (1) loose, granular sediment, (2) saturation of the sediment by groundwater, and (3) strong shaking. Because the Proposed Project site is located in an area determined to have a low chance of seismic hazard and no habitable structures would be built as a part of the Project, the potential to expose people or structures to substantial adverse effects from liquefaction would be a non-factor. As such, the Project would have no impact in this area.

iv) The Proposed Project is in an area with relatively flat topography, indicating no potential for landslides. As such, the Proposed Project would have no impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

As shown in Table 4.7-1, the Project soils have a slight erosion potential. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions. However, because the Project includes the removal of sediment directly adjacent to the Feather River, some riverbank erosion may occur. However, this erosion would be minimal and would not result in the loss of a substantial amount of topsoil. Additionally, implementation of mitigation measures **BIO-8** and **BIO-9** and resulting BMPs would assist in the reduction of erosion on the riverbank. As such, the Project would have a less-than-significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒

As discussed previously, the Project site has no potential for landslides due to the flat topography of the site.

Lateral spreading is a form of horizontal displacement of soil toward an open channel or other “free” face, such as an excavation boundary. Lateral spreading can result from either the slump of low cohesion and unconsolidated material or, more commonly, by liquefaction of either the soil layer or a subsurface layer underlying soil material on a slope, resulting in gravitationally driven movement. One indicator of potential lateral expansion is frost action. Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing (NRCS 2020). As indicated in Table 4.7-1, the Web Soil Survey identifies the Project site as having soils with no frost action potential. Additionally, the Project is for the removal of sediment and invasive primrose. No structures would be constructed as a part of the Project. As such, the potential for impacts due to lateral spreading would be nonexistent. The Project would have no impact in this area.

With the withdrawal of fluids, the pore spaces within the soils decrease, leading to a volumetric reduction. If that reduction is significant enough over an appropriately thick sequence of sediments, then regional ground subsidence can occur. This typically only occurs within poorly lithified sediments and not within competent rock.[2] No oil, gas, or high-volume water extraction wells are known to be present in the Project area. According to the U.S. Geological Survey (USGS), the Project site is not located in an area of land subsidence (USGS 2018). No structures would be constructed as a part of the Project. As such, the

[2] The processes by which loose sediment is hardened to rock are collectively called lithification.

potential for impacts due to subsidence would be nonexistent. The Project would have no impact in this area.

Collapse occurs when water is introduced to poorly cemented soils, resulting in the dissolution of the soil cementation and the volumetric collapse of the soil. In most cases, the soils are cemented with weak clay (argillic) sediments or soluble precipitates. This phenomenon generally occurs in granular sediments situated within arid environments. Collapsible soils will settle without any additional applied pressure when sufficient water becomes available to the soil. Water weakens or destroys bonding material between particles that can severely reduce the bearing capacity of the original soil resulting in damage to buildings and foundations. No structures would be constructed as a part of the Project. As such, the potential for impacts due to collapse would be nonexistent. The Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒

Expansive soils are types of soil that shrink or swell as the moisture content decreases or increases. Structures built on these soils may experience shifting, cracking, and breaking damage as soils shrink and subside or expand. Expansive soils can be determined by a soil's linear extensibility. There is a direct relationship between linear extensibility of a soil and the potential for expansive behavior, with expansive soil generally having a high linear extensibility. Thus, granular soils typically have a low potential to be expansive, whereas clay-rich soils can have a low to high potential to be expansive.

According to the NRCS, linear extensibility values for the Project site are 1.5 percent. Soils with linear extensibility in that range correlate to soils having a low expansion potential, as noted in Table 4.7-1. The shrink-swell potential is low if the soil has a linear extensibility of less than three percent, moderate if three to six percent, high if six to nine percent, and very high if more than nine percent. If the linear extensibility is more than three percent, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. As shown in Table 4.7-1, 100 percent of the Project site soils have a low shrink-swell potential. Additionally, no structures would be constructed as a part of the Project. As such, the potential for impacts due to collapse would be nonexistent. The Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater	☐	☐	☐	☒

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
disposal systems where sewers are not available for the disposal of wastewater?				

The Project does not involve the use of septic tanks or a septic system. The Proposed Project would have no impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

A search of the UCMP failed to indicate the presence of paleontological resources in the Project Area. Although paleontological resources sites were not identified in the Project Area, there is the possibility that unanticipated paleontological resources will be encountered during ground-disturbing Project-related activities. Therefore, mitigation is required to reduce this potential impact. As such, mitigation measure **GEO-1** is included to reduce impacts to unknown paleontological resources to a less-than-significant level.

4.7.3 Mitigation Measures

GEO-1: Discovery of Unknown Paleontological Resources

- If any paleontological or other geologically sensitive resources are identified during any phase of Project development, the construction manager shall cease operation at the site of the discovery and immediately notify SBFCA. SBFCA shall retain a qualified paleontologist to provide an evaluation of the find and to prescribe mitigation measures to reduce impacts to a less-than-significant level. In considering any suggested mitigation proposed by the consulting paleontologist, the SBFCA shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, Project design, costs, land use assumptions, and other considerations. If avoidance is unnecessary or infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the Project site while mitigation for paleontological resources is carried out.

  Timing/Implementation: *During dredging operations*

  Monitoring/Enforcement: *SBFCA and the Project construction lead*

4.8 Greenhouse Gas Emissions

4.8.1 Environmental Setting

Greenhouse Gas (GHG) emissions are released as byproducts of fossil fuel combustion, waste disposal, energy use, land use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and chlorofluorocarbons, creates a blanket around the earth that allows light to pass through but traps heat at the surface, preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

The local air quality agency regulating the SVAB is the FRAQMD, the regional air pollution control officer for the basin. The FRAQMD has yet to establish a significance threshold for construction and operational GHG emissions. However, the Sutter County Climate Action Plan (CAP) developed a CEQA Threshold and Screening Tables for land use projects. The purpose of the CAP CEQA Threshold and Screening Tables are to provide guidance on how to determine the significance of a project's GHG contribution. They are based on the CAP, the GHG inventories within the CAP, and the GHG reduction measures that reduce emissions consistent with the reduction goals of AB 32, which promulgates the statewide GHG-reduction goal of achieving 1990 levels of statewide GHG emissions by the end of the year 2020. The CAP CEQA Threshold and Screening Tables are used by Sutter County staff for review of development projects in order to ensure that the specific reduction strategies in the CAP are implemented as part of the CEQA process from development projects.

The Screening Tables, used for larger land use development projects, use a point system geared towards encouraging efficiency in building developments. Projects that achieve 100 points or more do not need to quantify GHG emissions and are assumed to have a less than significant impact. Small projects with minor levels of GHG emissions, or ones that do not proposed buildings such as the Proposed Project, typically cannot achieve the 100-point threshold and therefore must quantify GHG emission impacts. As such, Sutter County developed a two-tier pre- screening procedure using a threshold of 3,000 metric tons of CO_2e per year. This threshold is based on evidence that 90 percent of CO_2e emissions are from CEQA projects that exceed 3,000 metric tons CO_2e per year. Both cumulatively and individually, projects that generate less than 3,000 metric tons CO_2e per year have a negligible contribution to overall emissions. Therefore, the County has concluded that projects generating less than 3,000 metric tons of CO_2e would be less than significant and would not have to be further evaluated.

It is noted that Sutter County's bright-line threshold of 3,000 metric tons of CO_2e annually is based, in part, on the GHG-reducing target established for the year 2020 under AB 32, but the Project will be implemented in the year 2021. Statewide goals for GHG reductions in the years beyond 2020 were codified into State law with the passage of Senate Bill (SB) 32, which mandates that California achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. Therefore, the Project's contribution to GHG emissions will be compared to a significance threshold of 1,800 metric tons of CO_2e per year, which equates to 40 percent less than 3,000 metric tons.

The Appendix G thresholds for GHG emissions do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA. With respect to GHG emissions, the CEQA Guidelines Section 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or other performance-based standards." (14 CCR 15064.4(b)). A lead agency may use a "model or methodology" to estimate GHG emissions and has the discretion to select the model or methodology it considers "most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change." (14 CCR 15064.4(c)). Section 15064.4(b) provides that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment:

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

In addition, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence" (14 CCR 15064.7(c)). The CEQA Guidelines also clarify that the effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see CEQA Guidelines Section 15130(f)). As a note, the CEQA Guidelines were amended in response to SB 97. In particular, the CEQA Guidelines were amended to specify that compliance with a GHG emissions reduction plan renders a cumulative impact insignificant.

Per CEQA Guidelines Section 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include a "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plans [and] plans or regulations for the reduction of greenhouse gas emissions." Put another way, CEQA Guidelines Section 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with adopted programs, plans, policies and/or other regulatory strategies to reduce GHG emissions.

In *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 2014, 213, 221, 227, following its review of various potential GHG thresholds proposed in an academic study [Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203], the California Supreme Court identified the use of numeric bright-line thresholds as a potential pathway for compliance with CEQA GHG requirements. The study found numeric bright line thresholds designed to determine when small projects were so small as to not cause a cumulatively considerable impact on global climate change was consistent with CEQA. Specifically, PRC section 21003(f) provides it is a policy of the state that "[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment." The Supreme Court-reviewed study noted, "[s]ubjecting the smallest projects to the full panoply of CEQA requirements, even though the public benefit would be minimal, would not be consistent with implementing the statute in the most efficient, expeditious manner. Nor would it be consistent with applying lead agencies' scarce resources toward mitigating actual significant climate change impacts." (Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203, 221, 227.)

The significance of the Project's GHG emissions is evaluated consistent with CEQA Guidelines Section 15064.4(b)(2) by considering whether the Project complies with applicable plans, policies, regulations, and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. For the Proposed Project, the Sutter County CAP's 3,000 metric tons of CO_2e per year threshold developed, in part, on the GHG-reducing target established for the year 2020 under AB 32, is reduced to 1,800 metric tons of CO_2e consistent with the statewide goals for GHG reductions in the years beyond 2020 that were codified into State law with the passage of SB 32 and used as the significance threshold. As previously described, the 3,000 metric tons of CO_2e per year threshold represents a 90 percent capture rate (i.e., this threshold captures projects that represent approximately 90 percent of GHG emissions from new sources). The 3,000 metric tons of CO_2e per year value is typically used in defining small projects within the County that are considered less than significant because it represents less than one percent of future 2050 statewide GHG emissions target and the lead agency can provide more efficient implementation of CEQA by focusing its scarce resources on the top 90 percent. Using a threshold of 1,800 metric tons of CO_2e annually is more conservative than the 3,000 metric tons of CO_2e emissions annually as it would represent a capture rate of more than 90 percent. The fact that small projects below a numeric bright line threshold are not subject to CEQA-based mitigation does not mean such small projects do not help the state achieve its climate change goals because even small projects participate in or comply with non-CEQA-based GHG reduction programs, such implementing projects in accordance with statewide GHG-reducing energy efficiency building standards, called Cal Green or Title 24 energy-efficiency building standards (Crockett 2011) which seek to reduce GHG emissions emitted during construction-related projects such as that proposed by the Project.

4.8.2 Greenhouse Gas Emissions (VII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☒	☐

4.8.2.1 Project Implementation Greenhouse Gas Emissions

A potent source of GHG emissions associated with the Proposed Project would be combustion of fossil fuels during dredging, dewatering and disposal activities. The dredging phase of the Proposed Project is temporary but would result in GHG emissions from the use of heavy construction equipment and construction-related vehicle haul trips.

Dredging-related activities that would generate GHGs include worker commute trips, haul trucks carrying dredged material from the Project site, and off-road construction equipment (e.g., bulldozers, loaders, excavators). Table 4.8-1 illustrates the specific dredging generated GHG emissions that would result from the Project.

Table 4.8-1. Dredging-Related Greenhouse Gas Emissions

Emission Source	CO2e (Metric Tons/ Year)
2021 Implementation	193
Sutter County CAP Threshold	1,800
Exceed Significance Threshold?	**No**

Sources: CalEEMod version 2016.3.2. Refer to Appendix C for Model Data Outputs.

As shown in Table 4.8-1, Project dredging and primrose removal activities would not result in the exceedance of 1,800 metric tons of CO_2e during Project implementation. Once dredging and hauling is complete, the generation of these GHG emissions would cease. A less than significant impact would occur.

4.8.2.2 Post-Implementation Greenhouse Gas Emissions

The Proposed Project would not include the provision of new permanent stationary or mobile sources of emissions, and therefore, by its very nature, would not generate quantifiable GHG emissions. Therefore, no impact would occur.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

The Sutter County CAP includes GHG inventory, an emission reduction target, and reduction measures to reach the target. As previously described, the CAP includes a two-tiered approach using CEQA Threshold and Screening Tables. Due to the relatively short duration of dredging activity and lack of post-implementation contribution to GHG emissions the Project's contribution to GHG emissions was compared to the significance threshold of 1,800 metric tons of CO_2e, as previously described. As shown in Table 4.8-1, the Project would produce 193 metric tons of CO_2e during the one-time construction phase. This number does not exceed the threshold and is therefore consistent with the County CAP and statewide GHG reduction efforts. The Project would not conflict with any applicable plans or policies related to the reduction of GHG emissions. A less-than-significant impact would occur.

4.9 Hazards and Hazardous Materials

4.9.1 Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, State, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined by the California Health and Safety Code § 25501 as follows:

> "Hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

A hazardous material is defined in Title 22, § 662601.10, of the CCR as follows:

> A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.

The release of hazardous materials into the environment could potentially contaminate soils, surface water, and groundwater supplies.

Under Government Code § 65962.5, both the Department of Toxic Substances Control (DTSC) and the State Water Resources Control Board (SWRCB) are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. A search of the DTSC (2020) and SWRCB (2020) lists identified no open cases of hazardous waste violations on, or within 0.5 mile of the Proposed Project site.

The USEPA maintains the Enforcement and Compliance History Online (ECHO) program. The ECHO website provides environmental regulatory compliance and enforcement information for approximately 800,000 regulated facilities nationwide. The ECHO website includes environmental permit, inspection, violation, enforcement action, and penalty information about USEPA-regulated facilities. Facilities included on the site are CAA stationary sources; CWA facilities with direct-discharge permits, under the National Pollutant Discharge Elimination System (NPDES); generators and handlers of hazardous waste, regulated under the Resource Conservation and Recovery Act; and public drinking water systems, regulated under the Safe Drinking Water Act. ECHO also includes information about USEPA cases under other environmental statutes. When available, information is provided on surrounding demographics, and ECHO includes other USEPA environmental data sets to provide additional context for analyses, such as Toxics Release Inventory data. According to the ECHO program, the Project site is not listed as having a hazardous materials violation (USEPA 2020a).

4.9.2 Hazards and Hazardous Materials (VIII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

Typical incidents that could result in accidental release of hazardous materials involve leaking storage tanks, spills during transport, inappropriate storage, inappropriate use, and/or natural disasters. If not remediated immediately and completely, these and other types of incidents could cause toxic fumes and contamination of soil, surface water, and groundwater. Depending on the nature and extent of the contamination, groundwater supplies could become unsuitable for use as a domestic water source.

Human exposure to contaminated soil or water could have potential health effects depending on a variety of factors, including the nature of the contaminant and the degree of exposure.

Hazardous materials must be stored in designated areas designed to prevent accidental release to the environment. California Building Code requirements prescribe safe accommodations for materials that present a moderate explosion hazard, high fire or physical hazard, or health hazards.

Hazardous materials regulations, which are codified in Titles 8, 22, and 26 of the CCR, and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code, were established at the State level to ensure compliance with federal regulations and to reduce the risk to human health and the environment from the routine use of hazardous substances. Protection against accidental spills and releases provided by this legislation includes physical and mechanical controls of fueling operations, including automatic shutoff valves; requirements that fueling operations are contained on impervious surface areas; oil/water separators or physical barriers in catch basins or storm drains; vapor emissions controls; leak detection systems; and regular testing and inspection of fueling stations.

The Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The Proposed Project would include the removal of approximately 1.5 acres of invasive water primrose and approximately 3,400 cy of sediment from the Boat Ramp facility. None of these dredging operations would include substantial amount of hazardous material. Any materials would be required to be used, stored, and disposed in accordance with existing regulations and product labeling and would not create a significant hazard to the public or to the environment. Therefore, the Project would have a less-than-significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐

As discussed in Issue a), the Project would not result in the routine transport, use, disposal, handling, or emission of any hazardous materials that would create a significant hazard to the public or the environment. Potential dredging equipment-related hazards could be created during the course of Project dredging operations at the site, given that these activities involve the use of heavy equipment, which uses small and incidental amounts of oils and fuels and other potentially flammable substances. The level of risk associated with the accidental release of hazardous substances is not considered significant due to the small volume and low concentration of hazardous materials used during dredging. The dredging contractor would be required to use standard controls and safety procedures that would avoid and minimize the potential for accidental release of such substances into the environment. Standard practices would be observed such that any materials released are appropriately contained and remediated as required by local, State, and federal law.

The Project does not involve any operation hazards as once the dredging and primrose removal is completed, the Project will be complete. No ongoing operation of facilities, equipment, or other uses are a part of the Project.

The Project would have a less-than-significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

There are no schools within 0.25 mile of any of the Project site. The Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

Under Government Code § 65962.5, both the DTSC and the SWRCB are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. A search of the DTSC and SWRCB lists identified no open cases of hazardous waste violations on or near the Project site. Therefore, the Proposed Project is not located on a parcel included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 (DTSC 2020; SWRCB 2020). As a result, this would not create a significant hazard to the public or to the environment and would have no impact.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use	☐	☐	☐	☒

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
airport, would the project result in a safety hazard for people residing or working in the project area?				

The nearest airport to the Project site is the Sutter County Airport, located more than 10 miles south of the Project site. According to the Sutter County Airport Land Use Compatibility Plan, the Proposed Project is located outside of the airport's safety zones (Sacramento Area Council of Governments [SACOG] 1994). As such, the Project would have no impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

The Sutter County Emergency Operations Plan addresses the planned response to emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Sutter County (Sutter County 2011b). The Sutter County Office of Emergency Management provides information on emergency evacuation routes in the event of an Oroville Dam failure. Within the Project Area, the only identified emergency evacuation route is State Route 99.

The Proposed Project does not include any actions that would impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. All Project activities would not impede the use of surrounding roadways in an emergency evacuation. The Project would not involve construction on or near a roadway or within a roadway right of way. While the Project would involve the transportation of dredged materials to the disposal site, this would not result in the inability to use those roadways in an emergency. As such, implementation of the Proposed Project would result in a less-than-significant impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

California Department of Forestry and Fire Protection (CAL FIRE) has determined that there are no Very High Fire Hazard Severity Zones in Sutter County. The Proposed Project would not construct any structures. For these reasons, the Project would have no impact in this area.

4.10 Hydrology and Water Quality

4.10.1 Environmental Setting

4.10.1.1 Regional Hydrology

Surface Water

The Project site is located in the greater Sacramento River hydrologic region. The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of Alpine and Amador counties are also within the region. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta (California Department of Water Resources [DWR] 2006). The lower Feather River is the largest natural tributary to the Sacramento River (USEPA 2020b).

The Project site is located within boundaries of the Lower Feather River Watershed, which is part of the Sacramento River Watershed. The Lower Feather River Watershed begins from the waters behind the Oroville Dam, the tallest dam in the U.S. There are approximately 190 miles of major creeks and rivers, 695 miles of minor streams, and 1,266 miles of agricultural water delivery canals in the Lower Feather River Watershed. Hydrology also is influenced by operation of the Sutter Bypass, which brings Sacramento River water through Butte Slough and into the Lower Feather River. This system is designed, in part, to relieve flood flows in the Sacramento River. The USGS gaging station at Oroville shows daily flows in the Lower Feather River (post–Oroville Dam) are held at about 300 cubic feet per second (cfs). Periodic high-flow releases from Lake Oroville are in the 50,000 to 100,000 cfs range with an all-time high of 150,000 cfs in 1986 (SRWP 2010).

Groundwater

Groundwater in the State of California is managed and monitored by the DWR. The Project site is within the Sacramento Valley – Sutter Subbasin, (basin number 5-021.62) of the Sacramento Valley Hydrologic Region (DWR 2020). Sutter County proposed a jurisdictional basin boundary modification to the East Butte Subbasin (5-021.59) and Sutter Subbasin (5-021.62). The jurisdictional internal/consolidation modification contains two boundary modification requests: (1) Change all the subbasin boundaries to match exactly the Sutter County jurisdictional boundary; and (2) incorporate (absorb) all of the East Butte Subbasin within Sutter County jurisdictional boundary into the Sutter Subbasin. DWR selected a final Sutter Subbasin boundary that closely matched Sutter County's jurisdictional boundaries. The original Sutter Subbasin description was provided in the 2006 Bulletin 118 (B118) Update completed by the DWR. The 2006 basin descriptions included available information on narrative descriptions of basin boundaries, summaries of the hydrologic and hydrogeologic setting, groundwater storage capacity and water budget, groundwater level and quality trends, well yields, basin management, and references. However, not all 2006 basin descriptions, including the Sutter Subbasin, have been updated for B118 Interim Update 2018 at this time.

As such, the following information is provided from the 2006 B118 for the Sutter Subbasin. The Sutter Subbasin is the portion of the Sacramento Valley Groundwater Basin bounded on the north by the confluence of Butte Creek and the Sacramento River, on the west by the Sacramento River, on the south by the confluence of the Sacramento River and the Sutter Bypass, and on the east by the Feather River. The subbasin lies entirely within the Sacramento River watershed with the most notable hydrological features being the Sacramento and Feather Rivers. B118, indicates stream percolation, deep percolation of rainwater, and percolation of irrigation water are the principal sources of groundwater recharge in the Sacramento Valley. DWR's 1992 California Water Plan estimated a useable storage potential of five million-acre feet for Sutter County. There are no published reports, which specifically discuss the amount of groundwater in storage for the Sutter Subbasin. There are no published reports, which specifically discuss the amount of groundwater in storage (DWR 2006).

Project Site Hydrology

The Project site is on the western bank of the Feather River and includes the parking lot, boat ramp and dock, and grass field of the Live Oak Park and Recreation Area and the sediment and primrose removal areas. The water primrose marsh is an area adjacent to the Feather River and above the OHWM/existing water level. This marsh is in a portion of the riverbank that is subject to heavy sediment deposition. At the time of the April 2020 biological field survey, the Feather River water elevation was several feet below that of the marsh. The marsh is dominated entirely by water primrose.

There are no man-made drainage facilities on the Project site. All stormwater would percolate into the ground or flow into the Feather River. Other than the Feather River, there are no other waterbodies on the Project site.

4.10.2 Hydrology and Water Quality (IX) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐

Sediment can be suspended in the water during dredging. Many chemical constituents are lipophilic[3] and will absorb into or attach to organically enriched or fine particles of sediment. Water quality may be affected from dredging when contaminants on the sediment particles are either dissolved or resuspended in the water. Dredging operations may cause some degradation temporarily to surface waters as concentrations of turbidity, total suspended solids, and other wastes may increase and dissolved oxygen decrease as bottom sediments are disturbed in the excavation process.

In order to determine the potential for existing chemical constitutes at the Project site, Blackburn Consulting (2020) completed a preliminary soil screening analysis in May of 2020. This analysis is included in Appendix D of this Initial Study. This analysis took two soil samples within the proposed dredging area and determined that the test soils meet the USEPA's Regional Screening Levels (RSLs) for unrestricted land use, however, additional testing is required to determine project-wide conditions and compliance with USACE standards (Blackburn Consulting 2020). Specific results for chemical constitutes with measurable results are shown in Table 4.10-1. All other chemical constitutes evaluated during the Blackburn analysis were at non-detectable levels.

Table 4.10-1. Soil Sample Analytical Results

Sample ID	TPH (mg/kg)	CAM-17 Metals (mg/kg)						
	Motor Oil	Chromium	Cobalt	Copper	Lead	Nickel	Vanadium	Zinc
Live Oak-1 12"	22	23	8.6	14	3.5	35	27	21
Live Oak-2 12"	17	29	8.8	12	ND	42	27	22
Reporting Limit	10	2.0	2.0	1.0	3.0	2.0	5.0	1.0
USEPA RSLs Residential	*2,500*	*36,000*	*23*	*3,100*	*80*	*820*	*390*	*23,000*

Source: Blackburn Consulting 2020
Notes:
1. TPH = Total Petroleum Hydrocarbons
2. "Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
3. mg/kg = milligrams per kilogram
4. EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
5. ND: not detected at or above method reporting limit
6. Reporting Limit may vary depending upon analytical results, see full analytical results report

As shown in Table 4.10-1, Total Petroleum Hydrocarbons (TPH) as motor oil was detected in both samples at the Live Oak site. However, detected concentrations were below RSLs for residential land use. TPH as gasoline and diesel fuel was not detected in any of the samples tested. Metals including barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in the soil samples at concentrations below the RSLs for residential land use. All other metals were not detected at concentrations equal to or greater than laboratory reporting limits. Semi-Volatile Organic Compounds

[3] Lipophilicity refers to the ability of a chemical compound to dissolve in fats, oils, lipids, and non-polar solvents such as hexane or toluene.

were not detected in any of the samples tested. Organochlorine Pesticides were not detected in any of the samples tested (Blackburn Consulting 2020).

Title 40 of the CFR Part 122 discusses the requirements of the NPDES. In accordance with NPDES regulations, the State of California requires that any construction activity affecting one acre or more obtain a General Construction Activity Stormwater Permit (General Permit) to minimize the potential effects of construction runoff on receiving water quality. However, Section 122.3(b) of Title 40 excludes discharges of dredged or fill material into Waters of the U.S., which are regulated under Section 404 of CWA from this regulation.

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into Waters of the U.S., including wetlands. Activities in Waters of the U.S. regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into Waters of the U.S., unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities). The basic premise of the Section 404 program is that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation's waters would be significantly degraded. In other words, as a part of the application process for the 404 permit, steps must be shown that have been taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.

Additionally, a Nationwide Permit 16 (NWP 16) for return water pursuant Title 33 CFR 323.2(d) is required for the Project. Along with Nationwide Permit 16, a CWA Section 401 permit is required for the Proposed Project due to the disturbance of Waters of the U.S., then a Water Quality Certification must be obtained from the Central Valley RWQCB prior to initiation of Project activities.

Finally, California Fish and Game Code Section 1602 requires any person, State, or local governmental agency, or public utility notify CDFW prior to beginning any activity that may do one or more of the following:

- Divert or obstruct the natural flow of any river, stream, or lake;
- Change the bed, channel, or bank of any river, stream, or lake;
- Use material from any river, stream, or lake; or
- Deposit or dispose of material into any river, stream, or lake.

All of the permitting requirements discussed above require the identification and implementation of BMPs to reduce the potential for water quality impacts, as necessary. Standard BMPs include silt fencing or straw wattles to prevent sediment from re-entering the river once the dredged material is placed in the de-watering area. For any in-water work, water quality sampling will be required and BMPs such as a turbidity curtain or something similar will likely be required to minimize impacts to fish and water quality downstream.

Strict permitting compliance, as required through implementation of mitigation measures **BIO-8** and **BIO-9**, coupled with the use of appropriate BMPs, would reduce potential water quality impacts during dredging activities to a less-than-significant level.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐

The Proposed Project has been initiated to remove sediment and primrose from the Live Oak boat ramp area. No structures or impermeable surfaces would be constructed as a part of the Project. None of the proposed dredging operations would result in the direct decrease of groundwater supplies or recharge. Placing the estimated 3,400 cy of dredged soil at either the Gridley WWTP or in a landfill would not result in or substantially interfere with any potential groundwater recharge as these facilities. While compaction of these soils may result in the inability of rainwater to penetrate the soil, the amount of dredged soil is not of such a size to substantially impede groundwater recharge. As such, the Proposed Project would have a less-than-significant impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would:	☐	☐	☒	☐
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☒
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
(iv) impede or redirect flood flows?	☐	☐	☐	☒

The Project is the removal of sediment adjacent to the Live Oak boat ramp. Once completed, the area would return to its natural state. No impervious surfaces would be constructed as a part of the Project.

Strict permitting compliance, as required through implementation of mitigation measures **BIO-8** and **BIO-9**, coupled with the use of appropriate BMPs, would reduce potential substantial erosion or siltation onsite or offsite during dredging activities to a less-than-significant level. Once the Project is completed, the affected riverbank would return to its natural state and would not increase the amount of erosion or siltation in the area. Therefore, the Project would have a less-than-significant impact in this area.

The Project is the removal of sedimentation and primrose within and adjacent to the Feather River. The Project would not change the natural drainage of the area. As such, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. The Project would have no impact in this area.

All storm drainage in the area is provided through natural drainage. The Project would not change this drainage. As such, the Proposed Project would have no impact in this area.

The removal of sediment and primrose would not impede or redirect flood flows. The Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐

The Project is the removal of sediment adjacent to the Live Oak boat ramp. Once completed, the area would return to its natural waterway state. During the dredging process, the Project has the potential to result in an increase in sedimentation to the Feather River. However, compliance with required permitting (i.e. Section 401, 404, 1602 as discussed under Item a) would reduce this potential to a less-than-significant level. Once the Proposed Project is completed, no increase of sedimentation or increase in turbidity would occur. The Project would have a less-than-significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

The Feather River is a part of the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (RWQCB 2018). This Basin Plan covers the entire area included in the Sacramento and San Joaquin River drainage basins. The Project site is also located within the boundaries of the Sutter

County Groundwater Management Plan (Sutter County 2012a). Both plans provide objectives for the protection of surface and ground water quality within the Sacramento River Basin. The removal of sediment and primrose at the Live Oak boat ramp may result in the potential increase of sediment in the river due to dredging operations. However, this would be a short-term result of dredging and would cease upon completion of the Project. Additionally, permitting compliance, coupled with the use of appropriate BMPs, as discussed under Item a previously, would reduce potential water quality impacts during dredging activities. As such, the Project would not conflict with or obstruct implementation of either of these plans or objectives. The Project would have a less-than-significant impact in this area.

4.11 Land Use and Planning

4.11.1 Environmental Setting

While the Feather River provides the boundary between Sutter and Yuba counties, the Project site appears to be wholly located within Sutter County. The Project site is located along the banks of the Feather River and the immediate area is primarily characterized by agricultural land, ruderal grassland, open space, and limited riparian vegetation. The Project site is surrounded by rural agricultural lands and open space, with some rural residencies to the west of the site on the outskirts of the City of Live Oak. Shown in Table 4.11-1 are the General Plan land use designation and zoning district for the Project site.

Table 4.11-1. General Plan Land Use and Zoning District	
General Plan Designation:	**Sutter County:** Agriculture 20/ Park and Recreation (AG-20/PR) for Boat Ramp facility. Open Space (OS) for area to be dredged.
Zoning:	**Sutter County:** Recreation (REC) for Boat Ramp facility. Agriculture (AG) for area to be dredged

4.11.2 Land Use and Planning (X) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Physically divide an established community?	☐	☐	☐	☒

The Project site is not within an established community. Therefore, implementation of the Proposed Project would not divide an established community and would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Cause a significant environmental impact due to a conflict with any land use plan, policy, or	☐	☐	☐	☒

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
regulation adopted for the purpose of avoiding or mitigating an environmental effect?				

The Proposed Project would include the removal of sediment and primrose from the Live Oak boat ramp facility. The Proposed Project would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No impact would occur.

4.12 Mineral Resources

4.12.1 Environmental Setting

The State-mandated Surface Mining and Reclamation Act of 1975 requires the identification and classification of mineral resources in areas within the state subject to urban development or other irreversible land uses that could otherwise prevent the extraction of mineral resources. These designations categorize land as Mineral Resource Zones (MRZ-1 through MRZ-4).

Neither Sutter County's 2030 General Plan nor the California Department of Conservation Division of Mine Reclamation (DMR), identifies the Project site as within a mineral resource zone (DMR 2019; Sutter County 2011a).

4.12.2 Mineral Resources (XI) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

As discussed above, the City, County, or CGS does not identify any mineral resources in the Project vicinity, including on the Project site. Therefore, no impacts would occur to mineral resources.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

The Project site is not identified as a mineral resource recovery site in the Sutter County General Plan. There would be no impact in this area.

4.13 Noise

4.13.1 Environmental Setting

4.13.1.1 Noise Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. The selection of a proper noise descriptor for a specific source is dependent on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/community noise equivalent level (in L_{dn}/CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise Level (L_{eq})** is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
- **Community Noise Equivalent Level (CNEL)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 p.m. to 10:00 p.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately six dB for each doubling of distance from a stationary or point source (USEPA 1971). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately three dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2011). Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed (FHWA 2011).

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60- to 70-dBA range, and high, above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived by humans.
- Outside of the laboratory, a three-dBA change is considered a just-perceivable difference.
- A change in level of at least five dBA is required before any noticeable change in community response would be expected. An increase of five dBA is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The Project is proposing sediment and invasive species removal through the process of dredging along the banks of the Feather River located at the Live Oak Boat Ramp. The Project site consists of the area to be dredged and a staging area. The nearest noise sensitive receptors to the Project site are the rural residencies located approximately 700 feet distant along Pennington Road and Archer Avenue.

Vibration Fundamentals

Ground vibration can be measured several ways to quantify the amplitude of vibration produced. This can be through peak particle velocity or root mean square velocity. These velocity measurements measure maximum particle at one point or the average of the squared amplitude of the signal, respectively.

Vibration impacts on people can be described as the level of annoyance and can vary depending on an individual's sensitivity. Generally, low-level vibrations may cause window rattling but do not pose any threats to the integrity of buildings or structures.

Existing Ambient Noise Environment

Sutter County contains extensive agricultural land uses along with a range of residential, industrial, commercial, recreational, and open space areas. Key noise sources in the County include motor vehicle traffic, agricultural activities, airplane traffic, railroads, and stationary sources such as food processing plants. The Project site is surrounded by rural agricultural lands and open space, with some rural residencies and the Feather River. Pennington Road, a Rural Minor Arterial Road in the County, provides access to the Project site. Noise producing activity at the exiting Live Oak Recreational Boat Ramp, that is included in the Project site, includes the starting of boat engines, internal circulation of vehicles and other common parking lot activity such as people speaking and car doors slamming.

4.13.2 Noise (XII) Environmental Checklist and Discussion

Would the project result in		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐

4.13.2.1 Project Implementation Noise

Noise associated with implementation of the Proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite dredging activities as well as vehicle traffic on area roadways associated with material hauling and worker commutes. Dredging would require the use of heavy-duty equipment and noise from such sources typically occurs intermittently and varies. Noise generated by equipment, including excavators, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During dredging, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site. The nearest noise sensitive land uses to the Project site are the rural residencies located approximately 700 feet distant.

Chapter 11, *Noise*, Policy N1.6 of the Sutter County General Plan limits noise-generating "construction-related" activities within 1,000 feet of noise-sensitive uses (i.e., residential uses, daycares, schools, convalescent homes, and medical care facilities) to daytime hours between 7:00 a.m. and 6:00 p.m. on weekdays, 8:00 a.m. and 5:00 p.m. on Saturdays, and prohibits such activity on Sundays and holidays unless permission for the latter has been applied for and granted by the County. The County does not promulgate a numeric threshold pertaining to the noise associated with construction. This is due to the fact that construction noise is temporary, short term, intermittent in nature, and would cease on completion of the Project. Additionally, dredging would occur through the Project site and would not be concentrated at one point.

To estimate the worst-case onsite construction noise levels that may occur at the nearest noise-sensitive receptors in the Project vicinity, the dredging equipment noise levels were calculated using the Roadway Noise Construction Model for the dredging process and compared against the construction-related noise level threshold established in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998 by National Institute for Occupational Safety and Health (NIOSH). A division of the US Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than eight hours per day; for every three-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. For the purposes of this analysis, the lowest, more conservative threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby existing and future planned sensitive receptors.

The anticipated short-term construction noise levels generated for the necessary equipment is presented in Table 4.13-1. As previously stated, the nearest noise sensitive land uses to the Project site are residences located approximately 700 feet distant from the Project site boundary.

Table 4.13-1. Onsite Construction Average (dBA) Noise Levels by Receptor Distance and Construction Equipment

Equipment	Estimated Exterior Construction Noise Level @ Closest Residence	Construction Noise Standard (dBA Leq)	Exceeds Standards?
Dredging			
Dumpers/Tenders (2)	49.5 (each)	**85**	**No**
Rubber Tired Loaders (1)	52.2	**85**	**No**
Cranes (1)	49.7	**85**	**No**
Combined Dredging Equipment	**56.4**	**85**	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Appendix E for Model Data Outputs.
Notes: Construction equipment used during construction derived from CalEEMod 2016.3.2.
L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown, no cumulative or individual piece of dredging equipment would exceed 85 dBA NIOSH construction noise standard at the nearby noise-sensitive receptors. A less-than-significant impact would occur, and no mitigation is necessary.

4.13.2.2 Post-Project Implementation

As previously mentioned, the Project is proposing sediment and invasive species removal through the process of dredging along the banks of the Feather River located at the Live Oak Boat Ramp. Upon completion of the Project it would not attract new stationary or mobile sources of noise beyond what is currently experienced. The Proposed Project would have no noise impact once Project dredging is complete.

Would the project result in	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐

4.13.2.3 Construction-Generated Vibration

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable the Project would be associated with short-term, dredging-related activities. Dredging and related activities on the Project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Dredging-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as bulldozers and trucks. It is noted that pile drivers would not be necessary during Project implementation. Vibration decreases rapidly with distance and it is acknowledged that Project activities would occur throughout the Project site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 4.13-2.

Table 4.13-2. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Approximate Vibration Decibels (VdB) at 25 Feet
Large Bulldozer	87
Caisson Drilling	87
Loaded Trucks	86
Hoe Ram	87
Jackhammer	79
Small Bulldozer/Tractor	58

Source: Caltrans 2020b

Due to the nature of the Project, dredging-related vibration levels are compared to the County vibration threshold for construction. Chapter 11, *Noise*, Policy N1.7 of the Sutter County General Plan requires construction projects and new development anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby noise-sensitive uses using the standards presented in Table 4.13-3. These standards are based on criteria from the Federal Transit Administration (FTA) as follows.

Table 4.13-3. Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Impact Levels (VdB)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Source: FTA 2018; Sutter County General Plan 2011

Notes: Vibration levels are measured in or near the vibration-sensitive use.

a. Frequent Events" is defined as more than 70 vibration events of the same source per day.
b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
c. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.
d. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels.

It is acknowledged that Project activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest structure. The nearest structure to the Project site is located approximately 700 feet away and would be classified as Land Use Category 2 as it consists of residences. Due to the nature of the Project, the impact levels for *infrequent events* will be used as dredging for the Proposed Project is anticipated to last approximately five days. Thus, impact events cannot exceed 80 VdB. As shown in Table 4.13-2, the highest vibration decibel at 25 feet generated from construction equipment is 87 VdB. As previously mentioned, ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As a result, the structure located at 700 feet is calculated to experience vibration levels up to 44 VdB and therefore would not be negatively affected. Project vibration levels at the nearest structure would not exceed recommended criteria. This impact is less than significant.

Post-Implementation Vibration

Upon completion of the Proposed Project the Project site would not include the use of any stationary equipment beyond current conditions that would result in excessive groundborne vibration levels. For this reason, no impact would occur.

For a project		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the Project Area to excessive noise levels?	☐	☐	☐	☒

The nearest airport to the Project site is the Sutter County Airport, located more than 10 miles south of the Project site. The Project site is not located within an area covered by an airport land use plan or within two miles of a public or private use airport. According to the Sutter County Airport Land Use Compatibility Plan, the Proposed Project is located outside of the airport's safety zones (SACOG 1994). Thus, no impact would occur with implementation of the Proposed Project.

4.14 Population and Housing

4.14.1 Environmental Setting

The California Department of Finance (DOF) provides estimated population and housing unit demographics by year throughout the state. The DOF estimates that the city of Live Oak had a population of 9,200 and the unincorporated County had a population of 21,092 as of January 1, 2020 (DOF 2020), There were 2,780 total housing units in the city and 7,939 in the unincorporated County as of January 1, 2020 (DOF 2020).

4.14.2 Population and Housing (XIII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒

No new roads or extensions of existing roads are proposed. The Proposed Project does not include the construction of any new homes. Therefore, direct or indirect increases in population growth would not occur as a result of the Proposed Project.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

No residences would be removed as a result of the Proposed Project. The Project would have no impact on existing housing.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

As discussed under Issue b), the Project would not involve the removal or relocation of any housing and would therefore not displace a substantial number of people or necessitate the construction of any replacement housing. The Project would have no impact on existing housing.

4.15 Public Services

4.15.1 Environmental Setting

Public services include fire protection, police protection, parks and recreation, and schools. Generally, impacts in these areas are related to an increase in population from a residential development. Levels of service are generally based on a service to population ratio, except for fire protection, which is usually based on a response time. For example, the Sutter County Sheriff's Department (SCSO) adopted officer-to-residential ratio is 1.1 sworn officer per 1,000 persons and 0.06 support personnel per 1,000 persons. Further, the County strives to provide an average service level of 1.02 sworn firefighters and 0.9 support personnel per 1,000 population and to provide a six-minute response time 90 percent of the time (Sutter 2010a). Finally, General Plan Policy PS 6.2 provides a standard of 10 acres per 1,000 residents of park and open space lands within the County (Sutter County 2011a).

4.15.1.1 Police Services

The Sutter County Sheriff's Office (SCSO) provides law enforcement services to the Project site. The Sheriff's Office is comprised of three divisions along with the Administrative Services Unit, the Training Section, and the City of Live Oak substation. The SCSO provides full services to Sutter County.

The Operations Division consists of the Investigations Section, Patrol Section, and the Live Oak Substation contract. The Jail Division consists of the Corrections Section and the Court Bailiff Services. The Support Services Section consists of the Communications, Civil, and Records sections. The Training Section consists of the Training Unit, CCW Permits, and Background Investigations (SCSO 2020).

The nearest Sheriff's Office to the Proposed Project is located at 9867 O Street in the city of Live Oak, approximately 1.75 miles to the west of the site.

4.15.1.2 Fire Services

The Project site is served by the Sutter County Fire Department (SCFD) for fire protection and emergency services. In 1996 the Live Oak Fire Department, the Oswald-Tudor Fire Department, and the Sutter Fire Department consolidated to form what is now the SCFD-County Service Area F. The SCFD protects approximately 250 square miles of Sutter County. The SCFD includes three stations – Live Oak Fire Station, Sutter Fire Station, and Oswald Tudor Fire Station. Throughout the three fire stations the SCFD has 16 paid staff, two Battalion Chiefs, nine Captains, and five Engineers under the direction of the Fire Services Manager. Supporting those 16 personnel are approximately 30 Volunteer Firefighters (SCFD 2020). The nearest fire station to the Project site is located at 9867 O Street in the city of Live Oak, approximately 1.75 miles to the west of the site.

4.15.1.3 Schools

Sutter County's public school system is comprised of 12 individual school districts under the lead of the Sutter County Superintendents Office, which provides financial oversight and administering countywide educational programs. The 12 Sutter County public school districts include eight elementary school districts, two high school districts, and two joint elementary/high school unified districts (Sutter County 2010a). The Live Oak Unified School District (LOUSD) provides most of the educational services for the City and the area surrounding the Project. The LOUSD has two elementary schools, one middle school, one high school, and one alternative school (LOUSD 2020).

4.15.1.4 Parks

Numerous park and recreation facilities are located within Sutter County and include State wildlife areas for hunting, fishing, hiking; river recreation areas for boating, picnicking, and fishing; parks for recreation and community events; and sports facilities for baseball, soccer, and golf. There is a total of 58,548.74 acres of parks and recreation facilities within the county, plus 6.1 miles of bikeway (Sutter County 2010a). The Live Oak Park and Recreation Area is maintained by the Sutter County General Services Department. The 11.5-acre park includes facilities for camping, RV spaces, boat launch, fishing, day use, group facilities, picnic areas, and restrooms. The Proposed Project is located in this park facility.

