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Feather River Fish Monitoring Station

DRAFT Initial Study/

Proposed Mitigated Negative Declaration



California Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

July 2022

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Initial Study — Feather River Fish Monitoring Station

1. Project Title:

Feather River Fish Monitoring Station

2. Lead Agency Name and Address:

California Department of Water Resources
1416 Ninth Street
Sacramento, California 95814

3. Contact Person and Phone Number:

Jason Kindopp
Environmental Program Manager I
(916) 812-7640
Jason.Kindopp@water.ca.gov

4. Project Location:

Approximately 4 miles southwest of the city of Oroville, Section 35, Township 19 north, Range 3 east, within Palermo USGS 7.5-minute quadrangle in Butte County, near 39.46098° N, -121.60846° W.

5. Project Sponsor's Name and Address:

California Department of Water Resources
3500 Industrial Blvd., Second Floor
Sacramento, CA 95691

6. General Plan Designation:

N/A – State-owned Water Conveyance System.

7. Zoning:

Public Land.

8. Description of Project:

DWR proposes to install a Fish Monitoring Station (Project) on the Lower Feather River to provide information on run-timing, origin (hatchery or natural), and abundance of steelhead and Chinook salmon. Once constructed, the Fish Monitoring Station will be used to meet the NMFS

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OCAP BO requirements to answer basic life-history and abundance questions that will contribute to improved management of these species. The Project consist of four main components: resistance board weir, upstream passage complex, a PIT tag antenna array, and the solar power system. Project activities involve vegetation trimming; construction and installation of a resistance board weir; construction and installation of an upstream passage complex (fish counting chutes, camera boxes, security enclosure, and live trap); installation of a pit tag antenna array; installation of a floodplain junction box; installation of a fenced power and controller area (solar panels, fence, security cameras, and conduit); and installation of warning and directional signage. The Project will take approximately 5 weeks to construct and is scheduled to be built between March - September.

9. Surrounding Land Uses and Setting:

Land uses in the vicinity include rural development, recreation, agriculture, timber production, hydropower generation, and livestock grazing. The nearest urban uses occur along State Route (SR) 70 in the communities of Oroville, Oak Grove, Palermo, and Biggs. The vegetation communities surrounding the Project area include valley/foothill riparian habitat and riverine habitat.

10. Other Public Agencies Whose Approval is Required:

- U.S. Army Corps of Engineers.
- Central Valley Regional Water Quality Control Board.
- California Department of Fish and Wildlife.
- Office of Historic Preservation.
- National Marine Fisheries Service.
- Central Valley Flood Protection Board.

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation?

Yes, consultation was requested, and the process is described in more detail in the Tribal Cultural Resources section of the Initial Study.

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Mitigated Negative Declaration

Project: Feather River Fish Monitoring Station

Lead Agency: California Department of Water Resources (DWR)

Project Location: The Feather River Fish Monitoring Station Project (Project) in and adjacent to the low-flow channel (LFC) of the Feather River at river mile (RM) 61 upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County, California. This location corresponds to a portion of Section 35, Township 19 North, Range 3 East of the Palermo, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The Project is located on California Department of Fish and Wildlife property within the Oroville Wildlife Area (OWA) and is comprised of multiple components in the following locations: resistance board weir, upstream passage complex, and PIT tag antenna array (N 39.46098 W -121.60846); floodplain junction box (N 39.46074 W -121.60854); and fenced power and controller area (N 39.46003 W -121.60834).

Project Description: DWR proposes to install a Fish Monitoring Station (Project) on the Lower Feather River to provide information on run-timing, origin (hatchery or natural), and abundance of steelhead and Chinook salmon. Once constructed, the Fish Monitoring Station will be used to meet the NMFS OCAP BO requirements to answer basic life-history and abundance questions that will contribute to improved management of these species. The Project consists of four main components: resistance board weir, upstream passage complex, a PIT tag antenna array, and the solar power system. Construction activities will involve vegetation trimming; construction and installation of the resistance board weir; construction and installation of the upstream passage complex (fish counting chutes, camera boxes, security enclosure, and live trap); installation of the pit tag antenna array; installation of a floodplain junction box; installation of the fenced power and controller area (solar panels, fence, security cameras, and conduit); and installation of warning and directional signage. This project will take approximately 5 weeks to construct and is scheduled to be built between the March- September of 2023.

Determination: An Initial Study (IS) was prepared to determine if the Project has the potential to cause significant environmental impacts. Based

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on the analysis conducted in the IS, it has been determined that implementing the Project will not have a significant impact on the environment after the adoption and implementation of mitigation measures.

Mitigation Measures: The following mitigation measures will be implemented as part of the Project to avoid, minimize, rectify, reduce or eliminate, or compensate for potentially significant environmental impacts. Implementation of these mitigation measures would reduce the potentially significant environmental impacts of the Project to less than significant levels:

Mitigation Measure Bio-1 Avoid and minimize potential impacts to special-status plants and wildlife

The avoid and minimize the potential impacts to plants and wildlife that may occur within the Project area, the following measures will be implemented:

1. A qualified biologist will conduct pre-construction surveys no more than two weeks prior to the start of construction for any special-status plants or wildlife that have the potential to occur within the Project area.
2. Prior to the start of construction, boundaries of the work site shall be delineated by flagging and staking or other similar method to show the exact location of work. No work shall occur outside the delineated area. If flagging is disturbed or removed, it shall be replaced immediately. Environmentally sensitive areas within the Project footprint may be marked with either large, flagged stakes connected by cord, or survey laths or wooden stakes prominently flagged with survey ribbon or fencing. All flagging shall be removed upon project completion.
3. To the extent practicable, construction activities causing disturbances to environmental resources will be minimized, and best efforts shall be used to avoid removing or damaging trees, vegetation, and other habitat.
4. Project activities shall be performed during daylight hours and will not occur prior to 7 a.m. or after 7 p.m.
5. Prior to beginning work, a Worker Environmental Awareness Program (WEAP) training will be provided by a qualified biologist. All personnel who will be at the work site during construction activities are required to complete the training prior to beginning work at the site. The

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training will be given at or near the work site. The WEAP training will consist of briefing sessions developed by biologists, archaeologists, and others familiar with environmental, cultural, and tribal resources at the work site. At a minimum, the environmental portion of the training shall include a description and discussion of the importance of avoiding impacts to special-status wildlife, the general measures that are being implemented to conserve these species as they relate to the Project and Project area, and procedures to follow should they encounter wildlife during work. New personnel are required to attend the training prior to beginning work. A refresher WEAP training will be provided if needed to present additional topics pertaining to the above subjects.

6. A Biological Monitor will be either present or on-call during construction activities and will have the authority to halt work activities if concern over environmental resources becomes apparent.
7. The qualified biologist shall be notified if wildlife is encountered in the project site. Wildlife shall be given the opportunity to escape during construction activities and construction personnel shall avoid harming wildlife within the construction site. Construction personnel shall not move, handle, or harass wildlife on site. If federally or State-listed species are observed on site, all work will halt, and the animal will be allowed to leave the Project area on their own. In the event wildlife is harmed or killed, the qualified biologist shall be notified of the incident. If the specimen is a State or federally listed species, the Department will notify the appropriate agency (i.e., USFWS, NMFS, CDFW).
8. The worksite shall be kept clean and trash-free at all times. All trash shall be properly contained, removed from the worksite, and disposed of properly to prevent attracting wildlife.
9. Construction related vehicles within the Project area are prohibited from exceeding 15 miles per hour on straight and level roads, or 10 miles per hour in areas with curves or steepness. Speed signs shall be installed along project roadways at a maximum of 500 feet apart. Vehicle speeds may be required to be further reduced in the event of reduced visibility conditions including, but not limited to, fog, rain, snow, mud, or twilight or dark conditions.
10. Construction vehicles and equipment are restricted to existing roads and designated haul routes. No off-road parking or vehicle or equipment staging is allowed in areas not previously delineated.

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11. Motorized equipment will be kept clean and in good working condition and will not be left idling while not in use for more than 5 minutes. All fueling and maintenance of vehicles or other equipment shall occur on established staging areas and at least 50 feet away from any on-site water feature.
12. Absorbent materials will be available on-site. Any accidental leaks or spills will be immediately cleaned up, and the equipment will not be able to return to the Project area until it has been repaired sufficiently to prevent further leaks or spills.
13. Erosion control measures shall be the appropriate type for the site conditions and will not harm or entrap wildlife.

Mitigation Measure Bio-2: Avoid and minimize impacts to special-status amphibians and reptiles

To avoid and minimize the potential impacts to special-status amphibians and reptiles that may occur within the Project area, the following general measures will be implemented:

1. In areas with the potential for special-status reptiles and amphibians to occur, prior to the onset of project activities, a qualified biologist will conduct pre-activity surveys to determine whether any such species are present. A qualified biologist must, at a minimum, have experience conducting surveys to identify foothill yellow-legged frog, California red-legged frog, western pond turtle, and/or giant garter snake and their associated habitat.
2. Any active rodent burrows or suitable cracks identified by a qualified biologist during the pre-activity survey will be flagged so that they can be avoided.
3. Any burrows, cracks, or fissures suitable for rodents that cannot be avoided and will be temporarily impacted by the movement and placement of equipment or other project activities will be covered with plywood to avoid burrow collapse.
4. If any special-status reptiles or amphibians are observed within an active work area, the on-site biologist will determine if the work can continue without harm to the individual(s). If the biologist determines that it is not safe to continue work, all work will cease until the animal has left the work area. Once the individual(s) is determined by the on-

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site biologist to have left the work area and is out of harm's way, work may resume.

Mitigation Measure Bio-3: Avoid and minimize impacts to western pond turtle

To avoid and minimize the potential impacts to western pond turtle that may occur within the Project area, the following general measures will be implemented:

1. Pre-activity presence/absence surveys for Western Pond Turtle shall occur within 48 hours prior to the onset of project activities in areas where construction will occur.
2. If western pond turtles are observed on land during the pre-activity surveys, the upland area within 100 meters of the boundary of the aquatic habitat will be flagged and avoided if feasible.
3. If Western Pond Turtles are observed during a pre-activity survey or during project activities, they will be relocated outside of the Project area to appropriate aquatic habitat by a qualified biologist.

Mitigation Measure Bio-4: Avoid and minimize impacts to nesting birds

To avoid and minimize the potential impacts to nesting birds (non-raptor or non-rookery) protected by the MBTA and Fish and Game Code Section 3503 that may occur within the Project area, the following general measures will be implemented:

1. If construction activities occur between March 15 to August 31, a qualified biologist will conduct a preconstruction survey for actively nesting birds in the Project footprint and 50-foot buffer surrounding the Project footprint within 72 hours prior to the onset of project activities. The qualified biologist(s) must, at a minimum, have experience conducting surveys to identify the specific species and associated habitat that could occur on site.
2. If any active nests are identified within or adjacent to the Project area, an appropriate buffer will be put in place to ensure that no take (as defined by MBTA), and no take, possession, or needless destruction (as prohibited under the Fish and Game Code) occurs. This buffer will be up to 50 feet, but can be smaller, dependent upon on-site conditions and at the discretion of the qualified biologist.

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Mitigation Measure Bio-5: Avoid and minimize impacts to rookery birds

To avoid and minimize the potential impacts to special-status rookery birds that may occur within the Project area, the following general measures will be implemented:

1. If construction activities occur between February 1 and August 31, a qualified biologist will conduct a pre-activity survey for active rookeries in the Project footprint and 500-foot buffer surrounding the Project footprint within 72 hours prior to the onset of project activities. The qualified biologist(s) must, at a minimum, have experience conducting surveys to identify the specific rookery bird species and associated habitat that could occur on site.
2. If any active rookeries are identified within or adjacent to the Project area, an appropriate buffer will be put in place to ensure that the birds are not disturbed during work activities. This buffer will be up to 500 feet, but can be smaller, dependent on-site conditions and at the discretion of the qualified biologist.

Mitigation Measure Bio-6: Avoid and minimize impacts to raptors

To avoid and minimize the potential impacts to raptors that may occur within the Project area, the following general measures will be implemented:

1. If construction activities occur between February 1 and August 31, a qualified biologist will conduct a pre-activity survey for actively nesting raptors in the Project footprint and the 500-foot buffer surrounding the Project footprint within 72 hours prior to the onset of Project activities. The qualified biologist(s) must, at a minimum, have experience conducting surveys to identify the specific species and associated habitat that could occur on site.
2. If any active raptor nests are identified within or adjacent to the Project footprint during the preconstruction survey or during work activities, an appropriate buffer will be put in place to avoid disturbance to raptors as a result of work activities. This buffer will be up to 500 feet, but can be smaller, dependent on-site conditions, individual bird behavior, and at the discretion of the qualified biologist.
3. Actively nesting raptors will be monitored by a qualified biologist during construction activities for signs of distress or disturbance as a result of project activities. Should the birds show signs of distress, work will

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cease at that location until the birds have resumed normal behavior and it is determined by the on-site biologist that work can be resumed.

Mitigation Measure Bio-7: Avoid and minimize impacts to Bald Eagle

To avoid and minimize the potential impacts to Bald Eagles that may occur within the Project area, the following measures will be implemented:

1. If construction activities occur between February 1 and August 31, a USFWS/CDFW-approved biologist will conduct a pre-activity survey for actively nesting Bald Eagles in the project footprint and 660-foot buffer surrounding the Project footprint within two weeks prior to the onset of Project activities.
2. No work will occur within 330 feet of the active nest.

If an active eagle nest is located within 660 feet of the project footprint, the USFWS and CDFW will be consulted and activities within 660 feet of an active nest must be evaluated and approved by a USFWS/CDFW approved biologist before work commences.

Mitigation Measure Bio-8: Avoid and minimize impacts to CCV Steelhead

To avoid and minimize the potential impacts to CCV Steelhead that may occur within the Project area, the following measures will be implemented:

1. If DWR plans to conduct in-water work prior to July 1, DWR will perform CCV Steelhead redd surveys of the Project footprint in Jan-March prior to in-water work.
2. If an active CCV Steelhead redd is located within the Project footprint, in-water work will not start until July 1 and construction activities will avoid active CCV Steelhead redds.

Mitigation Measure Bio-9: Valley Elderberry Longhorn Beetle

To avoid and minimize the potential impacts to Valley Elderberry Longhorn Beetle (VELB) that may occur within the Project area, the following measures will be implemented:

1. When feasible, project activities shall be sited at least 50 meters from elderberry shrubs with stem diameter greater than 1-inch.
2. If activities must be conducted within 50 meters of an elderberry shrub with stem diameter greater than 1-inch, the following measures will apply:

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A. activities will be conducted outside of VELB flight season (March 1-July 31) as feasible;

B. a biological monitor will be present to monitor all project activities within 50 meters of the elderberry shrub;

C. and all ground disturbing activities (boring, post pounding, staking, or vegetation removal) will be located at least 6 meters from the dripline of the elderberry shrub; and high visibility fencing or flagging will be installed to delineate the 6-meter avoidance buffer.

Mitigation Measure Bio-10: Avoid and minimize impacts to special-status plants

To avoid and minimize the potential impacts to special-status plants that may occur within the Project area, the following measures will be implemented:

1. A qualified biologist will conduct surveys prior to the start of construction during the appropriate seasons for any special-status plant species that have the potential to occur within the Project area. If any are identified, they will be flagged and avoided, if feasible.
2. If special-status plants are identified within the Project area and cannot be avoided, DWR will coordinate with USFWS/CDFW, and an attempt will be made to transplant the individuals or collect and disperse seeds.

Mitigation Measure Cul-1: Adherence to Secretary of the Interior's Standards for the Treatment of Historic Properties

Should any unexpected cultural resources be exposed during project activities, all work would temporarily stop in the immediate vicinity (e.g., 100 feet) of the find until it can be evaluated by a qualified archaeologist, defined as one meeting the U.S. Secretary of the Interior's Professional Qualifications Standards for Archeology and with expertise in California archaeology, and an appropriate plan of action can be determined in consultation with DWR.

Mitigation Measure Cul-2: Discovery of Human Remains

Should human remains be discovered during the course of project activities, all work will stop immediately in the vicinity (e.g., 100 feet) of the finds until they can be verified. The coroner will be contacted in accordance with Health and Safety Code section 7050.5(b). Protocol and requirements outlined in

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Health and Safety Code sections 7050.5(b) and 7050.5(c) as well as Public Resources Code section 5097.98 will be followed.

Mitigation Measure Cul-3: Worker Awareness and Response for Undiscovered Historical Resources, Archaeological Resources, and Tribal Cultural Resources

Prior to the start of construction, DWR shall provide a worker environmental awareness program (WEAP) training to the construction contractor and DWR inspectors regarding the potential for cultural and tribal cultural resources that could be encountered during ground disturbance, the regulatory protections afforded to such finds, and the procedures to follow in the event of discovery of a previously unknown resource, including notifying DWR archaeologists.

Alicia Seesholtz Alicia Seesholtz (Acting) 6/29/2022

Jason Kindopp
Environmental Program Manager I
California Department of Water Resources
Division of Integrated Science and Engineering

Date

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Acronyms and Abbreviations

2012 Plan	Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan
AMM	avoidance and minimization measure
amsl	above mean sea level
ASC	Anthropological Studies Center
ARC	Archaeological Research Center
BCAQMD	Butte County Air Quality Management District
BMP	best management practice
BRCP	Butte County Regional Conservation Plan
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CCV Steelhead	California Central Valley Steelhead
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	California Fire Code
cfs	cubic feet per second
CHRIS	California Historical Resources Information System
CNNDB	California Natural Diversity Database

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CNPS	California Native Plant Society
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CVFPB	Central Valley Flood Protection Board
CVRWQCB	Central Valley Regional Water Quality Control Board
CV spring-run Chinook Salmon	Central Valley spring-run Chinook Salmon
CWT	coded wire tags
dBA	weighted decibels
DBH	diameter breast height
DPS	distinct population segment
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FTA	Federal Transit Agency
ESU	evolutionary significant unit
FDXb	full duplex version B Pit tags
GHG	greenhouse gas

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GGERP	DWR's Greenhouse Gas Emissions Reduction Plan
HDX	half duplex Pit tags
L	sound level
LFR	Lower Feather River
LFC	low-flow channel
iPaC	Information for Planning and Consultation
$mtCO_2e$	metric tons of carbon dioxide equivalent
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEIC	Northeastern Information Center
NMFS	National Marine Fisheries Service
NMFS OCAP BO	National Marine Fisheries Service Biological Opinion on the effects of the proposed long-term operations, criteria and plan for the Central Valley Project and the State Water Project
NOAA	National Oceanic and Atmospheric Administration
OWA	Oroville Wildlife Area
ppt	parts per thousand
PPV	peak particle velocity
Project	Feather River Fish Monitoring Station Project
RCEM	Roadway Construction Emissions Model

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RM	river mile
SPCB	ventilated steel box
SLF	Sacred Lands File
SR	State Route
SVAB	Sacramento Valley Air Basin
TAC	toxic air contaminant
TCR	Tribal Cultural Resource
Update 2020	Greenhouse Gas Emissions Reduction Plan Update 2020
USA	Underground Service Alert
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley Elderberry Longhorn Beetle
WEAP	Worker Environmental Awareness Program

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

The California Department of Water Resources (DWR) proposes to install a Fish Monitoring Station (Project) on the Lower Feather River (LFR) that utilizes an Alaskan-style resistance board weir and a pit tag antenna array to provide information on run-timing, origin (hatchery or natural), and abundance of steelhead and Chinook salmon. This Fish Monitoring Station will meet existing federal permitting requirements and provide valuable data that will contribute to the installation and operation of a future fish segregation weir in the LFR. This document represents DWR's evaluation of the potential environmental impacts of the Project under the California Environmental Quality Act (CEQA) and is intended to satisfy the responsibilities of the lead agency under CEQA for a Mitigated Negative Declaration.

1.1 Background

Currently, there is a lack of basic abundance and life-history data on fall-run and spring-run Chinook salmon (Oncorhynchus tshawytscha), and Central Valley steelhead (Oncorhynchus mykiss) in the Feather River. The National Oceanic and Atmospheric Administration (NOAA) Fisheries Biological Opinion on the effects of the proposed long-term operations, criteria and plan for the Central Valley Project and the State Water Project (NMFS OCAP BO) requires that DWR complete additional studies of spring-run Chinook salmon and Central Valley steelhead in the Feather River to assess populations and run timing (National Marine Fisheries Service 2009). A resistance board weir, such as the one used on the Stanislaus River (Anderson et al. 2007), will provide a means to obtain information on timing and abundance of steelhead and Chinook salmon within the LFR. Appraisal of various weir designs established that the resistance board weir was the most suitable design to achieve desired objectives for the LFR. This design can withstand high and fluctuating flows better than traditional weirs and will temporarily submerge when debris loads generally would wash out or impair the function of a traditional weir, thus increasing the reliability of the data obtained (Tobin 1994). Use of the weir will allow for gathering the data necessary to meet

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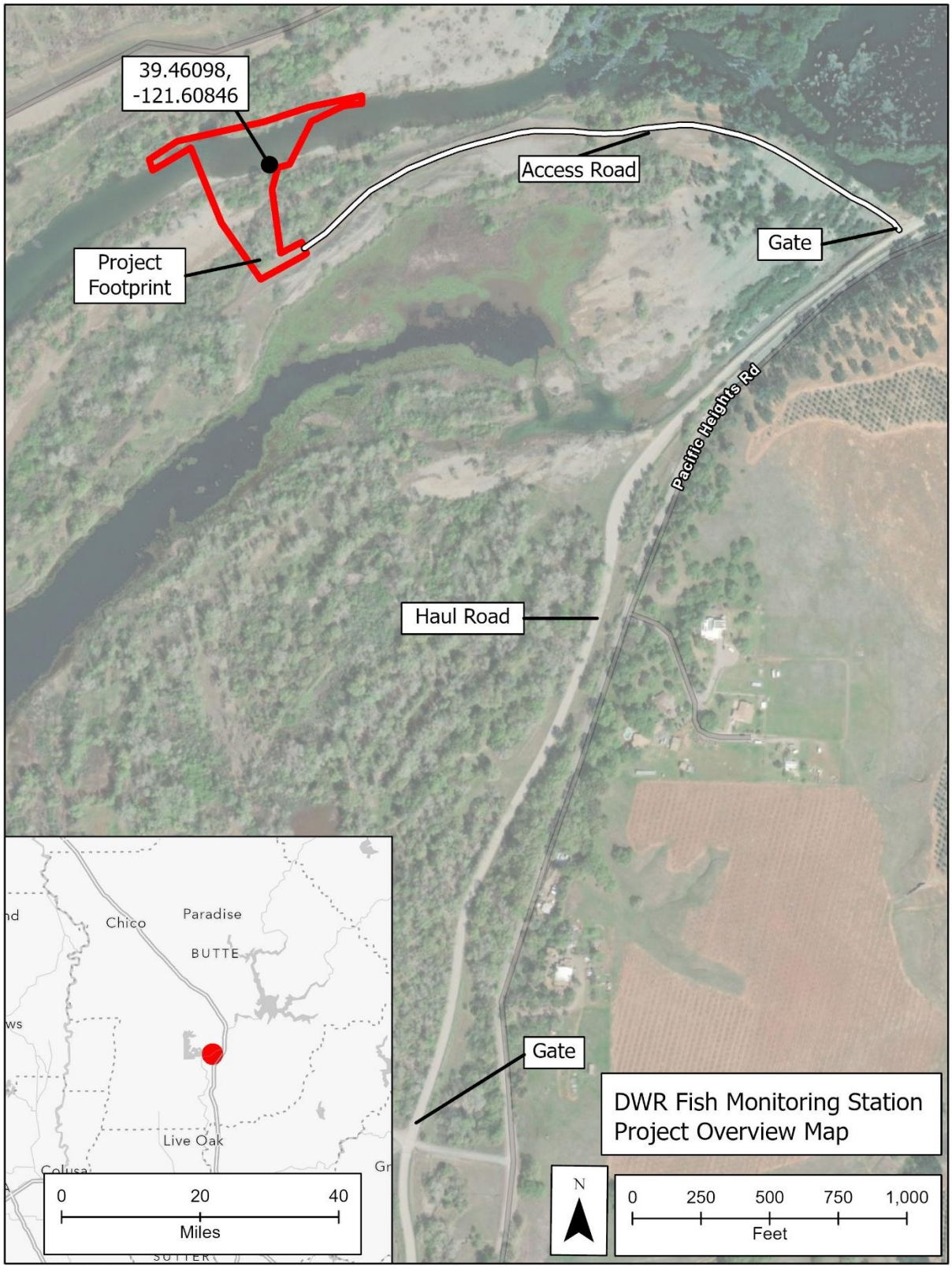
the NMFS OCAP BO requirements to answer basic life-history and abundance questions that will contribute to improved management of spring-run and fall-run Chinook salmon and steelhead in the LFR.