4.15.2 Public Services (XIV) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire Protection?	☐	☐	☒	☐
Police Protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other Public Facilities?	☐	☐	☐	☒

4.15.2.1 Fire Protection

The Project site is located less than two miles from the nearest fire station. The Proposed Project would not result in an increase in population and thereby not require additional fire facilities to serve this population. The Proposed Project would not require any additional SCFD facilities, equipment, or staff and is not anticipated to create an additional burden on existing fire facilities. Therefore, the Project would have a less-than-significant impact in this area.

4.15.2.2 Police Services

The Proposed Project would not result in a significant increase in demand for police protection resulting in new or expanded police facilities. Police facilities and the need for expanded facilities are based on the staffing levels these facilities must accommodate. Police staffing levels are generally based on the population/police officer ratio, and an increase in population is usually the result of an increase in housing or employment. The Project would not result in an increase in population to the area. As such, the Project would not result in the need for increase in police protection or police facilities. Therefore, the Proposed Project would have a less-than-significant impact in this area.

4.15.2.3 Schools

The Proposed Project is removal of sediment and invasive primrose within the banks of the Feather River. Because the Proposed Project would not increase the population or result in substantial employment gains, an increase of student population in the LOUSD would not occur nor would require additional educational facilities. Therefore, the Proposed Project would have no impact in this area.

4.15.2.4 Parks

While the Proposed Project may limit the use of the Live Oak Park and Recreation Area during dredging operations, it would not require the expansion of or new park facilities. As stated previously, the need for additional parkland is primarily based on an increase in population to an area. Given that the Project would not result in an increase in population, the Project would not burden any parks in the surrounding area beyond capacity by generating additional recreational users. Therefore, the Proposed Project would also not result in an increase in demand for parks and recreation facilities in the surrounding area. There would be no impact to parks from implementation of the Proposed Project.

4.15.2.5 Other Public Facilities

The Proposed Project does not result in an increase in housing or population in the county resulting in an increased use of other public facilities. Therefore, the Project would have no impacts on other public facilities.

4.16 Recreation

4.16.1 Environmental Setting

As stated previously, there are a total of 58,548.74 acres of parks and recreation facilities within Sutter County, plus 6.1 miles of bikeway (Sutter County 2010a).

4.16.2 Recreation (XV) Materials Checklist

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Increase the use of existing neighborhood and regional parks or other recreational facilities such	☐	☐	☐	☒

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
that substantial physical deterioration of the facility would occur or be accelerated?				

As stated previously, the need for additional parkland is primarily based on an increase in population to an area. Given that the Proposed Project would not increase Sutter County's population, the Project would not burden any parks in the surrounding area beyond capacity by generating additional recreational users. Therefore, the Proposed Project would not increase the use of park and recreational facilities resulting in substantial physical deterioration of the facility. There would be no impact to recreational facilities from construction of the Proposed Project.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

No recreational facilities are proposed as a part of the Project. The Proposed Project would have a no impact in this area.

4.17 Transportation/Traffic

4.17.1 Environmental Setting

4.17.1.1 Existing Street and Highway System

The Project is located in a rural area surrounded by agricultural uses. Access to the Project site is provided by Pennington Road via State Route 99. Pennington Road is an east/west trending two-lane rural road and is identified as a major road in the Sutter County General Plan Background Report (Sutter County 2008). Pennington Road is also identified as a rural minor collector in the Background Report with a 2008 traffic count of approximately 1,660 to 1,790 trips per day depending on location. This count provided a Level of Service (LOS) A at that time. Pennington Road is also identified as a Rural Minor Arterial from Live Oak western city boundary west to Township Road in the General Plan. General Plan Policy M 2.5 required the following LOS on county roads.

> "Develop and manage the County roadway segments and intersections to maintain LOS D or better during peak hour, and LOS C or better at all other times. Adjust for seasonality. These standards shall apply to all County roadway segments and intersections, unless otherwise addressed in an adopted specific plan or community plan."

According to the Background Report, LOS C for a rural two-lane roadway was 7,000 to 10,600 daily trips while LOS D was 10,600 to 16,400 daily trips.

State Route 99 extends from the Sacramento County line north through Sutter County to the Butte County line. The roadway has two and four lanes over its length and provides regional access to the Sacramento metropolitan area in the south and the cities of Gridley and Chico in the north and beyond. The Caltrans provides traffic volumes of California state highways. According to this information, at the Pennington Road/State Route 99 juncture, State Route 99 had an average daily trip count of 19,100 and 21,000 trips in 2018 (Caltrans 2018).

4.17.1.2 Alternative Transportation Modes

Bicycle Facilities. The County of Sutter Pedestrian and Bicycle Master Plan provides a guideline for the future bike and pedestrian facilities in the County. According to this Plan, there are no existing bicycle or pedestrian facilities within the area of the Project site. However, the Plan does include proposed Class II bike path along Pennington Road connecting the city of Live Oak to the Live Oak Park and Recreation Area (Sutter County 2012b).

Public Transit. Public transportation bus service is provided in Sutter County through Yuba-Sutter Transit. However, no bus routes or stops are available within the Project area. The nearest bus route is located in the city of Live Oak. The Live Oak Route offers two round-trips Monday through Friday from Live Oak to Yuba City and Marysville. Within Live Oak, six scheduled stops are available or eligible passengers will be picked up or dropped off at any address by advance reservation (Yuba-Sutter Transit 2020).

4.17.2 Transportation/Traffic (XVII.) Environmental Checklist and Discussion

	Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities?	☐	☐	☒	☐

Because the Proposed Project would not directly or indirectly introduce a new population in the region, once completed, the total number of vehicle trips generated by the Project is not expected to change from existing conditions. Project sediment and primrose removal will, however, result in temporary increases in local traffic due to the transport of Project personnel, equipment, and material to and from the Project site.

The dredging of the sediment and removal of primrose from the Project site is considered to have only short-term effects on traffic and circulation conditions within the area. There are no planned road closures as a result of Project construction and traffic control would be provided, as necessary. The Project site is not located in an area that would affect transit, bicycle, or pedestrian facilities as none are in the area.

Therefore, the Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system and would have a less-than-significant impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☒	☐

CEQA Guidelines Section 15064.3, subdivision (b) provides criteria for analyzing transportation impacts based on a vehicle miles traveled (VMT) methodology instead of the now superseded (as of January 1, 2019) LOS methodology. Pertinent to the Proposed Project are those criteria identified in Section 15064.3(b)(1) Land Use Projects. According to this section:

> "Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor[4] should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact."

SACOG is an association of local governments in the six-county Sacramento region. Its members include the counties of El Dorado, Placer, Sacramento, Sutter, Yolo, Yuba, and the 22 cities within. SACOG provides transportation planning and funding for the region and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's long-range transportation plan. As a part of the regional transportation planning for the SACOG region, SACOG provides the Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS). The MTP/SCS pro-actively links land use, air quality, and transportation needs. The MTP/SCS supports the Sacramento Region Blueprint, which implements smart growth principles, including housing choice, compact development, mixed-use development, natural resource conservation, use of existing assets, quality design, and transportation choice. It also provides increased transportation options while reducing congestion, shortening commute times, and improving air quality (SACOG 2020).

According to the 2016 MTP/SCS Draft EIR, the criteria for determining significance under CEQA related to VMT would be if any of the following would occur:

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[4] "High-quality transit corridor" means an existing corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. For the purposes of this Appendix, an "existing stop along a high-quality transit corridor" may include a planned and funded stop that is included in an adopted regional transportation improvement program.

1. Cause an increase in VMT per capita that exceeds the applicable baseline average.
2. Cause an increase in VMT on congested roadways (C-VMT) per capita relative to the applicable baseline for the area and cause an increase in C-VMT per capita that exceeds the baseline regional average.

As stated previously, the only traffic caused by the Project would be construction traffic during dredging operations. Once completed, the Project would not result in additional traffic in the area. Land transportation of the dredged soil would likely be by truck. Dump trucks vary by size and capacity. In the U.S., most standard dump trucks have one front steering axle and one (4×2 four-wheeler) or two (6×4 six-wheeler) rear axles that typically have dual wheels on each side. As a rule, a typical dump truck will hold approximately 12 to 16 cy of material. However, this is limited by the weight of the material being transported. Soil weighs 1,700 to 2,400 lbs per cy, while stone weighs 2,500 to 3,000 lbs per cy. In general, the maximum quantity per truckload is 12 cy of stone or 14 cy of topsoil. Moisture content of the soils/stone can greatly affect the weight; generally, dryer materials are lighter in weight. For the purpose of this analysis, it is assumed that the dredged material will be dry, allowing for a capacity of 14 yards of material per truck. Using this assumption, the dredged material to be disposed of offsite would require approximately 243 truckloads of material to transport the 3,400 cy of dredged soils or an average of 48 truckloads per day over the five day dredging operation.

The Proposed Project would result in a short-term increase in the amount of traffic on the local roadways during construction. However, the Proposed Project would not result in an increase in population, housing or commercial uses in the area and therefore not result in an increase in VMT. Additionally, the Project would not increase capacity of any of the affected roadways in the area and as such, would not lead to a measurable and substantial increase in VMT. Therefore, the Proposed Project would have a less-than-significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒

No modifications to roadway features are proposed as part of the Project. Therefore, the Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Result in inadequate emergency access?	☐	☐	☐	☒

No new developments or modifications to roadway features are proposed as part of the Project. Therefore, the Project would not result in any adverse impact on emergency access. As such, the Project would have no impact regarding emergency access.

4.18 Tribal Cultural Resources

This section describes the affected environment and regulatory setting for Tribal Cultural Resources (TCRs) in the Project Area. The following analysis of the potential environmental impacts related to TCRs is derived primarily from the following sources:

- California Native American Heritage Commission Sacred Lands File Search, March 24, 2020;
- Cultural Resources Inventory Report for the Live Oak Boat Ramp Sediment and Invasive Species Removal Project (ECORP 2020b);
- Ethnographic overviews of the Nisenan (Beals 1933; Kroeber 1925; Littlejohn 1928; Wilson and Towne, 1978); and
- Confidential AB52 tribal consultation record between SBFCA and the United Auburn Indian Community.

4.18.1 Environmental Setting

4.18.1.1 Ethnographic, Religious, and Cultural Context

The Project Area is in the territory occupied by the Penutian-speaking Nisenan. Nisenan were observed by early ethnographers to inhabit the drainages of the Yuba, Bear, and American rivers, and also the lower reaches of the Feather River, extending from the east banks of the Sacramento River on the west to the mid to high elevations of the western flank of the Sierra Nevada to the east. The territory extends from the area surrounding the current city of Oroville on the north to a few miles south of the American River in the south. The Sacramento River is the western boundary, and in the east, it extended to a general area located within a few miles of Lake Tahoe. The descendants of traditional Nisenan, including the UAIC, continue to reside in the region and retain many of the traditional lifeways that were described by ethnographers, as summarized below.

At the time of contact, ethnographers identified that the basic social and economic group for the traditional Nisenan was the family or household unit. The nuclear and/or extended family formed a corporate unit. These basic units were combined into distinct village or hamlet groups, each largely composed of relatives in the same extended family. Tribelet populations of Valley Nisenan were as large as 500 persons at contact, while foothill and mountain tribelets ranged between 100 and 300 persons.

Early Nisenan groups practiced seasonal migration, a subsistence strategy involving moving from one area or elevation to another to harvest plants, fish, and hunt game across different ecosystems that were in relatively close proximity to each other. Ethnographers noted that during most of the year, Nisenan usually lived in permanent villages located below about 2,500 feet that generally had a southern exposure, were surrounded by an open area, and were located above, but close to watercourses. The rather large uninhabited region between the 3,000-foot contour and the summit of the Sierra Nevada was considered open ground that was only used by communities living along its edge. Permanent villages in the foothills and mountains were usually located on high ground between rivers. Valley villages were also usually located on raised areas to avoid flooding. Studies indicate that at one time there were settlements located on every small stream within Nisenan territory, but permanent villages were not located in steep, dark, narrow canyons of large rivers, or at altitudes where deep snows persisted throughout the winter. In fact, permanent occupation sites above 3,500 feet were only located in protected valleys.

The Spanish arrived on the central California coast in 1769. The first known occupation by Euro-Americans was marked by American and Hudson Bay Company fur trappers in the late 1820s establishing camps in Nisenan territories. In 1833, a deadly epidemic (probably malaria) swept through the Sacramento Valley and had a devastating effect on Nisenan populations. Entire villages were lost, and many surviving Nisenan retreated into the hills. An estimated 75 percent of their population was wiped out, and only a handful were left to face the gold miners and settlers who were soon to follow. Captain John Sutter settled in Nisenan territory in 1839, and through force and persuasion he coerced most of the remaining Valley Nisenan to be on peaceful terms. The discovery of gold, however, led to their territory being overrun within a matter of a few years. James Marshal's 1848 gold discovery was in the middle of Nisenan territory, and thousands of miners were soon living in the area. As Europeans flooded Northern California after 1849 and mining methods changed, the assistance of the native population was less relied on and were viewed as an obstacle to settlement of land. This dynamic led to widespread killing, destruction, and persecution of the Nisenan and their culture. The survivors were relegated to working in agriculture, logging, ranching, or domestic pursuits. A native culture resurgence occurred around 1870 with influence from the Ghost Dance revival, but by the 1890s, the movement had all but ended in dissolution. By the Great Depression, it was said that no living Nisenan could remember a time before European contact.

Despite enduring over a century of adversity and hardship, descendants of the pre-contact Nisenan exist in thriving communities today. They are members of modern society and many still practice traditional Nisenan customs. Nisenan and other modern Native American populations participate in pan-Indian activities and celebrations.

4.18.1.2 Regulatory Setting

Assembly Bill 52

Effective July 1, 2015, AB 52 amended CEQA to require that: 1) a lead agency provide notice to those California Native American tribes that requested notice of projects proposed by the lead agency; and 2) for any tribe that responded to the notice within 30 days of receipt with a request for consultation, the lead agency must consult with the tribe. Topics that may be addressed during consultation include TCRs, the potential significance of project impacts, type of environmental document that should be prepared, and possible mitigation measures and project alternatives.

Pursuant to AB 52, Section 21073 of the PRC defines California Native American tribes as "a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of the Statutes of 2004." This includes both federally and non-federally recognized tribes.

Section 21074(a) of the PRC defines TCRs for the purpose of CEQA as:

1) Sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    a. included or determined to be eligible for inclusion in the California Register of Historical Resources; and/or
    b. included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; and/or
    c. a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Because criteria a and b also meet the definition of an Historical Resource under CEQA, a TCR may also require additional consideration as an Historical Resource. TCRs may or may not exhibit archaeological, cultural, or physical indicators.

Recognizing that California tribes are experts in their tribal cultural resources and heritage, AB 52 requires that CEQA lead agencies provide tribes that requested notification an opportunity to consult at the commencement of the CEQA process to identify TCRs. Furthermore, because a significant effect on a TCR is considered a significant impact on the environment under CEQA, consultation is used to develop appropriate avoidance, impact minimization, and mitigation measures.

In accordance with Section 21082.3(c)(1) of the PRC, "… information, including, but not limited to, the location, description, and use of the tribal cultural resources, that is submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with subdivision (r) of Section 6254 of, and Section 6254.10 of, the Government Code, and subdivision (d) of Section 15120 of Title 14 of the CCR, without the prior consent of the tribe that provided the information." Therefore, the details of tribal consultation summarized herein are provided in a confidential administrative record and not available for public disclosure without written permission from the tribes.

Summary of Tribal Consultation under AB 52

AB52 consultation requirements went into effect on July 1, 2015 for all projects that had not already published a Notice of Intent to Adopt a Negative Declaration or MND or published a Notice of Preparation of an EIR (Section 11 [c]) before that date. At the time SBFCA was ready to initiate CEQA review, it had received written requests to receive project notices from two California Native American Tribes which identified themselves as being traditionally and culturally affiliated with the lands subject to SBFCA jurisdiction: The United Auburn Indian Community of Auburn Rancheria, and The Torrez Martinez Desert Cahuilla Indians. In 2016, The Torrez Martinez Desert Cahuilla Indians rescinded their general AB52 notification request to defer to tribes closer the SBFCA's areas of operation.

- On March 23, 2020, SBFCA determined that it had a complete project description and it was ready to begin review under CEQA. SBFCA mailed an initial notification letter to UAIC and an invitation to consult on the Project. SBFCA requested responses to the offer to consult within 30 days of the receipt of the letter. Correspondence with UAIC is summarized below.

United Auburn Indian Community of Auburn Rancheria

- On April 29, 2020, UAIC sent a formal response to SBFCA via email. The tribe acknowledged receipt of SBFCA's offer to consult and requested a copy of the cultural resources report for the Project Area. On April 30, 2020 SBFCA officially initiated consultation via email and informed the tribe that the cultural resources study was in progress and report would be provided upon completion. On June 6, 2020 SBFCA transmitted ECORP's completed report to the tribe. On July 16, 2020, UAIC responded with comments on the reports, indicating it agrees with the need for a tribal monitor and requesting schedule, whether or not other tribes responded, and if the monitor will be compensated. In its response, UAIC did not indicate that there are any TCRs known to exist inside the Project Area. SBFCA replied the same day, and confirmed that a tribal monitor will be compensated, that SBFCA will give UAIC a week's notice prior to construction, and that no other tribes have responded to the request for consultation.
- On August 4, 2020, SBFCA provided UAIC with updated project plans and a revised version of the cultural resources report, which included a slightly larger area than was consulted upon originally. Later that day on August 4, 2020, UAIC acknowledged receipt of the updated plans. Consultation is ongoing as of the preparation of this document and, in accordance with state law, will be concluded before the adoption of this environmental document.

Information about potential impacts to TCRs was drawn from: 1) the results of a search of the Sacred Lands File of the NAHC; 2) existing ethnographic information about pre-contact lifeways and settlement patterns; 3) information on archaeological site records obtained from surveys of the Project area and the California Historical Recourse Information System; and 4) the tribal consultation record under AB 52 for the Project.

4.18.1.3 Sacred Lands File Search

A search of the NAHC Sacred Lands File was requested on March 24, 2020. The NAHC responded on March 27, 2020, that the sacred lands file search was positive, and suggested contacting UAIC for more information. UAIC was offered an opportunity to consult, as summarized above.

4.18.1.4 Ethnographic Information

The ethnographic information reviewed for the Project, including ethnographic maps (Wilson and Towne 1978) lists several villages along the Feather River, the nearest one being six miles south of the Project Area. There is nothing in the ethnographic literature that suggests that the Project location is either known or suspected to have ethnographic villages or resources within its boundaries.

4.18.1.5 Archaeological Site Records

The entire Project Area was subjected to an archaeological survey and records search review, and no Native American sites were identified within its boundaries. In addition, approximately 50 percent of the area within a 0.5-mile radius surrounding the Project Area has been subject to cultural surveys; no pre-contact or historic archaeological sites have been previously recorded in the vicinity.

4.18.1.6 Tribal Consultation Results

The UAIC did not provide any information during consultation to date that the Project Area contains known TCRs. However, there remains a possibility that undiscovered TCRs could become known during construction, and if TCRs are impacted, this would be considered a significant impact. Therefore, a mitigation measure is required to reduce the impact to unknown TCRs to less than significant.

4.18.2 Tribal Cultural Resources (XVII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☐	☒	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of	☐	☒	☐	☐

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.				

While no known TCRs were identified by the cultural resources inventory or Native American tribes in the Project area, the unanticipated, and accidental discovery of California Native American tribal cultural resources are possible during Project implementation and have the potential to impact TCRs. As such, mitigation measure **TCR-1** has been included to reduce the potential for impacts to TCRs to a less than significant level.

4.18.3 Mitigation Measures

TCR-1: Tribal Monitoring

- All vegetation removal, soil excavation, and activity that has the potential to disturb more than six inches of original ground should be monitored by a qualified tribal monitor representing a consulting tribe. The monitor must be given a minimum of 48 hours' notice of the opportunity to be present during these activities and to coordinate closely with the archaeological monitor, to observe work activities, and assist in ensuring that sensitive tribal resources are not impacted. The monitor must be given a reasonable opportunity to inspect soil and other material as work proceeds to assist in determining if resources significant to the tribes are present. If potential tribal resources are discovered, a reasonable work pause or redirection of work by the contractor may be requested. If the tribe cannot recommend a monitor or if the tribal monitor does not report at the scheduled time, then all work will continue as long as the specified notice was provided. Tribal monitoring will not occur for equipment set-up or tear-down that does not disturb the ground surface more than six inches in depth; hydroseeding; paving; placement of imported fill/gravel/rock; restoration; or backfilling of previously excavated areas. Excavated sediment from the river channel, which was redeposited from upstream by the 2017 Oroville Dam incident, will not be subjected to screening. However, any potential TCRs observed in any location will be subject to the decision process in mitigation measure **CUL-2** and subsequent consultation between the monitoring tribe and the lead agencies to evaluate and, if necessary, treat the discovery to the satisfaction of the lead agencies. If the discovery includes human remains, then the procedures in mitigation measure **CUL-3** shall apply.

  Timing/Implementation: *During construction*

  Monitoring/Enforcement: *SBFCA and Project construction lead*

4.19 Utilities and Service Systems

4.19.1 Environmental Setting

4.19.1.1 Water Service

The Project site is located in the Butte Water District (BWD) service area. The BWD is a multi-county district, located in southern Butte County and northern Sutter County. The BWD, which is an independent special district, is located directly south of the Thermalito Afterbay and borders the Feather River on the east side and extends southward into Sutter County south of the Live Oak area. Established in 1956, the BWD was formed primarily to provide irrigation water for farms in the Gridley and East Biggs area. The BWD now consists of a total of approximately 31,300 acres: 18,865 acres in Butte County and approximately 12,465 acres in Sutter County. Parcels within the BWD are located in the unincorporated areas of both counties, and in the incorporated limits of the cities of Biggs, Gridley, and Live Oak. The BWD is comprised primarily of agricultural lands, such as rice fields and orchards. The BWD supplies water to approximately 650 customers for agricultural irrigation and has 1,400 water outlets (Butte Local Agency Formation Commission [LAFCO] 2010).

4.19.1.2 Wastewater and Storm Drainage

Wastewater facilities are not provided within the Project Area. Wastewater collection and disposal at the Live Oak Park and Recreation Area is provided through portable toilets. There are no formal storm drainage facilities in the Project Area. Any existing storm drainage in the area is provided though natural drainages, including the Feather River.

4.19.1.3 Solid Waste

The Yuba-Sutter Regional Waste Management Authority (YSRWMA) is the area's regional waste management agency. YSRWMA was established in 1990 through a joint exercise of powers agreement between Sutter and Yuba counties and the cities of Live Oak, Marysville, Wheatland, and Yuba City for the purpose of providing reliable, economical, integrated, and environmentally sound waste management services to the residents, businesses, and organizations of the bi-county area (YSRWMA 2020).

As shown in Table 4.19-1, the majority of the YSRWMA solid waste is disposed of at the Recology Ostrom Road Landfill. According to the information published by CalRecycle (CalRecycle 2020b) in 2018, the Recology Ostrom Road Landfill received approximately 99.0 percent of Sutter and Yuba County's solid waste. As of June 2007, the Recology Ostrom Road Landfill had a remaining capacity of more than 39 million cubic yards and a cease operation date of December 31, 2066 (CalRecycle 2020a).

Table 4.19-1. Solid Waste Disposal Facilities Used by the YSRWMA - 2018

Destination Facility	Solid Waste Disposal Year 2018		Landfill Information		
	Tons Per Year	Percent	Remaining Capacity (cubic yards)	Remaining Capacity Date	Cease Operation Date
Altamont Landfill	119	0.1%	65,400,000	12/31/2014	1/1/2025
Anderson Landfill	30	0.0%	10,409,132	1/1/2015	1/1/2093
Azusa Land Reclamation Co. Landfill	11	0.0%	51,512,201	9/30/12	1/1/2045
Clean Harbors Buttonwillow	7	0.0%	n/a	n/a	1/1/2040
Foothill Sanitary Landfill	3	0.0%	125,000,000	6/10/2010	12/31/2082
Forward Landfill, Inc.	228	0.1%	22,100,000	12/31/2012	1/1/2020
L and D Landfill	120	0.1%	4,100,000	5/31/2005	1/1/2023
Neal Road Recycling and Waste Facility	6	0.0%	20,847,970	7/1/2009	1/1/2048
Potrero Hills Landfill	146	0.1%	13,872,000	1/1/2006	2/14/2048
Recology Hay Road	396	0.3%	30,433,000	7/28/2010	1/1/2077
Recology Ostrom Road LF Inc.	151,654	99.0%	39,223,000	6/1/2007	12/31/2066
Sacramento County Landfill (Kiefer)	169	0.1%	112,900,000	9/12/2005	1/1/2064
West Central Landfill	2	0.0%	6,589,044	12/1/2013	3/1/2032
Western Regional Landfill	196	0.1%	29,093,819	6/30/2005	1/1/2058
Yolo County Central Landfill	122	0.1%	n/a	n/a	1/1/2081
Yearly Total	153,208	100.0%			
Average per Resident (lbs/day)	4.7				
Average per Employee (lbs/day)	16.8				

Source: CalRecycle 2020a, 2020b, and 2020c

4.19.2 Utilities and Service Systems (XVIII) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒

4.19.2.1 Water

The Proposed Project would not require new water infrastructure or treatment facilities. The Project would have no impact in this area.

4.19.2.2 Wastewater

The Proposed Project would not require wastewater service or facilities or impact any existing facilities in the area. The Proposed Project would have no impact to existing wastewater infrastructure or treatment facilities.

Storm Drainage

The Proposed Project would not require storm drainage facilities. No new facilities would be required to serve the Project and the Project would have no impact in this area.

Electric Power

The Proposed Project would not require electrical facilities. No new facilities would be required to serve the Project and the Project would have no impact in this area.

Natural Gas

The Proposed Project would not require natural gas facilities. As such, the Project would have no impact to natural gas facilities.

Telecommunications

The Proposed Project would not require telecommunication facilities. No new telecommunication facilities would be required to serve the Project and the Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒

The Project is the removal of sediment and primrose at the Live Oak boat ramp. This process would not require the use of any water. Therefore, the Project would have no impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒

Refer to Item a) above

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐

The Proposed Project would include the removal of sediment and primrose from the Project site. While the anticipated disposal site would the Gridley WWTP Emergency Ponds, in the circumstance that this site is no longer available, disposal of the dredged material would occur at the Ostrom Road or Neal Road landfills. This landfill is permitted to accept soils, including contaminated soils, as long as these soils meet the landfill disposal standards. This soil would then be used as cover material and is not considered solid waste and therefore not a part of the waste stream. As such, the Proposed Project would not substantially increase solid waste in the area and the Ostrom Road or Neal Road landfills has sufficient capacity to accommodate the relatively minor amounts of waste that would be generated by the Proposed Project. The Proposed Project would have a less-than-significant impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Comply with federal, state, and local statutes and management and reduction regulations related to solid waste?	☐	☐	☒	☐

The Proposed Project is required to comply with all State and federal statutes regarding construction solid waste. This impact is considered less than significant.

4.20 Wildfire

4.20.1 Environmental Setting

The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels, and fuel moisture contents), and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point, while fuels such as trees have a lower surface area to mass ratio and require more heat to reach the ignition point.

The Project site is not in an area designated by CAL FIRE (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. Finally, the location of the

Project site makes it readily accessible by emergency personnel and vehicles in the event of a wildland fire.

4.20.2 Wildfire (XX) Environmental Checklist and Discussion

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

The Project site is not in an area designated by CAL FIRE (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. The Proposed Project does not include any actions that would impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. All construction activities would not impede the use of surrounding roadways in an emergency evacuation. The Project would have no impact in this area.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒

The Project site is not in an area designated by CAL FIRE as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. No inhabitable structures would be built or occupied as a part of the Project and the Project would have no impact in this area.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒

The Project site is not in an area designated by CAL FIRE as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. No new fuel breaks, emergency water sources would be required for development of the Project. No new power lines would be required to complete the Project. The Project would have no impact in this area.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

The Project site is not in an area designated by CAL FIRE as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. The Project would have no impact in this area.

4.21 Mandatory Findings of Significance

4.21.1 Mandatory Findings of Significance (XIX) Environmental Checklist and Discussion

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

As discussed in Sections 4.4 Biological Resources and 4.5 Cultural Resources, the Proposed Project may have potential impacts to these resources. However, implementation of mitigation measures **BIO-1** through **BIO-9** and **CUL-1** through **CUL-3** would reduce these impacts to a less-than-significant level.

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects	☐	☐	☐	☒

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				

Implementation of the Proposed Project, in conjunction with other approved or pending projects in the region, would not have the potential to result in cumulatively considerable impacts to the physical environment. The Project would have no impact.

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Direct and indirect impacts to human beings would not occur as a result of Proposed Project implementation. The Project would have no impact.

SECTION 5.0 LIST OF PREPARERS

5.1 Sutter Butte Flood Control Agency (Lead Agency)

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5.2 Peterson Brustead, Inc.

Chris Fritz, Project Manager

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Soil Screening Data Report

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SECTION 6.0 BIBLIOGRAPHY

Blackburn Consulting. 2020. Soil Screening Data Report, Feather River Sediment Removal Project, Live Oak Boat Launch and Yuba City Boat Launch. May 21, 2020. Blackburn File No. 3825.X

Butte LAFCO. 2010. Butte Water District Municipal Service Review and Sphere of Influence Plan. http://buttelafco.org/resources/municipal-service-reviews-and-sphere-influence-plans.

CAL FIRE. 2007. Fire Hazard Severity Zones in LRA. Adopted October 3, 2007. https://osfm.fire.ca.gov/media/6829/fhszl06_1_map51.pdf.

CalRecycle. 2020a. SWIS Facility/Site Search. https://www2.calrecycle.ca.gov/swfacilities/Directory?AutoBind=true&RegulatoryStatus=Permitted&OperationalStatus=Active&FacilityType=Disposal.

_______. 2020b. Disposal Reporting System (DRS): Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility.

_______. 2020c. Countywide, Regionwide, and Statewide Jurisdiction Diversion / Disposal Progress Report. https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006.

Caltrans. 2020a. Scenic Highways. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways . Accessed: June 12, 2020.

______. 2020b. *Transportation and Construction Vibration Guidance Manual*.

______. 2018. Traffic Volumes: Annual Average Daily Traffic (AADT). https://dot.ca.gov/programs/traffic-operations/census.

CARB. 2017. EMFAC2017 Emissions Model.

CGS. 2016. Earthquake Shaking Potential for California [map]. https://maps.conservation.ca.gov/geologichazards/

_______. 2010. An Explanatory Text to Accompany the Fault Activity Map of California. http://www.conservation.ca.gov/cgs/cgs_history/Documents/FAM_phamplet.pdf.

_______. 2002. California Geomorphic Provinces. http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_36/Documents/note_36.pdf.

Crockett, Alexander G. 2011. *Addressing the Significance of Greenhouse Gas Emissions Under CEQA: California's Search for Regulatory Certainty in an Uncertain World*.

DMR. 2019. Mines Online. http://maps.conservation.ca.gov/mol/index.html.

DOC. 2020a. Important Farmland Finder. Available at: http://maps.conservation.ca.gov/ciff/ciff.html.

______. 2020b. Data Viewer, Fault Activity Map of California. https://maps.conservation.ca.gov/

______. 2000c. *A General Location Guide for Ultramafic Rocks in California-Areas More Likely to Contain Naturally Occurring Asbestos.*

DOF. 2020. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2020 with 2010 Census Benchmark. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

DTSC. 2020. Hazardous Waste and Substance Site List http://www.envirostor.dtsc.ca.gov/public/. Accessed June 15, 2020.

DWR. 2020. Groundwater Information Center Interactive Map Application. https://gis.water.ca.gov/app/gicima/#bookmark_DepthBelowGroundSurface.

_______. 2006. California's Groundwater Bulletin 118 – Update 2006. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/5_021_62_SutterSubbasin.pdf

ECORP. 2020a. Biological Resources Assessment Live Oak Boat Ramp Sediment and Invasive Species Removal Project. September 2, 2020. Project Number 2015-036.10.

______. 2020b. Aquatic Resources Delineation. Live Oak Boat Ramp Sediment and Invasive Species Removal Project. August 7,2020. Project Number 2015-036.10.

______. 2020c. Cultural Resources Inventory, Live Oak Boat Ramp Sediment and Invasive Species Removal Project. May 2020. Project Number 2015-036.10.

FRAQMD. 2010. CEQA Air Quality Handbook

FHWA. 2011. *Effective Noise Control During Nighttime Construction*. Available online at: http://ops.fhwa.dot.gov/wz/workshops/accessible/schexnayder_paper.htm.

_____. 2006. Roadway Construction Noise Model.

FTA. 2018. Transit Noise and Vibration Impact Assessment.

Halterman. M., M.J. Johnson, J.A. Holmes, and S.A. Laymon. 2016. A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo, Final Draft dated: May 2016. U.S. Fish and Wildlife Techniques and Methods.

LOUSD. 2020. About LOUSD. https://www.lousd.k12.ca.us/About-LOUSD/index.html.

NIOSH. 1998. Occupational Noise Exposure.

NRCS. 2020. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/.

Recology. 2017. Sampling Requirements and Acceptance Criteria. September 9, 2017. https://41k4p01v6nzq13r4y42jb9xv-wpengine.netdna-ssl.com/wp-content/uploads/2017/12/Waste-Acceptance-Criteria-Revised-2017.09.06.pdf.

Rosenthal, Jeffrey, and Sam Willis. 2017. Geoarchaeological Investigation for the Sutter Basin Flood Risk Management Project, Cypress Avenue to Tudor Road, Feather River West Levee, Sutter County, California. DRAFT

RWQCB. 2018. The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and The San Joaquin River Basin. https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf.

______. 2006. Order No. R5-2006-0127, Waste Discharge Requirements for City of Gridley, Gridley Wastewater Treatment Plant Butte County.

SACOG. 2020. About SACOG. https://www.sacog.org/about-sacog.

______. 2015. 2016 MTP/SCS Draft Environmental Impact Report. SCH # 2014062060. September 2015. https://www.sacog.org/general-information/2016-mtpscs-draft-environmental-impact-report.

______. 1994. Sutter County Airport Comprehensive Land Use Plan. April 1994. https://www.sacog.org/sites/main/files/file-attachments/sutter_county_airpor_clup_april_1994_-_94-017.pdf?1456340175.

SCAQMD. 2003. Air Quality Management Plan.

_____. 1992. 1992 Federal Attainment Plan for Carbon Monoxide.

SCFD. 2020. Fire Services. https://www.suttercounty.org/doc/government/depts/ds/fs/cs_fire_services.

SCSO. 2020. Divisions. https://www.suttersheriff.org/div/default.aspx.

SRWP. 2020a. 2010. Sacramento River Watersheds. http://www.sacriver.org/aboutwatershed/roadmap/watersheds.

Sutter County. 2012. Sutter County Groundwater Management Plan. March 2010. https://www.suttercounty.org/assets/pdf/pw/wr/gmp/Sutter_County_Final_GMP_20120319.pdf.

______. 2012b. County of Sutter Pedestrian & Bicycle Master Plan – 2012. https://www.suttercounty.org/doc/government/depts/ds/pw/engineering.

______. 2011a. Sutter County General Plan. Adopted March 29, 2011. https://www.suttercounty.org/assets/pdf/cs/ps/General_Plan_Policy_Document.pdf.

______. 2011b. Emergency Operations Plan. October 2011. https://www.suttercounty.org/assets/pdf/cs/es/eop/Emergency_Operations_Plan_Basic.pdf.

______. 2010a. Sutter County General Plan Draft Environmental Impact Report. SCH No. 2010032074. September 2010. https://www.suttercounty.org/doc/government/depts/ds/ps/gp/gp_home.

______. 2010b. Sutter County Climate Action Plan.

______. 2008. General Plan Update Technical Background Report. February 2008. https://www.suttercounty.org/doc/government/depts/ds/ps/gp/gp_documents#background.

SWRCB. 2020. Geotracker. Accessed June 30, 2020. http://geotracker.waterboards.ca.gov.

UCMP. 2020. UCMP Locality Search – Sutter County. https://ucmpdb.berkeley.edu/loc.html

USACE. 2013. Sutter Basin, California, Sutter Basin Pilot Feasibility Draft Report – Draft Environmental Impact Report/Supplemental Environmental Impact Study. U.S. Army Corps of Engineers Sacramento District. June 2013.

USEPA. 2020a. Enforcement and Compliance History Online (ECHO) program. https://echo.epa.gov/.

______. 2020b. Feather and Sacramento Rivers Watersheds. https://www.epa.gov/sfbay-delta/feather-and-sacramento-rivers-watersheds#watersheds.

______. 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

USGS. 2018. Areas of Land Subsidence in California. https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html.

Yuba-Sutter Transit. 2020. Rural Routes - Live Oak. https://www.yubasuttertransit.com/live-oak.

YSRWMA. 2020. About the Regional Waste Management Authority. http://yubasutterrecycles.com/index.html.

SECTION 7.0 LIST OF APPENDICES

Appendix A – Emmissions Modeling Output, ECORP Consulting, Inc. 2020.

Appendix B – Biological Resources Assessment, ECORP Consulting, Inc. 2020.

Appendix C – Greenhouse Gase Modeling Output, ECORP Consulting, Inc. 2020.

Appendix D – Soil Screening Data Report, Blackburn Consulting, Inc. 2020.

Appendix E – Noise Modeling Output, ECORP Consulting, Inc. 2020.

Appendices

Appendix A

Live Oak Boat Ramp Sediment and Invasive Species Removal Project Emissions Modeling Output

OFFROAD EMISSIONS

Live Oak Boat Ramp

Sutter County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	7.92	Acre	7.92	344,995.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	61
Climate Zone	3			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project site does not contain utilities.

Land Use -

Construction Phase -

Off-road Equipment - Equioment list composed from typical equipment used during dredging and information provided by the Project applicant.

Trips and VMT - Numbber of hauling trips provided from the Project applicant (283). Trip length was caluclated from the Project site to the Ostrom Landfill.

Energy Use -

Water And Wastewater - No operational impacts.

Mobile Land Use Mitigation -

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	5.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.9222	9.6541	4.2314	0.0139	0.0411	0.3609	0.4020	0.0109	0.3348	0.3457	0.0000	1,324.3046	1,324.3046	0.3906	0.0000	1,334.0696
Maximum	**0.9222**	**9.6541**	**4.2314**	**0.0139**	**0.0411**	**0.3609**	**0.4020**	**0.0109**	**0.3348**	**0.3457**	**0.0000**	**1,324.3046**	**1,324.3046**	**0.3906**	**0.0000**	**1,334.0696**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.9222	9.6541	4.2314	0.0139	0.0411	0.3609	0.4020	0.0109	0.3348	0.3457	0.0000	1,324.3046	1,324.3046	0.3906	0.0000	1,334.0696
Maximum	**0.9222**	**9.6541**	**4.2314**	**0.0139**	**0.0411**	**0.3609**	**0.4020**	**0.0109**	**0.3348**	**0.3457**	**0.0000**	**1,324.3046**	**1,324.3046**	**0.3906**	**0.0000**	**1,334.0696**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**0.0000**	**1.8500e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**0.0000**	**1.8500e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Trenching	7/1/2021	7/7/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 7.92

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Cranes	1	8.00	231	0.29
Dredging	Dumpers/Tenders	2	8.00	16	0.38
Dredging	Rubber Tired Loaders	1	8.00	203	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	10	5.00	0.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9028	9.6424	4.0832	0.0135		0.3607	0.3607		0.3346	0.3346		1,285.8456	1,285.8456	0.3895		1,295.5839
Total	**0.9028**	**9.6424**	**4.0832**	**0.0135**		**0.3607**	**0.3607**		**0.3346**	**0.3346**		**1,285.8456**	**1,285.8456**	**0.3895**		**1,295.5839**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0194	0.0117	0.1482	3.9000e-004	0.0411	2.3000e-004	0.0413	0.0109	2.2000e-004	0.0111		38.4590	38.4590	1.0700e-003		38.4856
Total	**0.0194**	**0.0117**	**0.1482**	**3.9000e-004**	**0.0411**	**2.3000e-004**	**0.0413**	**0.0109**	**2.2000e-004**	**0.0111**		**38.4590**	**38.4590**	**1.0700e-003**		**38.4856**

3.2 Dredging - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9028	9.6424	4.0832	0.0135		0.3607	0.3607		0.3346	0.3346	0.0000	1,285.8456	1,285.8456	0.3895		1,295.5839
Total	**0.9028**	**9.6424**	**4.0832**	**0.0135**		**0.3607**	**0.3607**		**0.3346**	**0.3346**	**0.0000**	**1,285.8456**	**1,285.8456**	**0.3895**		**1,295.5839**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0194	0.0117	0.1482	3.9000e-004	0.0411	2.3000e-004	0.0413	0.0109	2.2000e-004	0.0111		38.4590	38.4590	1.0700e-003		38.4856
Total	**0.0194**	**0.0117**	**0.1482**	**3.9000e-004**	**0.0411**	**2.3000e-004**	**0.0413**	**0.0109**	**2.2000e-004**	**0.0111**		**38.4590**	**38.4590**	**1.0700e-003**		**38.4856**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.512796	0.026606	0.165464	0.111626	0.028005	0.006057	0.029203	0.113670	0.000830	0.000443	0.003492	0.001021	0.000787

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Unmitigated	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0657					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.0000e-005	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**		**1.8500e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0657					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.0000e-005	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**		**1.8500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Live Oak Boat Ramp

Sutter County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	7.92	Acre	7.92	344,995.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	61
Climate Zone	3			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project site does not contain utilities.

Land Use -

Construction Phase -

Off-road Equipment - Equioment list composed from typical equipment used during dredging and information provided by the Project applicant.

Trips and VMT - Numbber of hauling trips provided from the Project applicant (283). Trip length was caluclated from the Project site to the Ostrom Landfill.

Energy Use -

Water And Wastewater - No operational impacts.