1.1.1 Location

The Project is in and adjacent to the low-flow channel (LFC) of the Feather River at river mile (RM) 61 upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County, California (Figure 1 and Figure 2). This location corresponds to a portion of Section 35, Township 19 North, Range 3 East of the Palermo, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The Project is located on California Department of Fish and Wildlife property within the Oroville Wildlife Area (OWA) and is comprised of multiple components in the following locations: resistance board weir, upstream passage complex, and PIT tag antenna array (N 39.46098 W -121.60846); floodplain junction box (N 39.46074 W -121.60854); and fenced power and controller area (N 39.46003 W -121.60834). The Project footprint is comprised of the construction footprint, staging, and access areas (Figure 2 and Figure 3). The Project area is defined as the project footprint and surrounding area potentially impacted by the Project.

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Figure 1. Project Overview Map.



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Photo 1. At south bank of the LFR at the Project footprint boundary looking northeast. Looking upstream where the resistance board weir, upstream passage complex, and PIT tag antenna array will be constructed in the LFR.



Photo 2. LFR where the resistance board weir, upstream passage complex, and PIT tag antenna array will be constructed.



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Photo 3. Location where floodplain junction box will be constructed.



Photo 4. At the southeast corner of the staging area where the fenced power and controller area will be constructed.



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1.1.2 Purpose

Operation of the Project will provide data about run timing and population size of spring-run Chinook and steelhead to meet the NMFS OCAP BO requirements. Additionally, this information will aid decision makers in future resource management of the Feather River and Oroville Facilities. The goal of the Project will be achieved through the following four objectives:

Objective 1. Determine temporal trends in migration or movement of both adult steelhead and spring-run Chinook salmon.

Temporal trends will be based only on fish that enter the LFC and pass upstream of the Project, most steelhead and Chinook salmon spawn upstream of this location. The Project will be operated year-round since steelhead and Chinook salmon migrations overlap within the LFR throughout the year. The weir will have both upstream and downstream passage to help evaluate when adult steelhead immigrate and emigrate from the LFC. In addition, the weir will help DWR understand the temporal separation between spring-run and fall-run adults. Current methods blend spring-run and fall-run in-river populations.

Objective 2. Obtain accurate counts of both adult steelhead and Chinook salmon (hatchery and in-river).

While enumeration of Chinook is important, an accurate determination of the steelhead population is also a high priority. The weir is designed to pass all migrating fishes greater than 16 inches through the fish passage chutes. Salmon and steelhead passing through the chutes will be visually identified and counted via underwater video cameras and motion detection software. Both video and manual processing will be used to identify fish to species.

Objective 3. Determine origin (i.e., in-river or hatchery) of steelhead and Chinook salmon.

During passive counting, motion detection software will obtain video of each fish as it passes through the passage chute. Each steelhead and Chinook salmon will be examined for the presence of an adipose fin to determine origin. This will give a more precise representation of the proportion of natural origin salmonids that use the LFC, a critical component for

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understanding potential impacts of the Feather River Fish Hatchery on local salmonid populations.

Objective 4. Increase workplace safety and reduced costs.

Carcass surveys are used to determine an estimate for the population of salmon on the Feather River. Carcass survey techniques are extremely labor intensive requiring large crews to operate boats, wade, spear, and chop fish with machetes in the LFC. This survey is performed for 16 weeks and provides a fall-run population estimate. Crew sizes and boating hours will decrease significantly when operating the Project thereby lowering the risk of accidents and costs associated with the production of spring-run, fall-run, and steelhead population estimates.

1.1.3 Regulatory Requirements , Permits, and Approvals

- DWR has the responsibility to ensure that all requirements of CEQA and other applicable regulations are met. Other anticipated permitting requirements and approvals for the Project include:
- U.S. Army Corps of Engineers (USACE), Clean Water Act, Section 404 – Nationwide Permit 4 Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities. USACE is the federal lead agency for consultation under Section 106 of the NHPA.
    - State Office of Historic Preservation, National Historic Preservation Act (NHPA), Section 106.
- National Marine Fisheries Service (NMFS) Endangered Species Act, Section 7, letter of concurrence.
- NMFS Endangered Species Act 4(d) Authorization.
- U.S. Fish and Wildlife (USFWS) Endangered Species Act, Section 7, letter of concurrence.
- USACE, Section 408 (33 USC 408) Permission.
- Central Valley Flood Protection Board (CVFPB) Encroachment Permit.
- Central Valley Regional Water Quality Control Board (CVRWQCB), Clean Water Act, Section 401 Water Quality Certification.

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- California Department of Fish and Wildlife (CDFW), Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement.

1.2 Project Description

1.2.1 Project Overview

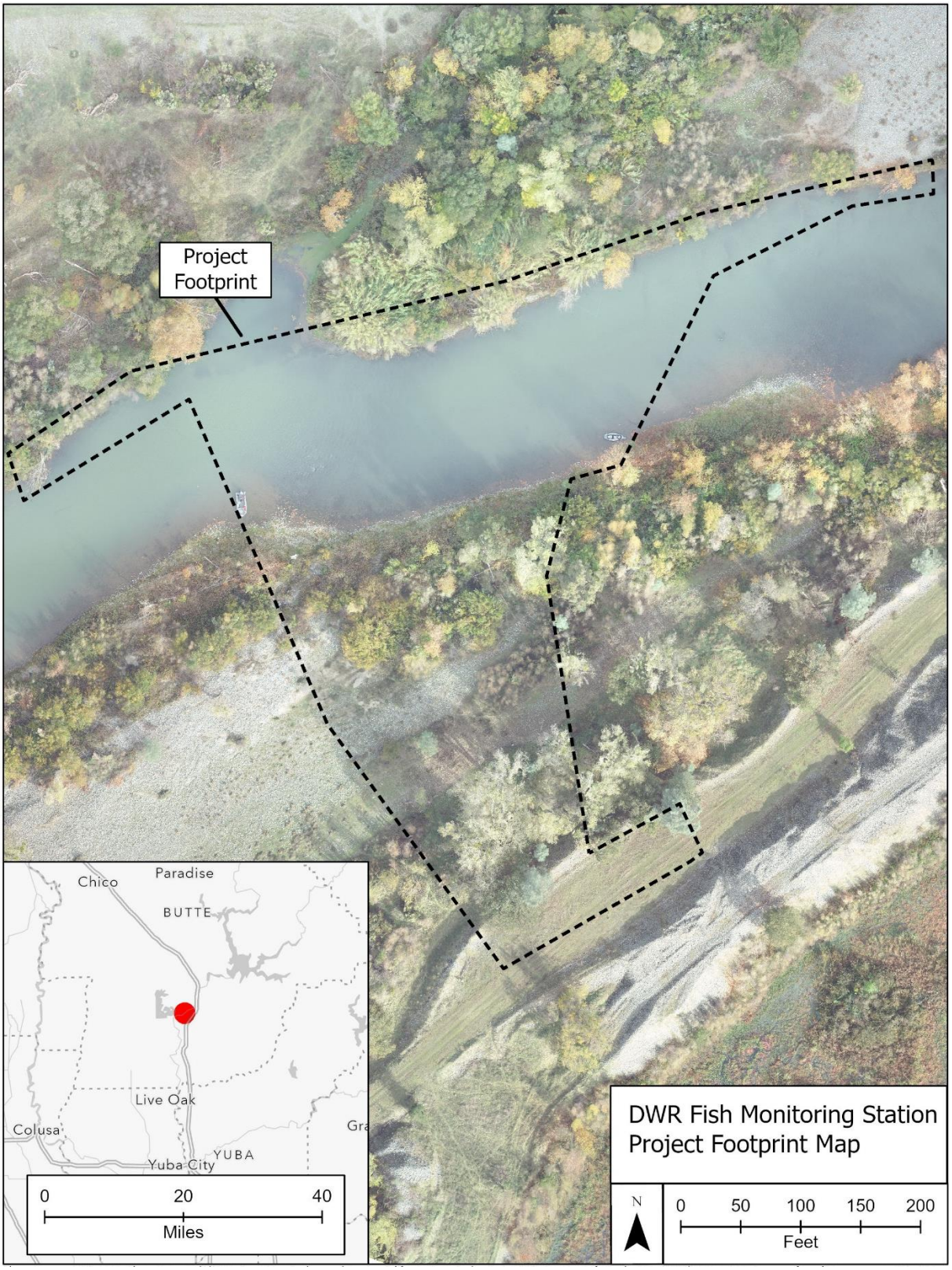
The Project will consist of four main components: resistance board weir, upstream passage complex, a PIT tag antenna array, and the solar power system (Figure 2 andFigure 3).

1.2.1.1 Resistance Board Weir

The resistance board weir consists of an array of rectangular panels stretching across the entire river channel creating a barrier to fish passage while allowing water to easily pass through Photo 5). Each panel is 3-feet wide and is made up of evenly spaced (1” spacing) 1” by 20’ PVC pickets. The upstream end of each panel is hinged to a rail or cable that is anchored to the river bottom. The downstream end is lifted above the water surface by the action of the stream flow against an inclined resistance board mounted underneath. Bulkheads and fixed panels prevent fish from passing around the outside of the weir. A portion of the weir will contain a series of modified boat passage panels allowing motorized and non-motorized boat traffic over the weir. Warning and directional signage will direct boat traffic to the boat passage panels. Migrating fishes (> 16 inches) will pass through one of four counting chutes located within the weir structure (see Upstream Passage Complex section below). Smaller fishes can pass freely through the weir pickets.

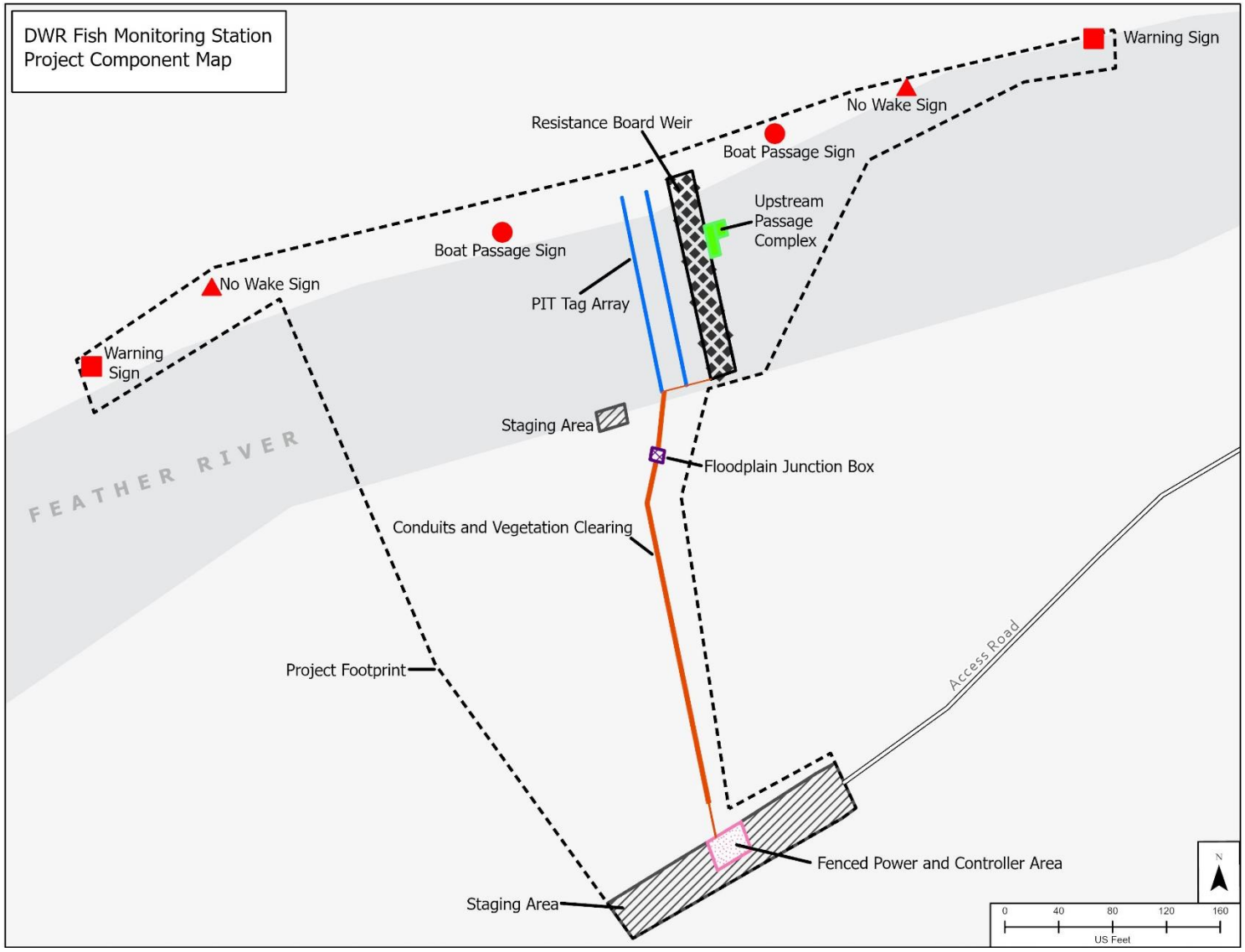
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Figure 2. Project Footprint Map.



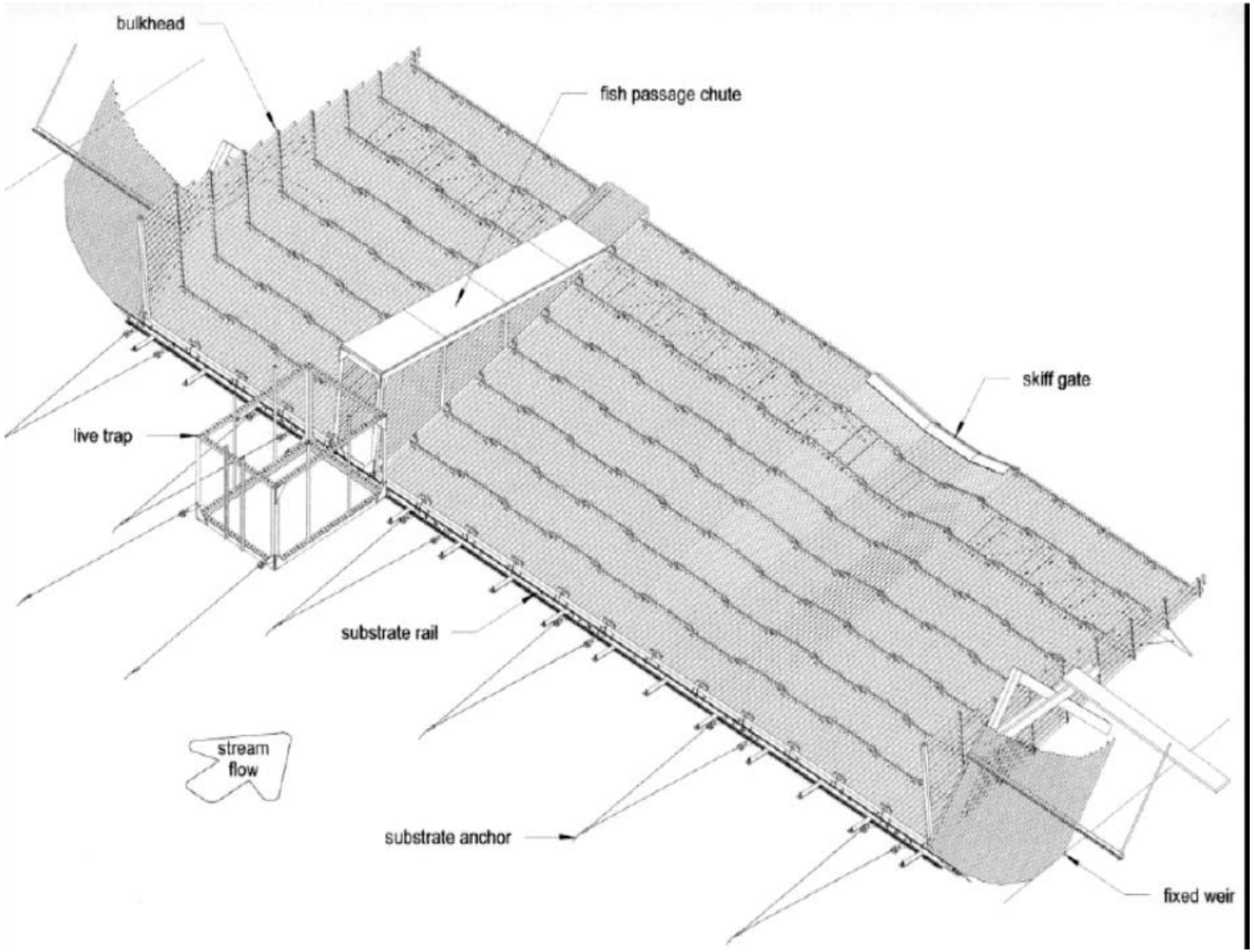
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Figure 3. Project Component Map.



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Figure 4. Conceptual drawing of an Alaskan-style resistance board weir. Weir consists of weir panels, a substrate rail, fish passage chutes, bulkheads, and fixed pickets.



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Photo 5. Example of resistance board weir in Stanislaus River.



Photo courtesy: Cramer Fish Sciences

1.2.1.2 Upstream Passage Complex

The Project will contain an upstream passage complex (Figure 5). The upstream passage complex will consist of four 12” x 16” x 48” video counting chutes, four 36” x 42” sealed camera boxes, a 7’ x 3’ x 24’ security enclosure, and a 12’ x 8’ live trap (trap installed only when conditions prevent passive video monitoring). The security enclosure and live trap will be constructed of aluminum framed panels filled with 1” aluminum poles with 1” spacing. The fish counting chutes will be housed within the security enclosure. Fish will swim along the weir panels attached to the substrate rail until they find one of two, 2’ x 2’ weir panel openings which allow access into one of the four upstream video counting chutes. The resistance board weir panel openings will be hinged to the security enclosure containing the counting chutes and camera boxes so that migrating fish are forced through the counting chutes. LED floodlights will be mounted to the four corners of the security enclosure.

The sealed aluminum camera boxes will contain two 12-volt Splashcam™ underwater video cameras and two LED underwater pond lights. Three

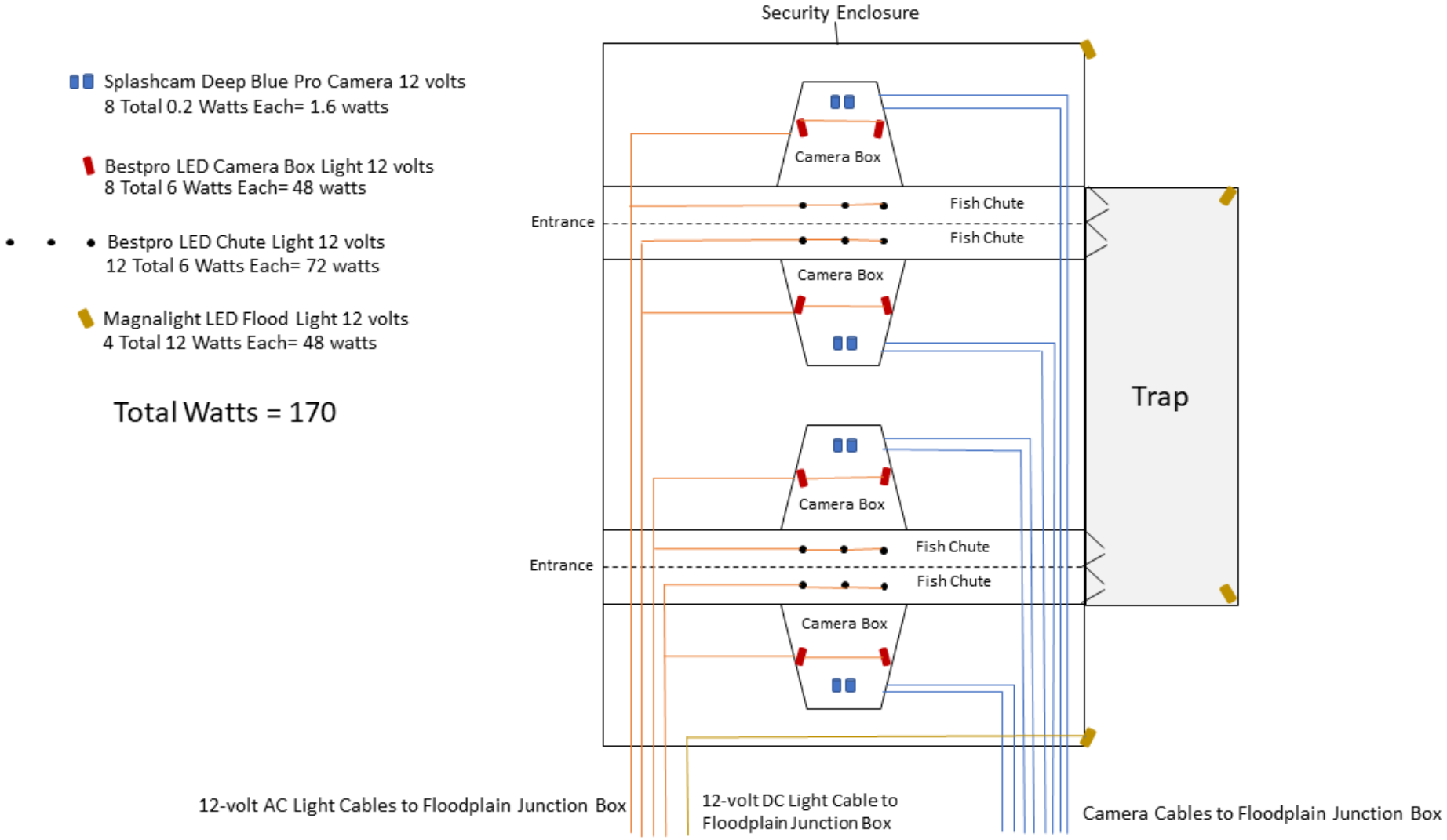
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12-volt LED underwater pond lights will be mounted to the top of each counting chute. A clear acrylic window will separate the camera box and fish counting chute enabling the cameras to get a clear view of fish passing through the chute. Rugged laptop computers using motion detection software will record video of fish moving through the chutes. These computers will be inside a ventilated steel box in the fenced power and controller area and will be connected to the video cameras in the camera boxes via Cat7 cables.

When turbidity is too high to monitor passage with video, a trap will be connected to the upstream counting chutes (Figure 6). The 12’ X 8’ rectangular live-trap will be constructed out of evenly spaced (1” spacing) round aluminum tubing creating a “fish safe” environment where fish can be contained and swim safely when the trap is closed. Trapping operations will take place during turbid water events that render the video monitoring system ineffective, and when DWR wishes to mark certain fish as they migrate upstream. When the trap is not in place down-migrating fish will pass through the same camera chutes as fish migrating upstream. When the trap is in place, one or more modified weir panels will also be used (if necessary) to allow fish to quickly migrate downstream. This weir panel will be partially submerged and have a fyke on the downstream end to prevent fish from migrating upstream.