Mobile Land Use Mitigation -

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	5.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	2.3000e-003	0.0241	0.0105	3.0000e-005	1.0000e-004	9.0000e-004	1.0000e-003	3.0000e-005	8.4000e-004	8.6000e-004	0.0000	2.9950	2.9950	8.9000e-004	0.0000	3.0171
Maximum	**2.3000e-003**	**0.0241**	**0.0105**	**3.0000e-005**	**1.0000e-004**	**9.0000e-004**	**1.0000e-003**	**3.0000e-005**	**8.4000e-004**	**8.6000e-004**	**0.0000**	**2.9950**	**2.9950**	**8.9000e-004**	**0.0000**	**3.0171**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	2.3000e-003	0.0241	0.0105	3.0000e-005	1.0000e-004	9.0000e-004	1.0000e-003	3.0000e-005	8.4000e-004	8.6000e-004	0.0000	2.9950	2.9950	8.9000e-004	0.0000	3.0171
Maximum	**2.3000e-003**	**0.0241**	**0.0105**	**3.0000e-005**	**1.0000e-004**	**9.0000e-004**	**1.0000e-003**	**3.0000e-005**	**8.4000e-004**	**8.6000e-004**	**0.0000**	**2.9950**	**2.9950**	**8.9000e-004**	**0.0000**	**3.0171**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	**5-3-2021**	**8-2-2021**	0.0264	0.0264
		Highest	0.0264	0.0264

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Trenching	7/1/2021	7/7/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 7.92

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Cranes	1	8.00	231	0.29
Dredging	Dumpers/Tenders	2	8.00	16	0.38
Dredging	Rubber Tired Loaders	1	8.00	203	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	10	5.00	0.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0241	0.0102	3.0000e-005		9.0000e-004	9.0000e-004		8.4000e-004	8.4000e-004	0.0000	2.9163	2.9163	8.8000e-004	0.0000	2.9383
Total	**2.2600e-003**	**0.0241**	**0.0102**	**3.0000e-005**		**9.0000e-004**	**9.0000e-004**		**8.4000e-004**	**8.4000e-004**	**0.0000**	**2.9163**	**2.9163**	**8.8000e-004**	**0.0000**	**2.9383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0787	0.0787	0.0000	0.0000	0.0788
Total	**4.0000e-005**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0787**	**0.0787**	**0.0000**	**0.0000**	**0.0788**

3.2 Dredging - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0241	0.0102	3.0000e-005		9.0000e-004	9.0000e-004		8.4000e-004	8.4000e-004	0.0000	2.9163	2.9163	8.8000e-004	0.0000	2.9383
Total	**2.2600e-003**	**0.0241**	**0.0102**	**3.0000e-005**		**9.0000e-004**	**9.0000e-004**		**8.4000e-004**	**8.4000e-004**	**0.0000**	**2.9163**	**2.9163**	**8.8000e-004**	**0.0000**	**2.9383**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0787	0.0787	0.0000	0.0000	0.0788
Total	**4.0000e-005**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0787**	**0.0787**	**0.0000**	**0.0000**	**0.0788**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.512796	0.026606	0.165464	0.111626	0.028005	0.006057	0.029203	0.113670	0.000830	0.000443	0.003492	0.001021	0.000787

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Unmitigated	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0223					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0223					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

HAUL TRUCK EMISSIONS

Construction Haul Truck Emissions

Live Oak Boat Ramp

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Metric Tons Annually
T7 Single Construction Haul Trucks	775	870	**NOx**	6.526801	0.015745018	5071.97	**11.1892**	**1.851**
			ROG	0.426037	0.001095851	331.13	**0.7305**	**0.121**
			PM10	0.115259	2.24684E-05	89.35	**0.1971**	**0.033**
			PM2.5	0.110273	2.14964E-05	85.48	**0.1886**	**0.031**
			CO	1.137284	0.013918396	893.50	**1.9712**	**0.326**
			SO2	0.017570	2.57037E-05	13.64	**0.0301**	**0.005**

[1] Daily VMT: Calculations factor the average distance from the project to the three proposed dump sites (26.7 miles). 283 total haul truck trips are anticipated in order to remove dredge material. Material hauling is assume to occur over 10 days for a total of 29 truck trips a day (283 ÷ 10 = 28.3 and this value is rounded up to 29). 26.7 miles x 29 tripss = 775 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 29 trips x 30 = 870 minutes daily

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017.

Appendix B

Live Oak Boat Ramp Sediment and Invasive Species Removal Project Biological Resources Assessment

Biological Resources Assessment

Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Sutter and Yuba Counties, California

September 2, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Citation: ECORP Consulting, Inc. 2020. Biological Resources Assessment for the Live Oak Boat Ramp Sediment and Invasive Species Removal Project, Sutter and Yuba Counties, California. September 2, 2020.

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LIST OF ACRONYMS AND ABBREVIATIONS

BA	Biological assessment
BCC	Birds of Conservation Concern
BO	Biological opinion
BRA	Biological resources assessment
°C	Degrees Celsius
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cm	Centimeters
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DPS	Distinct population segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily significant units

LIST OF ACRONYMS AND ABBREVIATIONS

FR	Federal Register
HCP	Habitat conservation plan
MBTA	Migratory Bird Treaty Act
MSL	Mean sea level
NCCP	Natural Community Conservation Plan
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
Project	Live Oak Boat Ramp Sediment and Invasive Species Removal Project
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SBFCA	Sutter Butte Flood Control Agency
SSC	Species of Special Concern
TL	Total length
WBWG	Western Bat Working Group

1.0 INTRODUCTION

On behalf of the Sutter Butte Flood Control Agency (SBFCA), ECORP Consulting, Inc. has conducted a biological resources assessment (BRA) for the Live Oak Boat Ramp Sediment and Invasive Species Removal Project (Project) located in Sutter County, California. The purpose of the assessment was to collect information on the biological resources present or with the potential to occur in the Project Study Area, assess potential biological impacts related to Project activities, and identify potential mitigation measures to inform and support the Project's California Environmental Quality Act (CEQA) documentation for biological resources.

2.0 STUDY AREA

2.1 Study Area Location

The approximately 8.22-acre Study Area is located east of the town of Live Oak at the end of Pennington Road (Figure 1. *Live Oak Boat Ramp Location and Vicinity*). This corresponds to the unsectioned Rancho Boga Landgrant (Mount Diablo Base and Meridian) of the "Gridley, California" 7.5-minute quadrangle (U.S. Geological Survey [USGS] 1952 photorevised 1973). The approximate center of the Study Area is located at 39.273745˚ and -121.631032˚ within the Honcut Headwaters – Lower Feather Watershed (Hydrologic Unit Code #18020159; Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016).

For the purposes of this report, the Study Area includes (1) the Live Oak Boat Ramp facility and adjacent lands, and (2) the area of proposed dredging within the Feather River (Figure 2. *Project Components*).

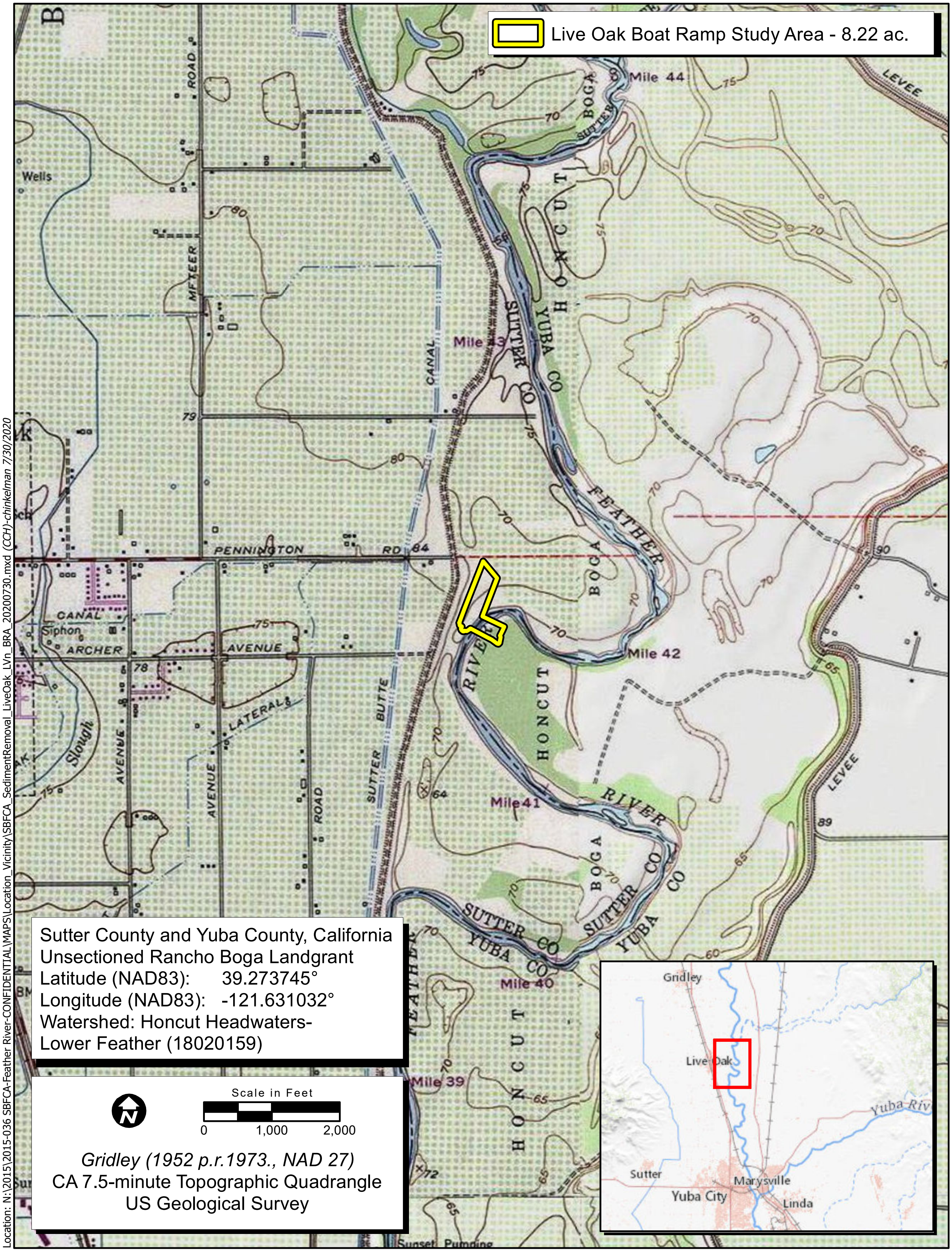
2.2 Project Description

The Project involves dredging to remove sediment that has accumulated in portions of the Feather River, exacerbated by the Oroville Dam Spillway incident of 2017. The dredging operation would be staged from the existing Live Oak Recreational Park Boat Ramp facility and adjacent lands (Figure 2). Dredging would remove approximately 1.5 acres of invasive water primrose (*Ludwigia peploides*) and approximately 3,400 cy of sediment from the Live Oak Recreational Park Boat Ramp facility. Dredged spoils would be dewatered at the boat ramp and/or disposed of at the Recology Ostrom Road Landfill, on agricultural fields, or utilized as fill at another project (Figure 3. *Potential Disposal Locations*).

Dredging would involve mechanical mining, which utilizes equipment such as an excavator with a bucket removing the sediment from shore and/or a barge, transporting the material to the dewatering area, and/or transporting the material to the disposal site(s).

2.3 Disposal Options

Potential sediment disposal options include agricultural soil for farmlands, County landfills, the City of Gridley overflow wastewater ponds berms, or the City of Marysville inactive wastewater ponds (Figure 3). Please note, this BRA does not include an analysis of the potential disposal locations.



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Location_Vicinity\SBFCA_SedimentRemoval_LiveOak_LVn_BRA_20200730.mxd (CCH)-chinkelman 7/30/2020

Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Live Oak Boat Ramp Location and Vicinity

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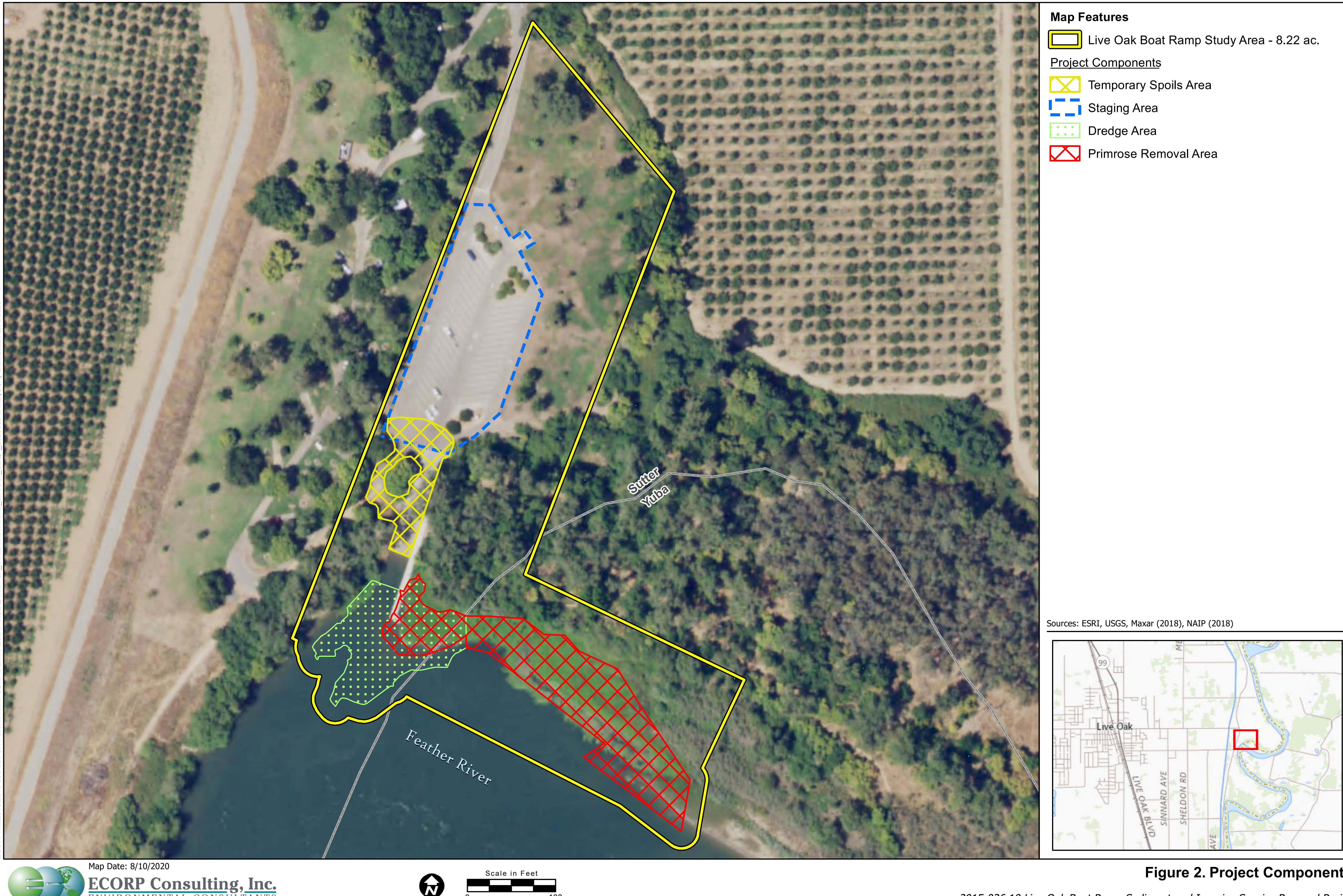
2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project



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Map Date: 8/10/2020

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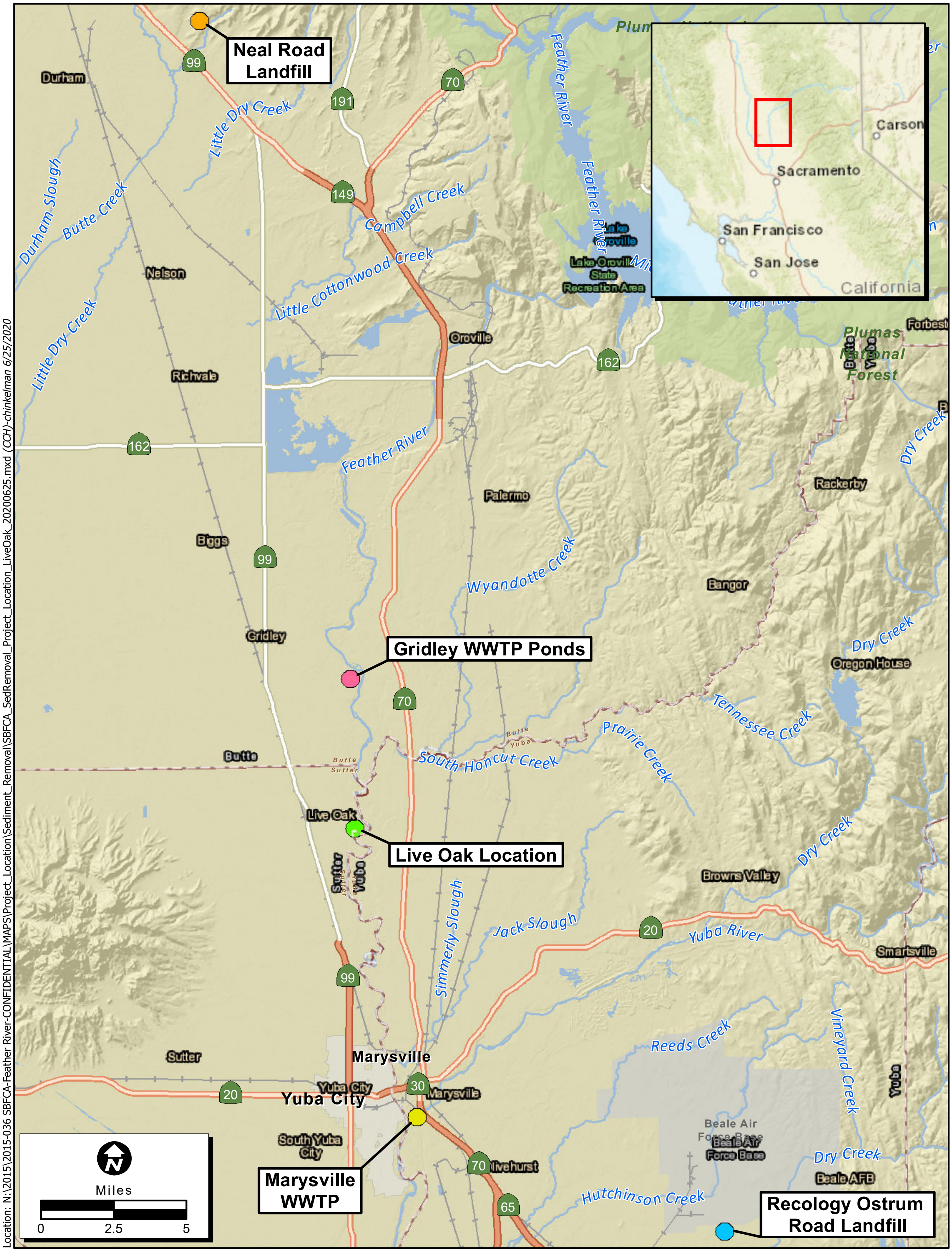
Figure 2. Project Components

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Project_Location\Sediment_Removal\SBFCA_SedRemoval_Project_Location_LiveOak_20200625.mxd (CCH)-chinkelman 6/25/2020

Map Date: 6/25/2020

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Figure 3. Potential Disposal Locations

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

2.3.1 Agricultural Soil

When dredged material is free of contaminants, nuisance weeds, and has the proper balance of nutrients, it has similar characteristics as productive agricultural soils and can be beneficial for increasing crop production when incorporated or mixed with native soils. This option will depend on the results of the forthcoming Sampling and Analysis Plan and the identification of available agricultural lands.

2.3.2 Landfill

The Project is exploring disposal options at the Ostrom Road Landfill near Wheatland and the Neal Road landfill near Chico.

2.3.3 Use at Another Local Project

The City of Gridley is looking for material to build up the berms around the City's existing wastewater treatment ponds. It is possible that the dredged material can be stockpiled at the overflow ponds (Figure 3) and subsequently used for the project. This option is currently being discussed with the City of Gridley. The City of Marysville has recently modified its wastewater collection and treatment system to connect to the Linda County Water District Regional Wastewater Treatment Facility for treatment and discharge. As such, the existing percolation/evaporation ponds (referred to as wastewater ponds throughout) are no longer needed, and the City of Marysville is in the process to formally close and restore the wastewater ponds. Under this option, the dredge material would be used in reclamation of the ponds. The wastewater ponds are located on the east side of the Feather River and north of the Yuba River (Figure 3). This option is currently being discussed with the City of Marysville to determine its viability.

2.4 Purpose of this Biological Resources Assessment

The purpose of this BRA is to assess the potential for occurrence of special-status plant and animal species or their habitat, and sensitive habitats such as wetlands within the Study Area. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols. The conclusions and recommendations presented in this report are based upon a review of the available literature and site reconnaissance.

For the purposes of this assessment, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- are listed or candidates for future listing as threatened or endangered under the California ESA;
- meet the definitions of endangered or rare under Section 15380 of the CEQA Guidelines;
- are identified as a Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW);
- are birds identified as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS);

- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1 and 2);
- are plants listed by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4);
- are plants listed as rare under the California Native Plant Protection Act (NPPA; California Fish and Game Code, § 1900 et seq.); or
- are fully protected in California in accordance with the California Fish and Game Code, §§ 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

Only species that fall into one of the above-listed groups were considered for this assessment. Other species without special status that are sometimes found in database or literature searches were not included within this analysis.

3.0 REGULATORY SETTING

3.1 Federal Regulations

3.1.1 Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by the USFWS and the National Marine Fisheries Service (NMFS). Section 9 of the federal ESA prohibits the taking of listed wildlife, where take is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct” (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 U.S. Code [USC] 1538). Under Section 7 of the federal ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of the federal ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan (HCP) is developed.

Section 7

Section 7 of the federal ESA mandates that all federal agencies consult with USFWS and/or NMFS to ensure that federal agencies’ actions do not jeopardize the continued existence of a listed species or adversely modify Critical Habitat for listed species. If direct and/or indirect effects will occur to Critical Habitat that appreciably diminish the value of Critical Habitat for both the survival and recovery of a species, the adverse modifications will require formal consultation with USFWS or NMFS. If adverse effects are likely, the applicant must conduct a biological assessment (BA) for the purpose of analyzing the potential effects of the project on listed species and critical habitat to establish and justify an "effect determination." The federal agency reviews the BA; if it concludes that the project may adversely affect a listed species or its habitat, it prepares a BO. The BO may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat.

Section 10

When no discretionary action is being taken by a federal agency but a project may result in the take of listed species, an incidental take permit under Section 10 of the federal ESA is necessary. The purpose of the incidental take permit is to authorize the take of federally listed species that may result from an otherwise lawful activity, not to authorize the activities themselves. In order to obtain an incidental take permit under Section 10, an application must be submitted that includes an HCP. In some instances, applicants, USFWS, and/or NMFS may determine that an HCP is necessary or prudent, even if a discretionary federal action will occur. The purpose of the HCP planning process associated with the permit application is to ensure that adequate minimization and mitigation for impacts to listed species and/or their habitat will occur.

Critical Habitat and Essential Habitat

Critical Habitat is defined in Section 3 of the federal ESA as (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the federal ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For inclusion in a critical habitat designation, habitat within the geographical area occupied by the species at the time it was listed must first have features that are essential to the conservation of the species. Critical Habitat designations identify, to the extent known and using the best scientific data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the primary constituent elements). Primary constituent elements are the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These include but are not limited to the following:

- Space for individual and population growth and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, or rearing (or development) of offspring; or
- Habitats that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of a species.

Excluded essential habitat is defined as areas that were found to be essential habitat for the survival of a species and assumed to contain at least one of the primary constituent elements for the species but were excluded from the Critical Habitat designation. The USFWS has stated that any action within the excluded essential habitat that triggers a federal nexus will be required to undergo the Section 7(a)(1) process, and the species covered under the specific Critical Habitat designation would be afforded protection under Section 7(a)(2) of the federal ESA.

Essential Fish Habitat

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), federal agencies are required to consult with the NMFS for activities that may affect Essential Fish Habitat (EFH). EFH consists of the waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity, and includes several important components: adequate substrate; water quality; water quantity, depth, and velocity; channel gradient and stability; food; cover and habitat complexity; space; access and passage; and habitat connectivity (Pacific Fishery Management Council 2000).

3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the U.S. and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

3.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit [16 USC 668(a); 50 CFR 22]. USFWS may authorize take of bald eagles and golden eagles for activities where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided (50 CFR 22.26).

3.1.4 Federal Clean Water Act

The purpose of the federal Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the U.S." without a permit from the U.S. Army Corps of Engineers (USACE).

"Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to, the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines" (33 CFR § 328.2(f)). In addition, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands (over 0.5 acre of impact) may require an individual permit. Projects that only minimally affect wetlands (less than 0.5 acre of impact) may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

3.1.5 Rivers and Harbors Act

The Rivers and Harbors Act of 1899 (the Act) makes it a misdemeanor to discharge refuse matter of any kind into the navigable waters, or tributaries thereof, of the U.S. without a permit; or to excavate, fill, or alter the course, condition, or capacity of any port, harbor, channel, or other areas covered by the Act without a permit. The Act also makes it illegal to dam navigable streams without a license (or permit) from Congress.

Section 10 of the Act applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the U.S. and requires the approval of the USACE, Chief of Engineers.

The alteration of a USACE federally authorized civil works project requires a permit pursuant to Section 408 (33 USC 408, Section 14 of the Act). Projects with minimal impacts require approval by the USACE Sacramento District Construction Operations Group; however, projects with more substantial impacts may require USACE Headquarters review. Coordination with the Central Valley Flood Protection Board, who serve as the Non-Federal Sponsor, is required as a part of the process of obtaining a Section 408 permit.

Section 10 of the Act requires authorization from the Secretary of the Army, acting through the USACE, for the construction of any structure in or over any navigable Waters of the U.S. Structures or work outside the limits defined for navigable Waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the U.S., and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction.

3.2 State Regulations

3.2.1 California Fish and Game Code

California Endangered Species Act

The California ESA (Fish and Game Code Sections 2050-2116) generally parallels the main provisions of the federal ESA, but unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called "candidates" by the State). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered, threatened or candidate species or result in destruction or adverse modification of essential habitat.

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the federal ESA and California ESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the California ESA and/or federal ESA. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code § 4700 for mammals, § 3511 for birds, § 5050 for reptiles and amphibians, and § 5515 for fish) provide that fully protected species may not be taken or possessed at any time. Furthermore, the CDFW prohibits any state agency from issuing incidental take permits for fully protected species. The CDFW will issue licenses or permits for take of these species for necessary scientific research or live capture and relocation pursuant to the permit.

Native Plant Protection Act

The NPPA of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in California Fish and Game Code §§ 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

Birds of Prey

Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA.

Section 3503 of the California Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Additionally, Subsection 3503.5 prohibits the take, possession, or destruction of any birds and their nests in the orders Strigiformes (owls) or Falconiformes (hawks and eagles). These provisions, along with the federal MBTA, serve to protect nesting native birds.

3.2.2 Species of Special Concern

SSC are defined by CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under the federal ESA, California ESA or the California Fish and Game Code, but currently satisfy one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role;
- The species is listed as federally (but not State) threatened or endangered, or meets the State definition of threatened or endangered but has not formally been listed;
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for State threatened or endangered status.

SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, State-threatened, or endangered species are considered “significant” under CEQA.

3.2.3 California Rare Plant Ranks

The CNPS maintains the Inventory of Rare and Endangered Plants of California (CNPS 2020), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academia, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere.
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere.
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere.
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere.

- Rare Plant Rank 3 – a review list of plants about which more information is needed.
- Rare Plant Rank 4 – a watch list of plants of limited distribution.

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of 1 through 3, with 1 being the most threatened and 3 being the least threatened. Threat Ranks are generally present for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

- Threat Rank 0.1 – Seriously threatened in California (more than 80 percent of occurrences threatened/high degree and immediacy of threat).
- Threat Rank 0.2 – Moderately threatened in California (20-80 percent occurrences threatened/moderate degree and immediacy of threat).
- Threat Rank 0.3 – Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known).

Factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank; and differences in Threat Ranks do not constitute additional or different protection (CNPS 2017). Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, or 2 are typically considered significant under CEQA Guidelines § 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

3.2.4 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of stormwater runoff associated with construction activities. General Construction Permits for projects that disturb one or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, with any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities.

3.2.5 California Environmental Quality Act

In accordance with CEQA Guidelines § 15380, a species not protected on a federal or State list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in the federal ESA, California ESA, and §§ 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the CEQA Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either USFWS or CDFW.

CEQA Significance Criteria

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant, and are particularly relevant to SSC. Generally, impacts to listed (rare, threatened, or endangered) species are considered significant, requiring lead agencies through analysis in a CEQA document and often require mitigation to avoid or minimize potential impacts. Assessment of "impact significance" to populations of non-listed species (e.g., SSC) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

Specifically, § 15064.7 of CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) 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 sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or State HCP.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, State, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population-wide or region-wide basis.

3.2.6 Local Plans and Ordinances

Sutter County General Plan

The Biological Resources element of the *Sutter County General Plan Policy Document* includes several goals and policies focusing on fish and wildlife habitat, wetlands, riparian and other vegetation communities, open space preservation, and the Sutter Buttes. (Sutter County 2015).

The goals and policies emphasize conservation of function and values for wetland and riparian communities (including no-net loss of wetlands); preservation of special-status fish, wildlife, and plant species and habitats; prohibition of land mitigation within Sutter County for projects within other jurisdictions unless there is a benefit to Sutter County; and preservation of native oak trees when possible through the review of discretionary development projects and activities (Sutter County 2015).

4.0 METHODS

4.1 Literature Review

The following resources were reviewed to determine the special-status species that have been documented within or in the vicinity of the Study Area. Results of the species searches are included as Attachment A.

Live Oak Study Area:

- CDFW CNDDB data for the "Gridley, California" 7.5-minute quadrangles as well as the eight surrounding USGS quadrangles (CDFW 2020);
- USFWS Information, Planning, and Consultation System Resource Report List for the Study Area (USFWS 2020a); and
- CNPS' electronic Inventory of Rare and Endangered Plants of California was queried for the "Gridley, California" 7.5-minute quadrangles and the 10 surrounding quadrangles (CNPS 2020).

Additional background information was reviewed regarding the documented or potential occurrence of special-status species within or near the Study Area from the following sources:

- The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004 (California Department of Fish and Game [CDFG] 2005);
- California Bird Species of Special Concern (Shuford and Gardali 2008);
- Amphibian and Reptile Species of Special Concern in California (Thompson, Wright, and Shaffer 2016);
- Mammalian Species of Special Concern in California (Williams 1986);

- California's Wildlife, Volumes I-III (Zeiner, et al. 1988, 1990a, 1990b);
- A Guide to Wildlife Habitats of California (Mayer and Laudenslayer Jr., eds. 1988);
- USFWS Online Critical Habitat Mapper (USFWS 2020b); and
- NRCS Web Soil Survey (NRCS 2020a).

4.2 Site Reconnaissance

ECORP Biologists Keith Kwan and Gabrielle Attisani conducted the site reconnaissance visit April 8, 2020. The Study Area was systematically surveyed on foot using an ESO Arrow Global Positioning System unit with sub-meter accuracy, topographic maps, and aerial imagery to ensure total site coverage. Special attention was given to identifying those portions of the Study Area with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring onsite were characterized and the following biological resource information was collected:

- Potential aquatic resources.
- Vegetation communities.
- Plant and animal species directly observed.
- Animal evidence (e.g., scat, tracks).
- Existing active raptor nest locations.
- Burrows and any other special habitat features.
- Representative Study Area photographs (Attachment).
- An aquatic resources delineation in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE 2008a) was conducted during the April 2020 site visit.

5.0 RESULTS

5.1 Site Characteristics and Land Use

The Study Area includes the Feather River, the Live Oak Boat Ramp (operated by Sutter County), and surrounding lands on the west bank of the Feather River. The developed portions of the boat ramp include a paved roadway, parking area, the boat ramp, and landscaped picnic/day-use areas. The undeveloped areas around the boat ramp include riverbank riparian habitat.

5.2 Special-Status Species Considered for the Project

Based on species occurrence information from the literature review and observations in the field, a list of special-status plant and animal species that have the potential to occur within the Study Areas was generated . Only special-status species as defined in Section 1.3 were included in this analysis. Each of these species' potential to occur within the Study Areas was assessed based on the following criteria:

- **Present** - Species was observed during the site visit or is known to occur within the Study Area based on documented occurrences within the CNDDB or other literature.
- **Potential to Occur** - Habitat (including soils and elevation requirements) for the species occurs within the Study Area.
- **Low Potential to Occur** - Marginal or limited amounts of habitat occurs and/or the species is not known to occur within the vicinity of the Study Area based on CNDDB records and other available documentation.
- **Absent** - No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur within the vicinity of the Study Area based on CNDDB records and other documentation.

5.2.1 Land Cover Types and Vegetation Communities

Vegetation communities or land cover types found within the Study Area included riparian woodland and paved/developed. Descriptions of the land cover types and vegetation communities present within the Study Area are provided below.

Riparian Woodland

Riparian woodland is found along the riverbanks and in unimproved areas around the boat ramp and day-use facilities of the Study Area. The riparian woodland vegetation is made up of a closed canopy of mature trees including Fremont's cottonwood (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*), with scattered valley oak (*Quercus lobata*), and box elder (*Acer negundo*). Other plants found in the understory included sandbar willow (*Salix exigua*) and other willow species, Himalayan blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*).

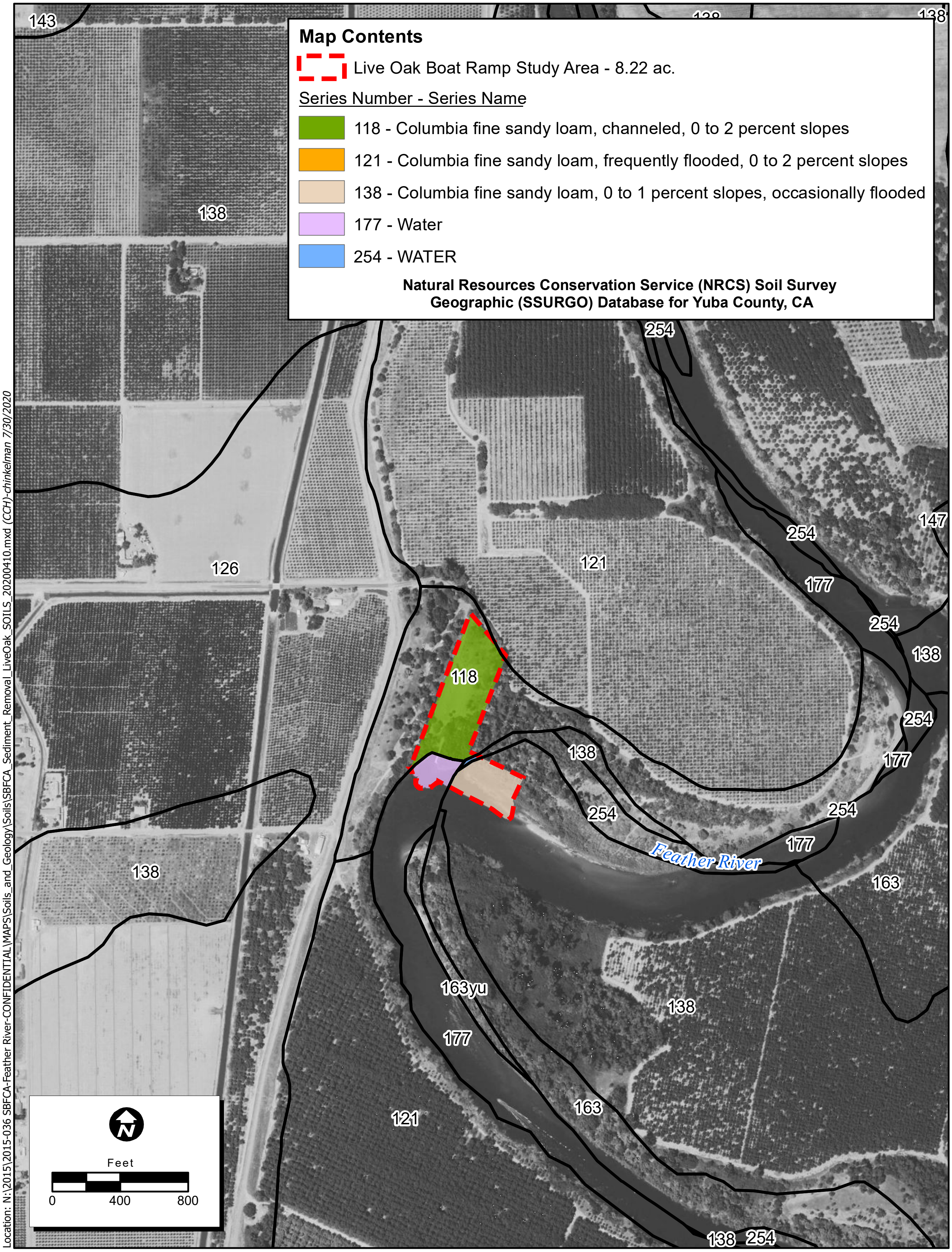
Paved/Developed

Paved, developed portions of the Study Area are characterized by existing paved roads and parking areas, compacted dirt/gravel parking areas, and pedestrian paths to the Feather River. The majority of the dirt/gravel roads and paths were unvegetated.

5.3 Soils

According to the Web Soil Survey (NRCS 2020a), three soil units, or types, have been mapped within the Study Area (Figure 4. *Natural Resources Conservation Service Soil Types*):

- 118 – Columbia fine sandy loam, channeled, 0 to 2 percent slopes
- 121 – Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes
- 138 – Columbia fine sandy loam, 0 to 1 percent slopes, occasionally flooded



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Soils_and_Geology\Soils\SBFCA_Sediment_Removal_LiveOak_SOILS_20200410.mxd (CCH)-chinkelman 7/30/2020

Map Date: 7/30/2020
Photo Source: NAIP (2018)

Figure 4. Natural Resources Conservation Service Soil Types

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

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All of these soil units contain hydric components and are considered hydric (NRCS 2020b).

5.4 Aquatic Resources

A total of 2.385 acres of aquatic resources have been mapped within the Study Area (Table 1). A discussion of the aquatic resources is presented below and the aquatic resources delineation map for the Study Area is presented on Figure 5. *Aquatic Resources Delineation*.

Wetlands

Water Primrose Marsh

The water primrose marsh is an area adjacent to the Feather River and above the ordinary high-water mark/existing water level. This marsh is in a portion of the riverbank that is subject to heavy sediment deposition. At the time of the April 2020 field survey, the Feather River water elevation was several feet below that of the marsh. The marsh is dominated entirely of water primrose.

Other Waters/Non-Wetland Waters

Feather River

The Feather River is perennial and exhibits bed and bank. Flows and water levels are regulated upstream at Oroville Dam. The limits of the river, for purposes of this study, were delineated at the water's edge on the day of the field survey (April 8, 2020), or based on aerial photograph interpretation (Google Earth imagery date: May 17, 2018) and were not based on a specific elevation or gage data. Levees line the Feather River.

5.5 Wildlife Observations

The Study Area supports a variety of common wildlife species. A detailed list of wildlife species observed in the vicinity of the Study Area during the April site visit is included as Attachment C.

5.6 Evaluation of Species Identified in the Literature Search

A list of all of the special-status plant and wildlife species identified in the literature search as potentially occurring within the Study Areas is provided in Table 1. This table includes the listing status for each species, a brief habitat description, and a determination on the potential to occur in or near the Study Area. Following the table is a brief description of each species with potential to occur.

Figure 5.
Aquatic Resources Delineation

Sample Points	Type	Latitude	Longitude
1	Waters Point	39.273400	-121.631554
2	Upland Point	39.273404	-121.631514
3	Waters Point	39.273397	-121.631736

Map Features

Live Oak Boat Ramp Study Area - 8.22 ac.