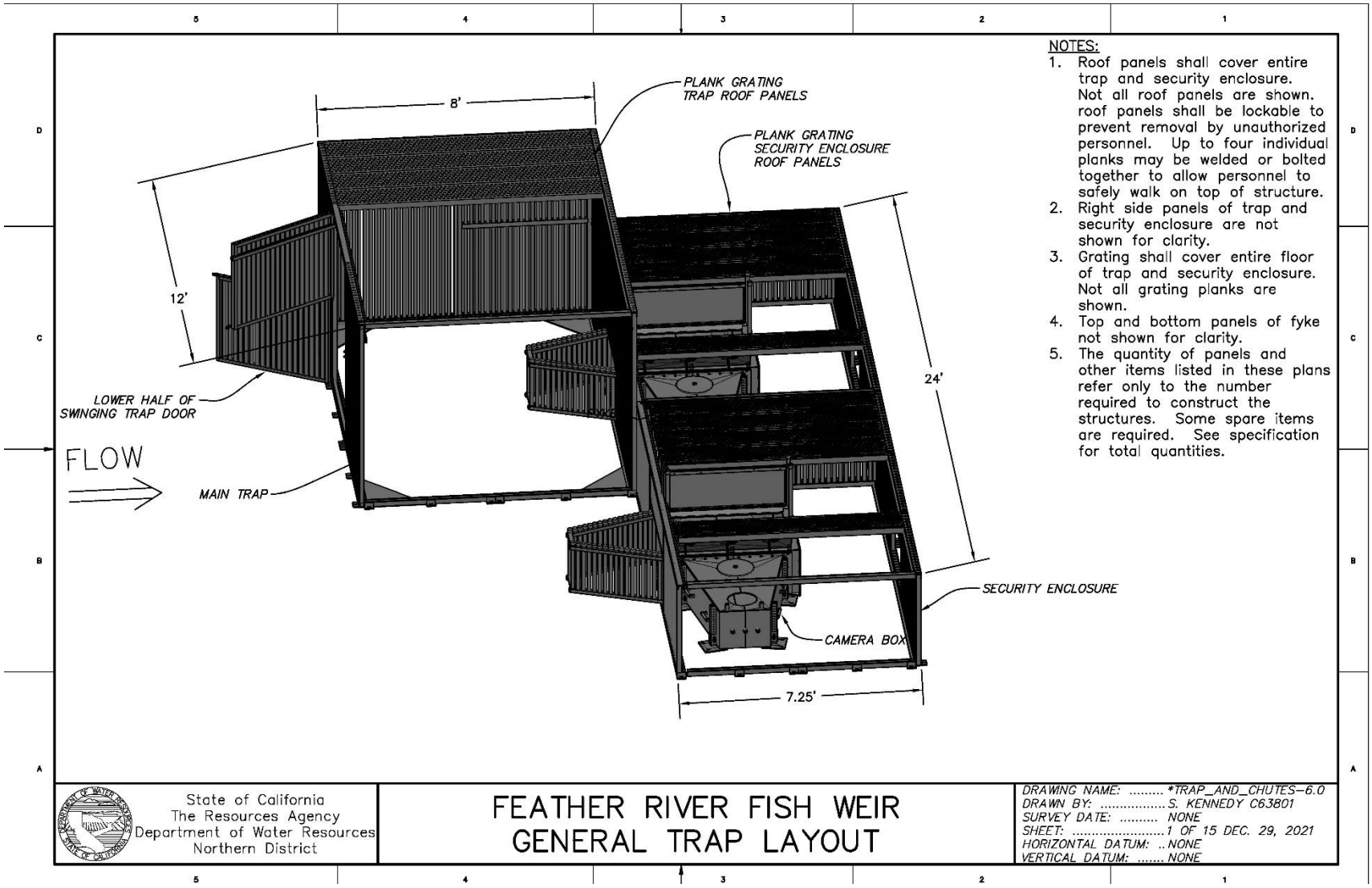
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Figure 5. Upstream Passage Complex Diagram. (Note: not to scale)



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Figure 6. FMS Trap drawing.



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1.2.1.3 Pit Tag Antenna

Biomark, Inc. IS-1001 pit tag antennas will be installed on the river substrate twenty feet downstream of the resistance board weir (Photo 6). The antenna array spans the entire river channel and will detect both half duplex (HDX) and full duplex version B (FDXb) Pit tags. The Pit tag antenna will detect pit tagged fish that swim over the antennas as they migrate through the LFC. Two Passover arrays will provide direction of migration and temporal information about the migrating fish.

The Pit tag antennas will be powered by 4 solar panels. A 3'w x 2'h x 2'd ventilated steel box will house a bank of 4 batteries and charge controller. Another 3'w x 4'h x 2'd ventilated steel box will house the master controller for the pit tag antenna array. The 4 solar panels, batteries, charge controller, and master controller will be in the chain linked fenced power and controller area on the levee.

Photo 6. Example of an upstream and downstream pit tag antennas in the Lower Yuba River (Photo courtesy of CDFW).



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1.2.1.4 Solar Power System

The solar power system consists of the fenced power and controller area, junction box, and conduit. The system will be installed south of the river from the weir to the top of the levee at the Project footprint (Figure 2 and Figure 3). The solar power system will provide 12-volt power to all the lights at the weir; 12-volt power to the security cameras at the solar array and weir; and 120-volt power to the computers.

1.2.1.4.1 Fenced Power and Controller Area

The solar power system components located on the levee will consist of the solar panel array, the charge controller, the battery bank, 12v DC to 120v AC inverter, and a 12V AC transformer. The charge controller, inverter, transformer and batteries will be housed in a 72” w x 46”h x 30”d ventilated steel box (SPCB) near the solar panel array (Figure 3). The rugged laptop computers with external hard drives will be placed in the same box. A transfer switch or another type of power connection device will be installed in the SPCB to allow for Feather River Program staff to connect a generator to the power system to charge batteries and/or power the lights and cameras at the weir (if necessary). All cables for the solar power system will be placed in metal conduit.

The solar array and the ventilated steel boxes will be surrounded and covered by chain link fencing to prevent theft and vandalism. A lockable gate will be installed in the perimeter fencing to allow staff to access the solar panels and SPCB. Security cameras will be placed near the solar array and the weir to deter theft and vandalism and to provide a way to view the Project from the office when personnel are not present.

1.2.1.4.2 Floodplain Junction Box

A 3’w x 2’h x 2’d steel junction box will be placed in the floodplain between the solar power system on the levee and the weir (Figure 3). This junction box will house the connection points for the camera cables coming from the weir and the Cat7 cables coming from the computers on the levee. The junction box will also serve as a connection point for the 12-volt DC and 12-volt AC cables used to power the cameras and lights at the weir. The 12-volt and Cat7 cables coming from the solar power component box to the

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junction box in the floodplain will be contained in above ground metal conduit.

1.2.2 Project Activities

1.2.2.1 Project Site Access

Access to the project site will utilize existing paved haul roads, a rocked and maintained access road, and the Feather River. For weir and floodplain box construction, materials will primarily be brought in by boat. Within the vegetated and undisturbed areas, the Project will be accessed by foot to reduce potential impacts to vegetation and habitat.

1.2.2.2 Construction Activities

Construction activities will involve vegetation trimming; installation of the substrate rail; installation of the substrate cable; installation of the floating panels; installation of the bulkheads and aluminum picket weir; installation of the Underwater Video Monitoring System; installation of security enclosure and fish trap; installation of the floodplain junction box; installation of solar panels and conduit; installation of fencing; installation of the security camera for the solar panels; installation of warning and directional signage; and installation of the pit tag antenna array. Temporary and permanent impacts of Project activities are summarized in Table 1and Table 2 below.

Table 1. Summary of Proposed Temporary Project Components

Component	Temporary Impact (Acres)	Description
Staging Area 1	0.142	Staging areas are encompassed within the Project footprint. Staging areas will be used for staging vehicles and materials but will not be altered.
Staging Area 2	0.007	Staging areas are encompassed within the Project footprint. Staging areas will be used for staging vehicles and materials but will not be altered.
Vegetation Trimming	0.026	Minor vegetation trimming. 3’ around the conduits and within the footprint of the floodplain junction box. No trees greater than 3” diameter breast height (DBH) will be removed.

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Component	Temporary Impact (Acres)	Description
Project Footprint	3.536	The Project footprint includes all temporary construction limits and encompasses all Project activities. The area includes staging areas, vegetation trimming locations, and access areas. 3.265 acres of the Project footprint is usedused only for access and soil will not be disturbed.

Table 2. Summary of Proposed Permanent Project Components

Component	Permanent Impacts (Acres)	Description
Resistance Board Weir	0.068	Resistance board weir will be installed using hand tools and operated year-round across the LFC. The resistance board weir will be anchored to the banks and across the bed of the channel and includes a substrate rail, cable, floating resistance board panels, and picket weir panels. Components are only anticipated to be removed for maintenance and to avoid high-flow events.
Upstream Passage Complex	0.006	The upstream passage complex is installed using hand tools and operated year-round within the LFC. The complex consists of 1) security enclosure containing fish passage chutes and camera boxes and 2) a fish trap. The security enclosure will be attached to the resistance board weir with the specialized fish passage weir panels and anchored to the channel bed. The fish trap will be attached to the security enclosure and anchored to the channel bed. Components are anticipated to only be removed for maintenance and to avoid high-flow events.
Pit Tag Array	0.004	Two rows of pit tag antenna will be permanently installed by using hand tools to anchor the array to the channel bed across the LFC. The array will remain and be operated year-round.

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Component	Permanent Impacts (Acres)	Description
Signage	0.001	On both the upstream and downstream side of the weir, 1 warning sign, 1 wake sign, and 1 boat passage signs will be installed (3 upstream and 3 downstream). On both the upstream and downstream side of the weir, green and red markers will be installed. All installation will use hand tools and components will remain for the duration of project operations.
Solar Power System-Fenced Power and Controller Area	0.015	Solar panels, solar panel job box, pit tag antenna master controller, pit tag antenna battery bank, security cameras, and security fencing will be installed using hand tools and tractor or truck with an auger.
Solar Power System-Floodplain Junction Box	0.005	A flood plain junction box and security camera will be installed between the channel and fenced power and controller area. A cable conduit will be installed connecting the weir and pit tag array, flood plain junction box, and fenced power and controller area. Installation will only require the use of hand tools, and the junction box can be removed at any time.

1.2.2.2.1 Vegetation Trimming

Hand tools will be used to trim vegetation as needed for installation of the solar power system conduits and floodplain junction box. Vegetation primarily consisting of blackberries, non-native vegetation, and low-lying grasses will also be trimmed along a 3’ wide trail along the conduit line from the solar array site to the weir site using pruning shears and machetes. Additionally, low-lying vegetation primarily consisting of blackberries and low-lying grasses will be trimmed where the junction box will be placed. No trees greater than 3” DBH will be removed. Sensitive plants, particularly the elderberry shrubs on both sides of the levee, would be avoided and clearly marked as an Ecologically Sensitive Area.

1.2.2.2.2 Resistance Board Weir Construction

Weir construction will begin with the installation of the substrate rail across the bottom of the river channel. A stringline anchored with steel form stakes will be used to mark the desired location and orientation of the substrate rail

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and will be removed once the rail is installed. Each 10’ rail segment will be bolted together at each splice joint and then anchored to the river bottom using a combination of ¾” x 5’ rebar stakes. The stakes will be placed on both sides of each rail leg and duckbill anchors will be placed directly in line with each splice joint. The stakes will be driven into the river bottom by a hydraulic post pounder, or hand driven with an 8lb sledgehammer. Sandbags will be placed against the upstream and downstream sides of the substrate rail to prevent scouring.

A substrate cable will be pulled through the guides on top of the substrate rail by hand and tensioned with a winch or comealong and a cable grip. The substrate cable will be anchored on each end by running the cable around a large tree or rock (if available), or an anchor plate. The anchor plate will be made of a 3-foot 3/8” thick plate with (3) 1” holes and chain link welded to it. 5-foot rebar stakes will be driven through the 1-inch holes to anchor the plate to the substrate. The substrate cable would then be run through the chain link and tensioned. The crew may snorkel to double check the substrate rail.

Floating resistance board panels will be attached to the substrate cable by their j-hooks. The 5-foot-wide boat passage panels will be shackled to the cable to prevent detachment by boat passage. Individual panels are to be connected to adjacent panels by sliding a single PVC connecting picket through the empty slots on the connecting stringers. All panels will be constructed at an off-site facility and transported to the site by boat and staged temporarily on the riverbank. No vegetation will be removed for temporary staging of weir panels.

The bulkhead T-posts will be hand driven into the substrate using a hydraulic post pounder. Each T-post will be covered by PVC to avoid damage to the outermost panels. The posts will be lashed to the bulkheads to prevent the weight of the bulkhead from sinking the weir panels. Aluminum picket weir panels will be placed on the side of the bulkhead opposite the weir. Each panel will made up of two 4’ horizontal metal stringers with 1 1/4” holes on 1” spacing for the 1 1/8” pickets, two 4’ vertical supports, and two 4’ adjustable legs. Aluminum poles will be inserted into the stringers. The panels will extend up the bank to form an impenetrable barrier to adult

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salmon and steelhead. Sandbags will be placed at the base of the pickets to prevent scouring.

Installation of the weir should take 3 days with a 5-person crew. This is dependent on flow conditions and the experience of the crew.

1.2.2.2.3 Upstream Passage Complex

Once the resistance board weir is installed. Fish passage chutes and camera boxes would be joined with the specialized fish passage weir panels. A 7’ x 24’ area of the river bottom would be leveled off using shovels, mcleods, and moving large rocks by hand. Fish passage chutes and camera boxes will then be anchored to the river bottom using 5-foot rebar stakes like those that anchor the substrate rail. Stakes will be driven with a hydraulic post pounder. Cameras, lights, and cables would be installed by hand and connected at the junction box (Figure 5).

The 7’ x 3’ x 24’ security enclosure will then be built around the video monitoring system. The bottom of each security enclosure panel will fit into a perimeter channel that is anchored to the substrate using 5’ rebar stakes every 2’ around the perimeter. Individual panels will be bolted together, and the removable roof would then be installed completing the enclosure. A variety of hand tools will be needed to complete the security enclosure.

The fish trap that attaches to the upstream wall of the security enclosure will be installed the same way as the security enclosure. The fish trap will be removable and only used as needed. A 12’ x 8’ area will be leveled off using shovels, mcleods, and moving large rocks by hand. Bar grating will cover the floor of the trap. The fish trap will have a perimeter channel that individual wall panels fit into. The channel will be anchored with 5’ rebar stakes driven into the river bottom with a hydraulic post pounder at two-foot increments. Individual panels would bolt together like the panels of the security enclosure.

Installation of the upstream passage complex should take 2 days with a 5-person crew. This is dependent on flow conditions and the experience of the crew.

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1.2.2.2.4 Pit Tag Array

The Pit tag antenna array will be installed 20 feet below the resistance board weir. The antennas will be transported to the weir site by boat. Seven antennas placed end to end will form the upstream and downstream passover lines. Each passover line will span the width of the wetted river channel and will be 15 to 30 feet apart. A total of 14 20-foot antennas would be needed to form the array. Each 20-foot antenna will be anchored with two Model 88 DB-1 Duckbill Earth Anchors. Earth anchors will be driven into the river bottom using a hydraulic post pounder. Ratchet straps will then be secured to the cable loop of the duckbill anchor, wrapped around the antenna, and ratcheted down to hold the antenna in place.

Installation of the pit tag array should take 3 to 5 days with a 5-person crew. This is dependent on flow conditions and the experience of the crew.

1.2.2.2.5 Signage

Warning and directional signage like what is shown below will be installed to help boat traffic and anglers safely navigate their way over or around the weir. This signage will be placed directly upstream and downstream of the weir (Table 3).

Table 3. Distance from weir and contents of warning and directional signage.

Sign Type	Distance from Weir	Sign Content
Warning Sign	350–400 feet	WARNING OBSTRUCTION AHEAD APPROACH WITH CARE
No Wake Sign	250 feet	CAUTION NO WAKE ZONE 5 MPH
Boat Passage Sign	150 feet	REMAIN BETWEEN CHANNEL MARKERS TRIM MOTOR PASS WITH CARE

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Warning signs 350 to 400 feet above and below the weir will be installed by driving two 7-foot T-posts 2-feet into the substrate with a T-post pounder for each sign. Signs would then be wired to the T-posts. No Wake signs will be installed 250 feet from the weir using the same process as the warning signs. Signs directing boat traffic to the modified boat passage panels will be installed 150 feet from the weir. Green and red markers will be attached to either side of the boat passage section of the weir (green to port, red to starboard traveling upstream) in a manner that they will not be submerged should a boat pass, further marking the channel.

Installation of signage should take 1 day with a 2-person crew. This is dependent on flow conditions and the experience of the crew.

1.2.2.2.6 Solar Power System

Fenced Power and Controller Area: The fenced power and controller area is relatively flat, open, and free of vegetation so only light earthwork will be needed to prepare the site (Figure 2 and Figure 3). Solar panels and ground mounts will be transported to the area on flatbed trucks using the 4x4 crossing between the haul road and the levee (Figure 1). A low-boy tractor trailer will deliver a tractor or truck with an auger attachment to dig holes for the solar panel ground mounts. The mounts will be set in concrete and panels will be mounted. After installation of the solar panels, a chain link fence would be constructed around and over the solar panels to guard against vandalism. Security cameras will be installed strategically on the fenced area. One ventilated 72” wide x 46” high x 30” deep job box will be used to store the charge controller, inverter, and batteries, laptop computers, and external hard drives. Additionally, four solar panels and the housings for the pit tag antenna master controller and pit tag antenna battery bank will be installed inside the security fencing.

Construction of the solar power system would take approximately 10 days for a solar contractor to complete.

Floodplain Junction Box: Galvanized metal conduit will be installed to protect power cables and Cat7 cables that carry power and data from the job boxes at the solar panels to the floodplain junction box (Figure 3). The conduit would be anchored to the surface of the ground with 5’ rebar spikes every 10’. Rebar stakes would be driven into the ground with a hydraulic

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post pounder or a sledgehammer. The floodplain junction box will be installed by leveling a 9’ x 9.5’ area with shovels and mcleods. Some vegetation will be trimmed, no trees will be removed. A security camera will be installed in an adjacent tree to monitor the floodplain junction box. The cables running from the cameras and lights inside the security enclosure at the weir to the floodplain junction box will be protected by galvanized metal conduit. This run of conduit would also be on the ground surface anchored with 5’ rebar stakes every 10 feet. Super flex ½” black conduit will be used to house cables from the pit tag array master controller down to the antennas in the river. The conduit will run on the substrate surface and be secured with 5’ rebar stakes every 10 feet.

Construction of the floodplain junction box and conduit from the junction box to the weir should take 1 day.

1.2.2.2.7 Clean-up

After construction is complete, all construction debris would be removed from the construction area. Clean-up should take a 3 to 5 person crew a maximum of one day to complete.

1.2.2.3 Construction Equipment

Construction equipment utilized for the Project may include but is not limited to the following:

- One low-boy tractor trailer.
- One tractor or truck with an auger.
- One concrete mixer trailer.
- Three 4 x 4 pickups.
- Three jet boats.
- One jon boat (non-motorized).
- One hydraulic post pounder and generator.

Miscellaneous hand tools including 8-pound sledgehammers, shovels, garden rakes, mcleods, come a long, machetes, T-post pounder, pruning shears, wrenches, cordless drill, and cordless angle grinder.

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1.2.2.4 Operation

The weir is designed to prevent adult fish (fish greater than sixteen inches) from bypassing the weir by directing them through the chutes (or live-trap) to record information on the fish. Each fish passing through the weir and upstream passage complex will be video recorded, counted and identified to species using the recording. Fish with tags will also be noted using equipment designed to detect the tags (e.g., PIT tag, coded wire tags (CWT), or radio/acoustic tags). Because salmon and steelhead are present in the Feather River year-round, operation of the weir will occur 365 days per year, flow permitting. Although the system is designed to function passively (e.g., video monitoring), some handling of salmon and steelhead will be necessary to record information. The fish trap will be installed sparingly in situations when high turbidity events render the camera inoperable or if DWR needs to mark individuals or take tissue samples. Typically, the fish trap will be removed once turbidity events end, which typically last a few days in the LFC but can persist up to a few weeks. Otherwise, no handling of fish would be necessary.

When DWR biologists need to handle the fish, the chutes will be closed on the upstream end to trap fish in a live-trap box, which will be expanded or reduced to safely accommodate the number of individuals being trapped. When recording information on the fish, individuals will be handled without anesthetic and will be immediately released into a holding area once the necessary information has been obtained. The holding area will allow individuals to recover from handling without washing onto the weir. Fishes will be allowed to leave the recovery area volitionally. On occasion, biological samples may also be taken from salmon and steelhead for genetic analysis. Additional marking of individual salmon and steelhead may occur as needed to specifically assess migration behavior, growth, and population estimation techniques.

The frequency of collecting information when fish are trapped in the weir will vary based on the number of fish passing through the weir. Schedules for fish handling and servicing the traps will strictly adhere to federal and State scientific research and collecting permits.

Snorkel surveys will be conducted at regular intervals downstream of the weir to assess the fishes' reaction to the weir and determine if significant

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migration delays occur. If delays are occurring, weir operations will be modified to allow relatively unimpeded passage. Snorkel surveys will also be used to ensure the weir is structurally sound and "fish safe." DWR biologists will be experienced in sampling and handling anadromous salmonids, and at least one trained and qualified person shall be onsite throughout the duration of each processing event to ensure adherence to approved sampling and handling protocols.

During high flows, the weir panels, upstream passage complex, and PIT tag array may need to be temporarily removed. Current average Thermalito Diversion Dam flow release into the LFC is typically between 600 and 700 cubic feet per second (cfs) with a minimum release of 600 cfs. At around 1500-2500 cfs, DWR would decide as to what parts of the in-water materials should be removed based on time of year, reservoir storage, value of data, etc. If released flows are not anticipated to reach or exceed 5,000 cfs for more than a few days, DWR would plan to remove the security enclosure. If released flows are estimated to exceed 10,000 cfs for more than a week, DWR would remove the weir panels. Components will be reinstalled once flows return to normal.

Additional operation activities include checking in-water equipment, checking the floodplain junction box, and checking the fenced power and controller area almost daily throughout the year.

1.2.3 Construction Schedule

Construction of the Project is anticipated to occur between May and September 2023. Active work will take approximately 5 weeks and in-water work will not occur from May through June. Work will occur during daylight hours from 7 a.m. to 7 p.m., Monday through Friday.

1.2.4 Best Management Practices

Best Management Practice (BMP)-1: Air Quality Control Plan – This plan shall document efforts to reduce air pollution and shall include, but not be limited to the following:

1. Fugitive dust control. Efforts to control fugitive dust include watering, applying chemical suppressants, minimizing areas of disturbance, covering surfaces, or other favorable dust control measures. Measures

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listed below shall be implemented as reasonable or necessary to prevent fugitive dust from leaving the work site.

A. Ensure equipment is properly maintained.

B. Construct graded surfaces as early in the Project as possible.

C. Limit construction vehicle speeds to no greater than 15 mph.

D. Cover haul vehicles in a manner to ensure compliance with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.

E. Apply water and other dust palliatives as frequently as necessary to control fugitive dust.

2. Minimize construction-related vehicle emissions. Emission measures shall include, but are not limited to:

   A. Prohibit trucks and construction vehicles from idling more than 5 minutes when not in use.

   B. Maintain all construction equipment in proper working condition and perform preventive maintenance. Required maintenance shall include but not be limited to compliance with all manufacturer's recommendations, proper upkeep and replacement of mufflers and filters, and maintenance of all engine and emissions systems in proper operating condition

   C. Implement a tire-inflation program on the work site to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives on-site and every two weeks for equipment that remains on-site. Check vehicles used for hauling materials off-site weekly for correct tire inflation. Vehicles used for hauling materials off site shall be checked at least weekly for correct tire inflation.

   D. Handling, loading, unloading, or transporting materials to and on the work site using equipment with on-road rated engines, to the extent feasible.

   E. Use only coatings and solvents on the Project that are consistent with the local air quality control district or air quality management district rules, California Air Resources Control Board, and all other applicable laws and regulations.

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BMP-2: Green House Gas Emissions – According to DWR's Greenhouse Gas Emissions Reduction Plan Update 2020 (Update 2020), all DWR projects are expected to implement the following BMPs into the project design:

1. Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether the specifications for the use of equipment with repowered engines, electric drive trains, or other high-efficiency technologies are appropriate and feasible for the project or specific elements of the project.
2. Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.
3. Ensure that all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, use alternative fuels, such as propane or solar, to power generators to the maximum extent feasible.
4. Evaluate the feasibility and efficacy of producing concrete on-site and specify that batch plants be set up on-site or as close to the site as possible.
5. Evaluate the performance requirements for concrete used on the project and specify concrete mix designs that minimize GHG emissions from cement production and curing while preserving all required performance characteristics.
6. Limit deliveries of materials and equipment to the site to off peak traffic congestion hours.
7. Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by the State airborne toxics control measure [Title 13, Section 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.
8. Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine

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and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an Air Quality Control Plan prior to commencement of construction.