Reference Coordinates

Feature Type

Upland Point

Waters Point

Aquatic Resources Delineation[1]*

Wetland

Water Primrose Marsh

Non-Wetland Aquatic Resources

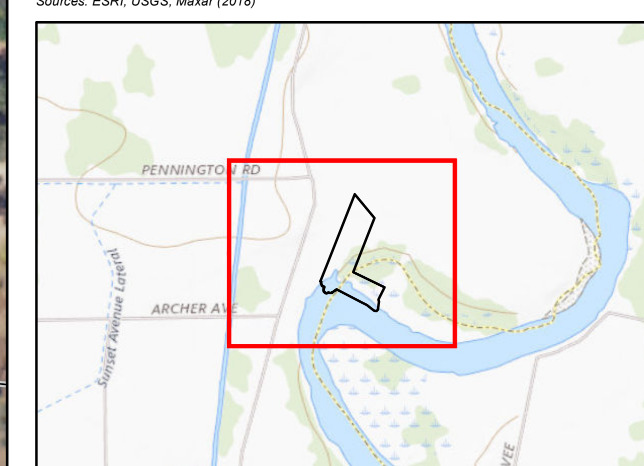
Feather River OHWM

Aquatic Resources	Total (acres)
Wetlands	***0.479***
Water Primrose Marsh	0.479
Non-wetland Aquatic Resources	***1.906***
Feather River OHWM	1.906
Total (acres)	**2.385**

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Sources: ESRI, USGS, Maxar (2018)



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ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Jurisdictional_Delineation\USACE_Delineation\Sediment_Removal\Sediment_Removal\SBFCA_SedimentRemoval_LiveOak_ARD_20200731.mxd(CCH) -chinkelman 7/31/2020

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

Map Date: 7/31/2020

Several species and sensitive habitat types came up in the database and literature searches (Attachment A) but are not included in Table 1 because the species have been formally delisted or are only tracked by the CNDDB and possess no special-status, or because the identified sensitive habitats are not located within the Study Area. They are not discussed further in this report.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Plants						
Ferris' milk-vetch *(Astragalus tener* var. *ferrisiae)*	–	–	1B.1	Vernally mesic meadows and seeps and in sub-alkaline flats within valley and foothill grasslands (7'–246').	April–May	Absent. No suitable habitat within Study Area.
Heartscale *(Atriplex cordulata* var. *cordulata)*	–	–	1B.2	Alkaline or saline habitat within valley and foothill grasslands, meadows and seeps, and chenopod scrub communities (0'–1,837').	April–October	Absent. No suitable habitat within Study Area.
Lesser saltscale *(Atriplex minuscula)*	–	–	1B.1	Alkaline, sandy soils in chenopod scrub, playas, and valley and foothill grassland (49'–656').	May–October	Absent. No suitable habitat within Study Area.
Subtle orache *(Atriplex subtilis)*	–	–	1B.2	Alkaline soils within valley and foothill grassland (131'–328').	Jun, Aug, Sep	Absent. No suitable habitat within Study Area.
Mexican mosquito fern *(Azolla microphylla)*	–	–	4.2	Marshes and swamps, ponds or slow-moving bodies of water (98'–328').	August	Low potential to occur. Marginally suitable habitat within Study Area.
Valley brodiaea (*Brodiaea rosea* ssp. *vallicola*)	–	–	4.2	Old alluvial terraces with silty, sandy, or gravelly loam within vernal pools and swales in valley and foothill grassland (33'–1,100').	April–May	Absent. No suitable habitat within Study Area.
Pink creamsacs *(Castilleja rubicundula* var. *rubicun dula)*	–	–	1B.2	Serpentinite substrates in chaparral openings, cismontane woodland, meadows and seeps, and valley and foothill grassland (66'–2,986').	April–June	Absent. No suitable habitat within Study Area.
Pappose tarplant (*Centromadia parryi* ssp. *parryi*)	–	–	1B.2	Often on alkaline soils within chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, vernally mesic valley and foothill grassland (0'–1,378').	May–November	Absent. No suitable habitat within Study Area.
Parry's rough tarplant *(Centromadia parryi* ssp. *rudis)*	–	–	4.2	Alkaline, vernally mesic seeps in valley and foothill grassland and vernal pools, sometimes found on roadsides (0'–328').	May–October	Absent. No suitable habitat within Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Red-stemmed cryptantha *(Cryptantha rostellata)*	-	-	4.2	Often roadsides and gravelly, volcanic openings within cismontane woodland and valley and foothill grassland (131' – 2,624').	April-June	Low potential to occur. Marginally suitable habitat within Study Area.
Recurved larkspur *(Delphinium recurvatum)*	–	–	1B.2	Alkaline soils in chenopod scrub, cismontane woodland, and valley and foothill grasslands (10'–2,592').	March–June	Absent. No suitable habitat within Study Area.
Shield-bracted monkeyflower *(Erythranthe glaucescens)*	-	-	4.3	Serpentinite seeps and sometimes streambanks within chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (197' – 4,068').	February-August	Low potential to occur. Marginally suitable habitat within Study Area.
Water star-grass (*Heteranthera dubia*)	–	–	2B.2	Alkaline, still or slow-moving water in marshes and swamps. Requires a pH of 7 or higher, usually in slightly eutrophic waters.	July-October	Absent. No suitable habitat within Study Area.
Woolly rose-mallow *(Hibiscus lasiocarpos* var. *occidentalis)*	–	–	1B.2	Marshes and freshwater swamps. Often in riprap on sides of levees (0'–394').	June–September	Potential to occur. Suitable habitat present within the Study Area.
Ahart's dwarf rush *(Juncus leiospermus* var. *ahartii)*	–	–	1B.2	Mesic areas in valley and foothill grassland. Species has an affinity for slight disturbance such as farmed fields (USFWS 2005) (98'–751').	March–May	Absent. No suitable habitat within Study Area.
Red Bluff dwarf rush *(Juncus leiospermus* var. *leiospermus)*	–	–	1B.1	Vernally mesic areas in chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools (115'–4,101').	March–June	Absent. No suitable habitat within Study Area.
Colusa layia *(Layia septentrionalis)*	–	–	1B.2	Sandy or serpentinite soils in chaparral, cismontane woodland, and valley and foothill grasslands (328'–3,593').	April–May	Low potential to occur. Marginally suitable habitat within Study Area.
Woolly meadowfoam *(Limnanthes floccosa* ssp. *floccosa)*	–	–	4.2	Vernally mesic chaparral, cismontane woodland, valley and foothill grassland, and vernal pools (197'–4,380').	March–May	Absent. No suitable habitat within Study Area.
Veiny monardella *(Monardella venosa)*	–	–	1B.1	Heavy clay soils in cismontane woodland and valley and foothill grasslands (197'–1,345').	May–July	Absent. No suitable habitat within Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Baker's navarretia *(Navarretia leucocephala* ssp. *bakeri)*	–	–	1B.1	Vernal pools and mesic areas within cismontane woodlands, lower montane coniferous forests, meadows and seeps, and valley and foothill grasslands (16'–5,709').	April–July	Absent. No suitable habitat within Study Area.
Adobe navarretia *(Navarretia nigelliformis* ssp. *nigellif ormis)*	–	–	4.2	Clay and sometimes serpentinite soils in vernally mesic valley and foothill grasslands and sometimes in vernal pools (328'–3,281').	April–June	Absent. No suitable habitat within Study Area.
Slender Orcutt grass *(Orcuttia tenuis)*	FT	CE	1B.1	Vernal pools, often gravelly (115'–5,774').	May–September	Absent. No suitable habitat within Study Area.
Ahart's paronychia *(Paronychia ahartii)*	–	–	1B.1	Cismontane woodland, valley and foothill grassland, and vernal pools (98'–1673').	February-June	Low potential to occur. Marginally suitable habitat present within the Study Area.
Wine-colored tufa moss *(Plagiobryoides vinosula)*	–	–	4.2	Usually in granitic rock or granitic soil along seeps and streams, sometimes in clay in cismontane woodland, Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, and riparian woodland (98'–5,692').	–	Low potential to occur. Marginally suitable habitat within Study Area.
Hartweg's golden sunburst *(Pseudobahia bahiifolia)*	FE	CE	1B.1	Clay, often acidic soils in cismontane woodland, valley and foothill grasslands (49'–492').	March–April	Low potential to occur. Marginally suitable habitat within Study Area.
California alkali grass (*Puccinellia simplex*)	–	–	1B.2	Alkaline, vernally mesic areas in sinks, flats and lake margins in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools (7'–3,051').	March–May	Absent. No suitable habitat within Study Area.
Sanford's arrowhead *(Sagittaria sanfordii)*	–	–	1B.2	Shallow marshes and freshwater swamps (0'–2,133').	May–October	Low potential to occur. Marginally suitable habitat within Study Area.
Greene's tuctoria *(Tuctoria greenei)*	FE	CR	1B.1	Vernal pools (98'–3,510').	May–July	Absent. No suitable habitat within Study Area.
Brazilian watermeal *(Wolffia brasiliensis)*	–	–	2B.3	Assorted shallow freshwater marshes and swamps (66'–328').	April–December	Low potential to occur. Marginally suitable habitat within Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Invertebrates						
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	-	-	Elderberry shrubs.	Any season	Absent. No suitable habitat (elderberry shrubs) within Study Area.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	-	-	Vernal pools/wetlands	November - April	Absent. No suitable habitat within Study Area.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	-	-	Vernal pools/wetlands.	November - April	Absent. No suitable habitat within Study Area.
Fish						
Delta smelt (*Hypomesus transpacificus*)	FT	CE	-	Sacramento-San Joaquin delta.	N/A	Absent. Outside the known range for this species.
Pacific lamprey (*Lampetra tridentata*)	-	-	SSC	Anadromous; undammed streams rivers, streams, and creeks with gravel spawning substrates.	N/A	Present [2]
River lamprey (*L. ayresi*)	-	-	SSC	Anadromous; undammed streams rivers, streams, and creeks with gravel spawning substrates.	N/A	Present [2]
Sacramento hitch (*Lavinia exilicauda*)	-	-	SSC	Low-velocity habitats of warm water rivers and lakes	N/A	Present [2]
Sacramento splittail (*Pogonichthys macrolepidotus*)	-	-	SSC	Estuarine environments, rivers, sloughs, and alkaline lakes.	N/A	Low potential to occur. Historically present prior to substantial hydrologic alterations
Hardhead (*Mylopharodon conocephalus*)	-	-	SSC	Relatively undisturbed streams at low to mid elevations in the Sacramento-San Joaquin and Russian River drainages. In the San Joaquin River, scattered populations found in tributary streams, but only rarely in the valley reaches of the San Joaquin River.	N/A	Present [2]
Chinook salmon (Central Valley fall-run/late fall-run evolutionarily significant units [ESU]) (*Oncorhynchus tshawytscha*)	SC	--	SSC	Anadromous; undammed cold water rivers and streams having riffles with large gravel substrates and relatively deep pools.	N/A	Present [2]

Table 1. Potentially Occurring Special-Status Species						
Common Name (Scientific Name)	**Status[1]**			**Habitat Description**	**Survey Period**	**Potential To Occur Onsite**
	FESA	**CESA/ NPPA**	**Other**			
Chinook salmon (Central Valley spring-run ESU)	FT	T	-	Anadromous; undammed cold water rivers and streams having riffles with large gravel substrates and relatively deep pools.	N/A	Present [2]
Steelhead (Central Valley distinct population segment [DPS]) (*Oncorhynchus mykiss*)	FT	-	-	Anadromous; undammed cold water rivers and streams having riffles with gravel substrates and relatively deep pools.	N/A	Present [2]
Green Sturgeon (Southern DPS) (*Acipenser medirostris*)	FT	-	-	Anadromous; undammed cold water rivers having relatively deep pools with large substrates.	N/A	Low potential to occur. There is little past or current evidence of occurrence or spawning in the Feather Rivers.
Riffle sculpin (*Cottus gulosus*)	-	-	SSC	Riffles or pools of cold headwater streams having coarse substrates and adequate cover.	N/A	Present [2]
Amphibians						
California tiger salamander (Central California DPS) (*Ambystoma californiense*)	FT	CT	SSC	Vernal pools, wetlands (breeding) and adjacent grassland or oak woodland; needs underground refuge (e.g., ground squirrel and/or gopher burrows). Largely terrestrial as adults.	March-May	Absent. Outside known range and no suitable habitat present.
California red-legged frog (*Rana draytonii*)	FT	-	SSC	Lowlands or foothills at waters with dense shrubby or emergent riparian vegetation. Adults must have aestivation habitat to endure summer dry down.	May 1 - November 1	Absent. Outside known range and no suitable habitat present.
Foothill yellow-legged frog (*Rana boylii*)	-	CC	SSC	Foothill yellow-legged frogs can be active all year in warmer locations, but may become inactive or hibernate in colder climates. At lower elevations, foothill yellow-legged frogs likely spend most of the year in or near streams. Adult frogs, primarily males, will gather along main-stem rivers during spring to breed.	May - October	Absent. Outside known range and no suitable habitat present.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Reptiles						
Northwestern pond turtle (*Actinemys marmorata*)	-	-	SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches.	April-September	Potential to occur. Suitable habitat within the Study Area.
Giant garter snake (*Thamnophis gigas*)	FT	CT		Freshwater ditches, sloughs, and marshes in the Central Valley. Almost extirpated from the southern parts of its range.	April - October	Absent. No suitable habitat within the Study Area.
Birds						
Yellow-billed cuckoo (*Coccyzus americanus*)	FT	CE	BCC	Breeds in California, Arizona, Utah, Colorado, and Wyoming. In California, they nest along the upper Sacramento River and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other known nesting locations include Feather River (Butte, Yuba, Sutter counties), Prado Flood Control Basin (San Bernardino and Riverside counties), Amargosa River and Owens Valley (Inyo Co.), Santa Clara River (Los Angeles Co.), Mojave River and Colorado River (San Bernardino Co.). Nests in riparian woodland. Winters in South America.	June 15- August 15	Potential-suitable nesting habitat is present and within 500 feet of the Study Area.
California black rail (*Laterallus jamaicensis coturniculus*)	-	CT	BCC, CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills (Butte, Yuba, Nevada, Placer, El Dorado counties)	March-September (breeding)	Absent. No suitable nesting habitat within the Study Area.
Greater sandhill crane *(Antigone canadensis tabida)*	-	CT	CFP	Breeds in NE California, Nevada, Oregon, Washington, and BC, Canada; winters from CA to Florida. In winter, they forage in burned grasslands, pastures, and feed on waste grain in a variety of agricultural settings (corn, wheat, milo, rice, oats, and barley), tilled fields, recently planted fields, alfalfa fields, row crops and burned rice fields.	March-August (breeding); September-March (wintering)	Absent. No suitable wintering habitat within the Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1]			Habitat Description	Survey Period	Potential To Occur Onsite
	FESA	CESA/ NPPA	Other			
Bald eagle (*Haliaeetus leucocephalus*)	Delisted	CE	CFP, BCC	Typically nests in forested areas near large bodies of water in the northern half of California; nest in trees and rarely on cliffs; wintering habitat includes forest and woodland communities near water bodies (e.g. rivers, lakes), wetlands, flooded agricultural fields, open grasslands	February – September (nesting); October-March (wintering)	Low potential to occur. Suitable nesting habitat is present but the area is small and people are constantly present.
White-tailed kite (*Elanus leucurus*)	-	-	CFP	Nesting occurs within trees in low elevation grassland, agricultural, wetland, oak woodland, riparian, savannah, and urban habitats.	March-August	Potential to occur. Suitable habitat within the Study Area.
Northern harrier (*Circus hudsonius*)	-	-	SSC	Nests on the ground in open wetlands, marshy meadows, wet/lightly grazed pastures, (rarely) freshwater/brackish marshes, tundra, grasslands, prairies, croplands, desert, shrub-steppe, and (rarely) riparian woodland communities.	April-September	Absent. No suitable habitat within the Study Area.
Swainson's hawk (*Buteo swainsoni*)	-	CT	BCC	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures	March-August	Potential to occur. Suitable nesting habitat within the Study Area.
Burrowing owl *(Athene cunicularia)*	-	-	BCC, SSC	Nests in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g. prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds.	February-August	Absent. No suitable habitat within the Study Area.
Nuttall's woodpecker *(Dryobates nuttallii)*	-	-	BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands.	April-July	Potential to occur. Suitable nesting habitat within the Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	Status[1] CESA/ NPPA	Status[1] Other	Habitat Description	Survey Period	Potential To Occur Onsite
Least Bell's vireo (*Vireo bellii pusillus*)	FE	CE	BCC	In California, breeding range includes Ventura, Los Angeles, Riverside, Orange, San Diego, and San Bernardino counties., and rarely Stanislaus and Santa Clara counties. Nesting habitat includes dense, low shrubby vegetation in riparian areas, brushy fields, young second-growth woodland, scrub oak, coastal chaparral and mesquite brushland. Winters in southern Baja California Sur.	April 1-July 31	Absent. Species is extirpated from the region.
Yellow-billed magpie (*Pica nuttallii*)	-	-	BCC	Endemic to California; found in the Central Valley and coast range south of San Francisco Bay and north of Los Angeles County; nesting habitat includes oak savannah with large in large expanses of open ground; also found in urban parklike settings.	April-June	Potential to occur. Suitable nesting habitat within the Study Area.
Bank swallow (*Riparia riparia*)	-	CT	-	Nests colonially along coasts, rivers, streams, lakes, reservoirs, and wetlands in vertical banks, cliffs, and bluffs in alluvial, friable soils. May also nest in sand, gravel quarries and road cuts. In California, breeding range includes northern and central California.	May-July	Absent. No suitable habitat within the Study Area.
Oak titmouse (*Baeolophus inornatus*)			BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree)	March-July	Potential to occur. Suitable nesting habitat within the Study Area.
Wrentit *(Chamaea fasciata)*	-	-	BCC	Coastal sage scrub, northern coastal scrub, chaparral, dense understory of riparian woodlands, riparian scrub, coyote brush and blackberry thickets, and dense thickets in suburban parks and gardens.	March-August	Potential to occur. Suitable nesting habitat within the Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Lawrence's goldfinch (*Spinus lawrencei*)	-	-	BCC	Breeds in Sierra Nevada and inner Coast Range foothills surrounding the Central Valley and the southern Coast Range to Santa Barbara County east through southern California to the Mojave Desert and Colorado Desert into the Peninsular Range. Nests in arid and open woodlands with chaparral or other brushy areas, tall annual weed fields, and a water source (e.g., small stream, pond, lake), and to a lesser extent riparian woodland, coastal scrub, evergreen forests, pinyon-juniper woodland, planted conifers, and ranches or rural residences near weedy fields and water.	March-September	Absent. No suitable habitat within the Study Area.
Song sparrow "Modesto" (*Melospiza melodia heermanni*)	-	-	BCC, SSC	Resident in central and southwest California, including Central Valley; nests in marsh, scrub habitat	April-June	Potential to occur. Suitable nesting habitat within the Study Area.
San Clemente spotted towhee (*Pipilo maculatus clementae*)	-	-	BCC, SSC	Resident on Santa Catalina and Santa Rosa Islands; extirpated on San Clemente Island, California. Breeds in dense, broadleaf shrubby brush, thickets, and tangles in chaparral, oak woodland, island woodland, and Bishop pine forest.	Year round resident; breeding season is April-July	Absent. This subspecies is not found in the region.
Tricolored blackbird (*Agelaius tricolor*)	-	CT	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta counties south to San Bernardino, Riverside and San Diego counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields.	March-August	Absent. No suitable habitat within the Study Area.

Table 1. Potentially Occurring Special-Status Species						
	Status[1]					
Common Name (Scientific Name)	**FESA**	**CESA/ NPPA**	**Other**	**Habitat Description**	**Survey Period**	**Potential To Occur Onsite**
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	-	-	BCC, SSC	Breeds in salt marshes of San Francisco Bay; winters San Francisco south along coast to San Diego Co.	March-July	Absent. This subspecies is not found in the region.
Mammals						
Pallid bat *(Antrozous pallidus)*	-	-	SSC	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (Western Bat Working Group [WBWG] 2017).	April-September	Absent. No suitable habitat within the Study Area.
Ringtail (*Bassariscus astutus*)	-	-	FP	Most often found in riparian corridors in forested, shrubby habitats. Dens in rock outcrops, hollow trees and snags at low to middle elevations. Its range includes the North and South Coast Ranges, Sierra Nevada, Cascades, and the mountainous areas of the Mojave Desert.	Any season	Potential to occur. Suitable habitat with the Study Area.
Townsend's big-eared bat *(Corynorhinus townsendii)*	-	-	SSC	Caves, mines, buildings, rock crevices, trees.	April-September	Absent. No suitable habitat within the Study Area.

Table 1. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1] FESA	CESA/ NPPA	Other	Habitat Description	Survey Period	Potential To Occur Onsite
Marysville California kangaroo rat *(Dipodomys californicus eximius)*	-	-	SSC	Dipodomys californicus inhabits open grasslands or open areas in mixed chaparral. It prefers areas that get less than 50 cm of precipitation per year, and requires well drained soils that are suitable for burrowing. This species requires fine sand or soil for dust bathing. It is found from elevations of 60 to 400 m (Brylski, 2001; Kelt, 1988)	Any season	Absent. No suitable habitat within the Study Area.
Western mastiff bat (*Eumops perotis californicus*)	-	-	SSC	Primarily a cliff-dwelling species, found in similar crevices in large boulders and buildings (WBWG 2017).	April-September	Absent. No suitable habitat within the Study Area.
Western red bat (*Lasiurus blossevillii*)	-	-	SSC	Roosts in foliage of trees or shrubs; Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2017).	April-September	Potential to occur. Suitable habitat within the Study Area.
American badger *(Taxidea taxus)*	-	-	SSC	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils.	Any season	Absent. No suitable habitat within the Study Area.

Status Codes[1]:

FE ESA listed, Endangered.
FT ESA listed, Threatened.
FC Candidate for ESA listing as Threatened or Endangered.
FP CDFW Fully Protected
WL CDFW Watch List
CE CESA or NPPA listed, Endangered.
CT CESA or NPPA listed, Threatened.
CR CESA or NPPA listed, Rare.
CC Candidate for CESA listing as Threatened or Endangered
CFP California Fish and Game Code Fully Protected Species (§ 3511-birds, § 4700-mammals, § 5050-reptiles/amphibians).
CH Critical habitat for the species is mapped within the Study Area.
SSC CDFW Species of Special Concern
SC Federal Species of Concern
BCC USFWS Bird of Conservation Concern
1B CRPR /Rare or Endangered in California and elsewhere.
2B CRPR /Rare or Endangered in California, more common elsewhere.
4 CRPR /Plants of Limited Distribution - A Watch List.
0.1 Threat Rank/Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat)
0.2 Threat Rank/Moderately threatened in California (20-80 percent occurrences threatened / moderate degree and immediacy of threat)
0.3 Threat Rank/Not very threatened in California (<20 percent of occurrences threatened / low degree and immediacy of threat or no current threats known)

[2] Source: San Joaquin River Restoration Program 2014.

5.6.1 Plants

A total of 29 special-status plant species were identified as having the potential to occur within the Study Area based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, 19 of those species were determined to not have potential to occur within the Study Area due to the absence of suitable habitat or the Study Area was outside the elevational range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining 10 species that have the potential to occur within the Study Area are presented below.

Mexican Mosquito Fern

Mexican mosquito fern (*Azolla microphylla*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual/perennial that occurs in marshes and swamps (e.g., ponds and slow-moving water) (CNPS 2020). Mexican mosquito fern blooms in August and is known to occur at elevations ranging from 98 to 328 feet above MSL (MSL) (CNPS 2020). The current range for Mexican mosquito fern in California includes Butte, Colusa, Glenn, Inyo, Kern, Lake, Modoc, Nevada, Plumas, San Bernardino, Santa Clara, San Diego, and Tulare counties (CNPS 2020).

While there are no CNDDB documented occurrences of Mexican mosquito fern within 10 miles of the Live Oak Study Area (CDFW 2020), the water primrose marsh within the Study Area provides marginally suitable habitat for this species. Mexican mosquito fern has low potential to occur onsite.

Red-Stemmed Cryptantha

Red-stemmed cryptantha (*Cryptantha rostellata*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs on gravelly, volcanic openings as well as roadsides, in cismontane woodland and valley and foothill grassland (CNPS 2020). Red-stemmed cryptantha blooms between April and June and is known to occur at elevations ranging from 131 to 2,625 feet above MSL (CNPS 2020). The current range of this species includes Butte, Colusa, Glenn, Mariposa, Napa, Shasta, Siskiyou, Sutter, Tehama, and Trinity counties (CNPS 2020).

While there are no CNDDB documented occurrences of red-stemmed crypantha within five miles of the Study Area (CDFW 2020), the ruderal vegetation and riparian woodland within the Study Area provides marginally suitable habitat for this species. Red-stemmed crypantha has low potential to occur onsite.

Shield-Bracted Monkeyflower

Shield-bracted monkeyflower (*Erythranthe glaucescens*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 4.3 species. This species is an herbaceous annual that occurs in serpentine seeps and sometimes streambanks of chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (CNPS 2020). Shield-bracted monkeyflower blooms from February through August and is known to occur at elevations ranging from 196 to 4,069 feet above MSL (CNPS 2020). The current range of this species includes Butte, Colusa, Lake, Nevada, Shasta, and Tehama counties (CNPS 2020).

While there are no CNDDB documented occurrences of shield-bracted monkeyflower within five miles of the Study Area (CDFW 2020), the streambank within the Study Area provides marginally suitable habitat for this species. Shield-bracted monkeyflower has low potential to occur onsite.

Woolly Rose-Mallow

Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis)* is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a rhizomatous, herbaceous perennial that occurs in marshes and freshwater swamps, and often in riprap on sides of levees (CNPS 2020). Rose-mallow blooms from June through September and is known to occur at elevations ranging from sea level to 394 feet above MSL (CNPS 2020). Rose-mallow is endemic to California; the current range of this species in California includes Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo counties (CNPS 2020).

While there are no CNDDB documented occurrences of wooly rose-mallow within five miles of the Study Area (CDFW 2020), the marsh and streambanks within the Study Area provide suitable habitat for this species. Woolly rose-mallow has potential to occur onsite.

Colusa Layia

Colusa layia (*Layia septentrionalis*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in sandy or serpentinite soils in chaparral, cismontane woodland, and valley and foothill grasslands (CNPS 2020). Colusa layia blooms from April to May and is known to occur at elevations ranging from 328 to 3,593 feet above MSL (CNPS 2020). Colusa layia is endemic to California; the current range of this species includes Butte, Colusa, Glenn, Lake, Mendocino, Napa, Sonoma, Sutter, Tehama, and Yolo counties (CNPS 2020).

While there are no CNDDB documented occurrences of Colusa layia within five miles of the Study Area (CDFW 2020), the ruderal vegetation within the Study Area provides marginally suitable habitat for this species. Colusa layia has low potential to occur onsite.

Ahart's Paronychia

Ahart's paronychia (*Paronychia ahartii*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. Ahart's paronychia is an annual herb that occurs in cismontane woodland, valley foothill and grassland, and vernal pools (CNPS 2020). Ahart's paronychia blooms from February through June, and is known to occur at elevations ranging from 98 to 1,673 feet above MSL (CNPS 2020). Ahart's paronychia is endemic to California; the current range for this species is Butte, Shasta and Tehama counties (CNPS 2020).

While there are no CNDDB documented occurrences of Ahart's paronychia within five miles of the Study Area (CDFW 2020), ruderal vegetation within the Study Area provides marginally suitable habitat for this species. Ahart's paronychia has low potential to occur onsite.

Wine-Colored Tufa Moss

Wine-colored tufa moss (*Plagiobryoides vinosula*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is a moss that occurs usually in granitic rock or granitic soil along seeps and streams (or sometimes in clay) within cismontane woodland, Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, or riparian woodland (CNPS 2020). Wine-colored tufa moss is known to occur at 98 to 5,692 feet above MSL (CNPS 2020). The current range of this species is Butte, Fresno, Inyo, Kern, Lake, Monterey, San Bernardino, San Diego, and Tulare counties (CNPS 2020).

While there are no CNDDB documented occurrences of wine-colored tufa moss within five miles of the Study Area (CDFW 2020), the riparian woodland within the Study Area provides marginally suitable habitat for this species. Wine-colored tufa moss has low potential to occur onsite.

Hartweg's Golden Sunburst

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is listed as endangered pursuant to both the federal and California ESAs, and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs on clay soils that are often acidic in cismontane woodlands, and valley and foothill grasslands (CNPS 2020). Hartweg's golden sunburst blooms from March to April and is known to occur at elevations ranging from 49 to 492 feet above MSL (CNPS 2020). Hartweg's golden sunburst is endemic to California; the current range of this species includes Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties (CNPS 2020). This species is believed to be extirpated from Yuba County (CNPS 2020).

There is one documented CNDDB documented occurrence of Hartweg's golden sunburst within five miles of the Study Area (CDFW 2020), the ruderal vegetation within the Study Area provides marginally suitable habitat for this species. Hartweg's golden sunburst has low potential to occur onsite.

Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is not listed pursuant to the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial rhizomatous herb that occurs in shallow, freshwater marshes and swamps (CNPS 2020). Sanford's arrowhead blooms from May through October, and is known to occur at elevations ranging from sea level to 2,133 feet above MSL (CNPS 2020). Sanford's arrowhead is endemic to California; the current range of this species includes Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Marin, Napa, Orange, Placer, Sacramento, San Bernardino, San Joaquin, Shasta, Solano, Tehama, Tulare, Ventura, and Yuba counties; it is believed to be extirpated from both Orange and Ventura counties (CNPS 2020).

While there are no CNDDB documented occurrences of Sanford's arrowhead within five miles of the Study Area (CDFW 2020), the marsh within the Study Area provides marginally suitable habitat for this species. Ahart's paronychia has low potential to occur onsite.

Brazilian Watermeal

Brazilian watermeal (*Wolffia brasiliensis*) is not listed pursuant to either the federal or California ESA, but is designated as a CRPR 2B.3 species. This species is an herbaceous perennial that occurs in assorted shallow freshwater marshes and swamps (CNPS 2020). Brazilian watermeal blooms from April through December and is known to occur at elevations ranging from 66 to 328 feet above MSL (CNPS 2020). The current range for Brazilian watermeal in California includes Butte, Glenn, Sutter and Yuba counties (CNPS 2020)

While there are no CNDDB documented occurrences of Brazilian watermeal within five miles of the Study Area (CDFW 2020), the marsh within the Study Area provides marginally suitable habitat for this species. Brazilian watermeal has low potential to occur onsite.

5.6.2 Fish

The lower Feather River in the Study Area provides migration, spawning, and rearing habitat for a diverse assemblage of native and non-native fish species, including both resident and anadromous (i.e., ocean migrating) species. At least 31 fish species, including 13 native and 18 non-native species, have been documented in the lower Feather River in the study (Seesholtz et al. 2004). A total of 10 special-status fish species were identified as having the potential to occur within Study Area based on the literature review (Table 1). Nine of these species were determined to have some potential to occur in the Study Area. These species are described below.

Chinook Salmon

Two separate ESUs of Chinook salmon occur in the study area: (1) an experimental population of Central Valley spring-run ESU, and (2) Central Valley fall-run ESU. Each of these ESUs is discussed below.

Central Valley Spring-run ESU Chinook Salmon

The Central Valley spring-run ESU Chinook salmon (spring-run ESU) was listed as a threatened species under the federal ESA on September 16, 1999 (50 CFR 50394) and under the California ESA in February 1999. The spring-run ESU includes all spawning populations in the Sacramento River and its tributaries, including the Feather River, and one artificial propagation program, the Feather River Hatchery spring-run Chinook program. Annual estimates of spring-run ESU escapement for the Feather River basin ranged from approximately 146 (1967) to 8,662 (2003) and was last estimated to be 2,110 in 2018 (GrandTab 2019).

The majority of spring-run Chinook salmon enters freshwater to spawn as three-year-old fish (Fisher 1994). Upstream migrations of adult spring-run Chinook salmon begin in late January and continue through September (CDFG 1998; NMFS 2014). These sexually immature fish hold in deep, cold freshwater pools of rivers to mature for several months prior to spawning (Moyle 2002) and generally enter their natal streams from mid-February through July (CDFG 1998). Spawning typically occurs from mid-August to early October, with peak spawning occurring in September (Moyle 2002). Embryo survival is dependent upon water temperatures between five to 13 degrees Celsius (°C) and high dissolved oxygen saturation (Moyle 2002). Embryos hatch in approximately 40 to 60 days, depending on water temperature, and remain in gravel as alevins for four to six weeks before emerging as fry from November through March (Moyle 2002). Juveniles typically reside in freshwater for 12 to 16 months and emigrate as yearlings from October through March, with peak emigration occurring from November to December (NMFS 2014).

The Feather River supports a population of Central Valley spring-run ESU Chinook salmon. Therefore, this ESU has potential to occur in the Study Area during the adult immigration and juvenile emigration periods.

Central Valley Fall-run/Late Fall-run ESU Chinook Salmon

The Central Valley fall-run ESU, a federal Species of Concern and California SSC, is currently the only run of Chinook salmon occurring naturally in the San Joaquin River basin and is the largest run in the Sacramento River basin. Annual estimates of fall-run escapement for the Feather River basin ranged from approximately 6,126 fish in 1990 to 203,515 fish in 2001 and was last estimated at 73,150 fish in 2018 (GrandTab 2019).

Adult fall-run Chinook salmon migrate into the San Joaquin and Sacramento river systems from September through January, with peak immigration occurring in October and November (Moyle 2002). Spawning typically occurs from October through December, and fry typically begin to emerge in late December and January. Fall-run Chinook salmon may emigrate as post-emergent fry, juveniles, or as smolts after rearing in their natal streams for up to six months.

The Feather River supports a population of Central Valley fall-run ESU Chinook salmon and, therefore, this ESU has potential to occur in the Study Area during the adult immigration and juvenile emigration periods.

California Central Valley DPS Steelhead

California Central Valley DPS steelhead, the anadromous form of rainbow trout, were listed as threatened under the federal ESA on March 19, 1998 (63 Federal Register [FR] 13347). This DPS includes steelhead populations in the Sacramento River and San Joaquin River, inclusive and downstream of the Merced River. The listing was updated to include Coleman National Fish Hatchery and Feather River Hatchery steelhead populations on January 5, 2006 (71 FR 834).

Adult steelhead, typically averaging 600 to 800 millimeters in length (Moyle et al. 1989), generally leave the ocean and begin upstream migration through the Delta to spawning reaches in the upper Sacramento and San Joaquin rivers and tributaries from August through March (McEwan 2001), with peak immigration occurring in January and February (Moyle 2002). Spawning generally occurs from January through April (McEwan and Jackson 1996). Redds are typically dug by female fish in water depths of 10 to 150 centimeters (cm) and where water velocities over redds range from 20 to 155 cm per second (Moyle 2002). Juvenile steelhead rear in their natal streams for one to three years prior to emigrating from the river. Emigration of one- to three-year old sub-adults primarily occurs from January through June (Snider and Titus 2000). Unlike Chinook salmon, steelhead are iteroparous (i.e., able to spawn repeatedly) and may spawn for up to four consecutive years before dying; however, it is rare for steelhead to spawn more than twice and the majority of repeat spawners are females (Busby et al. 1996). Although one-time spawners comprise the majority, Shapolov and Taft (1954) report that repeat spawners are relatively numerous (i.e., 17.2 percent) in California streams. Thus, kelts (post-spawning adults) may be present in the study area shortly after spawning (i.e., January through mid-April).

The lower Feather River supports a population of California Central Valley DPS steelhead and, therefore, the DPS has the potential to occur in the Study Area during the adult and juvenile migration periods.

Green Sturgeon

On April 7, 2006, NMFS proposed the Southern DPS of green sturgeon, which includes all fish populations south of the Eel River, California, as threatened under the federal ESA (71 FR 17757). The agency determined that the Northern DPS, which includes all populations north of the Eel River (inclusive), do not warrant listing. The designation of the Southern DPS was based on information demonstrating: (1) the majority of spawning adults are concentrated into one spawning river (i.e., the Sacramento River), (2) existence of continued threats that had not been adequately addressed since the previous green sturgeon status review, (3) downward trends in juvenile abundance, and (4) habitat loss in the upper Sacramento and Feather rivers. The Final Rule establishing take prohibitions for the Southern DPS was promulgated on June 2, 2010 (75 FR 30714).

Although little is known about the spawning habits of green sturgeon in the Sacramento-San Joaquin system, spawning times are thought to be similar to those documented for the Klamath River (Emmett et al. 1991). There are three general phases in green sturgeon life history: (1) freshwater stage (<three years old), (2) coastal migrants (three to13 years old for females; three to nine years old for males); and (3) adults (>13 years old for females, >nine years old for males) (EPIC et al. 2001). Adults typically migrate into fresh water beginning in late February; spawning occurs from March to July, with peak activity from April to June (Moyle et al. 2015). Emigration typically occurs after a period of over-summering followed by out-migration in the fall/winter period coinciding with increases in flow.

Based on information from catches of green sturgeon eggs, larvae, and juveniles, and additional data derived from monitoring studies of white sturgeon, it appears that green sturgeon in the Sacramento River spawn from above Hamilton City to above Red Bluff Diversion Dam, maybe as far upstream as Keswick Dam (CDFG 2002). Juvenile green sturgeon are believed to reside in freshwater habitats from one to three years, before emigrating to the Delta under winter high-flow events. However, the timing of emigration is unknown (EPIC et al. 2001). Following emigration from the upper Sacramento River, juvenile green sturgeon are widely distributed throughout the Delta (Radtke 1966).

Although adult green sturgeon have been documented occasionally in the Feather River, the numbers are low, sporadic, and there is limited evidence of historic or current spawning (Moser et al. 2016). However, green sturgeon eggs were collected in the Feather River in June 2011 (Seesholtz et al. 2015), indicating potentially successful spawning in this system. Based on this information, there is a low potential for green sturgeon to occur in the Study Area.

Pacific Lamprey

Pacific lamprey (*Lampetra tridentata*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC due to declining abundance throughout its range in California (Moyle et al. 2015). The reason for this decline is believed to be a secondary effect of the reduction in abundance of anadromous salmonids, the primary prey of Pacific lamprey.

Lampreys are eel-like, jawless fishes with a cartilaginous skeleton and disc-shaped, sucker-like mouths. Pacific lamprey are predatory and anadromous, although landlocked (i.e., potamodromous) populations exist in some inland water bodies. The adult predatory, ocean-residing stage typically lives for three to four years and these fish rarely stray far from the mouths of their natal streams (Moyle 2002). Adult fish ranging from 30-76 cm total length (TL) typically move upstream to spawning streams from March to late June (Moyle 2002). After males and females excavate a redd, the female attaches to the substrate and releases 20,200 to 200,000 eggs that are fertilized by males. The majority of adult fish die following spawning, although a small proportion may survive to spawn the following year at a larger size. The fertilized eggs hatch after approximately 19 days at 15°C (Moyle 2002). The larval ammocoetes remain in the gravel for a short period before emerging and being swept downstream, where they burrow into soft sediments and filter organic material from the substrates. Following a five- to seven-year residence period in freshwater, the ammocoetes undergo metamorphosis to an adult, predatory stage that is tolerant of saltwater and subsequently migrate downstream under high winter flows to the ocean.

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

River Lamprey

The river lamprey is a California SSC. The abundance of this species in California is believed to be declining, primarily due to degradation and fragmentation of suitable spawning and rearing habitats and declines in salmonid prey species (Moyle et al. 2015).

The river lamprey is relatively small (averaging 17 cm) and highly predaceous (Moyle 2002). They are anadromous and will attack fish in both fresh and salt water (Moyle 2002). The river lamprey is distributed in streams and rivers along the eastern Pacific Ocean from Juneau, Alaska, to San Francisco Bay. It may have its greatest abundance in the Sacramento–San Joaquin River system, although it is not commonly observed in large numbers (Moyle et al. 2015). A great deal of what is known about the river lamprey is from information on populations in British Columbia. There, adults migrate from the Pacific Ocean into rivers and streams in the fall and spawn from February through May. Adults will excavate a saucer-shaped depression in sand or gravel riffles where the eggs are deposited. After spawning, the adults perish. Ammocoetes remain in backwaters for several years, where they feed on algae and microorganisms (Moyle et al. 2015). The metamorphosis from juvenile to adulthood begins in July and is complete by the following April. Following completion of metamorphosis, river lamprey congregate immediately upriver from salt water and emigrate into the ocean in late spring (Moyle 2002).

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Sacramento Hitch

Sacramento hitch (*Lavinia exilicauda*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC due to long-term declines in abundance and distribution (Moyle et al. 2015). Major factors that may threaten the abundance and distribution of Sacramento hitch include major dams, water quality degradation associated with agricultural activities, alteration of the Sacramento-San Joaquin River Estuary, and invasive species (Moyle et al. 2015).

Sacramento hitch are relatively large (i.e., up to 35 cm TL), deep-bodied cyprinids that occur in warm low-elevation water bodies, including clear streams, turbid sloughs, lakes, and reservoirs (Moyle 2002). They have wide environmental tolerances, capable of withstanding short-term temperatures of nearly 38°C and salinities as high as nine parts per trillion (Moyle 2002). Sacramento hitch are omnivorous, feeding on zooplankton, filamentous algae, and aquatic and terrestrial insects (Moyle et al. 2015). Females typically mature in years two or three, while males mature in years one, two, or three. Spawning typically occurs in riffles of streams and in sloughs after spring rains increase flows and temperatures reach 14 to 18°C (Moyle 2002). Sacramento hitch are broadcast spawners that occur in groups with vigorous splashing. A spawning female releases 9,000 to 63,000 eggs into the water column, which are fertilized by one to five males immediately after their release. Fertilized eggs swell to approximately four times their initial size after settling into the substrate. Larvae hatch in three to seven days at 15 to 22°C and become free-swimming within three to four days (Moyle et al. 2015).

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Sacramento Splittail

Sacramento splittail (*Pogonichthys macrolepidotus*) is not listed pursuant to either federal ESA or California ESA; however, it was previously listed as a threatened species by the USFWS in 1999 and was subsequently delisted in 2003 in light of new information regarding the biology and status of the species (Moyle et al. 2004). It is currently designated by CDFW as a SSC due to declining abundance and distribution. Major factors that may threaten the abundance and distribution of Sacramento splittail include major dams, water quality degradation associated with agricultural activities, alteration of the Sacramento-San Joaquin River Estuary, and invasive species (Moyle et al. 2015).

Sacramento splittail relatively large (i.e., 40 cm TL) and long-lived (i.e., seven to 10 years) warm water fish typically found at water temperatures ranging from five to 24°C (Moyle 2002). When acclimated to elevated temperatures, splittail can tolerate temperatures up to 33°C (Moyle 2002). Adult splittail typically reach sexual maturity in their second year. Upon reaching maturity, adult splittail migrate upstream from November through February (Moyle 2002). Adults spawn on floodplains or flooded edge habitats in March and April at water temperatures between 14 and 19 degrees Fahrenheit (Moyle 2002) and then move back downstream. Eggs acquire adhesive properties following exposure to water and adhere to vegetation or other benthic substrates. Fertilized eggs generally hatch in three to five days and larvae begin feeding on plankton soon thereafter. Juvenile splittail inhabit shallow, low-velocity habitats with abundant vegetation as they migrate downstream to the Delta. Emigration through the lower Sacramento River occurs from February through August, with peak emigration occurring from March through June (Moyle 2002). Splittail are benthic foragers that feed primarily on aquatic invertebrates, although detritus may make up a substantial proportion of their diet (Moyle et al. 2015).

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Hardhead

Hardhead (*Mylopharodon conocephalus*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC due to declining numbers and small, isolated populations (Moyle et al. 2015). Primary threats to the species include dams and diversions, water quality degradation associated with agricultural activities, and invasive species (Moyle et al. 2015). This species has been documented in the Feather River near the study area (Seesholtz et al. 2004) and, thus, is considered present.

Hardhead occur in relatively undisturbed clear and cool (i.e., up to 20°C maximum summer temperature) low- to mid-elevation streams below approximately 1,500 meters (Moyle et al. 2015). Hardhead are primarily bottom-feeding fish that forage on aquatic invertebrates and aquatic vegetation, but will also prey on drifting invertebrates, plankton, and algae and terrestrial insects (Moyle et al. 2015). Hardhead reach maturity at age two and spawn primarily in April and May (Moyle 2002). Adult fish migrate into smaller tributary streams and aggregate in pools, returning to their home pools in larger rivers after spawning. Females produce over 20,000 eggs, which are deposited in sand or gravel substrates in riffles, runs, or heads of pools (Moyle 2002). After hatching, larval fish are believed to remain in near-shore areas with dense cover, gradually moving downstream and into deeper habitats with increased growth.

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Riffle Sculpin

Riffle sculpin is not listed pursuant to either the federal ESA or California ESA; however, it is designated by CDFW as a SSC. The primary threats to riffle sculpin include increasing isolation between populations, thereby increasing vulnerability to local extirpation, and habitat changes that may reduce flows or increase water temperatures (Moyle et al. 2015).

Riffle sculpin are common in many clear and cold (i.e., maximum temperature <26°C) perennial streams predominated by riffle habitats with rock or gravel substrates and relatively high dissolved oxygen concentrations (Moyle 2002). They are benthic dwellers that typically co-occur with rainbow trout, but occupy different microhabitats and, therefore, interactions between the two species are not common. Riffle sculpin are opportunistic feeders that prey upon benthic macroinvertebrates, amphipods, and other small fish. Riffle sculpin typically have a four-year life span and reach sexual maturity at the end of their second year. Spawning typically occurs from late February through April in nests on the underside of rocks in riffles, or in cavities of submerged logs (Moyle 2002). Embryos hatch in 11 to 24 days at temperatures of 10 to 15°C, and adult males guard the embryos and fry during this period.

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

5.6.3 Reptiles

A total of two special-status reptile species were identified as having the potential to occur within Study Areas based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, one of those species were determined to not have potential to occur within the Study Area due to the absence of suitable habitat or the Study Area was outside the range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining species that have potential to occur within the Study Area is presented below.

Northwestern pond turtle

The northwestern pond turtle (*Actinemys marmorata*) is not listed pursuant to either the federal or California ESAs; however, it is designated as a CDFW SSC. Northwestern pond turtles occur in a variety of fresh and brackish water habitats including marshes, lakes, ponds, and slow-moving streams (Jennings and Hayes 1994). This species is primarily aquatic; however, they typically leave aquatic habitats in the fall to reproduce and to overwinter (Jennings and Hayes 1994). Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops is optimal for basking and thermoregulation. Although adults are habitat generalists, hatchlings and juveniles and hatchlings require shallow edgewater with relatively dense submergent or short emergent vegetation in which to forage. Northwestern pond turtles are typically active between March and November. Mating generally occurs during late April and early May and eggs are deposited between late April and early August (Jennings and Hayes 1994). Eggs are deposited within excavated nests in upland areas, with substrates that typically have high clay or silt fractions (Jennings and Hayes 1994). The majority of nesting sites are located within 650 feet (200 meters) of the aquatic sites; however, nests have been documented as far as 1,310 feet (400 meters) from the aquatic habitat.

While there are no CNDDB documented occurrences of Northwestern pond turtle within five miles of the Study Area (CDFW 2020), the river within the Study Area provides suitable habitat for this species. Northwestern pond turtle has potential to occur onsite.

5.6.4 Birds

A total of 19 special-status bird species were identified as having the potential to occur within Study Area based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, 10 of those species were determined to not have potential to occur within the Study Area due to the absence of suitable habitat or the Study Area was outside the range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining nine species that have the potential to occur within the Study Area are presented below.

Yellow-billed cuckoo

The yellow-billed cuckoo (*Coccyzus americanus*) is listed as an endangered species pursuant to the California ESA and threatened under the federal ESA. The federal listing pertains to the western DPS, whose breeding range is west of the Rocky Mountains (USFWS 2014). In California, breeding populations can be found on the Feather River from Oroville to Verona in Butte, Yuba, and Sutter counties; the Owens Valley in Inyo County; the Santa Clara River in Los Angeles County; the Mojave River in San Bernardino County; and the Colorado River in San Bernardino and Imperial counties (Laymon 1998). The western DPS breeds in riparian vegetation communities. Along the Sacramento River, nesting habitat included depositional point bars with young stands of low woody vegetation (Laymon 1998). In southern California, breeding habitat includes desert riparian woodlands (Sonoran Zones) comprised of dense willow (*Salix* spp.), Fremont cottonwood (*Populus fremontii*), and mesquite (*Prosopis* spp.) (Hughes 2020).