9. Implement tire inflation program on jobsite to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives on-site and every two weeks for equipment that remains on-site. Check vehicles used for hauling materials off-site weekly for correct tire inflation. Procedures for the tire inflation program shall be documented in an Air Quality Management Plan prior to commencement of construction.
10. Develop a project specific ride share program to encourage carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.
11. Reduce electricity use in temporary construction offices by using high efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors develop and implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business.
12. For deliveries to project sites where the haul distance exceeds 100 miles and a heavy-duty class 7 or class 8 semi-truck or 53-foot or longer box type trailer is used for hauling, a SmartWay certified truck will be used to the maximum extent feasible.
13. Minimize the amount of cement in concrete by specifying higher levels of cementitious material alternatives, larger aggregate, longer final set times, or lower maximum strength where appropriate.
14. Develop a project specific construction debris recycling and diversion program to achieve a documented 50% diversion of construction waste.
15. Evaluate the feasibility of restricting all material hauling on public roadways to off-peak traffic congestion hours. During construction scheduling and execution minimize, to the extent possible, uses of public roadways that would increase traffic congestion.

BMP-3: Water Quality Management Plan- The following plan shall be implemented to minimize impacts to water quality.

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1. All fueling and maintenance of vehicles or other equipment for construction activities shall occur within the designated staging area over 300 feet (91 meters) away from any on-site water feature. Secondary containment for fuel and gas tanks will be used to prevent spills from entering any water features.
2. Absorbent materials will be available on-site. Any accidental leaks or spills will be immediately cleaned up, and the equipment will not be able to return to the project area until it has been repaired sufficiently to prevent further leaks or spills.
3. For work conducted in the Feather River LFC, suitable type of spill-stoppage materials will be kept on all project boats for immediate deployment, and all powered boats and hydraulically driven equipment will be fully maintained and checked for leaks prior to use.
4. During work conducted in the Feather River LFC, staff will watch for plumes or sheen on the water surface (an indication that oil or other material is entering the water and may affect water quality). If found, activities will cease until appropriate corrective measures have been completed or it has been determined that the environment will not be harmed.
5. Sandbags used for scour prevention will be filled with clean, and if possible local/native, sands such that they do not pose a water quality risk themselves.

BMP-4: Underground Utility Plan- To avoid impacts to underground utilities, the following activities will be conducted for each planned soil exploration location: a field reconnaissance; marking and/or staking the exploration site; and calling Underground Service Alert (USA) for utility clearance.

BMP-5: Fire Prevention and Control Plan – This plan shall comply with the provisions of the California Fire Code (CFC) Chapter 33, and shall include appropriate preventative measures, emergency procedures to be followed, current emergency telephone numbers, and an area map. At a minimum, the plan shall address the following items, if applicable:

1. Procedures and policies for preventing fires occurring on site during construction.

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2. Procedures and policies for controlling any worksite fires, access for firefighting, and other related fire prevention and control procedures developed in consultation with fire protection agencies.
3. Materials susceptible to spontaneous ignition shall be stored in an approved disposal container.
4. No fires will be allowed at the work site. Smoking will be allowed only in areas designated for smoking, which shall be in enclosed vehicles or in areas cleared of vegetation.
5. Motorized construction equipment shall be located such that the exhausts do not discharge against combustible materials. Equipment shall be fueled while in non-operation. Fuel shall only be stored in approved areas.
6. Contact with local firefighting agencies shall be maintained for updates on fire conditions, and such fire conditions shall be communicated to on-site employees daily during times of elevated fire danger.
7. Vehicles shall be restricted to project right of way unless otherwise allowed for fire control procedures.
8. If a fire should start, fire protection agencies shall be notified immediately and all reasonably necessary and prudent fire suppression activities shall commence, including but not limited to, extinguishers, water, and chainsaws.

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2.0 Environmental Factors Potentially Affected

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

☐ Aesthetics

☐ Agriculture/Forestry Resources

☐ Air Quality

☒ Biological Resources

☒ Cultural Resources

☐ Energy

☐ Geology/Soils

☐ Greenhouse Gas Emissions

☐ Hazards and Hazardous Materials

☐ Hydrology/Water Quality

☐ Land Use/Planning

☐ Mineral Resources

☐ Noise

☐ Population/Housing

☐ Public Service

☐ Recreation

☐ Transportation

☒ Tribal Cultural Resources

☐ Utilities/Service Systems

☐ Wildfire

☒ Mandatory Finding of Significance

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Determination:

On the basis of this initial evaluation:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Proposed Project have been made by or agreed to by the Proposed Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the Proposed 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 Proposed 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 Proposed Project, nothing further is required.

_____ _____

Signature Date

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2.1 Evaluation of Environmental Impacts

2.2.1 Aesthetics

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In nonurbanized areas, 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?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

E2.1.1.1 Environmental Setting

The Project is in and adjacent to the LFC of the Feather River within the 11,800-acre OWA. The immediate area is characterized by the LFC, with

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cobble substrate bordered by riparian vegetation, open floodplain, areas of dredge tailings from historic hydraulic mining, and an earthen levee. The Project area will be accessed via Pacific Heights Road which passes within approximately 0.25 miles southeast of the Project area, from which project activities may be visible from the roadway. Approximately 280 feet northwest of the Project area, there is a gravel access road that provides pedestrian access to the river adjacent to the Project area and is part of the network of access roads within the Oroville Recreation Area. The LFC is partially visually blocked from the gravel road by riparian vegetation. There are no designated or eligible scenic highway routes within the vicinity of the Project area, the nearest being a stretch of State Route (SR) 70 ending approximately 8.5 miles to the north at the intersection with SR 149 (California Department of Transportation 2022).

2.1.1.2 Discussion

a) Would the project have a substantial adverse effect on a scenic vista?

Less than significant impact. The Project is not within a scenic vista. Although the Project area would be visible from locations accessible to the public, such as from the OWA access road and Pacific Heights Road, the project is composed primarily of elements that will have a small on land footprint, a low aquatic profile and be partially submerged within the LFC, therefore not substantially altering the character of the existing scenic view. Therefore, these project impacts would be less than significant.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Less than significant impact. The Project is over 8 miles from the nearest highway eligible for designation as a State Scenic Highway and would have no impact on views from that route. Additionally, there are no existing structures, rock outcroppings, or historical buildings in the Project area. Minor removal of trees smaller than 3” DBH may occur only as needed for installation of the solar power system conduits, but removal of these few trees would not substantially damage the riparian habitat as a scenic resource. Therefore, these project impacts would be less than significant.

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c) Would the project, in nonurbanized areas, 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?

Less than significant impact. Views of the Project area are of the river corridor, associated riparian vegetation, and the adjacent floodplain and levee. Riparian vegetation along the banks of the LFC contributes to the natural character of the river corridor. The Project area does contain public views as it would be visible from locations accessible to the public, such as from the OWA access road and Pacific Heights Road. However, the Project would consist of a mostly submerged weir and pit tag array bank across the LFC, which would not substantially degrade the existing views of the river. The associated on-land master controller housing would also be visible, but would consist of a small footprint, would be placed in an existing disturbed area, and would not degrade the natural character of the river corridor. A floodplain junction box may also be visible from the river, but would consist of a small footprint, will be hidden by surrounding vegetation, and would not degrade the natural character of the river corridor. Therefore, these project impacts would be less than significant.

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than significant impact. The Project would include installation of lighting, but the Project would not create a substantial source of light or glare that would adversely affect day or nighttime views of the area. LED floodlights would be mounted to the four corners of the security enclosure and aimed to light the weir boat passage area when the motion sensor is triggered. The LED floodlights would be on for short durations and focused on the weir, so these floodlights would not add a significant amount of light or glare to the Project area. Additionally, two 12-volt halogen underwater pond lights will be mounted in the sealed aluminum camera boxes and three 12-volt LED underwater pond lights will be mounted to the fish counting chutes. These pond lights will be used to illuminate fishes passing through the video counting chutes and will not be aimed in such a way as to create

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substantial light or glare to the surrounding area. Therefore, these project impacts would be less than significant.

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2.1.2 Agriculture and Forestry Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
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?	☐	☐	☐	☒

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Environmental Issues	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?	☐	☐	☐	☒
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))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☐	☒

2.1.2.1 Environmental Setting

The Project is located within the 11,800-acre OWA, zoned as Natural Resource Conservation by the Butte County General Plan 2040 Update Settings and Trends Report and upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County (Butte County 2021). The Project footprint includes the LFC, the adjacent floodplain, and levee at RM 61. The upland portion of the Project footprint is characterized by riparian woodland and bare soil between the Feather River and Pacific Heights Road. The Project footprint includes an access road that connects to Pacific Heights Road to the southeast.

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2.1.2.2 Discussion

a) Would the project 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?

No impact. The Project is completely contained within OWA, between the Feather River and Pacific Heights Road. There is no farmland within the Project footprint, so no Prime Farmland, Unique Farmland or Farmland of Statewide Importance will be converted by the Project. Therefore, the Project will have no impact to farmland.

b) Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

No impact. The Project will not alter any land zoned for agriculture, and there are no Williamson Act parcels located within the Project area. So, the Project will not conflict with existing zoning for agricultural use or Williamson Act contract (Butte County 2021). Therefore, the Project will have no impact to zoning for agricultural use or a Williamson Act.

c) Would the project 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 Impact. The Project does not contain any land zoned as forest land, timberland, or timberland zoned Timberland Production, so the Project will not conflict with existing zoning or cause the rezoning of these resources. Therefore, the Project will have no impact to zoning for forest land or timberland.

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d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

No impact. The Project does not contain any land zoned as forest land and will not result in any land conversion to non-forest use. Therefore, the Project will have no impact to loss or conversion of forest land.

e) Would the project 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?

No impact. The Project will not alter the existing environment due to the limited footprint and the nature of the on-land facilities. Additionally, there are no agricultural, farmland or forest land resources within the project area, so the Project will not result in the conversion of any land from agricultural, farmland or forest land to non-agriculture or non-forest use. Therefore, the Project will have no impact to result in conversion of Farmland to non-forest use.

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2.1.3 Air Quality

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
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?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

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Environmental Issues	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?	☐	☐	☒	☐

2.1.3.1 Environmental Setting

National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) have been established for the following criteria pollutants: carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and lead (Pb). These standards have been established with a margin of safety to protect the public's health. Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) designate areas of the State as attainment, nonattainment, maintenance, or unclassified for the various pollutant standards according to the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), respectively.

An "attainment" designation for an area signifies that pollutant concentrations did not violate the NAAQS or CAAQS for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as identified in the criteria. A "maintenance" designation indicates that the area was previously in non-attainment and is currently in attainment for the applicable pollutant; the area must demonstrate continued attainment for a specified number of years prior to re-designation as an "attainment" area. An "unclassified" designation signifies that data do not support either an attainment or nonattainment status.

The Project area is in Butte County, which is located within the Sacramento Valley Air Basin (SVAB) and under the local jurisdiction of the Butte County Air Quality Management District (BCAQMD). Butte County is in a

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"non-attainment" status for ozone (State 1-hour and federal 8-hour) and State air quality standards for particulate matter (PM_{10} and $PM_{2.5}$) (Butte County Air Quality Management District 2019).

Sacramento Valley Air Basin

The SVAB covers all of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba Counties, the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bound by the North Coast Ranges to the west and the Northern Sierra Nevada Mountains to the east. The intervening terrain is relatively flat. It has a Mediterranean climate characterized by hot dry summers and mild rainy winters. During the year the temperature may range from 20° F to 115º F, with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is approximately 20 inches, with about 75% of the rain occurring during the rainy season, generally from November through March. Ozone is the primary criteria pollutant of concern in the SVAB.

Butte County Air Quality Management District Standards

The BCAQMD is the primary agency responsible for assuring that the NAAQS and CAAQS are attained and maintained in Butte County. The BCAQMD is one of six air quality management entities within the Northern Sacramento Valley Planning Area. Air quality districts are created pursuant to the California Clean Air Act (Butte County Air Quality Management District 2014).