This migratory species arrives from its wintering grounds in South America during June and departs from California during September (Small 1994). The incubation period is 11 to 12 days, and nestlings typically leave the nest after five to eight days (Laymon 1998). Western yellow-billed cuckoos feed upon large insects such as caterpillars, katydids, crickets, and grasshoppers, and occasionally frogs, lizards, bird eggs and young, and fruit and seeds (Laymon 1998; Hughes 2020). The recommended survey protocol includes multiple visits between June 15 and August 15 (Halterman et al. 2016).

While there are no CNDDB documented occurrences of yellow-billed cuckoo within five miles of the Study Area (CDFW 2020), the riparian woodland within and adjacent to the Study Area provides suitable habitat for this species. Yellow-billed cuckoo has potential to occur onsite.

Bald eagle

The bald eagle (*Haliaeetus leucocephalus*) has been delisted under the federal ESA but remains listed as endangered under the California ESA. It is fully protected pursuant to the California Fish and Game Code Section 3511 and the federal Bald and Golden Eagle Protection Act. It is a Bureau of Land Management sensitive species, a U. S. Forest Service sensitive species, and is considered a USFWS BCC. Bald eagles breed at lower elevations in the northern Sierra Nevada and North Coast ranges. Bald eagles breed in forested areas adjacent to large waterbodies (Buehler 2020). Tree species used for nesting is quite variable and includes conifers (dominant where available), oaks, hickories, cottonwoods and aspens (Buehler 2020). Nest trees are generally the largest tree available in a suitable area (Buehler 2020). Breeding activity occurs during late February through September, with peaks in activity from March to June.

There is one documented CNDDB occurrence of this species located within five miles of the Study Area (CDFW 2019). The riparian woodland within the Study Area provide marginal habitat for this species. Bald eagle has low potential to occur within the Study Area.

White tailed-kite

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either the California or federal ESAs; however, the species is fully protected pursuant to Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast, and all areas up to the Sierra Nevada foothills and southeastern deserts (Dunk 2020). In northern California, white-tailed kite nesting occurs from March through early August, with nesting activity peaking from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands (Dunk 2020).

While there are no CNDDB documented occurrences of white-tailed kite within five miles of the Study Area (CDFW 2020), the riparian woodland within the Study Area provides suitable habitat for this species. White-tailed kite has potential to occur onsite.

Swainson's hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and is protected pursuant to the California ESA. This species nests in North America (Canada, western U.S., and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2010). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus species*). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, disking, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

There are six documented CNDDB occurrence of this species located within five miles of the Study Area (CDFW 2019). The riparian woodland within the Study Area provides suitable habitat for this species. Swainson's hawk has potential to occur within the Study Area.

Nuttall's woodpecker

The Nuttall's woodpecker (*Dryobates nuttallii*) is not listed and protected under either the California or federal ESAs but is considered a USFWS BCC. They are resident from Siskiyou County south to Baja California. Nuttall's woodpeckers nest in tree cavities primarily within oak woodlands, but also can be found in riparian woodlands (Lowther et al. 2020). Breeding occurs during April through July.

While there are no CNDDB documented occurrences of Nuttall's woodpecker within five miles of the Study Area (CDFW 2020), the riparian woodland within the Study Area provides suitable habitat for this species. Nuttall's woodpecker has potential to occur onsite.

Yellow-billed magpie

The yellow-billed magpie (*Pica nuttalli*) is not listed pursuant to either the California or federal ESAs but is considered a USFWS BCC. This endemic species is a year-long resident of the Central Valley and Coast Ranges from San Francisco Bay to Santa Barbara County. Yellow-billed magpies build large, bulky nests in trees in a variety of open woodland habitats, typically near grassland, pastures or cropland. Nest building begins in late January to mid-February, which may take up to six to eight weeks to complete, with eggs laid during April to May, and fledging during May to June (Koenig and Reynolds 2020). The young leave the nest at about 30 days after hatching (Koenig and Reynolds 2020). Yellow-billed magpies are highly susceptible to West Nile Virus, which may have been the cause of death to thousands of magpies during 2004 to 2006 (Koenig and Reynolds 2020).

While there are no CNDDB documented occurrences of yellow-billed magpie within five miles of the Study Area (CDFW 2020), the riparian woodland within the Study Area provides suitable habitat for this species. Yellow-billed magpie has potential to occur onsite.

Oak titmouse

Oak titmouse (*Baeolophus inornatus*) are not listed and protected under either the California or federal ESAs but are considered a USFWS BCC. Oak titmouse breeding range includes southwestern Oregon south through California's Coast, Transverse, and Peninsular ranges, western foothills of the Sierra Nevada, and into Baja California; they are absent from the humid northwestern coastal region and the San Joaquin Valley (Cicero et al. 2020). They are found in dry oak or oak-pine woodlands but may also use scrub oaks or other brush near woodlands (Cicero et al. 2020). Nesting occurs during March through July.

While there are no CNDDB documented occurrences of oak titmouse within five miles of the Study Area (CDFW 2020), the riparian woodland within the Study Area provides suitable habitat for this species. Oak titmouse has potential to occur onsite.

Wrentit

The wrentit (*Chamaea fasciata*) is not listed in accordance with either the California or federal ESAs but is designated as a BCC by the USFWS. Wrentit are a sedentary resident along the west coast of North America from the Columbia River south to Baja California (Geupel and Ballard 2020). Wrentit are found in coastal sage scrub, northern coastal scrub, and coastal hard and montane chaparral and breed in the dense understory of valley oak riparian, Douglas-fir and redwood forests, early-successional forests, riparian scrub, coyote bush and blackberry thickets, suburban parks, and larger gardens (Geupel and Ballard 2020). Nesting occurs during March through August.

While there are no CNDDB documented occurrences of wrentit within five miles of the Study Area (CDFW 2020), the riparian woodland within the Study Area provides suitable habitat for this species. Wrentit has potential to occur onsite.

Song sparrow "Modesto"

The song sparrow (*Melospiza melodia*) is considered one of the most polytypic songbirds in North America (Miller 1956 as cited in Arcese et al.2020). The subspecies *Melospiza melodia heermanni* includes as synonyms *M. m. mailliardi* (the "Modesto song sparrow") and *M. m. cooperi* (Arcese et al. 2020). The "Modesto song sparrow" is not listed and protected pursuant to either the California or federal ESAs but is considered a CDFW SSC. The subspecies *M. m. heermanni* can be found in central and southwestern California to northwestern Baja California (Arcese et al. 2020). Song sparrows in this group may have slight morphological differences but they are genetically indistinguishable from each other. The Modesto song sparrow occurs in the Central Valley from Colusa County south to Stanislaus County, and east of the Suisun Marshes (Grinnell and Miller 1944). Nesting habitat includes riparian thickets and freshwater marsh communities, with nesting occurring from April through June.

While there are no CNDDB documented occurrences of song sparrow within five miles of the Study Area (CDFW 2020), the thickets of the riparian woodland within the Study Area provides suitable habitat for this species. Song sparrow has potential to occur onsite.

5.6.5 Mammals

A total of seven special-status mammal species were identified as having the potential to occur within Study Areas based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, five of those species were determined to not have potential to occur within the Study Area due to the absence of suitable habitat or the Study Area was outside the range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining two species that have the potential to occur within the Study Areas are presented below.

Ringtail

Ringtail is not listed pursuant to the federal or California ESAs, but is designated as Fully Protected in California by CDFW. This is a smallish, somewhat cat-like procyonid, related to the widespread raccoon (*Procyon lotor*) and neotropical white-nosed coati (*Nasua narica*). Ringtails are mesocarnivores of riparian areas, especially those with abundant rocky outcrops, in low- to middle elevation drainages in blue oak woodlands, foothill pine/oak forests, chaparral, ponderosa pine woodlands, black oak woodlands, riparian deciduous forests, and mixed coniferous forest (Verner and Boss 1980). Highly nocturnal, ringtails consume small rodents, snakes, birds and their eggs, invertebrates, and some fruits, nuts, and carrion (Zeiner et al. 1990).

The thickets of the riparian woodland within the Study Area provides suitable habitat for this species. Ringtail has potential to occur onsite.

Western red bat

The western red bat (*Lasiurus blossevillii*) is not listed pursuant to either the California or federal ESAs; however, this species is considered a SSC by CDFW. The western red bat is easily distinguished from other western bat species by its distinctive red coloration. This species is broadly distributed, its range extending from southern British Columbia in Canada through Argentina and Chile in South America, and including much of the western U.S. This solitary species day roosts primarily in the foliage of trees or shrubs in edge habitats bordering streams or open fields, in orchards, and occasionally urban areas. They may be associated with intact riparian habitat, especially with willows, cottonwoods, and sycamores. This species may occasionally utilize caves for roosting as well. They feed on a variety of insects, and generally begin to forage one to two hours after sunset. This species is considered highly migratory; however, the timing of migration and the summer ranges of males and females may be different. Winter behavior of this species is poorly understood (WBWG 2017).

While there are no CNDDB documented occurrences of western red bat within five miles of the Study Area (CDFW 2020), the thickets of the riparian woodland within the Study Area provides suitable habitat for this species. Western red bat has potential to occur onsite.

5.7 Critical Habitat and Essential Fish Habitat

The Study Area is designated critical habitat for the following federally listed species:

- Central Valley spring-run ESU Chinook salmon,
- Central Valley DPS steelhead, and
- Southern DPS North American green sturgeon.

The Study Area is essential fish habitat for Pacific Coast salmon (i.e., Chinook salmon, including Central Valley spring-run and fall-run ESUs).

5.8 Sensitive Natural Communities

Four sensitive natural communities, Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, Great Valley Oak Riparian, and Northern Hardpan Vernal Pool, were identified as having potential to occur within the Study Area based on the literature review (CDFW 2020). Based on the site visit, there is no vernal pool habitat present within the Study Area. The riparian woodland within the Study Area may meet the characteristics of one of the riparian sensitive natural communities; however, the riparian woodland within the Study Area is limited to a small strip along the riverbank adjacent to the Live Oak Boat Ramp facilities.

5.9 Wildlife Movement/Corridors and Nursery Sites

The Feather River provides an important aquatic and terrestrial wildlife movement corridor. The river is both important migratory habitat for a diversity of native and non-native fish species, including both resident and anadromous (i.e., ocean migrating) species. Adjacent riparian woodlands and open spaces, though limited in extent, support riparian wildlife and wildlife movements through the upland portions of the Study Area.

The Study Area does not include a known nursery site; however, a Great egret (*Ardea alba*) rookery was observed on the opposite shore of the Feather River during the site reconnaissance visit (approximately 500 feet from the Project).

6.0 IMPACT ANALYSIS

This section specifically addresses the questions raised by the CEQA - Appendix G Environmental Checklist Form, IV. Biological Resources. This section also identifies the appropriate recommendations to reduce potential impacts of the actions to less than significant. The recommendations are described in detail in Section 5.0.

6.1 Special Status Species, Designated Critical Habitat and Essential Fish Habitat

Would the Project result in effects, either directly or through habitat modifications, to species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

The Project would result in temporary construction-related impacts to the upland and aquatic resources that provide habitat for special-status species within the Study Area. Potential impacts to upland habitats include temporary disturbance associated with staging, dewatering, and disposal of dredged spoils. The Project would result in aquatic impacts from dredging operations within the Feather River and the water primrose marsh. As such, the Project would potentially have a substantial adverse effect, either directly or through habitat modifications, on special-status species identified by CDFW, USFWS, and NMFS and on critical habitat and essential fish habitat as identified by NMFS. Impacts by species or habitat group are summarized below.

6.1.1 Impacts to Special-Status Plants

There is potential for one special-status plant species and low potential for nine special-status plant species to occur within the Study Area. Upland staging and dewatering areas would generate a temporary disturbance but would not result in permanent habitat modifications. For species with potential to occur in the water primrose marsh, dredging could impact these species, if present. Implementation of Recommendations BIO1 and PLANT1 described in Section 7.0 would avoid or minimize potential effects to special-status plants.

6.1.2 Impacts to Special-Status Fish Species, Critical Habitat, and Essential Fish Habitat

Nine special-status-fish species including three federally threatened species have potential to occur in the Study Area. Direct impacts to special-status fish species could occur as a result of dredging operations through noise, scraping bottom substrates and causing downstream turbidity. Implementation of the recommendation FISH1 outlined in Section 7.0 would minimize the effects of the Project on special-status fish species.

The Study Area includes designated critical habitat for three federally threatened fish species (Chinook salmon, steelhead, and green sturgeon) and is EFH for Chinook salmon and steelhead. Dredging operations would temporarily disturb designated critical habitat and EFH by scraping bottom substrates and causing turbidity downstream. These temporary effects would not affect the integrity of the physical and biological factors contributing to the critical habitat designation or result in permanent impacts or loss of EFH.

6.1.3 Impacts to Northwestern Pond Turtles

Northwestern pond turtles may occur in the upland, water primrose marsh and river portions of the Study Area. This species may inadvertently be captured by dredging equipment most likely resulting in direct mortality. More likely, noise and disturbance associated with setting up the dredging operation and installing best management practices (BMPs) for water quality would deter and displace turtles from the work area. This could increase or decrease susceptibility to predation, particularly for hatchlings, depending on how predators behave in response to the dredging operation. Overall, the effects are expected to be temporary and minimized by the implementation of recommendations of BIO1 and FISH1 outlined in Section 7.0.

6.1.4 *Impacts to Special-Status Birds*

One federally and State-listed and two State-listed bird species have the potential to occur in the Study Area. In addition, potential exists for six special-status bird species in the Study Area. Upland staging and dewatering areas would generate a temporary disturbance that would likely displace nesting birds from the Study Area for the duration of construction but would not result in permanent habitat modifications. If special-status birds initiate nesting prior to the start of construction, direct effects would largely be avoided by implementation of the recommendations BIRD1 and BIRD2 outlined in Section 7.0. The recommendations require pre-construction surveys and establishment of buffers and monitoring at nest sites until young of the year have fledged.

6.1.5 *Impacts to Special-Status Mammals*

There are two special-status mammals with potential to occur in the Study Area. The Project would not remove upland vegetation, including trees and is therefore not expected to result in adverse effects of habitat modification for special-status mammals. Implementation of recommendations MAM1 outlined in Section 7.0 would further reduce the potential for effects to special-status mammals.

6.2 Riparian Habitat and Sensitive Natural Communities

BIO Impact-2. Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

The Study Area supports riparian woodland habitat along the Feather River. Construction staging and dewatering dredged spoils would occur in upland, developed, or disturbed areas of the Study Area. No vegetation clearing or tree removal within riparian habitats is expected to be required; therefore, the Project would not result in permanent adverse effects to riparian habitats. Implementation of recommendations BIO1, RIP1, and RIP2 described in Section 7.0 would further reduce the potential for temporary impacts to riparian habitats.

6.3 Federally Protected Wetlands

BIO Impact-3. Would the Project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The Project would result in dredging of sediment and invasive species (water primrose). Additionally, the Project includes dredging in the Feather River. Project implementation would temporarily disturb Waters of the U.S., including wetlands, through proposed dredging and invasive species removal. Recommendations to reduce impacts to Waters of the U.S. are provided in Section 7.4.

6.4 Wildlife Movement/Corridors and Nursery Sites

BIO Impact 4. Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The Feather River is an important migratory corridor for native fish. Project dredging activities have the potential to interfere with natural movements of resident and migratory fish species. Implementation of Recommendations BIO1, RIP1, and FISH1 described in Section 7.0 are expected to avoid and minimize potential effects.

The forested uplands and open space lands within the Study Area provide some limited migratory opportunities for wildlife. Establishment of the staging areas, dewatering the dredged spoils, and operation of equipment is likely to temporarily disturb and displace most wildlife from the Study Area. Some wildlife such as birds or nocturnal species are likely to continue to use the habitats opportunistically for the duration of construction. Once construction is complete, wildlife movements are expected to resume.

As discussed in Section 5.8, the Study Area does not include a known nursery site; however, a Great egret rookery was observed on the opposite shore during the site reconnaissance visit. The Project would have no direct impact on the rookery, which is outside the Project limits by approximately 500 feet. Project-related noise would create temporary disturbance that could discourage nesting in the rookery for the duration of construction but would not result in permanent habitat modifications. Potential impacts to the rookery would be reduced by implementation of recommendation BIO1.

6.5 Local Policies, Ordinances, and Other Plans

BIO Impact 5. Does the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Project does not conflict with a local policy or ordinance protecting biological resources. If a conflict is identified, the Applicant would coordinate with the local jurisdiction to secure the necessary variance, permit, or approval.

BIO Impact 6. Does the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Study Area is not covered by any local, regional, or State conservation plan. Therefore, the Project would not conflict with a local, regional, or State conservation plan.

7.0 RECOMMENDATIONS

This section summarizes recommended measures to avoid, minimize, or compensate for potential impacts to biological resources from the proposed Project.

7.1 General Recommendations

The following general measure is recommended:

- **BIO1 –** The project will implement erosion control measures and BMPs to reduce the potential for sediment or pollutants at the Project site. Measures may include:
  - Erosion control measures will be placed between Waters of the U.S., and the outer edge of the staging and dewatering areas, within an area identified with highly visible markers (e.g., construction fencing, flagging, silt barriers) prior to commencement of construction activities. Such identification and erosion control measures will be properly maintained until construction is completed and the soils have been stabilized.
  - Fiber rolls used for erosion control will be certified by the California Department of Food and Agriculture as weed free.
  - Seed mixtures applied for erosion control will not contain California Invasive Plant Council designated invasive species (http://cal-ipc.org/) and will be composed of native species appropriate for the site.
  - Trash generated onsite will be promptly and properly removed from the site.
  - Any fueling in the upland portion of the Study Area will use appropriate secondary containment techniques to prevent spills.
  - A qualified biologist will conduct a mandatory Worker Environmental Awareness Program for all contractors, work crews, and any onsite personnel on the potential for special-status species to occur on the Project site. The training will provide an overview of habitat and characteristics of the species, the need to avoid certain areas, and the possible penalties for non-compliance.
  - A qualified biologist/biological monitor will be onsite during daily construction activities to ensure compliance with the anticipated terms and conditions of the Project regulatory permits and CEQA compliance document. If appropriate, the approved biologist will train an individual to act as the onsite construction monitor for periods when there is a low risk of effect to special-status species.

7.2 Special-Status Species

Recommendations to minimize impacts to special-status species or habitats are summarized below by species group.

7.2.1 Plants

The potential exists for 10 special-status plants to occur within the Study Area. Implementation of recommendations BIO1 would minimize the potential for impacts to plants associated with upland work areas. If the Project requires ground disturbance (i.e., grading or earthwork) in suitable habitat for the special-status plants, the following measures is recommended:

- **PLANT1 –** Preconstruction floristic surveys shall be conducted for any areas of proposed ground disturbance (i.e., grading or earth work) in the Study Area with the potential to support special-status plants. The area of ground disturbance and a 25-foot buffer would be surveyed by a qualified botanist during the appropriate blooming period prior to the start of Project activity. If no special-status plants are found during the preconstruction surveys, no further measures are necessary. If surveys identify any special-status plants, the Applicant shall identify them with flagging and avoid them with a 25-foot no-disturbance buffer during Project activities. If this avoidance is not feasible, the Applicant shall consult with CDFW to determine whether alternative avoidance measures that are equally protective are possible.

7.2.2 Fish Species, Critical Habitat, and Essential Fish Habitat

The Study Area supports listed and special-status fish species, designated Critical Habitat, and EFH. Therefore, the following measure is recommended:

- **FISH1 –** To avoid and minimize potential adverse effects to listed and special-status fish species, designated Critical Habitat, and EFH implement the following:
  - Implement dredging operations during a limited work window (likely June 15 through October 15) to avoid the most sensitive life stages of ESA-listed anadromous fish species.
  - Deploy measures, as practicable, to reduce sediment resuspension such as a turbidity curtain, if feasible, given the flow volume and velocity in the Study Area.
  - Employ a fish biologist to be onsite as needed to monitor dredging and check the spoils (i.e., sediment and vegetation).
  - Where mechanical dredging is used, attempt to exclude fish and other aquatic organisms from the area using block nets, to the extent feasible for the Study Area.
  - Through the CWA Section 404 process, request the USACE initiate ESA Section 7 Consultation with NMFS on the Project effects to ESA-listed anadromous fish species, designated critical habitat, and EFH.
  - Consult with CDFW and if necessary, secure an Incidental Take Permit 2081, pursuant to Section 2080 of the California Fish and Game Code.

7.2.3 Northwestern Pond Turtle

Northwestern pond turtles may occur incidentally within the river portion of the Study Area. Implementation of recommendations BIO1 and FISH1 would avoid and/or minimize potential adverse effects to northwestern pond turtles. Additionally, prior to establishment of construction staging and dewatering areas, the following measure is recommended:

NPT1 – Conduct a pre-construction northwestern pond turtle survey in the construction staging and dewatering areas 48 hours prior to construction activities. Any northwestern pond turtle individuals discovered in the Project work area immediately prior to or during Project activities shall be allowed to move out of the work area of their own volition. If this is not feasible, they shall be captured by a qualified wildlife biologist and relocated out of harm's way to the nearest suitable habitat at least 100 feet from the Project work area where they were found.

7.2.4 *Special-Status Birds and Migratory Bird Treaty Act-Protected Birds (including nesting raptors)*

To ensure Project implementation would not disturb nesting birds, the following measure is recommended:

- **BIRD1 –** To protect nesting birds, no Project activity shall begin from February 1 through August 31 unless the following surveys are completed by a qualified wildlife biologist. Separate surveys and avoidance requirements are listed below for all nesting birds, raptors, including bald eagle, burrowing owl, and Swainson's hawk.

    - All Nesting Birds - Within 14 days prior to construction (or less if recommended by CDFW), survey for nesting activity of birds within each Project work area and a 100-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

    - Raptors (including bald eagle) – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 500-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

    - Swainson's hawk – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 0.25-mile radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

- **BIRD2 –** To protect potentially nesting yellow-billed cuckoo, the following is recommended.

    - If it is anticipated that construction-related disturbances within 500 feet of suitable habitat cannot be avoided, protocol surveys for yellow-billed cuckoo will be conducted. Surveys will follow the latest version of *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo* (Halterman et al. 2015).

    - Biologists will coordinate with the USFWS and CDFW prior to conducting surveys to determine if the proposed Survey Area has been recently surveyed, define the parameters of the Survey Area, and discuss the survey methodology. Survey methods and results will be reported to the USFWS and CDFW at the conclusion of the surveys.

- If cuckoos are detected during surveys, the general location of the detection or the nest will be mapped by the biologists and SBFCA will establish a 500-foot, or other distance as approved by the USFWS and CDFW, no-disturbance buffer between construction activities and the area identified. The no-disturbance buffer will be maintained until it has been determined by a qualified biologist that young have fledged or the nest is no longer active.

7.2.5 Special-Status Mammals

The potential exists for two special-status mammals to occur within the Study Area. Upland staging and dewatering areas would generate a temporary disturbance but would not result in permanent habitat modifications. Implementation of recommendations BIO1 would minimize the potential for impacts to mammals from upland work areas. If the Project requires removal of trees or buildings, the following measures are recommended:

- **MAM1.** A qualified biologist would survey all trees proposed for removal to determine their potential to provide suitable ringtail nest sites (e.g., trees with cavities). If potential nest trees are found, an avoidance area would be fenced and/or flagged around the tree as close to construction limits as possible.

- **MAM2.** A qualified biologist would conduct a preconstruction roosting bat survey for all suitable roosting habitat (e.g., manmade structures, trees) prior to construction activities. If suitable roosting habitat is identified, a qualified biologist will conduct an evening bat emergence survey that may include acoustic monitoring to determine whether or not bats are present. If roosting bats are found, consultation with CDFW prior to initiation of construction activities may be required. If bats are not found during the preconstruction surveys, no further measures are necessary.

7.3 Riparian and Sensitive Natural Communities

Riparian habitat is protected under the California Fish and Game Code. The Project does not expect to require vegetation clearing. Nevertheless, to minimize the potential for impacts to riparian habitat, the following measures are recommended:

- **RIP1 –** The river channels will be accessed via areas where no permanent impacts to riparian vegetation will be required.

- **RIP2 –** A Streambed Alteration Agreement (SAA), pursuant to Section 1602 of the California Fish and Game Code, must be obtained for any activity that will impact the Feather River and riparian habitats. Minimization measures will be developed during consultation with CDFW as part of the SAA agreement process to ensure protections for affected fish and wildlife resources.

7.4 Waters of the U.S.

The Study Area supports Waters of the U.S., including a water primrose marsh and the Feather River. In addition to BIO1, FISH1, and RIP2, the following measure is recommended:

- **WTR1 –** To avoid or minimize anticipated short-term adverse effects to Waters of the U.S., implement the following:
  - If backwater from dewatered dredged spoils has potential to discharge to wetlands or Waters of the U.S., a Nationwide Permit 16 (Backwater) under Section 404 of the federal CWA must be obtained from USACE. The impacts from such actions are expected to be temporary and solely associated with the dewatering activities. Therefore, no net loss of aquatic resources is likely to occur as a result of the Project and no mitigation is required.
  - A Water Quality Certification or waiver pursuant to Section 401 of the CWA, as issued by RWQCB, must be obtained for Section 404 permit actions.
  - A Waste Discharge Requirement for dredge and fill in Waters of the State under the Porter-Cologne Water Quality Control Act as issued by RWQCB must be obtained for impacts to waters of the State.

7.5 Wildlife Movement Corridors and Nursery Sites

Implementation of recommendations BIO1, RIP1, and FISH1 are expected to avoid or minimize potential short-term effects on wildlife, aquatic movement corridors, and nursery sites.

8.0 REFERENCES

Arcese, P., M. K. Sogge, A. B. Marr, and M. A. Patten. 2020. Song Sparrow (Melospiza melodia), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.sonspa.01.

Bechard, Marc J., C. Stuart Houston, Jose H. Sarasola and A. Sidney England. 2010. Swainson's Hawk (*Buteo swainsoni*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/265.

Buehler, D. A. 2020. Bald Eagle (Haliaeetus leucocephalus), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.baleag.01.

Busby, P.J., T.C. Wainwright, G.J. Bryant, L. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status review of West Coast steelhead from Washington, Idaho, Oregon, and California. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-NWFSC-27.

CDFG. 2005. The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004. Sacramento, California.

_____. 2002. California Department of Fish and Game comments to NMFS regarding green sturgeon listing, 129 pp.

_____. 1998. Report to the Fish and Game Commission: A Status Review of the Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage. Candidate Species Status Report 98-01. Sacramento, California. June.

CDFW. 2020. Rarefind 5. Online Version, commercial version. California Natural Diversity Database. The Resources Agency, Sacramento. Accessed January 2020.

CNPS. 2020. Inventory of Rare and Endangered Plants in California (online edition, v8-02). California Native Plant Society. Sacramento, CA. Available online: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed January 2020.

Cicero, Carla, Peter Pyle and Michael A. Patten. 2020. Oak Titmouse (*Baeolophus inornatus*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.oaktit.01.

Dunk, J. R. 2020. White-tailed Kite (Elanus leucurus), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whtkit.01.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U. S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

EPIC. 2001. Petition to list the North American green sturgeon (*Acipenser medirostris*) as an endangered or threatened species under the endangered species act. Center for Biological Diversity, Waterkeepers Northern California, Petitioners.

Estep, J. A. 1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-1987. California Department of Fish and Game, Nongame Bird and Mammal Section Report.

Fisher, Frank W. 1994. Past and Present Status of Central Valley Chinook Salmon. Conservation Biology. 8(3): 870-873. September.

Geupel, G. R. and G. Ballard. 2020. Wrentit (Chamaea fasciata), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.wrenti.01.

GrandTab 2017. 2017.04.07: California Central Valley Chinook Population Database Report. Fisheries Branch, Anadromous Resources Assessment. April 17, 2017.

Grinnell, J., and A.H. Miller. 1944. The Distribution of the Birds of California. Cooper Ornithological Club, Berkeley (reprinted 1986 by Artemisia Press, Lee Vining, California).

Halterman. M., M.J. Johnson, J.A. Holmes, and S.A. Laymon. 2016. A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo, Final Draft dated: May 2016. U.S. Fish and Wildlife Techniques and Methods.

Hughes, J. M. 2020. Yellow-billed Cuckoo (Coccyzus americanus), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.yebcuc.01.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. A Report to the California Department of Fish and Game, Rancho Cordova, California.

Koenig, Walt and Mark D. Reynolds. 2009. Yellow-billed Magpie (*Pica nuttalli*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/180.

Laymon, S. A. 1998. Yellow-billed Cuckoo (*Coccycus americanus*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight.

Lowther, P. E., P. Pyle, and M. A. Patten. 2020. Nuttall's Woodpecker (Dryobates nuttallii), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.nutwoo.01.

Mayer, K.E. and W.F. Laudenslayer Jr (Eds). 1988. A Guide to Wildlife Habitats of California. California Department of Fish and Game.

McEwan, D. 2001. Central Valley Steelhead in Contributions to the biology of Central Valley salmonids. R.L. Brown (ed.), CDFG, 1–43.

McEwan, D., and T.A. Jackson. 1996. Steelhead Restoration and Management Plan for California. California. Department of Fish and Game, Sacramento, California, 234 pages.

Moser, M.L., J.A. Israel, M. Neuman, S.T. Lindley, D.L. Erickson, B.W. McCovey Jr., and A.P. Klimley. 2016. Biology and life history of green sturgeon (*Acipenser medirostris* Ayres, 1854): state of the science. J. Appl. Ichthyol. 32 (Suppl. 1) pp. 67-86.

Moyle, P.B. 2002. Inland Fishes of California: Revised and Expanded. University of California Press. 502pp.

Moyle, P.B., J.E. Williams, and E.D. Wikramanayake. 1989. Fish Species of Special Concern of California. Final report submitted to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA.

Moyle, P.B., R. M. Quiñones, J. V. Katz and J. Weaver. 2015. Fish Species of Special Concern in California. Third Edition. Sacramento: California Department of Fish and Wildlife. www.wildlife.ca.gov

NRCS. 2020a. Soil Survey Geographic (SSURGO) Database for Madera County, California. U.S. Department of Agriculture. Available Online: https://gdg.sc.egov.usda.gov/.

_______. 2020b. National Hydric Soils List. Available Online: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed October 12, 2017.

NRCS, USGS, and USEPA. 2016. Watershed Boundary Dataset for California. Available online: http://datageteway.nrcs.usda.gov. Accessed 21 September 2016.

NMFS. 2014. Recovery Plan for the Evolutionary Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead. West Coast Region, Sacramento California. July.

Pacific Fishery Management Council. 2000. Review of 1999 Ocean Salmon Fisheries. Portland Oregon. February 2000.

Radtke, L.D. 1966. Distribution of smelt, juvenile sturgeon and starry flounder in the Sacramento – San Joaquin Delta. Pp. 115-119 in Turner, S.L. and D.W. Kelley (Eds.), Ecological Studies of the Sacramento – San Joaquin Delta, Part II. California Department of Fish & Game, Fish Bulletin, 136.

San Joaquin River Restoration Program. 2014. *San Joaquin River Restoration Program: Fish Assemblage Inventory and Monitoring, 2012-2013*. February.

Seesholtz, A.S., B.J. Cavallo, J. Kindopp, and R. Kurth. 2004. Juvenile fishes of the lower Feather River: distribution, emigration patterns, and associations with environmental variables. American Fisheries Society Symposium 39: 141-166.

Seesholtz, A. M.; Manuel, M. J.; Van Eenennaam, J. P., 2015: First documented spawning and 620 associated habitat conditions for Green Sturgeon in the Feather River, California. Environ. Biol. Fish. 98, 905–912.

Shuford, W.D. and T. Gardali, eds. 2008. California Bird Species of Special Concern. Studies of Western Birds No. 1. Western Field Ornithologists, Camarillo, California and California Department of Fish and Game, Sacramento, California.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company. Vista, California. 342 pp.

Snider, B., and R.G. Titus. 2000. Timing, composition, and abundance of juvenile anadromous salmonid emigration in the Sacramento River near Knights Landing; October 1996–September 1997. Calif. Dept. of Fish and Game, Native Anadromous Fish and Watershed Branch, Stream Evaluation Program. Tech. Rep. 00-04. Online at http://www.Delta.dfg.ca.gov/afrp/documents/97klmgrt.pdf [accessed October 2004].

Sutter County. 2015. Biological Resources Element of the Sutter County General Plan Policy Document.

Thompson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. University of California Press, Oakland, California.

USFWS. 2020a. Species Lists. Available by request online: https://ecos.f ws.gov/ipac/. Accessed January 2020

_______. 2020b. Online Critical Habitat Mapper. https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77. Access February 2020.

USGS. 1952 photorevised 1973. “Gridley, California” 7.5-minute quadrangle. Denver, Colorado.

Verner, J. and A.S. Boss. 1980. California wildlife and their habitats: western Sierra Nevada. U. S. Forest Service General Technical Report PSW-37.

WBWG. 2017. Western Bat Species Accounts. Accessed February 2017. Available on-line at: http://wbwg.org/western-bat-species/

Williams, D.F. 1986. Mammalian Species of Special Concern in California. State of California Department of Fish and Game, Wildlife Management Division. Sacramento, California. 112pp.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (Eds). 1990a. California’s Wildlife, Volume II, Birds. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game, Sacramento, California.

_______. 1990b. California’s Wildlife, Volume III, Mammals. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game, Sacramento, California.

_______. 1988. California’s Wildlife, Volume I, Amphibian and Reptiles. California Statewide Habitat Relationships System, California Department of Fish and Game, Sacramento, California.

LIST OF ATTACHMENTS

ATTACHMENT A

Special-Status Species Searches

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Gridley (3912136) OR Sutter (3912126) OR Pennington (3912137) OR Biggs (3912146) OR West of Biggs (3912147) OR Honcut (3912135) OR Yuba City (3912125) OR Sutter Buttes (3912127) OR Palermo (3912145))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Antigone canadensis tabida greater sandhill crane	ABNMK01014	None	Threatened	G5T4	S2	FP
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Astragalus tener var. ferrisiae Ferris' milk-vetch	PDFAB0F8R3	None	None	G2T1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Atriplex subtilis subtle orache	PDCHE042T0	None	None	G1	S1	1B.2
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Castilleja rubicundula var. rubicundula pink creamsacs	PDSCR0D482	None	None	G5T2	S2	1B.2
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Dipodomys californicus eximius Marysville California kangaroo rat	AMAFD03071	None	None	G4T1	S1	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3S4	SSC
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Heteranthera dubia water star-grass	PMPON03010	None	None	G5	S2	2B.2
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Juncus leiospermus var. ahartii Ahart's dwarf rush	PMJUN011L1	None	None	G2T1	S1	1B.2
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Monardella venosa veiny monardella	PDLAM18082	None	None	G1	S1	1B.1
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus tshawytscha pop. 6 chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	G5	S1	
Orcuttia tenuis slender Orcutt grass	PMPOA4G050	Threatened	Endangered	G2	S2	1B.1
Paronychia ahartii Ahart's paronychia	PDCAR0L0V0	None	None	G3	S3	1B.1
Pseudobahia bahiifolia Hartweg's golden sunburst	PDAST7P010	Endangered	Endangered	G1	S1	1B.1
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Rana boylii foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Spinus lawrencei Lawrence's goldfinch	ABPBY06100	None	None	G3G4	S3S4	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Wolffia brasiliensis Brazilian watermeal	PMLEM03020	None	None	G5	S2	2B.3

Record Count: 55

Scientific N	Common N	Family	Lifeform	CRPR	GRank	SRank	CESA	FESA	Blooming P	Habitat	Micro Habi	Elevation L	Elevation L	Elevation H	Elevation H	CA Endemi	States	Counties	Quads	EO Total
Astragalus	Ferris' milk	Fabaceae	annual herl	1B.1	G2T1	S1	None	None	Apr-May	Meadows and seeps (v		2	5	75	245	T		BUT, COL, (	Liberty Isla	18
Atriplex coi	heartscale	Chenopodi	annual herl	1B.2	G3T2	S2	None	None	Apr-Oct	Chenopod	saline or al	0	0	560	1835	T		ALA, BUT, (	Maricopa (	66
Atriplex mi	lesser salts	Chenopodi	annual herl	1B.1	G2	S2	None	None	May-Oct	Chenopod	alkaline, sa	15	45	200	655	T		ALA, BUT, F	Buttonwillc	52
Atriplex sul	subtle orac	Chenopodi	annual herl	1B.2	G1	S1	None	None	Jun,Aug,Se	Valley and	Alkaline	40	130	100	330	T		BUT, FRE, K	Buttonwillc	24
Azolla micr	Mexican m	Azollaceae	annual / pe	4.2	G5	S4	None	None	Aug	Marshes and swamps (		30	95	100	330	F	AR, AZ, BA,	BUT, COL, (	Silverwood Lake (3411	
Brodiaea rc	valley brod	Themidace	perennial b	4.2	G5T3	S3	None	None	Apr-May(Ju	Valley and	Old alluvial	10	30	335	1100	T		BUT, CAL, N	Salt Spring Valley (381	
Castilleja ru	pink cream	Orobancha	annual herl	1B.2	G5T2	S2	None	None	Apr-Jun	Chaparral (	serpentinit	20	65	910	2985	T		BUT, CCA, (	Chittenden	38
Centromad	pappose ta	Asteraceae	annual herl	1B.2	G3T2	S2	None	None	May-Nov	Chaparral,	often alkali	0	0	420	1380	T		BUT, COL, (	Montara M	39
Centromad	Parry's rou	Asteraceae	annual herl	4.2	G3T3	S3	None	None	May-Oct	Valley and	alkaline, ve	0	0	100	330	T		BUT, COL, (	Santa Rita Bridge (371	
Cryptantha	red-stemm	Boraginace	annual herl	4.2	G4	S3	None	None	Apr-Jun	Cismontan	Often grav	40	130	800	2625	F	OR, WA	BUT, COL, (	Coulterville (3712062),	
Delphinium	recurved la	Ranunculac	perennial h	1B.2	G2?	S2?	None	None	Mar-Jun	Chenopod	alkaline	3	5	790	2590	T		ALA, BUT, (	Soledad Mt	120
Erythranth	shield-brac	Phrymacea	annual herl	4.3	G3G4	S3S4	None	None	Feb-Aug(Se	Chaparral,	serpentinit	60	195	1240	4070	T		BUT, COL, I	Loma Rica (3912134), I	
Hibiscus las	woolly rose	Malvaceae	perennial r	1B.2	G5T3	S3	None	None	Jun-Sep	Marshes ar	Often in rip	0	0	120	395	T		BUT, CCA, (	Clifton Cou	173
Juncus leio	Ahart's dwa	Juncaceae	annual herl	1B.2	G2T1	S1	None	None	Mar-May	Valley and foothill gras		30	95	229	750	T		BUT, CAL, F	Valley Sprir	13
Juncus leio	Red Bluff d	Juncaceae	annual herl	1B.1	G2T2	S2	None	None	Mar-Jun	Chaparral,	vernally me	35	110	1250	4100	T		BUT, PLA, S	Roseville (3	62
Layia septe	Colusa layia	Asteraceae	annual herl	1B.2	G2	S2	None	None	Apr-May	Chaparral,	sandy, serp	100	325	1095	3595	T		BUT, COL, (	Kenwood (	57
Limnanthes	woolly mea	Limnantha	annual herl	4.2	G4T4	S3	None	None	Mar-May(J	Chaparral,	vernally me	60	195	1335	4380	F	OR	BUT, LAK, L	Detert Rese	54
Monardella	veiny mona	Lamiaceae	annual herl	1B.1	G1	S1	None	None	May,Jul	Cismontan	heavy clay	60	195	410	1345	T		BUT, SUT, T	New Melor	4
Navarretia	Baker's nav	Polemonia	annual herl	1B.1	G4T2	S2	None	None	Apr-Jul	Cismontan	Mesic	5	15	1740	5710	T		COL, GLE, L	San Rafael	64
Navarretia	adobe nava	Polemonia	annual herl	4.2	G4T3	S3	None	None	Apr-Jun	Valley and	clay, somet	100	325	1000	3280	T		ALA, BUT, (	Pine Mountain (35118	
Orcuttia te	slender Orc	Poaceae	annual herl	1B.1	G2	S2	CE	FT	May-Sep(O	Vernal poo	Often grav	35	110	1760	5775	T		BUT, LAK, L	Elk Grove (	100
Paronychia	Ahart's par	Caryophylla	annual herl	1B.1	G3	S3	None	None	Feb-Jun	Cismontane woodland		30	95	510	1675	T		BUT, SHA, T	Honcut (39	58
Plagiobryoi	wine-color	Bryaceae	moss	4.2	G3G4	S2	None	None		Cismontan	usually gra	30	95	1735	5690	F	AZ, CO, NM	BUT, FRE, I	Morena Reservoir (321	
Pseudobah	Hartweg's g	Asteraceae	annual herl	1B.1	G2	S2	CE	FE	Mar-Apr	Cismontan	clay, often	15	45	150	490	T		FRE, MAD,	Friant (361	27
Puccinellia	California a	Poaceae	annual herl	1B.2	G3	S2	None	None	Mar-May	Chenopod	Alkaline, ve	2	5	930	3050	F	OR, UT	ALA, BUT, (	Lucerne Va	80
Sagittaria s	Sanford's a	Alismatace	perennial r	1B.2	G3	S3	None	None	May-Oct(N	Marshes and swamps (		0	0	650	2135	T		BUT, DNT,	Newport B	126
Tuctoria gr	Greene's tu	Poaceae	annual herl	1B.1	G1	S1	CR	FE	May-Jul(Se	Vernal pools		30	95	1070	3510	T		BUT, FRE, G	Woodlake	50
Wolffia bra	Brazilian w	Araceae	perennial h	2B.3	G5	S2	None	None	Apr,Dec	Marshes and swamps (		20	65	100	330	F	AL, AR, CT,	BUT, GLE, S	Camp Far V	6

EO A	EO B	EO C	EO D	EO X	EO U	EO Historic	EO Recent	EO Extant	EO Possibly	EO Extirpat	Notes	Full Scienti	Synonyms	Element Cc	USDA PLAN	Flora Statu	CBR Reasoi	Date Addec	Date Chang	Last Update
1	0	0	1	5	11	16	2	13	5	0	Rediscover	Astragalus tener Gray		PDFAB0F8I	ASTEF			1/1/1994		########
6	11	8	0	12	29	49	17	54	2	10	Threatenec	Atriplex coi	Atriplex coi	PDCHE040B0				1/1/1988		########
10	16	4	1	2	19	26	26	50	0	2	Historical o	Atriplex minuscula Stai		PDCHE042I	ATMI3			1/1/1994		########
3	2	1	0	4	14	20	4	20	2	2	Threatenec	Atriplex subtilis Stutz &		PDCHE042	ATSU5			1/1/1994		########
733), Oil Center (3511848), Miracle Hot Springs (3511855), Walker Pass (3511861), Tupman (3511933), Sausalito School (3511											Too comm	Azolla micr	Azolla mex	PPAZO01030				1/1/1994		########
2016), Jenny Lind (3812017), Valley Springs SW (3812018), Wallace (3812028), Clements (3812121), Goose Creek (3812131), C											Threatenec	Brodiaea rosea (Green		PMLIL0C0K2				1/7/2019		1/7/2019
4	6	1	3	4	20	16	22	34	4	0	Possibly thi	Castilleja ru	Castilleja ru	PDSCR0D482				1/1/2001		########
1	6	2	4	1	25	15	24	38	0	1	Threatenec	Centromadia parryi (G		PDAST4R0I	CEPAP4			1/1/2004		########
2015), Los Banos (3712017), Sandy Mush (3712025), San Luis Ranch (3712027), Brush Lake (3712151), Peters (3712181), Stock											Threatenec	Centromadia parryi (G		PDAST4R0I	CEPAR4			########		1/6/2015
Walter Springs (3812263), Sutter (3912126), Honcut (3912135), Chico (3912167), Leesville (3912224), Hall Ridge (3912276), Ir											See Bulletii	Cryptantha rostellata (		PDBOR0A2M0				########		########
11	23	11	3	15	57	73	47	105	1	14	Many occu	Delphinium recurvatur		PDRAN0B1	DERE2			1/1/1988		########
Honcut (3912135), Oroville Dam (3912154), Berry Creek (3912164), Cherokee (3912165), Hamlin Canyon (3912166), Chico (39											Threatenec	Erythranth	Mimulus gl	PDSCR1B1I	MIGL2			1/1/1974		########
0	78	38	16	1	40	73	100	172	0	1	Most occur	Hibiscus las	Hibiscus ca	PDMAL0H0R3				1/1/1974		########
1	6	2	1	1	2	8	5	12	1	0	Threatenec	Juncus leiospermus F.J		PMJUN011	JULEA			1/1/1984		5/7/2019
7	18	8	3	4	22	29	33	58	3	1	Threatenec	Juncus leiospermus F.J		PMJUN011	JULEL			1/1/1974		########
7	7	0	0	1	42	37	20	56	1	0	Historical o	Layia septentrionalis K		PDAST5N0I	LASE2			1/1/1994		########
9	18	9	2	0	16	54	0	54	0	0	Threatenec	Limnanthes floccosa H		PDLIM0204	LIFLF			1/1/1980		########
1	1	0	0	2	0	4	0	2	2	0	Rediscover	Monardella	Monardella	PDLAM18082				1/1/1984		########
5	8	3	0	10	38	41	23	54	6	4	May be mc	Navarretia leucocepha		PDPLM0C0	NALEB			1/1/1994		########
57), Jolon (3512182), Success Dam (3611818), Porterville (3611911), Wahtoke (3611964), Pine Flat Dam (3611973), Piedra (36											Possibly thi	Navarretia nigelliformi		PDPLM0C0	NANIN			4/2/2007		########
14	50	19	3	7	7	20	80	93	4	3	Seriously tl	Orcuttia tenuis Hitchc.		PMPOA4G(	ORTE			1/1/1974		9/4/2012
20	14	0	2	0	22	41	17	58	0	0	Threatenec	Paronychia ahartii B. E		PDCAR0L0	PAAH			1/1/1988		3/1/2018
.1665), Bighorn Basin (3411576), Pinto Valley (3511523), Mid Hills (3511524), Trona West (3511774), Cinco (3511831), White [											Threatenec	Plagiobryoides vinosul		NBMUS0Y090				########		########
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3	12	6	5	19	5	28	22	31	6	13	Threatenec	Tuctoria gr	Orcuttia gr	PMPOA6N(	TUGR			1/1/1974		########
0	1	0	0	0	5	2	4	6	0	0	See Madro	Wolffia brasiliensis We		PMLEM03(	WOBR			1/1/2001		5/8/2019

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

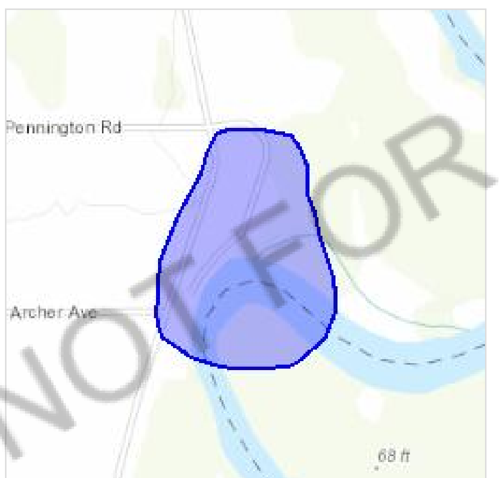
IPaC resource list

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

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

Location

Sutter and Yuba counties, California



Local office

Sacramento Fish And Wildlife Office

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

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

Endangered species

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

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

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

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

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

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

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

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

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

Reptiles

NAME	STATUS

Giant Garter Snake *Thamnophis gigas* — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/4482

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

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

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

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE

BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31

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

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

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

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5

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

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10

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

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

Breeds Apr 1 to Jul 31

Probability of Presence Summary

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

Probability of Presence (■)

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

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

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

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

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

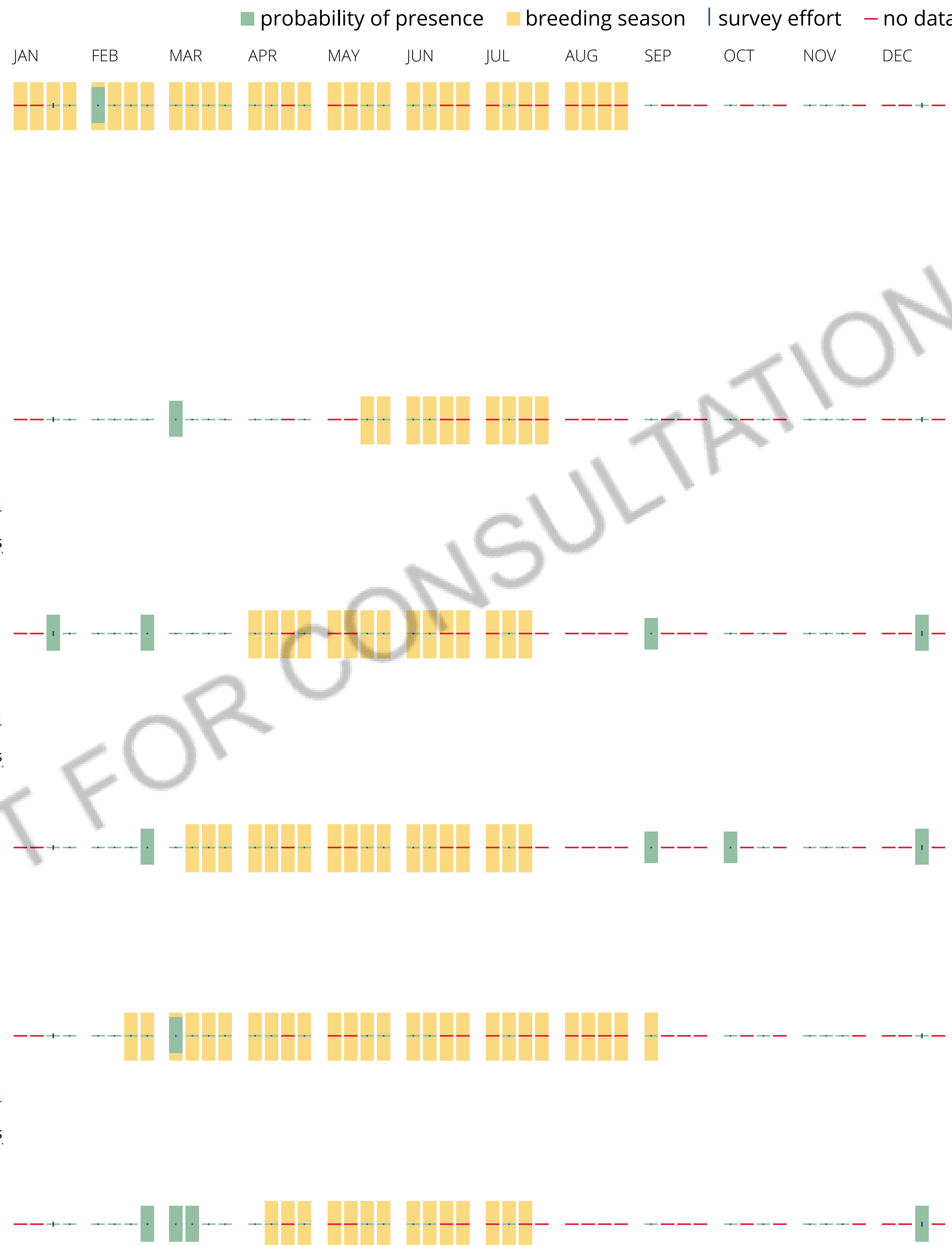
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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

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

Survey Timeframe

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



Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

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

Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

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

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

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

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

Yellow-billed Magpie
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

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

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

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

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

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

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

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

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

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

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

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

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

Palustrine

RIVERINE

Riverine

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

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

ATTACHMENT B

Representative Site Photographs

Photo 1. View of ramp lot at the Live Oak Park Recreational Boat Launch. View south. 04/08/2020

Photo 2. View of ramp lot at the Live Oak Park Recreational Boat Launch. View southwest. 04/08/2020

Photo 3. View of ramp lot at the Live Oak Park Recreational Boat Launch. View north. 04/08/2020

Photo 4. View of ramp lot at the Live Oak Park Recreational Boat Launch. View north. 04/08/2020

Photo 5. View of riverbank at the Live Oak Park Recreational Boat Launch. View southwest. 04/08/2020

Photo 6. View across the ramp lot at the Live Oak Park Recreational Boat Launch. View south. 04/08/2020

Photo 7. View of the parking lot at the Live Oak Park Recreational Boat Launch. View northeast. 04/08/2020

Photo 8. View of riverbank at the Live Oak Park Recreational Boat Launch. View southeast. 04/08/2020

Photo 9. View of riverbank at the Live Oak Park Recreational Boat Launch. View southwest. 04/08/2020

Photo 10. View across the ramp lot at the Live Oak Park Recreational Boat Launch. View north. 04/08/2020

Photo 11. View of the parking lot at the Live Oak Park Recreational Boat Launch. View south. 04/08/2020

Wildlife Observed Onsite

Common Name	Scientific Name
Birds	
Anna's Hummingbird	*Calypte anna*
Greater Yellowlegs	*Tringa melanoleuca*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*
Turkey Vulture	*Cathartes aura*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Belted Kingfisher	*Megaceryle alcyon*
Downy Woodpecker	*Dryobates pubescens*
Black Phoebe	*Sayornis nigricans*
Common Raven	*Corvus corax*
Tree Swallow	*Tachycineta bicolor*
Bushtit	*Psaltriparus minimus*
White-breasted Nuthatch	*Sitta carolinensis*

Aquatic Resources Delineation

Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Sutter County, California

Prepared For:

Sutter Butte Flood Control Agency

August 7, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

CARI	California Aquatic Resource Inventory
CDEC	California Data Exchange Center
CFR	Code of Federal Regulations
CWA	Clean Water Act
°F	Degrees Fahrenheit
FR	Federal Register
GPS	Global Positioning System
NRCS	Natural Resources Conservation Service
OHWM	Ordinary high-water mark
ORM	USACE Operations and Maintenance Business Information Link Regulatory Module
PJD	Preliminary Jurisdictional Determination
Project	Live Oak Boat Ramp Sediment and Invasive Species Removal Project
SFEI	San Francisco Estuary Institute
Study Area	Live Oak Boat Ramp Study Area
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WRCC	Western Regional Climate Center

1.0 INTRODUCTION

On behalf of the Sutter Butte Flood Control Agency, ECORP Consulting, Inc. conducted an aquatic resources delineation for the Live Oak Boat Ramp Sediment and Invasive Species Removal Project (Project) located in Sutter County, California. The Live Oak Boat Ramp Study Area (Study Area) is located on the Feather River east of the city of Live Oak in Sutter County, California (Figure 1. *Live Oak Boat Ramp Location and Vicinity*). This corresponds to the unsectioned Rancho Boga Landgrant lands within the "Gridley, California" 7.5-minute quadrangle (U.S. Geological Survey [USGS] 1952, photorevised 1973). The approximate center of the Study Area is located at 39.273745° latitude and -121.631032° longitude within the Honcut Headwaters-Lower Feather watershed (Hydrologic Unit Code #18020159; Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016). Driving directions from Sacramento to the Study Area are included as Attachment A.

This report describes aquatic resources identified within the Study Area that may be regulated by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the federal Clean Water Act (CWA). The information presented in this report provides data required by the USACE Sacramento District's Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE 2016a). The aquatic resource boundaries depicted in this report represent a calculated estimation of the jurisdictional area within the Study Area and are subject to modification following the USACE verification process.

The purpose of this report is to provide adequate information to USACE for the issuance of a Preliminary Jurisdictional Determination (PJD).

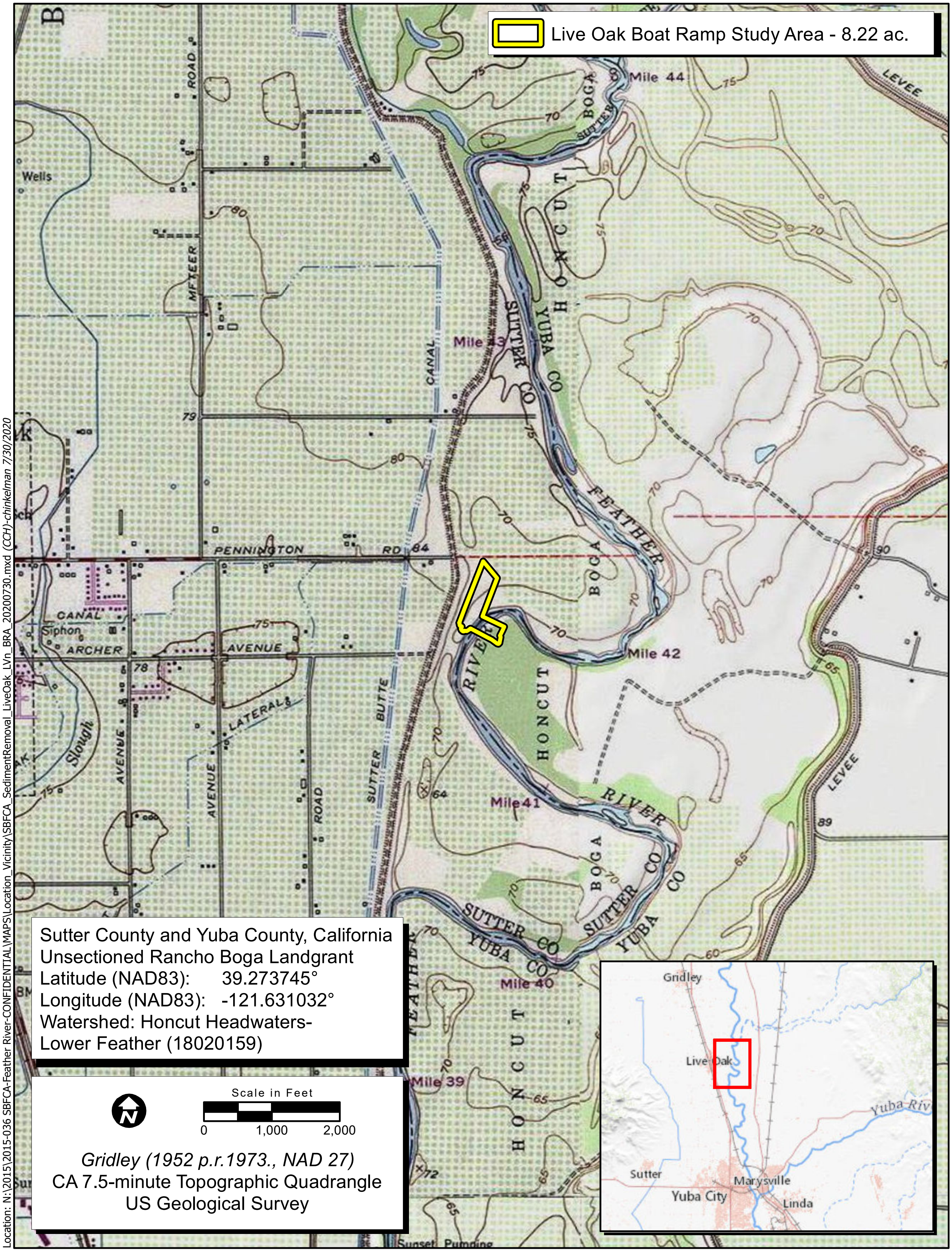
2.0 REGULATORY SETTING

2.1 Waters of the United States

This report describes aquatic resources, including wetlands, that may be regulated by USACE under Section 404 of the federal CWA. The following sections define these regulations.

2.1.1 Wetlands

Wetlands are "*those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*" (51 Federal Register [FR] 41250, Nov. 13, 1986, as amended at 58 FR 45036, Aug. 25, 1993). Wetlands can be perennial or intermittent.



Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Live Oak Boat Ramp Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

2.1.2 Other Waters

Other waters are nontidal, perennial, and intermittent watercourses and tributaries to such watercourses (51 FR 41250, Nov. 13, 1986, as amended at 58 FR 45036, August 25, 1993). The limit of USACE jurisdiction for nontidal watercourses (without adjacent wetlands) is defined in 33 Code of Federal Regulations (CFR) 328.4(c)(1) as the "ordinary high water mark" (OHWM). The OHWM 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" approximation of the lateral limit of USACE jurisdiction. The upstream limits of other waters are defined as the point where the OHWM is no longer perceptible.

2.2 Clean Water Act

The USACE regulates discharge of dredged or fill material into Waters of the U.S. under Section 404 of the CWA. "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to, the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines" (33 CFR § 328.2(f)). In addition, Section 401 of the CWA (33 U.S. Code 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands (over 0.5 acre of impact) may require an individual permit. Projects that only minimally affect wetlands (less than 0.5 acre of impact) may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board.

2.3 Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through the USACE, for the construction of any structure in or over any navigable Waters of the U.S. Structures or work outside the limits defined for navigable Waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the U.S., and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction.

2.4 Jurisdictional Assessment

The federal CWA's purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the U.S." without a permit from the USACE.

The following guidance is from the USEPA website:

"On October 22, 2019, the Environmental Protection Agency and Department of the Army (the agencies) published a final rule (Step One) to repeal the 2015 Rule defining "waters of the United States" and re-codify the regulatory text that existed prior to the 2015 Rule. The final Step One rule became effective on December 23, 2019. The Step One rule will be replaced by the Navigable Waters Protection Rule upon its effective date of June 22, 2020. Until the Navigable Waters Protection Rule takes effect, the Step One rule is in effect. 40 CFR 230.3(s) indicates that the term "waters of the United States" means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii. (From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii. Which are used or could be used for industrial purposes by industries in interstate commerce;

1. All impoundments of waters otherwise defined as waters of the United States under this definition;
2. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
3. The territorial sea;
4. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA."

3.0 METHODS

This aquatic resources delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE 2008a). The boundaries of aquatic resources were delineated through standard field methods (e.g., paired sample set analyses) and aerial photograph interpretation. Field data were recorded on Wetland Determination Data Forms - Arid West Region (Attachment B). A color aerial Google Earth© image (photo date: May 17, 2018) was used to assist with mapping and ground-truthing. *Munsell Soil Color Charts* (Munsell Color 2009) and the Web Soil Survey (NRCS 2020a) were used to aid in identifying hydric soils in the field. The Jepson Manual, 2nd Edition (Baldwin et al. 2012) was used for plant nomenclature and identification.

The field survey was conducted on April 8, 2020 by ECORP biologist Keith Kwan. The biologist walked accessible areas of the Study Area to determine the location and extent of aquatic resources. Paired locations were sampled to evaluate whether or not the vegetation, hydrology, and soils data supported an aquatic resource determination. At each paired location, one point was located such that it was within the estimated aquatic resource area, and the other point was situated outside the limits of the estimated aquatic resource area. An additional non-paired location was sampled to document the OHWM or existing water level as it lacked hydrophytic vegetation and hydric soils. Aquatic resources within the Study Area were recorded in the field using a post-processing capable Global Positioning System (GPS) unit with sub-meter accuracy (Apple iPad, Collector for ArcGIS app with EOS Arrow 100 submeter GPS unit with real-time correction).

3.1 Routine Determinations for Wetlands

To be determined a wetland, the following three criteria must be met:

- A majority of dominant vegetation species are wetland-associated species.
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.
- Hydric soils are present.

3.1.1 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase "*a prevalence of vegetation typically adapted for life in saturated soil conditions*." Prevalent vegetation is characterized by the dominant plant species comprising the plant community (Environmental Laboratory 1987). The dominance test is the basic hydrophytic vegetation indicator and was applied at each sampling point location. The "50/20 rule" was used to select the dominant plant species from each stratum of the community. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional species that individually comprise 20 percent or more of the total cover in the stratum (USACE 1992, 2008a).

Dominant plant species observed at each sampling point were then classified according to their indicator status (probability of occurrence in wetlands; Table 1), *North American Digital Flora: National Wetland Plant List* (Lichvar et al. 2016; Lichvar et al. 2018). If the majority (more than 50 percent) of the dominant vegetation on a site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), the site was considered to be dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species[1]

Plant Species Classification	Abbreviation	Probability of Occurring in Wetland
Obligate	OBL	Almost always occur in wetlands
Facultative Wetland	FACW	Usually occur in wetlands, but may occur in non-wetlands
Facultative	FAC	Occur in wetlands and non-wetlands
Facultative Upland	FACU	Usually occur in non-wetlands, but may occur in wetlands
Upland	UPL	Almost never occur in wetlands
Plants That Are Not Listed (assumed upland species)	N/L	Does not occur in wetlands in any region.

[1]Source: Lichvar et al. 2016

In instances where indicators of hydric soil and wetland hydrology were present, but the plant community failed the dominance test, the vegetation was re-evaluated using the Prevalence Index. The Prevalence Index is a weighted-average wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighting is by abundance (percent cover). If the plant community failed the Prevalence Index, the presence/absence of plant morphological adaptations to prolonged inundation or saturation in the root zone was evaluated.

3.1.2 Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS 2003). Indicators that a hydric soil is present include, but are not limited to, histosols, histic epipedon, hydrogen sulfide, depleted below dark surface, sandy redox, loamy gleyed matrix, depleted matrix, redox dark surface, redox depressions, and vernal pools.

At each sampling point a soil pit was excavated to the depth needed to document an indicator, to confirm the absence of indicators, or until refusal at each sampling point. The soil was then examined for hydric soil indicators. Soil colors were determined while the soil was moist using the *Munsell Soil Color Charts* (Munsell Color 2009). Hydric soils are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment. These processes and the features in the soil that develop can be identified by looking at the color and texture of the soils.

3.1.3 Hydrology

Wetlands, by definition, are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include, but are not limited to, visual observation of saturated soils, visual observation of inundation, surface soil cracks, inundation visible on aerial imagery, water-stained leaves, oxidized rhizospheres along living roots, aquatic invertebrates, water marks (secondary indicator in riverine environments), drift lines (secondary indicator in riverine environments), and sediment deposits (secondary indicator in riverine environments). The occurrence of one primary indicator is sufficient to conclude that wetland hydrology is present. If no primary indicators are observed, two or more secondary indicators are required to conclude wetland hydrology is present. Secondary indicators include, but are not limited to, drainage patterns, crayfish burrows, FAC-neutral test, and shallow aquitard.

3.2 Ordinary High-Water Mark/Non-Wetland Waters

The discussion in this section briefly summarizes *A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States* (OHWM Guide; USACE 2008b). The OHWM Guide is intended for delineating ephemeral/intermittent channels. The Feather River is perennial with flows controlled at Oroville Dam. Consequently, the OHWM Guide was used as a guidance document, but not strictly adhered to when identifying the OHWM of the Feather River. OHWM indicators commonly found in the Arid West include a clear natural scour line impressed on the bank, recent bank erosion, destruction of native terrestrial vegetation, and the present of litter and debris. Resources needed to delineate OHWM include aerial photography and other imagery, topographic maps and other maps (e.g., geological, soil, vegetation), rainfall data, stream gage data, and existing delineations (if present). Field identification of the OHWM includes noting general impression of the vegetation species and distribution, geomorphic features present, surrounding upland land use, and hydrologic alterations and instream and floodplain structures. In the field, the process of delineating the OHWM includes the identification of a low-flow channel (if present), a transition to an active floodplain, and an active floodplain through the presence of geomorphic features (e.g., presence of an active floodplain, benches, break in bank slope, staining of rocks, litter, or drift) and vegetation indicators (e.g., presence of sparse/low vegetation, annual herbs, hydromesic ruderals, pioneer tree seedlings and saplings, xeroriparian species).

3.3 Weather Conditions During Survey

Weather conditions for the survey were ideal, with clear skies, wind from 0 to 10 miles per hour, and temperatures ranging from 50 to 70 degrees Fahrenheit (˚F).

3.4 Limitations of the Survey

Limitations of the survey included the following:

- River flows and water levels within the Study Area is controlled via Oroville Dam. The OHWM delineated was largely based on the water level observed on April 8, 2020, and not necessarily based on the presence/absence of OHWM indicators or a defined gage elevation.
- Portions of the Survey Area were inaccessible due to dense riparian vegetation or steep/unstable riverbanks.

4.0 RESULTS

4.1 Existing Site Conditions

The Study Area includes the Feather River, the Live Oak Boat Ramp (operated by Sutter County), and surrounding lands on the west bank of the Feather River. The developed portions of the boat ramp include a paved roadway, parking area, the boat ramp, and landscaped picnic/day-use areas. The undeveloped areas around boat ramp include riverbank riparian habitat.

Vegetation communities or land cover types found within the Study Area included riparian woodland and developed. The riparian woodland community is found along the riverbanks and in unimproved areas around the boat ramp and day-use facilities. The riparian woodland vegetation is made up of a closed canopy of mature trees including Fremont's cottonwood (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*), with scattered Valley oak (*Quercus lobata*), and box elder (*Acer negundo*). Other plants found in the understory included sandbar willow (*Salix exigua*) and other willow species, Himalaya blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*).

Regional Conditions

The Study Area is situated in the Sacramento Valley Subregion of the Great Central Valley floristic region of California (Baldwin et. al. 2012). For the Marysville, California (045385) reporting station, the average minimum low temperature in the vicinity of the Study Area is 37.7˚F and the average maximum high temperature is 96.3˚F. Average annual precipitation is approximately 20.96 inches of rain (Western Regional Climate Center [WRCC] 2020).

This aquatic resources delineation was conducted in the early spring, at the beginning of the blooming season for many plant species. Most plants were identifiable to species based upon flowers, vegetative, and/or fruit morphology. The survey was conducted at an appropriate time of the year to observe wetland hydrology. During the 2019-2020 water year leading up to the field survey date (April 8, 2020), a total of 13.66 inches of precipitation was recorded at the Lincoln reporting station (California Data Exchange Center [CDEC] 2020), located approximately 30 miles south of Yuba City/Marysville. The last recorded precipitation events for this region prior to the field survey was 2.69 inches between April 4 and April 5, 2020 (CDEC 2020).

4.1.1 California Aquatic Resource Inventory

The California Aquatic Resource Inventory (CARI; San Francisco Estuary Institute [SFEI] 2017) is a statewide map of surface waters and related habitats combining multiple national and regional datasets, including the National Wetlands Inventory and the National Hydrography Dataset. CARI includes aquatic resource features mapped using a variety of remote sensing and modeling techniques. As such, these aquatic features may or may not exist as represented. In addition, CARI data varies in detail, accuracy, and age, and is meant to be used as a tool to assist with an aquatic resource delineation but not as the only source of information (SFEI 2017).

CARI waters mapped within the Study Area include Depressional, Depressional Forested, and River (Figure 2. *California Aquatic Resources Inventory)*. These CARI waters correspond to the riparian woodland, the water primrose marsh, and the Feather River.

4.1.2 Soils

According to the Web Soil Survey (NRCS 2020a), three soil units, or types, have been mapped within the Study Area (Figure 3. *Natural Resources Conservation Service Soil Types*):

- 118 – Columbia fine sandy loam, 0 to 2 percent slopes.
- 121 – Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes.
- 138 – Columbia fine sandy loam, 0 to 1 percent slopes, occasionally flooded.

All of these soil units contain hydric components and are considered hydric (NRCS 2020b) (Table 2).

Table 2. Soil Units Occurring within the Study Area[1]

Soil Unit	Hydric Components[2]	Hydric Component Landform
118-Columbia fine sandy loam, 0 to 2 percent slopes	Columbia, fine sandy loam, channeled; Holillipah; Shanghai	Flood plains
121-Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes	Columbia, fine sandy loam, channeled; Holillipah; Shanghai	Flood plains
138-Columbia fine sandy loam, 0 to 1 percent slopes, occasionally flooded	Columbia, fine sandy loam; Holipah	Flood plains

[1]Source: NRCS 2020a
[2]Source: NRCS 2020b

4.2 Aquatic Resources

A total of 2.385 acres of aquatic resources have been mapped within the Study Area, (Table 3). The wetland determination data forms are included as Attachment B, and a list of plant species observed within the Study Area is included as Attachment C. A discussion of the aquatic resources is presented below, and the aquatic resources delineation maps for the Study Area are presented on Figure 4. *Aquatic Resources Delineation*.

Figure 2. California Aquatic Resources Inventory (CARI)

Map Features

Live Oak Boat Ramp Study Area - 8.22 ac.

California Aquatic Resources Inventory (December 2017)

Streams

Fluvial Natural

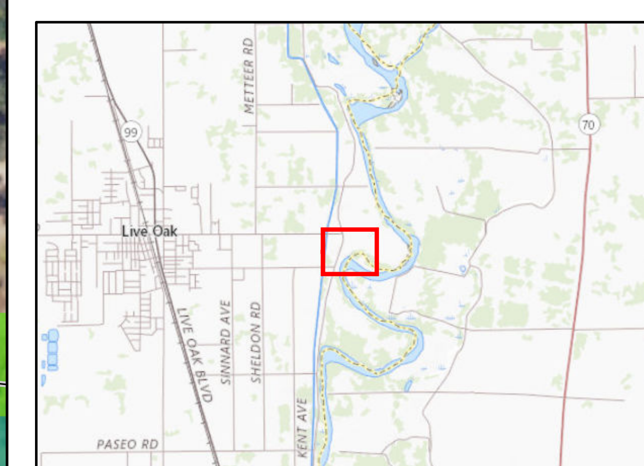
Fluvial Unnatural

Wetlands

Depressional

Depressional Forested

Riverine



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

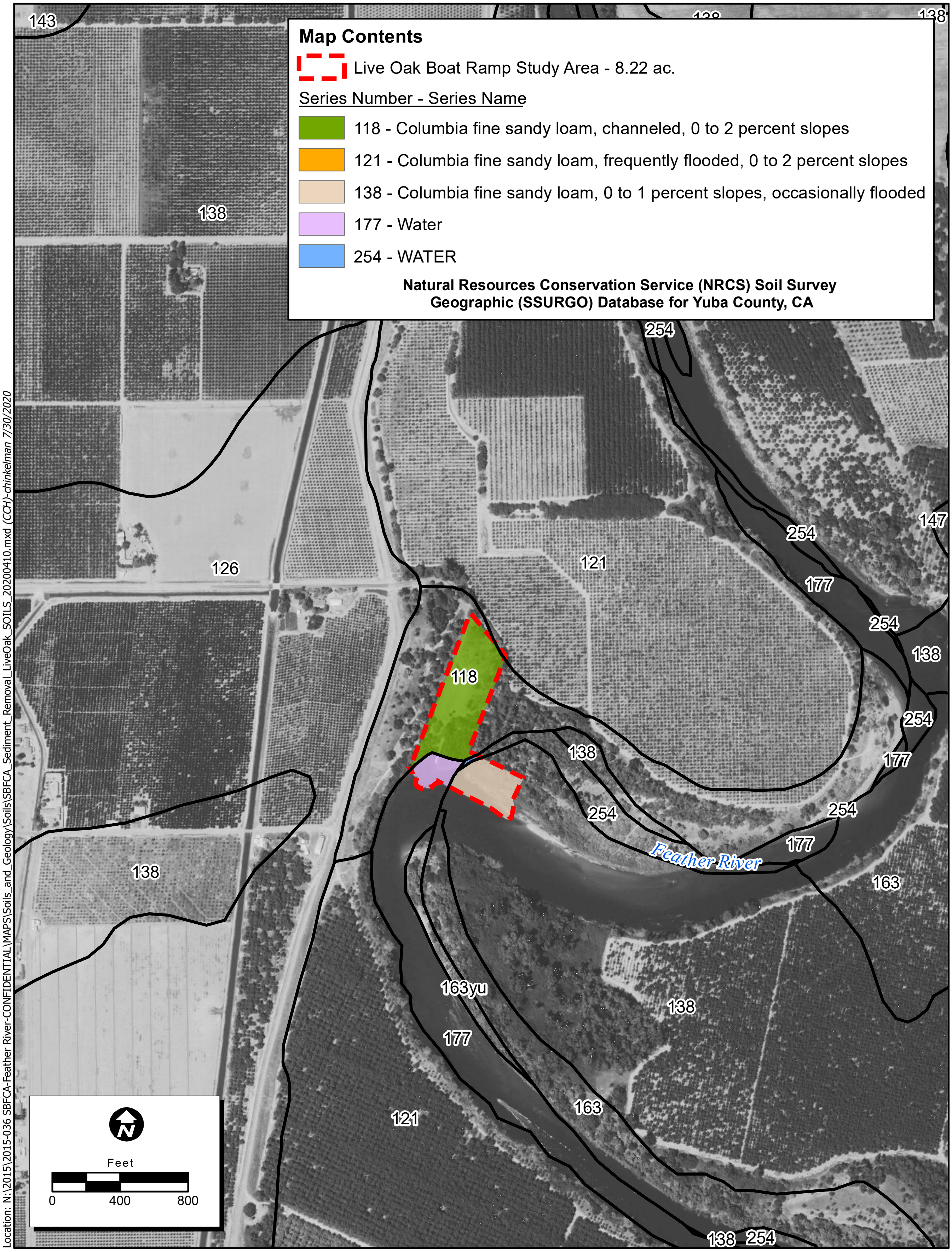
ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Jurisdictional_Delineation\USACE_Delineation\Sediment_Removal\SBFCA_SedimentRemoval_LiveOak_CARI_20200730.mxd(CCH) -chinkelman 7/30/2020

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)

Map Date: 7/30/2020



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Soils_and_Geology\Soils\SBFCA_Sediment_Removal_LiveOak_SOILS_20200410.mxd (CCH)-chinkelman 7/30/2020

Map Date: 7/30/2020
Photo Source: NAIP (2018)

Figure 3. Natural Resources Conservation Service Soils Units

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Figure 4.
Aquatic Resources Delineation

Sample Points	Type	Latitude	Longitude
1	Waters Point	39.273400	-121.631554
2	Upland Point	39.273404	-121.631514
3	Waters Point	39.273397	-121.631736

Map Features

Live Oak Boat Ramp Study Area - 8.22 ac.

Reference Coordinates

Feature Type

Upland Point

Waters Point

Aquatic Resources Delineation[1]*

Wetland

Water Primrose Marsh

Non-Wetland Aquatic Resources

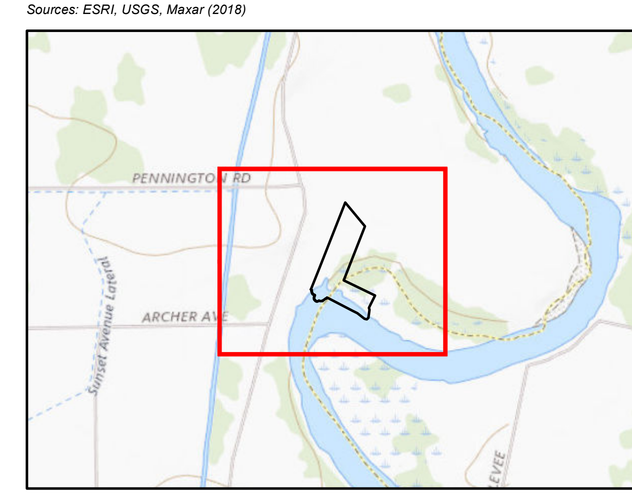
Feather River OHWM

Aquatic Resources	Total (acres)
Wetlands	***0.479***
Water Primrose Marsh	0.479
Non-wetland Aquatic Resources	***1.906***
Feather River OHWM	1.906
Total (acres)	**2.385**

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Sources: ESRI, USGS, Maxar (2018)



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Jurisdictional_Delineation\USACE_Delineation\Sediment_Removal\SBFCA_SedimentRemoval_LiveOak_ARD_20200731.mxd(CCH) -chinkelman 7/31/2020

2015-036.10 Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

Map Date: 7/31/2020

Representative site photographs are included as Attachment D. The USACE Operations and Maintenance Business Information Link Regulatory Module (ORM) aquatic resources table of potential Waters of the U.S. is included in Attachment E.

Table 3. Aquatic Resources

Type	Live Oak Boat Ramp Study Area Acreage[1]
Wetlands	
Water Primrose Marsh	0.479
Non-Wetland Waters	
Feather River	1.906
Total	**2.385**

[1]Acreages represent a calculated estimation and are subject to modification following the USACE verification process.

4.2.1 Wetlands

Water Primrose Marsh

The water primrose marsh is an area adjacent to the Feather River and above the OHWM/existing water level. This marsh is in a portion of the riverbank that is subject to heavy sediment deposition. At the time of the April 2020 field survey, the Feather River water elevation was several feet below that of the marsh. The marsh is dominated entirely of water primrose (OBL). The soil matrix color was 10YR4/2 with redox concentrations colored 7.5YR4/6. The soil was considered hydric due to the Depleted Matrix (F3) criterion, and the wetland hydrology was exhibited by the presence of primary indicators Biotic Crust (B12) and Oxidized Rhizospheres along Living Roots (C3).

4.2.2 Other Waters/Non-Wetland Waters

Feather River

The Feather River is perennial and exhibits bed and bank. Flows and water levels are regulated upstream at Oroville Dam. The limits of the river, for purposes of this study, were delineated at the water's edge on the day of the field survey (April 8, 2020), or based on aerial photograph interpretation (Google Earth imagery date: May 17, 2018) and were not based on a specific elevation or gage data. Levees line the Feather River.

5.0 JURISDICTIONAL ASSESSMENT

As per Regulatory Guidance Letter 16-01, an applicant may request a PJD "in order to move ahead expeditiously to obtain a Corps permit authorization where the requestor determin*es that it is in his or her best interest to do so … even where initial indications are that the aquatic resources on a parcel may not be jurisdictional*" (USACE 2016b). A significant nexus evaluation is not necessary to obtain a PJD.

The Feather River is designated as a navigable water from the mouth to the railroad bridge at Marysville, which is south of the Study Area. However, the Feather River within the Study Area is a continuation of the navigable Feather River, and therefore subject to regulation under the CWA. The water primrose marsh directly abuts the Feather River, and therefore is subject to regulation under the CWA.

6.0 CONCLUSION

A total of 2.385 acres of aquatic resources have been mapped within the Study Area. This acreage represents a calculated estimation of the extent of aquatic resources within the Study Area and do not imply jurisdiction; they are subject to modification following USACE review and/or the verification process. The placement of dredged or fill material into jurisdictional features would require a permit pursuant to Section 404 of the CWA and certification or waiver in compliance with Section 401 of the CWA.

7.0 REFERENCES

Baldwin, B. G., Goldman G. H., Keil D. J., Patterson R., Rosatti T. J., Wilken D. H. 2012. *The Jepson Manual; Vascular Plants of California, Second Edition*. Berkeley, CA: University of California Press.

CDEC. 2020. Hourly Data for Lincoln (LCN). Internet site: http://cdec.water.ca.gov/dynamicapp/QueryF?s=LCN&d=08-Apr-2020+03:11&span=300days. Accessed April 2020.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1 (On-line edition). Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station. p. 143. January 1987.

Lichvar, R. W., Banks D. L., Kirchner W. N., Melvin N. C. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron*. 2016:30:1-17. April 28, 2016.

Lichvar, R. W., Banks D. L., Gutierrez, R., Garland, M., Kirchner W. N. 2018. *The National Wetland Plant List. 2018 NWPL v3.3-Mapper Tool*. Internet site: http://wetland-plants.usace.army.mil/nwpl_static/v33/mapper/mapper.html. Accessed August 2019.

Munsell Color. 2009. Munsell Soil Color Book. Munsell Color. Grand Rapids, Michigan.

NRCS. 2020a. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/. Accessed April 2020.

_______. 2020b. Soil Data Access Hydric Soils List. https://www.nrcs.usda.gov/wps/portal/nrcs/mail/soils/use/hydric/. Accessed April 2020.

_______. 2003. *National Soil Survey Handbook*. http://soils.usda.gov/technical/handbook

NRCS, USGS, USEPA. 2016. Watershed Boundary Dataset for California. http://datagateway.nrcs.usda.gov.

SFEI. CARI Version 0.3. 2017. http://www.sfei.org/data/california-aquatic-resource-inventory-cari-version-03-gis-data#sthash.0SjnlwfO.dpbs.

USACE. 2016a. Minimum Standards for Acceptance of Aquatic Resources Delineation Reports. U.S. Army Corps of Engineers. p. 20. January 2016.

_______. 2016b. Regulatory Guidance letter 16-01, Jurisdictional Determinations. October 2016.

______. 2008a. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.

______. 2008b. Regulatory Guidance Letter 08-02, Jurisdictional Determinations. June 26, 2008.

______. 1992. Clarification and Interpretation of the 1987 Manual. Memorandum from Major General Arthur E. Williams. Dated 6 March 1992.

USGS. 1952, photorevised 1973. "Olivehurst, California" 7.5-minute Quadrangle. In: Survey. G, editor. Denver, Colorado.

USGS. 1952, photorevised 1973. "Yuba City, California" 7.5-minute Quadrangle. In: Survey. G, editor. Denver, Colorado.

WRCC. 2020. Period of Record Monthly Climate Summary, Marysville, California (045385), 02/01/1897 to 10/31/2007. Internet site: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5385. Accessed April 2020.

LIST OF ATTACHMENTS

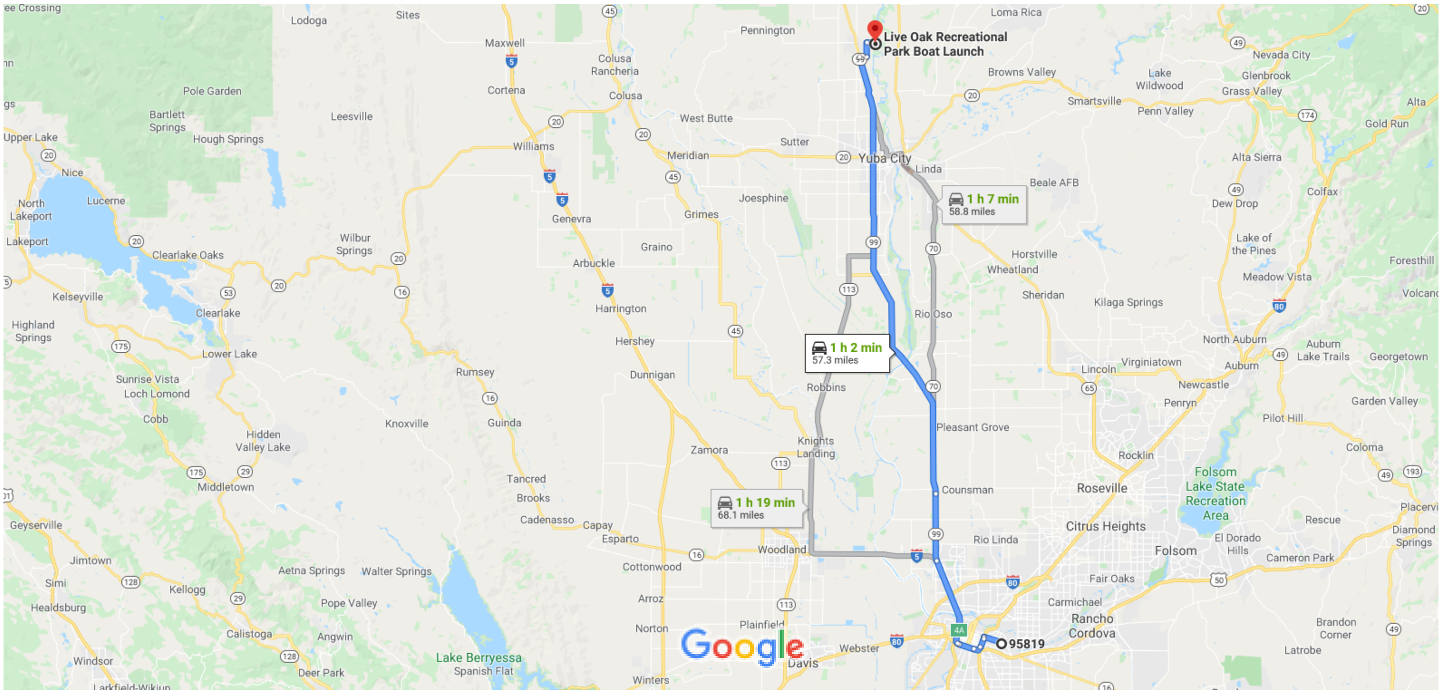
ATTACHMENT A

Driving Directions to Study Area

Google Maps

Sacramento, CA 95819 to Live Oak Recreational Park Boat Launch

Drive 57.3 miles, 1 h 2 min



Map data ©2020 Google 5 mi

Sacramento, CA 95819

Get on I-80BUS W from H St

6 min (1.8 mi)

1. Head north on 52nd St toward Hidden Ln

167 ft

2. Turn left onto Hidden Ln

262 ft

3. Turn right at the 1st cross street onto 51st St

197 ft

4. Turn left at the 1st cross street onto H St

1.5 mi

5. Sharp left to merge onto I-80BUS W toward CA-99 S/US-50

0.2 mi

Follow I-5 N and CA-99 N to Bishop Ave in Sutter County

52 min (52.9 mi)

6. Merge onto I-80BUS W

0.6 mi

7. Continue onto CA-51 S (signs for CA-99 S)

404 ft

8. Use the right 2 lanes to take the exit toward US-50 W

0.7 mi

9. Merge onto I-80BUS W/US-50 W

1.2 mi

10. Use the right 2 lanes to take exit 4A for Interstate 5 N/Interstate 5 S/State Route 99 North toward Redding/Los Angeles

0.1 mi

11. Keep right at the fork, follow signs for Redding/CA-99 N/I-5 N and merge onto I-5 N

7.3 mi

12. Keep right to continue on CA-99 N, follow signs for Yuba City/Marysville

5.5 mi

13. Keep left to stay on CA-99 N

37.4 mi

Take Sheldon Ave to Pennington Rd

5 min (2.5 mi)

14. Turn right onto Bishop Ave

0.6 mi

15. Turn left at the 2nd cross street onto Sheldon Ave

1.2 mi

16. Turn right onto Pennington Rd

⚠ Partial restricted usage road

0.8 mi

Live Oak Recreational Park Boat Launch

Pennington Rd, Live Oak, CA 95953

ATTACHMENT B

Wetland Determination Data Forms - Arid West Region

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Boat Ramp Sdmt./Inv. Species Removal City/County: Live Oak/Sutter Co. Sampling Date: 4/8/2020

Applicant/Owner: SBFCA State: CA Sampling Point: Live Oak 1

Investigator(s): Keith Kwan Section, Township, Range: uns. Rancho Boga Landgrant

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): C Lat: 39.273400 Long: -121.631554 Datum: NAD83

Soil Map Unit Name: 118-Columbia fine sandy loam, channeled, 0 to 2 percent slopes NWI classification: ______

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

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

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

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

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

Remarks:

Live Oak Boat Ramp; Ludwigia marsh/wetland adjacent to Feather River

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 10' radius)			
1. Ludwigia peploides	80	yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	80		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: Live Oak 1

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-18	10YR4/2	80	7.5YR4/6	20	c	m/pl		silty clay

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ **No** ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ✓ **No** ______

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Boat Ramp Sdmt./Inv. Species Removal City/County: Live Oak/Sutter Sampling Date: 4/8/2020

Applicant/Owner: SBFCA State: CA Sampling Point: 2

Investigator(s): Keith Kwan Section, Township, Range: uns. Rancho Boga Landgrant

Landform (hillslope, terrace, etc.): hillslope/riverbank Local relief (concave, convex, none): convex Slope (%): 10

Subregion (LRR): C Lat: 39.273404 Long: -121.631514 Datum: NAD83

Soil Map Unit Name: 118-Columbia fine sandy loam, channeled, 0 to 2 percent slopes NWI classification: ______

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

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

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

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

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks:

Live Oak Boat Ramp; upland adjacent to sample point 1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 6'x10')			
1. Vicia villosa	25	yes	N/L
2. Bromus diandrus	25	yes	N/L
3. Gnaphalium palustre	2	no	FACW
4. Artemisia douglasiana	5	no	FAC
5. Hordeum branchyantherum	10	no	FACW
6. Xanthium strumarium	2	no	FAC
7.			
8.			
= Total Cover	69		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 31 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR3/3	100						silt loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ______ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Live Oak Boat Ramp Sdmt./Inv. Species Removal City/County: Live Oak/Sutter Sampling Date: 4/8/2020

Applicant/Owner: SBFCA State: CA Sampling Point: 3

Investigator(s): Keith Kwan Section, Township, Range: uns. Rancho Boga Landgrant

Landform (hillslope, terrace, etc.): riverbank Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR): C Lat: 39.273397 Long: -121.631736 Datum: NAD83

Soil Map Unit Name: 118-Columbia fine sandy loam, channeled, 0 to 2 percent slopes NWI classification: ______

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

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

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

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

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

Feather River OHWM delineated based on field indicators observed, e.g. sediment deposition, debris line, development of soil/vegetation (above OHWM).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

no vegetation at the OHWM

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR3/3	100						loamy sand

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No ______ Depth (inches): 12"+

Water Table Present? Yes ______ No ______ Depth (inches): ______

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

Wetland Hydrology Present? Yes ✓ No ______

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

Remarks:

ATTACHMENT C

Plants Observed Onsite

Attachment C. Plants Observed Onsite (April 2020)		
Scientific Name	**Common Name**	**AW**
Acer negundo	*Box-elder*	FACW
Artemisia douglasiana	*Mugwort*	FAC
*Bromus diandrus**	*Ripgut brome*	N/L
*Cynodon dactylon**	*Bermuda grass*	FACU
Elymus triticoides	*Creeping wild-rye*	FAC
*Festuca perennis**	*Italian Ryegrass*	FAC
Fraxinus latifolia	*Oregon ash*	FACW
*Geranium dissectum**	*Cut-leaved geranium*	N/L
Hordeum brachyantherum	*Meadow barley*	FACW
*Hordeum murinum**	*Barley*	FACU
Juglans californica	*California black walnut*	FACU
Ludwigia peploides ssp. *peploides*	*Water primrose*	OBL
*Plantago lanceolata**	*English plantain*	FAC
Platanus racemosa	*California sycamore*	FAC
*Poa annua**	*Annual bluegrass*	FAC
Populus fremontii	*Fremont's cottonwood*	FAC
Quercus lobata	*Valley oak*	FACU
Quercus wislizeni	*Interior live oak*	N/L
*Robinia pseudoacacia**	*Black locust*	FACU
*Rubus armeniacus**	*Himalayan blackberry*	FAC
*Rumex crispus**	*Curly dock*	FAC
Salix exigua	*Sandbar willow*	FACW
Salix gooddingii	*Goodding's black willow*	FACW
Salix laevigata	*Red willow*	FACW
*Trifolium hirtum**	*Rose clover*	N/L
*Vicia villosa**	*Winter vetch*	N/L
Vitis californica	*California wild grape*	FACU

*-non-native species

Wetland Status Codes:

OBL - Obligate Wetland; Almost always occur in wetlands

FACW - Facultative Wetland; Usually occur in wetlands, but may occur in non-wetlands

FAC - Facultative; Occur in wetlands and non-wetlands

FACU - Facultative Upland; Usually occur in non-wetlands, but may occur in wetlands

UPL - Obligate Upland; Almost never occur in wetlands

N/L - Plants that are Not Listed; Does not occur in wetlands in any region

ATTACHMENT D

Representative Site Photographs

Photo 5. Live Oak Boat Ramp.

Photo 6. Live Oak Boat Ramp, Primrose Marsh and Dock.

Photo 7. Live Oak Boat Ramp, Primrose Marsh.

Photo 8. Live Oak Boat Ramp, Feather River Downstream of Boat Ramp.

ATTACHMENT E

USACE ORM Aquatic Resources Table

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
FR-01	CALIFORNIA	R2	RIVERINE	Area	1.906	ACRE	DELINEATE	39.272879	-121.631146	
LM-01	CALIFORNIA	PEM	RIVERINE	Area	0.303	ACRE	DELINEATE	39.272921	-121.630648	
LM-02	CALIFORNIA	PEM	RIVERINE	Area	0.176	ACRE	DELINEATE	39.273207	-121.631498	

ATTACHMENT F

Wetland Delineation Shape File (to be included with USACE submittal only)

Appendix C

Live Oak Boat Ramp Sediment and Invasive Species Removal Project Greenhouse Gas Modeling Output

Offroad Emissions

Live Oak Boat Ramp

Sutter County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	7.92	Acre	7.92	344,995.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	61
Climate Zone	3			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project site does not contain utilities.

Land Use -

Construction Phase -

Off-road Equipment - Equioment list composed from typical equipment used during dredging and information provided by the Project applicant.

Trips and VMT - Numbber of hauling trips provided from the Project applicant (283). Trip length was caluclated from the Project site to the Ostrom Landfill.

Energy Use -

Water And Wastewater - No operational impacts.

Mobile Land Use Mitigation -

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	5.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.9222	9.6541	4.2314	0.0139	0.0411	0.3609	0.4020	0.0109	0.3348	0.3457	0.0000	1,324.3046	1,324.3046	0.3906	0.0000	1,334.0696
Maximum	**0.9222**	**9.6541**	**4.2314**	**0.0139**	**0.0411**	**0.3609**	**0.4020**	**0.0109**	**0.3348**	**0.3457**	**0.0000**	**1,324.3046**	**1,324.3046**	**0.3906**	**0.0000**	**1,334.0696**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.9222	9.6541	4.2314	0.0139	0.0411	0.3609	0.4020	0.0109	0.3348	0.3457	0.0000	1,324.3046	1,324.3046	0.3906	0.0000	1,334.0696
Maximum	**0.9222**	**9.6541**	**4.2314**	**0.0139**	**0.0411**	**0.3609**	**0.4020**	**0.0109**	**0.3348**	**0.3457**	**0.0000**	**1,324.3046**	**1,324.3046**	**0.3906**	**0.0000**	**1,334.0696**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**0.0000**	**1.8500e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**0.0000**	**1.8500e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Trenching	7/1/2021	7/7/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 7.92

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Cranes	1	8.00	231	0.29
Dredging	Dumpers/Tenders	2	8.00	16	0.38
Dredging	Rubber Tired Loaders	1	8.00	203	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	10	5.00	0.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9028	9.6424	4.0832	0.0135		0.3607	0.3607		0.3346	0.3346		1,285.8456	1,285.8456	0.3895		1,295.5839
Total	**0.9028**	**9.6424**	**4.0832**	**0.0135**		**0.3607**	**0.3607**		**0.3346**	**0.3346**		**1,285.8456**	**1,285.8456**	**0.3895**		**1,295.5839**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0194	0.0117	0.1482	3.9000e-004	0.0411	2.3000e-004	0.0413	0.0109	2.2000e-004	0.0111		38.4590	38.4590	1.0700e-003		38.4856
Total	**0.0194**	**0.0117**	**0.1482**	**3.9000e-004**	**0.0411**	**2.3000e-004**	**0.0413**	**0.0109**	**2.2000e-004**	**0.0111**		**38.4590**	**38.4590**	**1.0700e-003**		**38.4856**

3.2 Dredging - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9028	9.6424	4.0832	0.0135		0.3607	0.3607		0.3346	0.3346	0.0000	1,285.8456	1,285.8456	0.3895		1,295.5839
Total	**0.9028**	**9.6424**	**4.0832**	**0.0135**		**0.3607**	**0.3607**		**0.3346**	**0.3346**	**0.0000**	**1,285.8456**	**1,285.8456**	**0.3895**		**1,295.5839**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0194	0.0117	0.1482	3.9000e-004	0.0411	2.3000e-004	0.0413	0.0109	2.2000e-004	0.0111		38.4590	38.4590	1.0700e-003		38.4856
Total	**0.0194**	**0.0117**	**0.1482**	**3.9000e-004**	**0.0411**	**2.3000e-004**	**0.0413**	**0.0109**	**2.2000e-004**	**0.0111**		**38.4590**	**38.4590**	**1.0700e-003**		**38.4856**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.512796	0.026606	0.165464	0.111626	0.028005	0.006057	0.029203	0.113670	0.000830	0.000443	0.003492	0.001021	0.000787

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Unmitigated	0.1880	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0657					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.0000e-005	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**		**1.8500e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0657					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.0000e-005	1.0000e-005	8.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.7300e-003	1.7300e-003	0.0000		1.8500e-003
Total	**0.1880**	**1.0000e-005**	**8.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.7300e-003**	**1.7300e-003**	**0.0000**		**1.8500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Live Oak Boat Ramp
Sutter County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	7.92	Acre	7.92	344,995.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	61
Climate Zone	3			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project site does not contain utilities.

Land Use -

Construction Phase -

Off-road Equipment - Equioment list composed from typical equipment used during dredging and information provided by the Project applicant.

Trips and VMT - Numbber of hauling trips provided from the Project applicant (283). Trip length was caluclated from the Project site to the Ostrom Landfill.

Energy Use -

Water And Wastewater - No operational impacts.

Mobile Land Use Mitigation -

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	5.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	2.3000e-003	0.0241	0.0105	3.0000e-005	1.0000e-004	9.0000e-004	1.0000e-003	3.0000e-005	8.4000e-004	8.6000e-004	0.0000	2.9950	2.9950	8.9000e-004	0.0000	3.0171
Maximum	**2.3000e-003**	**0.0241**	**0.0105**	**3.0000e-005**	**1.0000e-004**	**9.0000e-004**	**1.0000e-003**	**3.0000e-005**	**8.4000e-004**	**8.6000e-004**	**0.0000**	**2.9950**	**2.9950**	**8.9000e-004**	**0.0000**	**3.0171**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	2.3000e-003	0.0241	0.0105	3.0000e-005	1.0000e-004	9.0000e-004	1.0000e-003	3.0000e-005	8.4000e-004	8.6000e-004	0.0000	2.9950	2.9950	8.9000e-004	0.0000	3.0171
Maximum	**2.3000e-003**	**0.0241**	**0.0105**	**3.0000e-005**	**1.0000e-004**	**9.0000e-004**	**1.0000e-003**	**3.0000e-005**	**8.4000e-004**	**8.6000e-004**	**0.0000**	**2.9950**	**2.9950**	**8.9000e-004**	**0.0000**	**3.0171**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	5-3-2021	8-2-2021	0.0264	0.0264
		Highest	0.0264	0.0264

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Trenching	7/1/2021	7/7/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 7.92

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Cranes	1	8.00	231	0.29
Dredging	Dumpers/Tenders	2	8.00	16	0.38
Dredging	Rubber Tired Loaders	1	8.00	203	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	10	5.00	0.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0241	0.0102	3.0000e-005		9.0000e-004	9.0000e-004		8.4000e-004	8.4000e-004	0.0000	2.9163	2.9163	8.8000e-004	0.0000	2.9383
Total	**2.2600e-003**	**0.0241**	**0.0102**	**3.0000e-005**		**9.0000e-004**	**9.0000e-004**		**8.4000e-004**	**8.4000e-004**	**0.0000**	**2.9163**	**2.9163**	**8.8000e-004**	**0.0000**	**2.9383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0787	0.0787	0.0000	0.0000	0.0788
Total	**4.0000e-005**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0787**	**0.0787**	**0.0000**	**0.0000**	**0.0788**

3.2 Dredging - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0241	0.0102	3.0000e-005		9.0000e-004	9.0000e-004		8.4000e-004	8.4000e-004	0.0000	2.9163	2.9163	8.8000e-004	0.0000	2.9383
Total	**2.2600e-003**	**0.0241**	**0.0102**	**3.0000e-005**		**9.0000e-004**	**9.0000e-004**		**8.4000e-004**	**8.4000e-004**	**0.0000**	**2.9163**	**2.9163**	**8.8000e-004**	**0.0000**	**2.9383**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0787	0.0787	0.0000	0.0000	0.0788
Total	**4.0000e-005**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0787**	**0.0787**	**0.0000**	**0.0000**	**0.0788**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.512796	0.026606	0.165464	0.111626	0.028005	0.006057	0.029203	0.113670	0.000830	0.000443	0.003492	0.001021	0.000787

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Unmitigated	0.0343	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0223					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0223					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	7.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4000e-004	1.4000e-004	0.0000	0.0000	1.5000e-004
Total	**0.0343**	**0.0000**	**7.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.0000**	**1.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

HAUL TRUCK EMISSIONS

Construction Haul Truck Emissions

Live Oak Boat Ramp

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Metric Tons Daily	Daily CO2e
T7 Single Construction Haul Trucks	775	870	CO2	1859.782655	2.720688805	1443698.56	**1.44**	**1.51**
			CH4	0.019788	5.08994E-05	15.38	**0.00**	
			N2O	0.292332	0.000427654	226.93	**0.00**	

2021 Metric Tons
190.82

[1] Daily VMT: Calculations factor the average distance from the project to the three proposed dump sites (26.7 miles). 283 total haul truck trips are anticipated in order to remove dredge material. Material hauling is assume to occur over 10 days for a total of 29 truck trips a day (283 ÷ 10 = 28.3 and this value is rounded up to 29). 26.7 miles x 29 tripss = 775 miles traveled daily
[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 14 trips x 15 = 210 minutes daily (105 minutes of idling onsite).

All emission factors sourced from EMFAC2017.

Appendix D

Live Oak Boat Ramp Sediment and Invasive Species Removal Project Soil Screening Data Report

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(916) 375-8706

BLACKBURN
CONSULTING

Auburn (530) 887-1494
Fresno (559) 438-8411

Blackburn File No. 3825.X
May 21, 2020

Mr. Chris Fritz
Peterson Brustad, Inc.
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Subject: **SOIL SCREENING DATA REPORT**
Feather River Sediment Removal Project
Live Oak Boat Launch and Yuba City Boat Launch
Sutter County, California

Dear Mr. Fritz,

Blackburn Consulting (Blackburn) prepared this Soil Screening Data Report (Data Report) for the Feather River Sediment Removal Project (Project) in Sutter County, California. Blackburn prepared this Data Report in accordance with our proposal dated April 6, 2020. This Data Report is a preliminary assessment and intended for planning purposes. Additional sampling and testing are necessary to comply with US Army Corps of Engineers (USACE) standards and provide adequate data for design-level project documents. This Data Report contains Project Description, Soil Sample Collection and Test Results, and Conclusions.

PROJECT DESCRIPTION

Peterson Brustad, Inc. (PBI) requested Blackburn perform soil classification and environmental testing on accumulated sediment for proposed dredging activities at the Live Oak Boat Launch and the Yuba City Boat Launch in Sutter County, California (Figure 1). The USACE and other regulatory bodies require testing of water way sediments prior to dredging activities. PBI requested Blackburn "pre-profile" the proposed dredged material for general soil characteristics before a more rigorous sampling and testing plan is implemented prior to dredging activities.

SOIL SAMPLE COLLECTION AND TEST RESULTS

Sample Locations and Depths

Blackburn collected samples of the sediment soil for testing on May 5, 2020. Blackburn collected two samples from the Live Oak Boat Launch and three samples from the Yuba City Boat Launch at the approximate locations presented on Figure 2. We collected samples for environmental tests at approximately 12” below the sediment surface. We collected samples for soil classification tests from the upper 12” of sediment.

Soil Sample Collection Methodology

Blackburn collected soil samples with a hand auger where the sediment surface was above the water elevation. We collected samples below the water surface at the Yuba City Boat Launch by hand-driving an open-ended, small-diameter PVC pipe into the sediment . Appendix C contains photos of the general sample locations.

Blackburn transferred the samples for environmental tests into laboratory-supplied 4-ounce glass jars. The sample jars were labeled and placed in a chilled cooler for transport to Sunstar Laboratories, a California certified analytical laboratory, under continuous chain-of-custody documentation. Blackburn cleaned the sampling equipment with an Alconox wash solution and a distilled water rinse between each sample. The samples were submitted to SunStar Laboratories of Lake Forest, California for the following tests:

- Total Petroleum Hydrocarbon (TPH) as gasoline/diesel/motor oil by EPA Method 8015.
- Semi Volatile Organics (SVOC) by EPA Method 8270C.
- Organochlorine Pesticides (OCP) by EPA Method 8081A.
- Cam-17 Metals by EPA Methods 6010B and 7471A (mercury).

We placed soil samples for classification tests in plastic bags and delivered them to our West Sacramento Laboratory for soil classification testing. We performed the following classification tests:

- 200 Wash in accordance with ASTM D1140.
- Particle Size Analysis in accordance with ASTM D6913.
- Atterberg Limits in accordance with ASTM D4318

Environmental Test Results

Reported detection levels and environmental test results are presented in Tables 1-4 and discussed below. Applicable screening levels from the US EPA Regional Screening Levels (RSLs) are included in the tables for comparison. Appendix A presents Sunstar’s analytical test result report and chain-of-custody documentation.

Total Petroleum Hydrocarbons (TPHs), Table 1: TPH as Motor Oil (MORO) was detected in both samples at the Live Oak Boat Launch. Detected concentrations were below RSLs for residential land use. TPH as Gasoline (GRO) and Diesel (DRO) was not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Semi-Volatile Organic Compounds (SVOCs), Table 2: SVOCs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Organochlorine Pesticides (OCPs), Table 3: OCPs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Cam -17 Metals, Table 4: Barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in the soil samples at concentrations below the RSLs for residential land use. All other metals were not detected at concentrations equal to or greater than laboratory reporting limits.

Soil Classification Test Results

We collected five soil samples of the sediment at the boat launch facilities for classification tests; two at the Live Oak Boat Launch and three at the Yuba City Boat Launch. Our test results are shown in the following tables.

Soil Classification Test Results - Gradation					
Sample ID	**Soil Classification**	**Sieve Opening Size – Percent Finer**			
		½ -Inch	**No. 4**	**No. 40**	**No. 200**
Live Oak-1 0-12"	Poorly-graded SAND with SILT (SP-SM)	100	100	98.0	10.6
Live Oak-2 0-12"	SILTY SAND (SM)	NA	NA	NA	44.7
Yuba City-1 0-12"	Poorly-graded SAND (SP)	100	99.8	26.5	0.4
Yuba City-2 0-12"	Poorly-graded SAND (SP)	100	96.0	29.7	0.1
Yuba City-3 0-12"	Poorly-graded SAND (SP)	100	100	27.6	0.1

Soil Classification Test Results – Atterberg Limits			
Sample ID	**Soil Classification USCS**	**Liquid Limit**	**Plasticity Index**
Live Oak-2 0-12"	SILTY SAND (SM)	33	1

Appendix B contains the soil classification laboratory test results.

CONCLUSIONS

This Data Report provides preliminary information about the accumulated sediment at the Yuba City and Live Oak boat launch facilities prior to the development and implementation of a more detailed sampling and testing program required before any dredging activities. The preliminary tests indicate that the sediment tested at both facilities meets EPA RSLs for unrestricted land use, however, additional testing is required to determine project-wide conditions and compliance with USACE standards.

Our classification tests indicate that the sediment samples tested from the Yuba City Boat Launch are all non-plastic poorly graded sand (SP). The sediment samples we tested from the Live Oak Boat Launch classify as non-plastic poorly-graded sand with silt (SP-SM) and silty sand (SM).

Thank you for including Blackburn on your project team. Please let us know if you have any questions or need more information.

Sincerely,

BLACKBURN CONSULTING

Prepared by:	Reviewed by:
Luke Morrell, E.I.T. Environmental Engineer	Laura Long Environmental Project Manager
	REGISTERED PROFESSIONAL ENGINEER ROBERT B. LOKTEFF No. 2589 GEOTECHNICAL STATE OF CALIFORNIA
	Robert Lokteff, P.E., G.E. Principal Geotechnical Engineer

Attachments:
- Figure 1: Vicinity Map
- Figures 2a-2b: Site Map
- Table 1: Summary of Laboratory Analysis Results — TPHs
- Table 2: Summary of Laboratory Analysis Results — SVOCs
- Table 3: Summary of Laboratory Analysis Results — OCPs
- Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals
- Appendix A: Sunstar Laboratory Reports
- Appendix B: Soil Classification Laboratory Test Results
- Appendix C: Photo Report

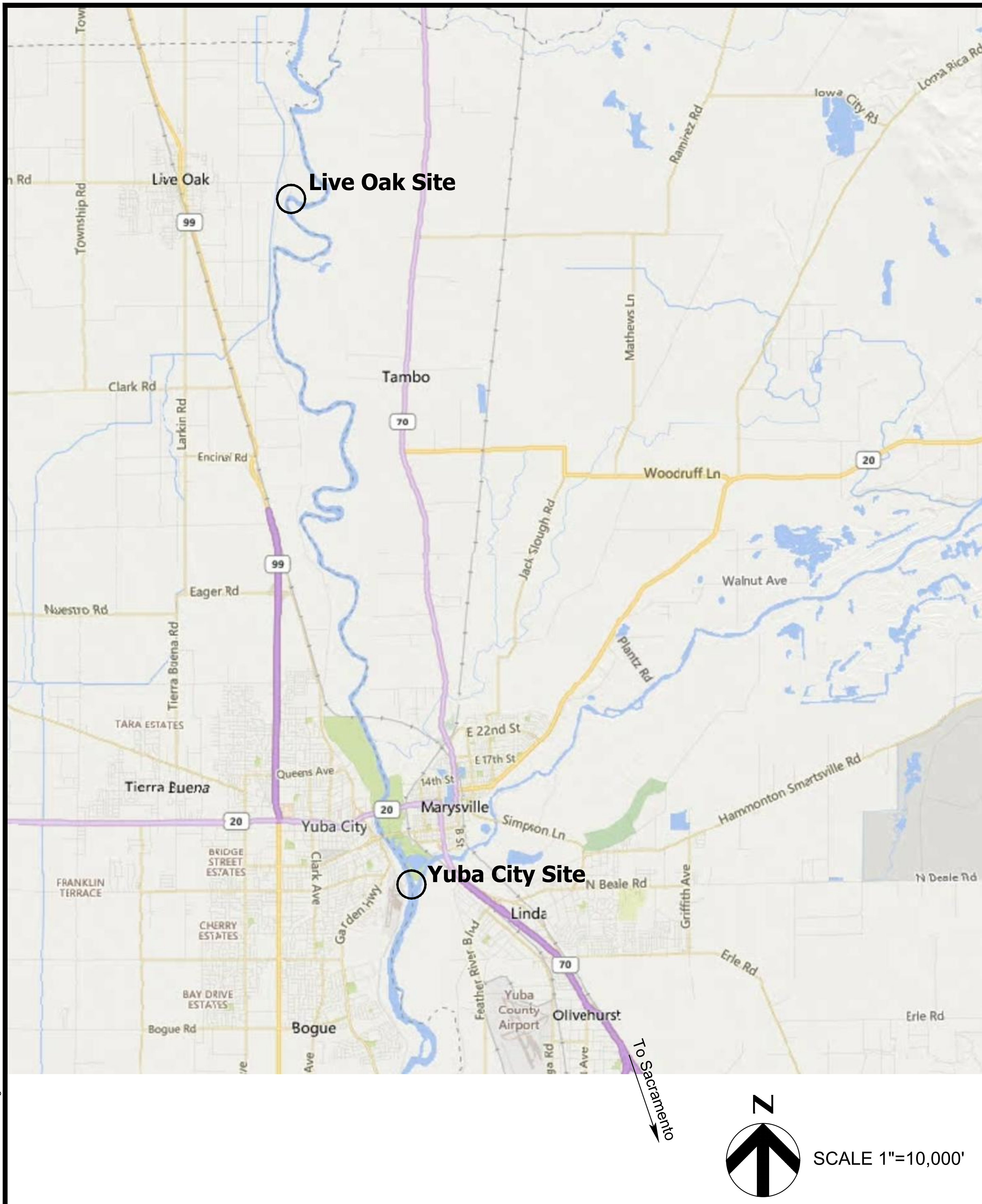
SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

FIGURES



BLACKBURN CONSULTING

VICINITY MAP

Feather River Sediment Removal Project
Live Oak and Yuba City Boat Launches
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 1

5/11/2020 3825.x Fig1 Feather River Sediment Removal.dwg

N

SCALE 1"= 200'

LEGEND

Approximate Sample Location

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg

BLACKBURN CONSULTING

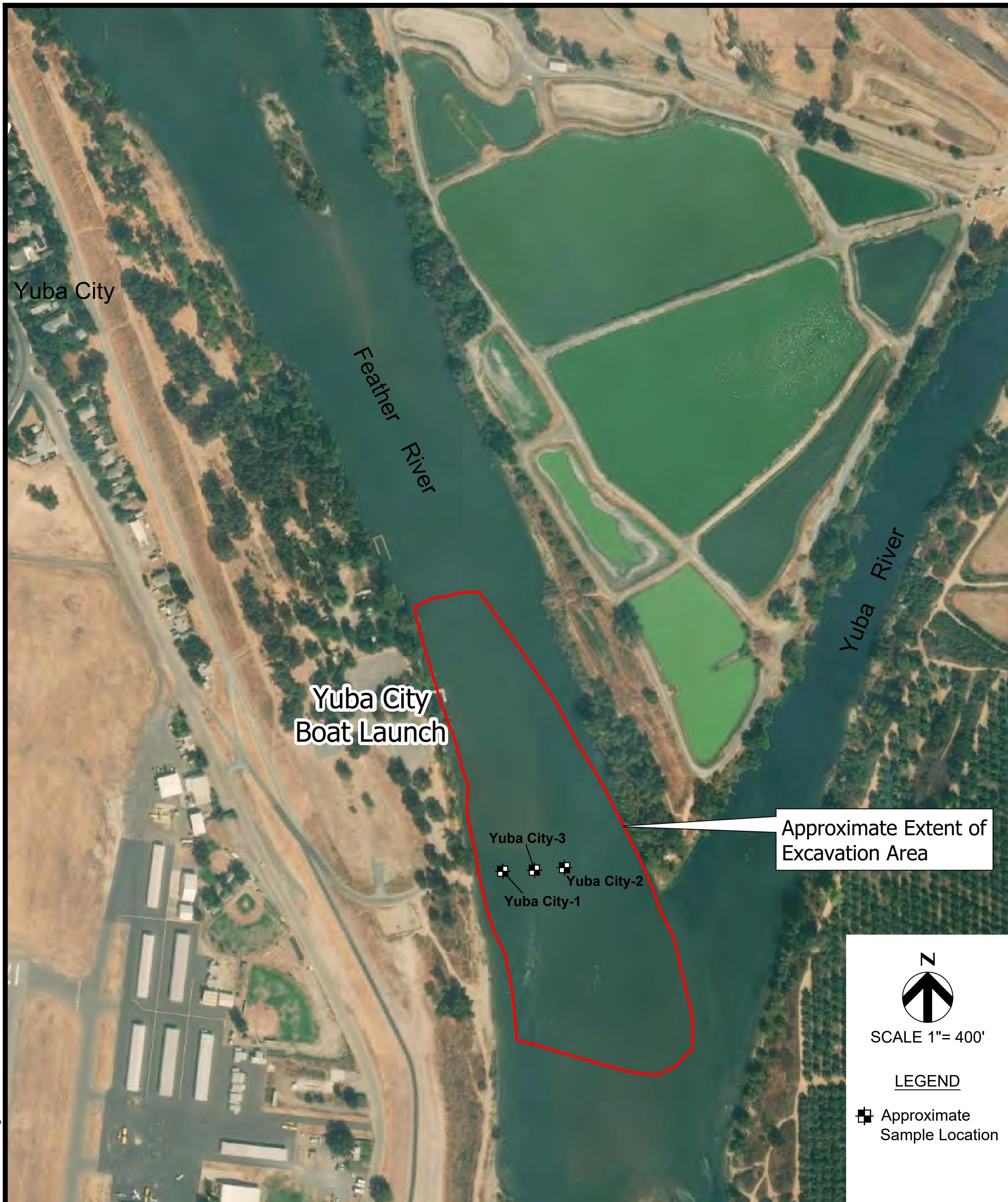
APPROXIMATE SAMPLING LOCATIONS

Live Oak Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2A



Source: Sutter Butte Flood Control Agency, Feather River Sediment Removal Project Site Specific Map, Figure 2, dated October 2019. Scale 1" = 400'

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS
Yuba City Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2B

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

TABLES

West Sacramento Office:
2491 Boatman Ave., Sacramento, CA 95691
(916) 375-8706

BLACKBURN CONSULTING

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411

Table 1 Extractable Petroleum Hydrocarbons (TPHs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS (mg/kg)

Sample Date	Sample ID:	TPH (Extractable Petroleum Hydrocarbons) (mg/kg) EPA Method 8015B		
		Gasoline (C6-C12)	Diesel Fuel (C13-C28)	Motor Oil (C29-C40)
5/5/2020	Live Oak-1 12"	ND	ND	**22**
	Live Oak-2 12"	ND	ND	**17**
	Yuba City-1 12"	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND
Reporting Limit**		10	10	10
EPA RSLs	Residential	82	96	2,500

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

West Sacramento Office:
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Fresno Office: (559) 438-8411

Table 2A Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg) EPA Method 8270C																									
		1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	Aniline	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	1-Methylnaphthalene	3-Nitroaniline	4-Methylphenol	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	1.0	1.0	1.0	1.0	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	0.3	1.0	1.0	0.3	1.0	0.3	0.3
EPA RSLs	Residential	7.8	1,800	95	---	2.6	6,300	7.8	190	1,300	130	1.7	0.36	4,100	340	190	3,200	630	---	9.9	---	---	5.1	---	6,300	2.7	---

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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(916) 375-8706

BLACKBURN CONSULTING

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411

Table 2B Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg) EPA Method 8270C																									
		4-Nitroaniline	4-Nitrophenol	2,3,5,6-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	Benzyl alcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Carbazole	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	N-Nitrosodiphenylamine	N-Nitrosodimethylamine	Nitrobenzene	Pentachlorophenol	Phenol
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5	0.3	1.0	0.3	0.3	0.3	0.3	1.0	1.0	1.0
EPA RSLs	Residential	27	---	---	1,900	6,300	6,300	0.1	3,100	39	290		6,300	630	66	51,000	---	0.19	1.2	1.8	1.8	570	110	0.002	5.1	1.0	19,000

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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BLACKBURN CONSULTING

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Fresno Office: (559) 438-8411

Table 2C Semi-Volatile Organic Compounds (SVOCs) PAHs

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																	
		EPA Method 8270C																	
		Pyridine	Azobenzene	Acenaph thene	Acenaph thylene	Anthracene	Benzo[a] anthracene	Benzo[a] pyrene	Benzo[b] fluoranthen e	Benzo (g,h,i) perylene	Benzo[k] fluor anthene	Chry sene	Dibenz[a,h]a nthracene	Fluoranth ene	Fluorene	Indeno [1,2,3-cd] pyrene	Naphth alene	Phenan threne	Pyrene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
EPA RSLs	Residential	5.8	5.6	3,300	---	17,000	1.1	0.11	1.1	---	11	110	0.028	2,400	2,300	1.1	2.0	---	1,800

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 3a Organochlorine Pesticides (OCPs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Organochlorine Pesticides (OCPs) by EPA Method 8081A (mg/kg)																					
		4,4'-DDE	4,4'-DDT	4,4'-DDD	alpha-BHC	alpha-Chlordane	Aldrin	beta-BHC	Chlordane (Technical)	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin Ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.020
EPA RSLs	Residential	1.9	2.0	1.9	0.039	0.086	0.44	0.3	0.44	---	0.034	470	470	---	19	---	---	0.57	0.44	0.13	0.07	320	0.49

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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(916) 375-8706

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411

Table 4 Cam-17 Metals

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	CAM-17 Metals (mg/kg)																
		EPA Method 6010B																EPA Method 7471A
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
5/5/2020	Live Oak-1 12"	ND	ND	**39**	ND	ND	**23**	**8.6**	**14**	**3.5**	ND	**35**	ND	ND	ND	**27**	**21**	ND
	Live Oak-2 12"	ND	ND	**41**	ND	ND	**29**	**8.8**	**12**	ND	ND	**42**	ND	ND	ND	**27**	**22**	ND
	Yuba City-1 12"	ND	ND	**60**	ND	ND	**22**	**7.7**	**7.1**	ND	ND	**41**	ND	ND	ND	**20**	**18**	ND
	Yuba City-2 12"	ND	ND	**49**	ND	ND	**17**	**6.6**	**6.3**	ND	ND	**31**	ND	ND	ND	**19**	**15**	ND
	Yuba City-3 12"	ND	ND	**42**	ND	ND	**22**	**6.8**	**7.3**	ND	ND	**37**	ND	ND	ND	**21**	**17**	ND
Reporting Limit**		3.0	5.0	1.0	1.0	2.0	2.0	2.0	1.0	3.0	5.0	2.0	5.0	2.0	2.0	5.0	1.0	0.1
EPA RSLs	Residential	31	0.11	15,000	16	71	36,000	23	3,100	80	390	820	390	390	0.78	390	23,000	1

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX A

Sunstar Laboratory Reports

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

13 May 2020

Luke Morrell
Blackburn Consulting-West Sac.
2491 Boatman Ave.
West Sacramento, CA 95691

RE: Feather River Sediment Removal

Enclosed are the results of analyses for samples received by the laboratory on 05/06/20 09:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mike Jaroudi
Project Manager

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project:	Feather River Sediment Removal	
2491 Boatman Ave.	Project Number:	3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager:	Luke Morrell	05/13/20 16:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
YubaCity-3 12"	T202211-01	Soil	05/05/20 09:10	05/06/20 09:40
YubaCity-2 12"	T202211-02	Soil	05/05/20 09:30	05/06/20 09:40
YubaCity-1 12"	T202211-03	Soil	05/05/20 09:50	05/06/20 09:40
LiveOAk-1 12"	T202211-04	Soil	05/05/20 11:25	05/06/20 09:40
LiveOAk-2 12"	T202211-05	Soil	05/05/20 12:00	05/06/20 09:40

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

DETECTIONS SUMMARY

Sample ID: YubaCity-3 12" **Laboratory ID:** T202211-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**42**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.8**	2.0	mg/kg	EPA 6010b	
Copper	**7.3**	1.0	mg/kg	EPA 6010b	
Nickel	**37**	2.0	mg/kg	EPA 6010b	
Vanadium	**21**	5.0	mg/kg	EPA 6010b	
Zinc	**17**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-2 12" **Laboratory ID:** T202211-02

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**49**	1.0	mg/kg	EPA 6010b	
Chromium	**17**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.6**	2.0	mg/kg	EPA 6010b	
Copper	**6.3**	1.0	mg/kg	EPA 6010b	
Nickel	**31**	2.0	mg/kg	EPA 6010b	
Vanadium	**19**	5.0	mg/kg	EPA 6010b	
Zinc	**15**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-1 12" **Laboratory ID:** T202211-03

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**60**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**7.7**	2.0	mg/kg	EPA 6010b	
Copper	**7.1**	1.0	mg/kg	EPA 6010b	
Nickel	**41**	2.0	mg/kg	EPA 6010b	
Vanadium	**20**	5.0	mg/kg	EPA 6010b	
Zinc	**18**	1.0	mg/kg	EPA 6010b	

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Mike Jaroudi, Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Sample ID: LiveOAk-1 12" **Laboratory ID:** T202211-04

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**22**	10	mg/kg	EPA 8015B	
Barium	**39**	1.0	mg/kg	EPA 6010b	
Chromium	**23**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.6**	2.0	mg/kg	EPA 6010b	
Copper	**14**	1.0	mg/kg	EPA 6010b	
Lead	**3.5**	3.0	mg/kg	EPA 6010b	
Nickel	**35**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**21**	1.0	mg/kg	EPA 6010b	

Sample ID: LiveOAk-2 12" **Laboratory ID:** T202211-05

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**17**	10	mg/kg	EPA 8015B	
Barium	**41**	1.0	mg/kg	EPA 6010b	
Chromium	**29**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.8**	2.0	mg/kg	EPA 6010b	
Copper	**12**	1.0	mg/kg	EPA 6010b	
Nickel	**42**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**22**	1.0	mg/kg	EPA 6010b	

SunStar Laboratories, Inc.

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Mike Jaroudi, Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*91.7 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**42**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**22**	2.0	"	"	"	"	"	"	
Cobalt	**6.8**	2.0	"	"	"	"	"	"	
Copper	**7.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**37**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**21**	5.0	"	"	"	"	"	"	
Zinc	**17**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*108 %*	*35-140*		*"*	*"*	*"*	*"*	
Surrogate: Decachlorobiphenyl		*108 %*	*35-140*		*"*	*"*	*"*	*"*	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Semivolatile Organic Compounds by EPA Method 8270C									
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12''

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol		*43.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6		*63.1 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5		*75.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl		*67.8 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol		*52.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4		*56.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*92.4 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**49**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**17**	2.0	"	"	"	"	"	"	
Cobalt	**6.6**	2.0	"	"	"	"	"	"	
Copper	**6.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**31**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**19**	5.0	"	"	"	"	"	"	
Zinc	**15**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.9 %*	*35-140*		*"*	*"*	*"*	*"*	
Surrogate: Decachlorobiphenyl		*92.6 %*	*35-140*		*"*	*"*	*"*	*"*	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol		*66.2 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6		*72.6 %*	*24-113*		"	"	"	"	
Surrogate: Nitrobenzene-d5		*95.5 %*	*21.3-119*		"	"	"	"	
Surrogate: 2-Fluorobiphenyl		*79.5 %*	*32.4-102*		"	"	"	"	
Surrogate: 2,4,6-Tribromophenol		*73.3 %*	*18.1-105*		"	"	"	"	
Surrogate: Terphenyl-dl4		*85.5 %*	*29.1-130*		"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

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Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*96.2 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	05/08/20	"	
Arsenic	ND	5.0	"	"	"	"	05/08/20	"	
Barium	**60**	1.0	"	"	"	"	05/08/20	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**22**	2.0	"	"	"	"	05/08/20	"	
Cobalt	**7.7**	2.0	"	"	"	"	05/08/20	"	
Copper	**7.1**	1.0	"	"	"	"	05/08/20	"	
Lead	ND	3.0	"	"	"	"	05/08/20	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**41**	2.0	"	"	"	"	05/08/20	"	
Selenium	ND	5.0	"	"	"	"	05/08/20	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**20**	5.0	"	"	"	"	05/08/20	"	
Zinc	**18**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*96.8 %*	*35-140*		*"*	*"*	*"*	*"*	
Surrogate: Decachlorobiphenyl		*94.0 %*	*35-140*		*"*	*"*	*"*	*"*	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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T202211-03 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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T202211-03 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol		*46.6 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6		*71.2 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5		*65.0 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl		*97.3 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol		*75.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4		*66.8 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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LiveOAk-1 12"

T202211-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

SunStar Laboratories, Inc.

Extractable Petroleum Hydrocarbons by 8015B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**22**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*93.1 %*	*65-135*		*"*	*"*	*"*	*"*	

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**39**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**23**	2.0	"	"	"	"	"	"	
Cobalt	**8.6**	2.0	"	"	"	"	"	"	
Copper	**14**	1.0	"	"	"	"	"	"	
Lead	**3.5**	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**35**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**21**	1.0	"	"	"	"	"	"	

Cold Vapor Extraction EPA 7470/7471

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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LiveOAk-1 12"

T202211-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*98.4 %*	*35-140*		*"*	*"*	*"*	*"*	
Surrogate: Decachlorobiphenyl		*99.4 %*	*35-140*		*"*	*"*	*"*	*"*	

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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T202211-04 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol		*66.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6		*68.5 %*	*24-113*		"	"	"	"	
Surrogate: Nitrobenzene-d5		*47.8 %*	*21.3-119*		"	"	"	"	
Surrogate: 2-Fluorobiphenyl		*70.7 %*	*32.4-102*		"	"	"	"	
Surrogate: 2,4,6-Tribromophenol		*75.9 %*	*18.1-105*		"	"	"	"	
Surrogate: Terphenyl-dl4		*73.7 %*	*29.1-130*		"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"
T202211-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**17**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*95.2 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**41**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**29**	2.0	"	"	"	"	"	"	
Cobalt	**8.8**	2.0	"	"	"	"	"	"	
Copper	**12**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**42**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**22**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.5 %*	*35-140*		*"*	*"*	*"*	*"*	
Surrogate: Decachlorobiphenyl		*93.7 %*	*35-140*		*"*	*"*	*"*	*"*	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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Mike Jaroudi, Project Manager

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol		*50.0 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6		*77.4 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5		*66.2 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl		*82.9 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol		*79.7 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4		*74.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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West Sacramento CA, 95691	Project Manager:	Luke Morrell	05/13/20 16:46

Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050726 - EPA 3550B GC										
Blank (0050726-BLK1)				Prepared & Analyzed: 05/07/20						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*96.7*		*"*	*99.0*		*97.6*	*65-135*			
LCS (0050726-BS1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	470	10	mg/kg	495		94.5	75-125			
Surrogate: p-Terphenyl	*100*		*"*	*99.0*		*101*	*65-135*			
LCS Dup (0050726-BSD1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	460	10	mg/kg	495		92.2	75-125	2.38	20	
Surrogate: p-Terphenyl	*101*		*"*	*99.0*		*102*	*65-135*			

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Blank (0050634-BLK1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							J
LCS (0050634-BS1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	94.3	5.0	mg/kg	100		94.3	75-125			
Barium	96.9	1.0	"	100		96.9	75-125			
Cadmium	96.8	2.0	"	100		96.8	75-125			
Chromium	97.5	2.0	"	100		97.5	75-125			
Lead	95.1	3.0	"	100		95.1	75-125			
Matrix Spike (0050634-MS1)		**Source: T202201-01**		Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	58.6	5.0	mg/kg	91.7	2.00	61.7	75-125			QM-05
Barium	155	1.0	"	91.7	89.9	70.7	75-125			QM-05
Cadmium	59.5	2.0	"	91.7	ND	64.8	75-125			QM-05
Chromium	66.9	2.0	"	91.7	7.52	64.7	75-125			QM-05
Lead	55.2	3.0	"	91.7	1.55	58.4	75-125			QM-05

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Matrix Spike Dup (0050634-MSD1)	**Source: T202201-01**		Prepared: 05/06/20 Analyzed: 05/08/20							
Arsenic	62.6	5.0	mg/kg	100	2.00	60.6	75-125	6.61	20	QM-05
Barium	171	1.0	"	100	89.9	81.2	75-125	10.0	20	QM-05
Cadmium	61.3	2.0	"	100	ND	61.3	75-125	2.98	20	QM-05
Chromium	70.5	2.0	"	100	7.52	63.0	75-125	5.17	20	QM-05
Lead	60.7	3.0	"	100	1.55	59.1	75-125	9.51	20	QM-05

Mike Jaroudi, Project Manager

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Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050633 - EPA 7471A Soil										
Blank (0050633-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	ND	0.10	mg/kg							
LCS (0050633-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.378	0.10	mg/kg	0.391		96.7	80-120			
Matrix Spike (0050633-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.415	0.10	mg/kg	0.417	ND	99.6	75-125			
Matrix Spike Dup (0050633-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.431	0.10	mg/kg	0.417	ND	104	75-125	3.89	20	

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PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
Blank (0050637-BLK1)				Prepared: 05/08/20 Analyzed: 05/11/20						
alpha-BHC	ND	5.0	ug/kg							
gamma-BHC (Lindane)	ND	5.0	"							
beta-BHC	ND	5.0	"							
delta-BHC	ND	5.0	"							
Heptachlor	ND	5.0	"							
Aldrin	ND	5.0	"							
Heptachlor epoxide	ND	5.0	"							
gamma-Chlordane	ND	5.0	"							
alpha-Chlordane	ND	5.0	"							
Endosulfan I	ND	5.0	"							
4,4´-DDE	ND	5.0	"							
Dieldrin	ND	5.0	"							
Endrin	ND	5.0	"							
4,4´-DDD	ND	5.0	"							
Endosulfan II	ND	5.0	"							
4,4´-DDT	ND	5.0	"							
Endrin aldehyde	ND	5.0	"							
Endosulfan sulfate	ND	5.0	"							
Methoxychlor	ND	5.0	"							
Endrin ketone	ND	5.0	"							
Toxaphene	ND	20	"							
Surrogate: Tetrachloro-meta-xylene	*9.37*		*"*	*10.0*		*93.7*	*35-140*			
Surrogate: Decachlorobiphenyl	*8.97*		*"*	*10.0*		*89.7*	*35-140*			
LCS (0050637-BS1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	37.9	5.0	ug/kg	40.0		94.8	40-120			
Heptachlor	39.7	5.0	"	40.0		99.2	40-120			
Aldrin	28.7	5.0	"	40.0		71.8	40-120			
Dieldrin	39.2	5.0	"	40.0		98.0	40-120			
Endrin	38.4	5.0	"	40.0		95.9	40-120			
4,4´-DDT	37.8	5.0	"	40.0		94.6	33-147			
Surrogate: Tetrachloro-meta-xylene	*9.65*		*"*	*10.0*		*96.5*	*35-140*			
Surrogate: Decachlorobiphenyl	*9.30*		*"*	*10.0*		*93.0*	*35-140*			

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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Mike Jaroudi, Project Manager

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
LCS Dup (0050637-BSD1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	44.0	5.0	ug/kg	40.0		110	40-120	14.9	30	
Heptachlor	46.6	5.0	"	40.0		117	40-120	16.1	30	
Aldrin	33.8	5.0	"	40.0		84.4	40-120	16.2	30	
Dieldrin	45.5	5.0	"	40.0		114	40-120	14.8	30	
Endrin	45.0	5.0	"	40.0		113	40-120	16.0	30	
4,4´-DDT	40.6	5.0	"	40.0		102	33-147	7.11	30	
Surrogate: Tetrachloro-meta-xylene	*11.1*		*"*	*10.0*		*111*	*35-140*			
Surrogate: Decachlorobiphenyl	*10.4*		*"*	*10.0*		*104*	*35-140*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Carbazole	ND	300	ug/kg							
Aniline	ND	300	"							
Phenol	ND	1000	"							
2-Chlorophenol	ND	1000	"							
1,4-Dichlorobenzene	ND	300	"							
N-Nitrosodi-n-propylamine	ND	300	"							
1,2,4-Trichlorobenzene	ND	300	"							
4-Chloro-3-methylphenol	ND	1000	"							
2-Methylnaphthalene	ND	300	"							
1-Methylnaphthalene	ND	300	"							
Acenaphthene	ND	300	"							
4-Nitrophenol	ND	1000	"							
2,4-Dinitrotoluene	ND	300	"							
Pentachlorophenol	ND	1000	"							
Pyrene	ND	300	"							
Acenaphthylene	ND	300	"							
Anthracene	ND	300	"							
Benzo (a) anthracene	ND	300	"							
Benzo (b) fluoranthene	ND	300	"							
Benzo (k) fluoranthene	ND	300	"							
Benzo (g,h,i) perylene	ND	1000	"							
Benzo (a) pyrene	ND	300	"							
Benzyl alcohol	ND	300	"							
Bis(2-chloroethoxy)methane	ND	300	"							
Bis(2-chloroethyl)ether	ND	300	"							
Bis(2-chloroisopropyl)ether	ND	300	"							
Bis(2-ethylhexyl)phthalate	ND	300	"							
4-Bromophenyl phenyl ether	ND	300	"							
Butyl benzyl phthalate	ND	300	"							
4-Chloroaniline	ND	300	"							
2-Chloronaphthalene	ND	300	"							
4-Chlorophenyl phenyl ether	ND	300	"							
Chrysene	ND	300	"							
Dibenz (a,h) anthracene	ND	300	"							
Dibenzofuran	ND	300	"							
Di-n-butyl phthalate	ND	300	"							

SunStar Laboratories, Inc.

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Mike Jaroudi, Project Manager

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
1,2-Dichlorobenzene	ND	300	ug/kg							
1,3-Dichlorobenzene	ND	300	"							
2,4-Dichlorophenol	ND	1000	"							
Diethyl phthalate	ND	300	"							
2,4-Dimethylphenol	ND	1000	"							
Dimethyl phthalate	ND	300	"							
4,6-Dinitro-2-methylphenol	ND	1000	"							
2,4-Dinitrophenol	ND	1000	"							
2,6-Dinitrotoluene	ND	1000	"							
Di-n-octyl phthalate	ND	300	"							
Fluoranthene	ND	300	"							
Fluorene	ND	300	"							
Hexachlorobenzene	ND	1500	"							
Hexachlorobutadiene	ND	300	"							
Hexachlorocyclopentadiene	ND	1000	"							
Hexachloroethane	ND	300	"							
Indeno (1,2,3-cd) pyrene	ND	300	"							
Isophorone	ND	300	"							
2-Methylphenol	ND	1000	"							
4-Methylphenol	ND	1000	"							
Naphthalene	ND	300	"							
2-Nitroaniline	ND	300	"							
3-Nitroaniline	ND	300	"							
4-Nitroaniline	ND	300	"							
Nitrobenzene	ND	1000	"							
2-Nitrophenol	ND	1000	"							
N-Nitrosodimethylamine	ND	300	"							
N-Nitrosodiphenylamine	ND	300	"							
2,3,5,6-Tetrachlorophenol	ND	300	"							
2,3,4,6-Tetrachlorophenol	ND	300	"							
Phenanthrene	ND	300	"							
Azobenzene	ND	300	"							
2,4,5-Trichlorophenol	ND	1000	"							
Pyridine	ND	300	"							
2,4,6-Trichlorophenol	ND	1000	"							

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: 2-Fluorophenol	*1610*		*ug/kg*	*3260*		*49.6*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3260*		*63.6*	*24-113*			
Surrogate: Nitrobenzene-d5	*2580*		*"*	*3260*		*79.3*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*2230*		*"*	*3260*		*68.3*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2310*		*"*	*3260*		*71.0*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2670*		*"*	*3260*		*82.0*	*29.1-130*			
LCS (0050636-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2170	1000	ug/kg	3320		65.3	34-114			
2-Chlorophenol	2120	1000	"	3320		63.9	34-114			
1,4-Dichlorobenzene	2070	300	"	3320		62.4	34-114			
N-Nitrosodi-n-propylamine	1990	300	"	3320		59.8	30-110			
1,2,4-Trichlorobenzene	2260	300	"	3320		67.9	39-119			
4-Chloro-3-methylphenol	2600	1000	"	3320		78.3	50-130			
Acenaphthene	2350	300	"	3320		70.7	34-114			
Pentachlorophenol	3090	1000	"	3320		93.0	50-130			
Pyrene	1840	300	"	3320		55.5	33.7-123			
Surrogate: 2-Fluorophenol	*1680*		*"*	*3320*		*50.5*	*15-121*			
Surrogate: Phenol-d6	*2140*		*"*	*3320*		*64.3*	*24-113*			
Surrogate: Nitrobenzene-d5	*2050*		*"*	*3320*		*61.6*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1750*		*"*	*3320*		*52.5*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2620*		*"*	*3320*		*78.9*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2800*		*"*	*3320*		*84.2*	*29.1-130*			
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2110	1000	ug/kg	3250		65.0	34-114	2.73	42	
2-Chlorophenol	2200	1000	"	3250		67.7	34-114	3.47	40	
1,4-Dichlorobenzene	2060	300	"	3250		63.6	34-114	0.489	28	
N-Nitrosodi-n-propylamine	2350	300	"	3250		72.3	30-110	16.7	38	
1,2,4-Trichlorobenzene	2220	300	"	3250		68.4	39-119	1.62	28	
4-Chloro-3-methylphenol	2620	1000	"	3250		80.6	50-130	0.633	42	
Acenaphthene	2450	300	"	3250		75.4	34-114	4.04	31	
Pentachlorophenol	3180	1000	"	3250		98.0	50-130	2.86	50	
Pyrene	1830	300	"	3250		56.4	33.7-123	0.762	31	
Surrogate: 2-Fluorophenol	*1840*		*"*	*3250*		*56.8*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3250*		*63.6*	*24-113*			

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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: Nitrobenzene-d5	*2630*		*ug/kg*	*3250*		*81.2*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1940*		*"*	*3250*		*59.6*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*3510*		*"*	*3250*		*108*	*18.1-105*			*S-GC*
Surrogate: Terphenyl-dl4	*2760*		*"*	*3250*		*84.9*	*29.1-130*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Notes and Definitions

S-GC	Surrogate recovery outside of established control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
J	Detected but below the Standard Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

SunStar Laboratories

Chain of Custody Record

25712 Commercentre Drive, Lake Forest, CA 92630
949-297-5020

Client: Blackburn Consulting
Address: 2491 Boatman Ave West Sac, CA
Phone: 916-375-8706 Fax:
Project Manager: Luke Morrell / Laura Long

Date: 5/5/20 Page: 1 Of 1
Project Name: Feather River Sediment Removal
Collector: LDM Client Project #: 3825.X
Batch #: T202211 EDF #:

Laboratory ID #	Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270 SVOCs	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals Cam 17	6020 ICP-MS Metals	7471A Mercury	8081 OCPs			Comments/Preservative	Total # of containers
01	Yuba City-3 12"	5/5/20	9:10	Jar	Soil				X				X	X		X	X				1
02	Yuba City-2 12"		9:30						X				X	X		X	X				1
03	Yuba City-1 12"		9:50						X				X	X		X	X				1
04	Live Oak-1 12"		11:25						X				X	X		X	X				1
05	Live Oak-2 12"		12:00						X				X	X		X	X				1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
[signature]	5/5/20 1315	Ed Stevens	5/5/20 1315
GLS	5/6/20 9:40	[signature]	5/6/20 9:40

Total # of containers: 5
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold: 3.4
Turn around time: STD

Notes

Sample disposal Instructions: Disposal @ $2.00 each ____ Return to client ____ Pickup ____

COC 18142

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

Rev. 02 Date 07/19
Receiving Form 001

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T202211

Client Name: BLACKBURN

Project: FEATHER RIVER SEDIMENT

Delivered by: ☐ Client ☐ SunStar Courier ☒ GSO ☐ FedEx ☐ Other

If Courier, Received by: ____ Date/Time Courier Received: ____

Lab Received by: BRIAN Date/Time Lab Received: 5/6/20 940

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due : 6/27/20

Temperature:	Cooler #1 2.2	°C +/- the CF (+ 1.2°C) =	3.4	°C corrected temperature
Temperature:	Cooler #2	°C +/- the CF (+ 1.2°C) =		°C corrected temperature
Temperature:	Cooler #3	°C +/- the CF (+ 1.2°C) =		°C corrected temperature

Temperature criteria = ≤ 6°C (no frozen containers) Within criteria? ☒ **Yes** ☐ **No**

If NO:

Samples received on ice? ☐ Yes ☐ **No → Complete Non-Conformance Sheet**

If on ice, samples received same day collected? ☐ Yes → Acceptable ☐ **No → Complete Non-Conformance Sheet**

Custody seals intact on cooler/sample	☒ Yes	☐ No*	☐ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked Cooler/Sample Review - Initials and date: BC 5/6/20

Comments:

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

WORK ORDER

T202211

Client: **Blackburn Consulting-West Sac.** **Project Manager:** **Mike Jaroudi**
Project: **Feather River Sediment Removal** **Project Number:** **3825.x**

Report To:
Blackburn Consulting-West Sac.
Luke Morrell
2491 Boatman Ave.
West Sacramento, CA 95691

Date Due:	05/13/20 17:00 (5 day TAT)		
Received By:	Brian Charon	Date Received:	05/06/20 09:40
Logged In By:	Brian Charon	Date Logged In:	05/06/20 09:58

Samples Received at: **3.4°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confir	No		

Analysis	Due	TAT	Expires	Comments
T202211-01 YubaCity-3 12'' [Soil] Sampled 05/05/20 09:10 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:10	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:10	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:10	
8270C	05/13/20 15:00	5	05/19/20 09:10	
T202211-02 YubaCity-2 12'' [Soil] Sampled 05/05/20 09:30 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:30	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:30	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:30	
8270C	05/13/20 15:00	5	05/19/20 09:30	
T202211-03 YubaCity-1 12'' [Soil] Sampled 05/05/20 09:50 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:50	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:50	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:50	
8270C	05/13/20 15:00	5	05/19/20 09:50	

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T202211

Client: Blackburn Consulting-West Sac. **Project Manager:** Mike Jaroudi
Project: Feather River Sediment Removal **Project Number:** 3825.x

Analysis	Due	TAT	Expires	Comments
T202211-04 LiveOAk-1 12'' [Soil] Sampled 05/05/20 11:25 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 11:25	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 11:25	
8081 Pesticides	05/13/20 15:00	5	05/19/20 11:25	
8270C	05/13/20 15:00	5	05/19/20 11:25	
T202211-05 LiveOAk-2 12'' [Soil] Sampled 05/05/20 12:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 12:00	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 12:00	
8081 Pesticides	05/13/20 15:00	5	05/19/20 12:00	
8270C	05/13/20 15:00	5	05/19/20 12:00	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By

Date

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

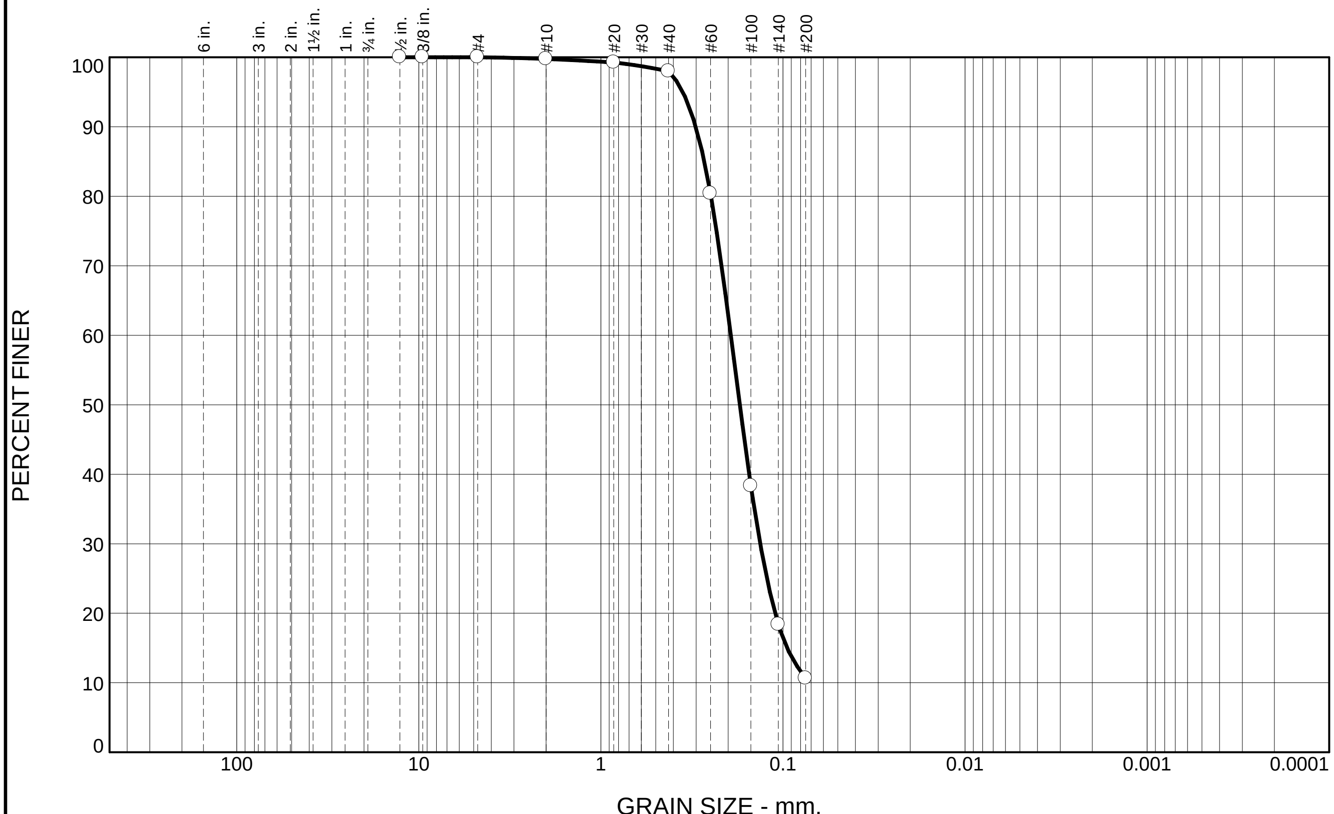
Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX B

Soil Classification Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.7	87.4	10.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	99.2		
#40	98.0		
#60	80.4		
#100	38.3		
#140	18.4		
#200	10.6		

* (no specification provided)

Material Description

Poorly-graded SAND with SILT, mottled dark gray & brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3013 D_{85}= 0.2703 D_{60}= 0.1933
D_{50}= 0.1726 D_{30}= 0.1334 D_{15}= 0.0949
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 1 **Date:**

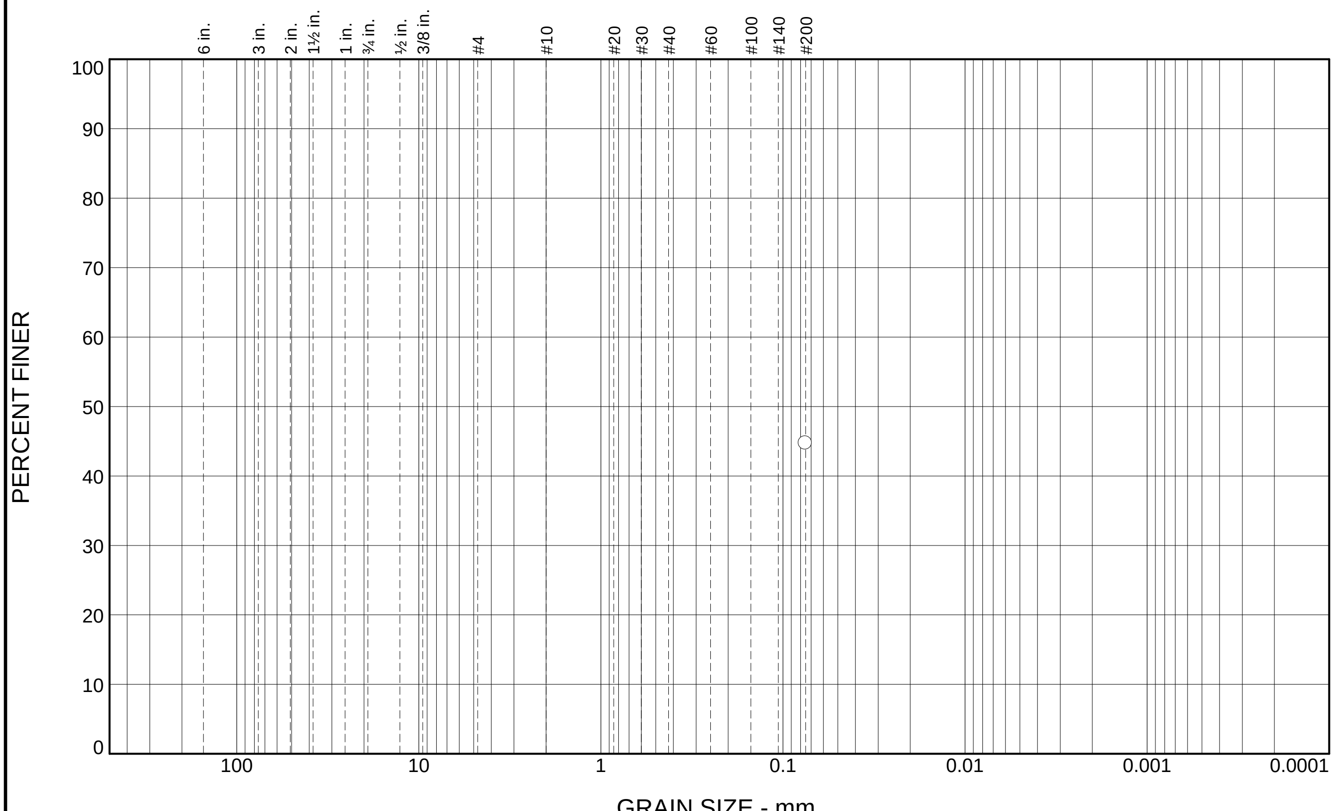
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						44.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	44.7		

* (no specification provided)

Material Description

SILTY SAND, dark brown

Atterberg Limits

PL= 32 LL= 33 PI= 1

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

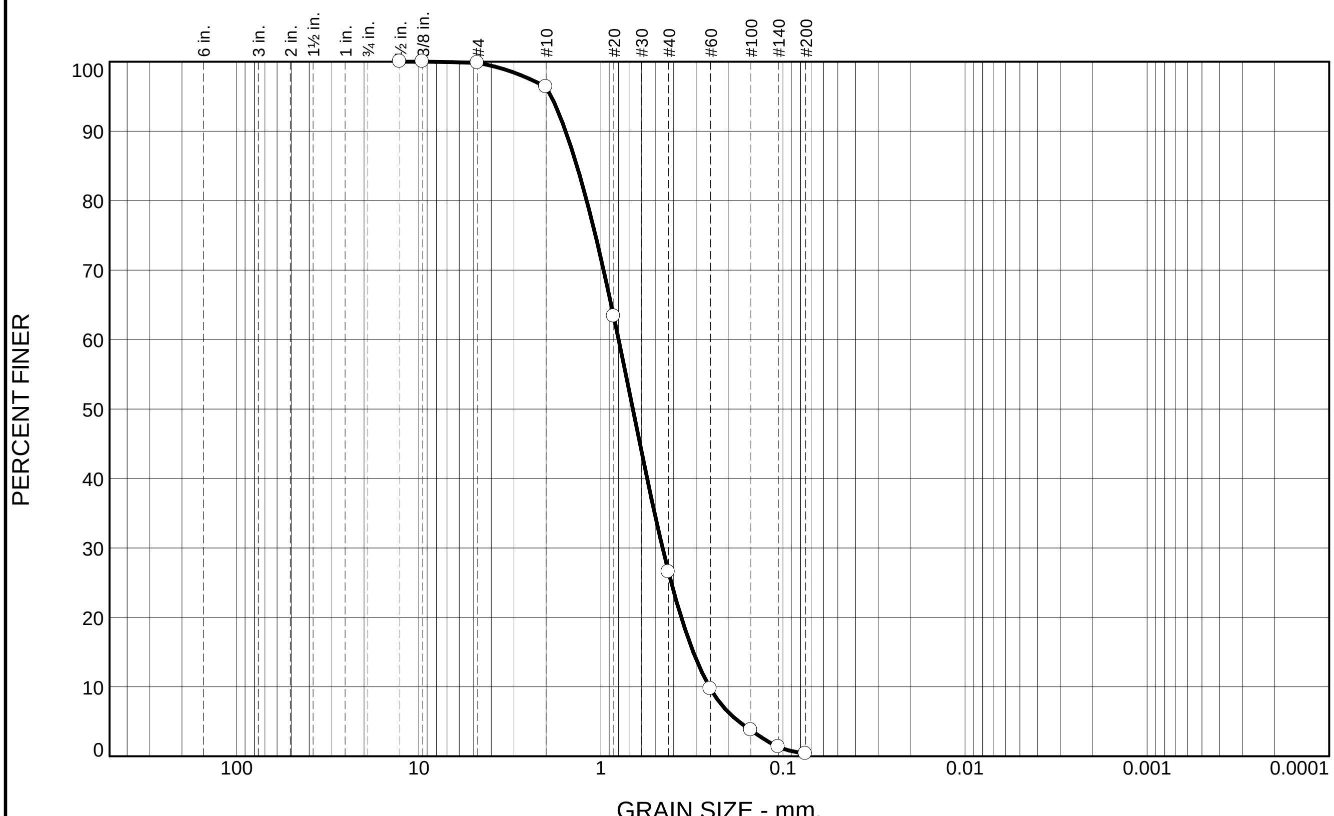
Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 2 **Date:**

Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project
Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	3.4	69.9	26.1	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#10	96.4		
#20	63.4		
#40	26.5		
#60	9.7		
#100	3.8		
#140	1.4		
#200	0.4		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.5612 D_{85}= 1.3540 D_{60}= 0.7989
D_{50}= 0.6674 D_{30}= 0.4582 D_{15}= 0.3108
D_{10}= 0.2537 C_u= 3.15 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 1 **Date:**

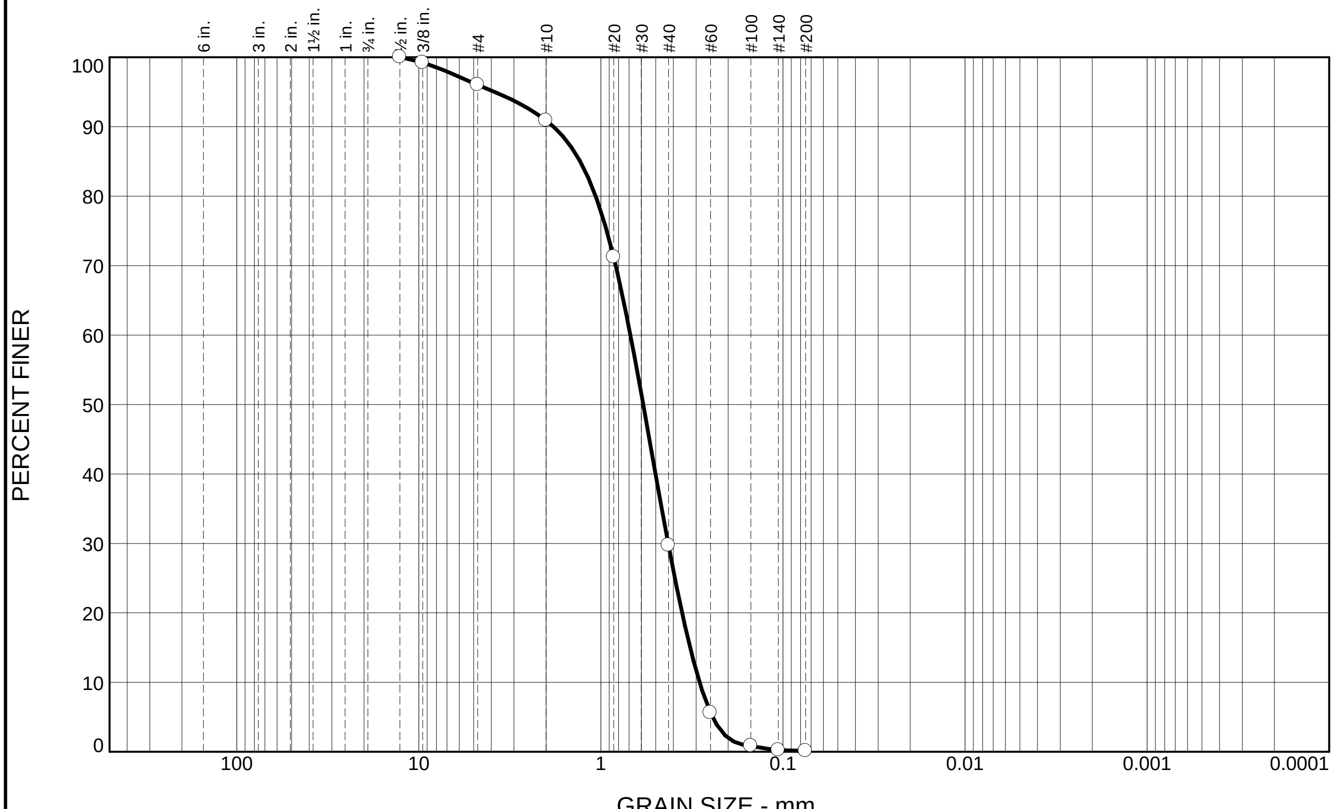
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.0	5.1	61.2	29.6	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.2		
#4	96.0		
#10	90.9		
#20	71.2		
#40	29.7		
#60	5.6		
#100	0.8		
#140	0.2		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.8245 D_{85}= 1.3002 D_{60}= 0.6885
D_{50}= 0.5854 D_{30}= 0.4270 D_{15}= 0.3235
D_{10}= 0.2871 C_u= 2.40 C_c= 0.92

Classification

USCS= SP AASHTO=

Remarks

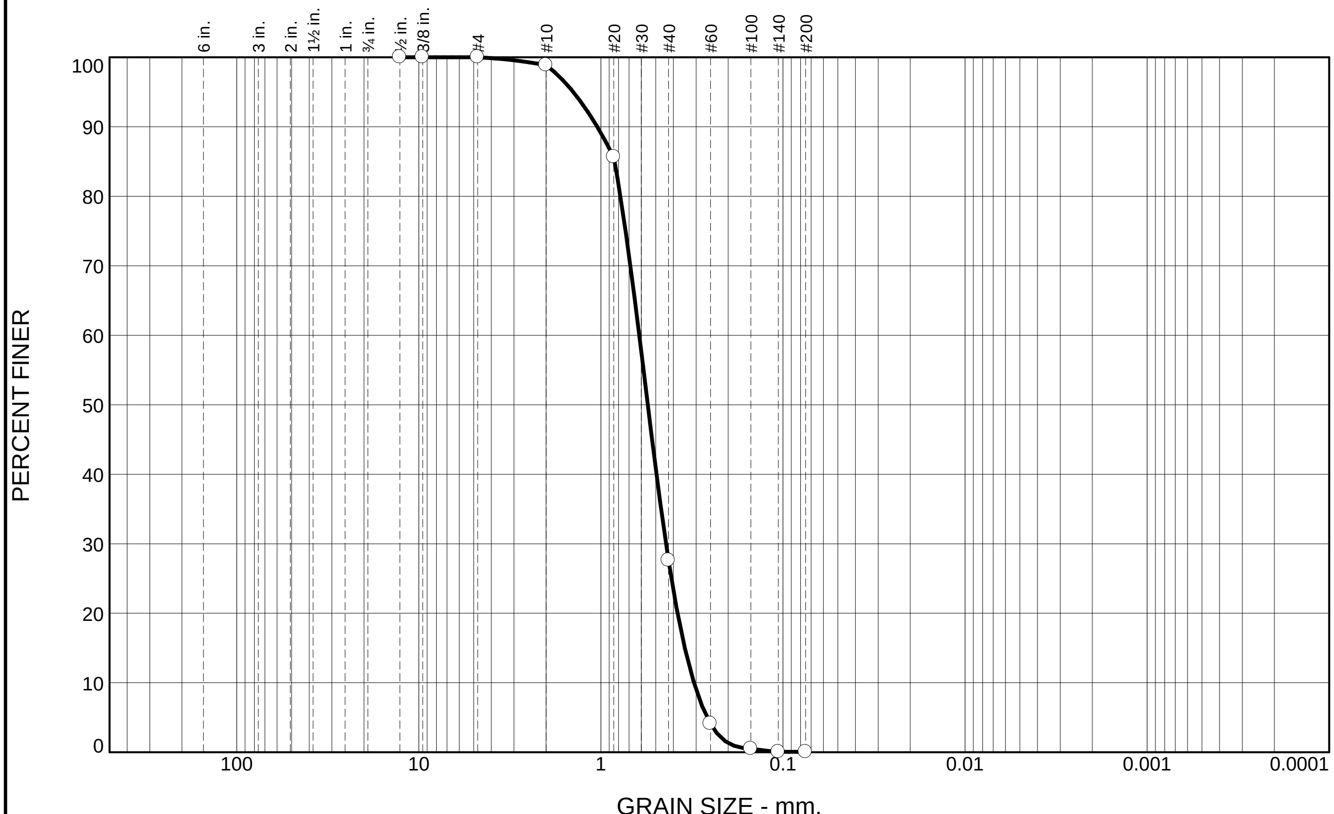
Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 2 **Date:**

Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project
Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	71.3	27.5	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	98.9		
#20	85.7		
#40	27.6		
#60	4.1		
#100	0.5		
#140	0.1		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0481 D_{85}= 0.8409 D_{60}= 0.6157
D_{50}= 0.5525 D_{30}= 0.4387 D_{15}= 0.3457
D_{10}= 0.3080 C_u= 2.00 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 3 **Date:**

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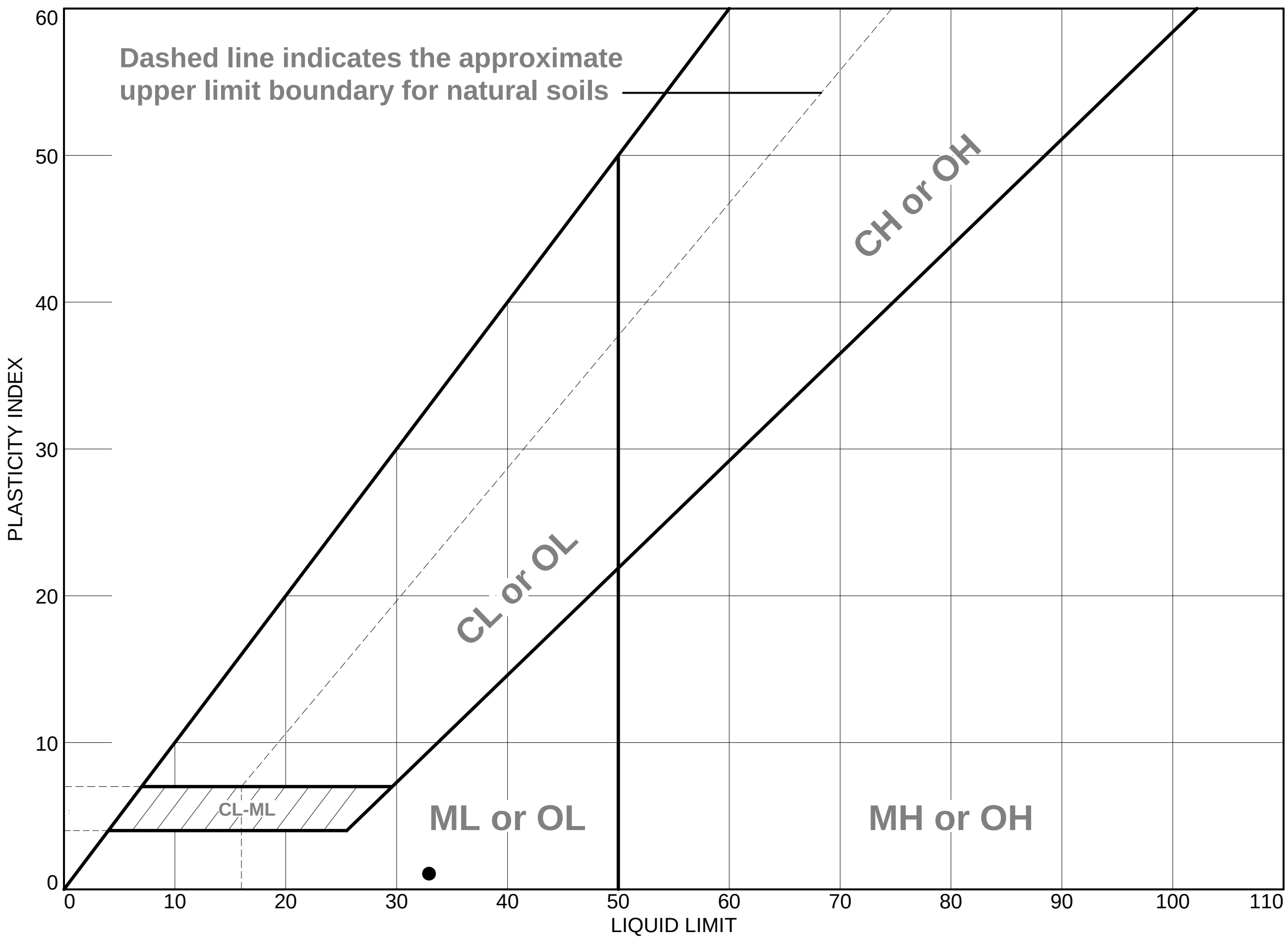
W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SILTY SAND, dark brown	33	32	1		44.7	SM

Project No. 3825.X **Client:** Sutter Butte Flood Control Agency

Project: Feather River Sediment Removal Project

● **Source of Sample:** Live Oak **Depth:** 0-12" **Sample Number:** 2

Remarks:

Blackburn Consulting

W. Sacramento, CA

Figure

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX C

Photo Report


Photo 1: Live Oak Boat Launch, Sample Location 1


Photo 2: Live Oak Boat Launch, Sample Location 2

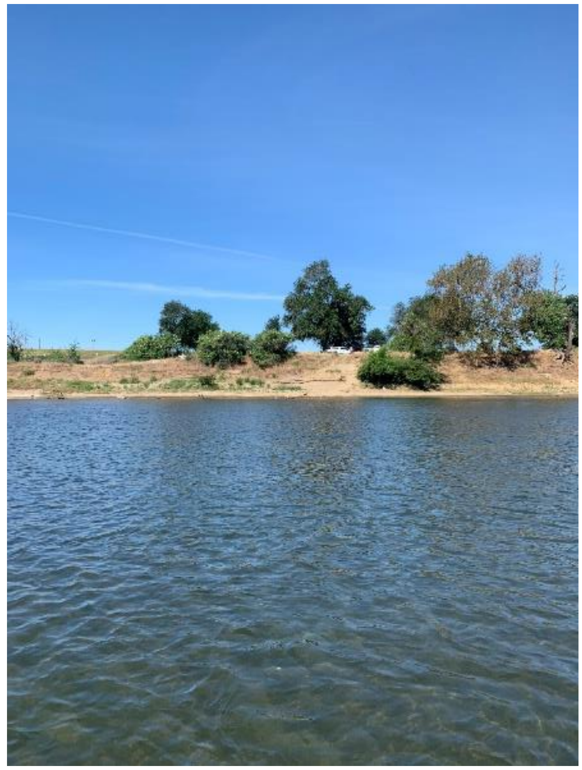


Photo 3: Yuba City Boat Launch, Typical Sample Location

Appendix E

Live Oak Boat Ramp Sediment and Invasive Species Removal Project

Noise Modeling Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/17/2020
Case Description: Dredging

Description	Land Use
Dredging	Residential

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)
Crane	No	16		80.6	700
Dump Truck	No	40		76.5	700
Dump Truck	No	40		76.5	700
Front End Loader	No	40		79.1	700

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		57.6	49.7
Dump Truck		53.5	49.5
Dump Truck		53.5	49.5
Front End Loader		56.2	52.2
	Total	**57.6**	**56.4**

*Calculated Lmax is the Loudest value.