The BCAQMD has thresholds for criteria air pollutants and toxic air contaminants, and greenhouse gasses. Thresholds for criteria air pollutants are based upon District Rule 430 - State New Source Review (SNSR), which incorporates stationary permitting significance thresholds for ambient air quality standards as required by California Health and Safety Code Section 40918. The BCAQMD has only established thresholds of significance for criteria air pollutants; while it provides guidance with regards to impacts related to toxic air contaminants and greenhouse gases (GHGs) (Butte County Air Quality Management District 2014). Project-specific modeling results for criteria air pollutants should be compared with Table 4 below to determine their significance.

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Table 4. BCAQMD Air Quality Thresholds of Significance for Criteria Air Pollutants

Pollutant	Construction Related	Operation-Related
ROG (reactive organic gasses)	137 lbs./day, not to exceed 4.5 tons/year	25 lbs./day
NO_X (nitrogen oxides)	137 lbs./day, not to exceed 4.5 tons/year	25 lbs./day
PM_{10} (particulate matter < 10 microns)	80 lbs./day	80 lbs./day

Source: BCAQMD 2014

Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan

The BCAQMD's Air Quality Attainment Plan was first adopted in 1994 and updated in 1994, 1997, 2000, 2003. The BCAQMD collaborated with other air pollution control districts in the Northern SVAB in 2006 to prepare a joint Air Quality Attainment Plan. The joint plan was updated in 2006, 2009, 2012, and 2015. The currently applicable air quality plan for the BCAQMD is the latest edition of the Northern Sacramento Valley Planning Area Air Quality Attainment Plan (at present, the 2015 Triennial Air Quality Attainment Plan). The Attainment Plan provides a description, designated attainment status, air monitoring and emission inventory, public education programs, pollutant transport, feasible control measures, and ozone trends for the Attainment Plan area (Butte County Air Quality Management District 2014).

Impact Assessment Approach

The Project's impacts to air quality were assessed using methods and assumptions recommended by the BCAQMD. The Project involves the construction of a fish monitoring station, which includes a resistance board weir, underwater video monitoring system, a PIT tag antenna array, and solar power system. Once construction of the Project is complete, all construction activities will cease, and no further construction-related emissions will be generated.

For operation-related emissions, the fish monitoring station would operate off power generated by the newly installed solar power system and therefore the facility itself would not generate air pollutants. The fish monitoring station will replace the need to conduct carcass surveys, currently used to

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estimate fall-run populations. In replacing these surveys, implementation of the Project would greatly reduce crew size and boating hours during the operational phase. While the Project would involve the use of a jet boat and occasional use of a passenger vehicle to access the facility, operations emissions would be greatly reduced in comparison to the current operations of the carcass survey. Therefore, because potential impacts to air quality would only occur during the period when construction is occurring, this impact analysis will focus on air pollutant emissions from project construction only. DWR quantified these emissions using the Roadway Construction Emissions Model (Version 9.0.0; Sacramento Metropolitan Air Quality Management District 2018) as recommended by BCAQMD. DWR conducted the analysis using the assumptions that can be seen in Appendix B.

2.1.3.2 Discussion

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

No impact. In general, a project would be deemed inconsistent with an air quality plan if it would result in or induce growth in population, employment, land use, or regional vehicle miles traveled (VMT) that is inconsistent with the growth (and therefore the emission projection) assumptions in the BCAQMD Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan (Butte County Air Quality Management District 2014).

The Project includes the construction of a fish monitoring station and would have no effect on growth of the above parameters due to the temporary nature of the Project and operations. Therefore, the Project will have no impact to the implementation of the applicable air quality plan.

b) Would the project 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

Less than significant impact. The BCAQMD has identified air quality thresholds of significance for criteria air pollutants for which the region is in

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non-attainment (see Table 2). According to the BCAQMD CEQA Guidelines, projects that do not exceed the significance thresholds may be assumed to have a less than significant impact regarding a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment (Butte County Air Quality Management District 2014).

The BCAQMD allows for the use of the Sacramento Metropolitan Air Quality Management District's Roadway Construction Emissions Model (RCEM) to quantify project emissions of criteria air pollutants. The maximum daily and annual emissions that are anticipated to result from Project activities are shown in Table 2, below. A conservative approach was taken when modeling Project emissions, and actual Project emissions are expected to be below the modeled projections. Emissions for all criteria pollutants during Project activities would be below BCAQMD daily and annual construction thresholds (Table 5).

Table 5. Maximum Daily and Annual Emissions Anticipated from Project Activities

Pollutant	BCAQMD Threshold of Significance for Average Daily Emissions (pounds)	Calculated Average Daily Construction Emissions (pounds)
ROG (reactive organic gasses)	137 (not to exceed 4.5 tons/year)	0.43 (0 tons/year)
NO_x (nitrogen oxides)	137 (not to exceed 4.5 tons/year)	3.03 (0.01 tons/year)
PM_{10} (particulate matter < 10 microns)	80 lbs./day	4.19 (0.01 tons/year)

Source: Roadway Construction Emissions Model (Sacramento Metropolitan Air Quality Management District 2018)

Because emissions for all criteria pollutants during Project activities would be below BCAQMD thresholds, no mitigation is required. The Project includes implementation of BMPs that would further reduce potential impacts to air quality. BMP-1: Air Quality Control Plan (Section 1.2.4) includes measures for fugitive dust suppression and reducing construction-related emissions. BMP-2: Greenhouse Gas Emissions (Section 1.2.4) includes BMPs set forth in Greenhouse Gas Emissions Reduction Plan Update 2020 (Update 2020) to further reduce GHG emissions from Project activities. Therefore, these Project impacts would be less than significant.

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a) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less than significant impact. Construction of the Project would result in short-term diesel emissions from on-site heavy-duty equipment. Project impacts would be short-term in duration and would not increase the amount of emissions due to the operation of the facility. Additionally, the Project area is approximately 0.2 miles away from the nearest sensitive receptor, a small cluster of residential houses along Pacific Heights Road, at which distance emissions from heavy-duty equipment will have dissipated. As discussed in section b) above, construction-related emissions are below the significance thresholds established by the BCAQMD. Therefore, these Project impacts would be less than significant.

b) Would the project create objectionable odors affecting a substantial number of people?

Less than significant impact. The Project would not result in odor-causing emissions that would affect a substantial number of people. The Project is located approximately 0.2 miles from the nearest sensitive receptor, a small cluster of residential houses along Pacific Heights Road. Odor created by the Project would only include odors associated with diesel exhaust from the use of heavy machinery, would be temporary in nature, is localized, and would dissipate rapidly from the Project area with an increase in distance. Therefore, these Project impacts would be less than significant.

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2.1.4 Biological Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, the U.S. Fish and Wildlife Service, or the National Marine Fisheries Service	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒

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Environmental Issues	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?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

2.1.4.1 Environmental Setting

The Project is in Butte County within the Sacramento Valley Subregion of the Great Central Valley Geographic Region of California (Baldwin et al. 2012). The Project is situated at an elevation range of approximately 110 to 135 feet above mean sea level. The regional climate is generally Mediterranean in nature with warm, dry summers and cool, wet winters. The average daily mean temperatures in the vicinity of the Project range from 47.5 degrees Fahrenheit in January to 81.1 degrees Fahrenheit in July. The average annual precipitation in the area is approximately 26 inches (based on 1991-2020 climate averages)(National Resource Conservation Service 2021).

The Project is located at the LFC of the Feather River and its floodplain. The Feather River is regulated by hydroelectric, water storage, and diversion projects upstream of the Project. The most influential projections for flows in

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the LFR are the Oroville Facilities Hydroelectric Project, which consists of Lake Oroville and the Thermalito facilities. Flow from Lake Oroville is released through the Thermalito facilities into the LFC of the Feather River or the Thermalito Power Canal.

The area was subject to dredge mining in the early 20th century, and dredge tailings occur throughout the Project. The topography within the Project area is nearly level within the floodplain of the river, with a steep bank associated with the levee along the east side with the terrain generally sloping southeast toward the levee.

2.1.4.1.1 Methodology

A table of special-status species and plant communities with the potential to occur within the Project area was compiled (Appendix A) for the Project. The table was developed from a review of the following sources:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) for the following nine USGS 7.5-minute Quadrangle maps: Shippee, Oroville, Oroville Dam, Biggs, Palermo, Bangor, Gridley, Honcut, and Loma Rica (California Department of Fish and Wildlife 2021);
- U.S. Fish and Wildlife Service website (USFWS) Information for Planning and Consultation (iPaC) system (U.S. Fish and Wildlife Service 2021b);
- California Native Plant Society (CNPS) on-line Inventory of Rare and Endangered Plants for the following nine USGS 7.5-minute Quadrangle maps: Shippee, Oroville, Oroville Dam, Biggs, Palermo, Bangor, Gridley, Honcut, and Loma Rica (California Native Plant Society 2021)
- National Marine Fisheries Service (NMFS) Protected Resources App (National Marine Fisheries Service 2021a)

The table includes information on species status, habitat description, and whether the species has the potential to occur in the Project area. The determinations of whether a species has the potential to occur were evaluated through a review of CNDDB Geographic Information System (GIS) records, analysis of aerial imagery, and information collected during DWR site surveys.

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2.1.4.1.2 Habitat Types

The channel within the Project has a cobble substrate and is unvegetated due to the depth and flow rate of water. Riparian scrub occurs adjacent to the channel on the north and south sides. This vegetation community is dominated by riparian shrubs and small trees, including sandbar willow (*Salix exigua*), arroyo willow (*Salix lasiolepis*), common buttonbush (*Cephalanthus occidentalis*), and rattlebox (*Sesbania punicea*). The north side of the channel is also dominated by giant reed (*Arundo donax*). Scattered large trees are also present in this vegetation community, including individuals of valley oak (*Quercus lobata*), Fremont's cottonwood *(Populus fremontii*), and California sycamore (*Platanus racemosa*). A sparsely vegetated cobble bar occurs south of the riparian scrub community within the active floodplain of the Feather River. The cobble bar is dominated by annual and perennial herbaceous species, including California poppy (*Eschscholzia californica*), Oregon false goldenaster (*Heterotheca oregonus*), Bermuda grass (*Cynodon dactylon*), soft brome (*Bromus hordeaceus*), and ripgut brome (*Bromus diandrus*).

The southern portion of the Project above the floodplain is a levee composed of dredged tailings; and vegetation consists of valley oak woodland and annual grasslands. Valley oak woodlands occur on a slope of the levee and are dominated by valley oak, gray pine (*Pinus sabiniana*), and Fremont's cottonwood. The understory of this vegetation community is dominated by annual and perennial grasses, including ripgut brome and smilo grass (*Stipa miliacea*).

Annual grasslands occur at the top of the levee within the Project footprint and is dominated by ripgut brome, soft brome, and wicker buckwheat (*Eriogonum luteolum*). A dirt road runs east to west at the top of the levee.

2.1.4.1.3 Special-Status Species

For this analysis, special-status has been defined to include those species that meet the definitions of rare, endangered, or threatened plants or animals under CEQA including species that are:

- Listed as endangered or threatened under the FESA (or formally proposed for, or candidates for, listing);

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- Listed as endangered or threatened under CESA (or proposed for listing);
- Designated as endangered or rare, pursuant to California Fish and Game Code Section 1901;
- Designated as fully protected, pursuant to California Fish and Game Code Sections 3511, 4700, or 5050;
- Designated as a species of special concern by CDFW; or
- Included in California Native Plant Society's Inventory of Rare Plants (Rare Plant Rank 1 through 4).

The table located in Appendix A provides a summary of regionally occurring special-status species based on queries of the CDFW CNDDB, USFWS iPaC, and the CNPS database. Potential to occur in the Project area was based on the presence of each species or its habitat recorded during biological surveys and consultation with DWR Environmental Scientists with experience on-site. Special-status species with no potential to occur within the Project area are not discussed further.

Based on the availability of suitable habitat and nearby occurrences, 24 special-status wildlife species and ten special-status plant species are considered to have a potential to occur in the Project area and are discussed further below.

Special-Status Wildlife

This section includes species accounts for wildlife species that have the potential to occur in the Project area and further discusses the effects determinations made in the species table found in Appendix A.

There are 24 wildlife species that have the potential to occur at the Project area: foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana draytonii*), western pond turtle (*Actinemys marmorata*), giant gartersnake (*Thamnophis gigas*), Tricolored Blackbird (*Agelaius tricolor*), Great Blue Heron (*Ardea herodias*), Burrowing Owl (*Athene cunicularia*), Swainson's Hawk (*Buteo swainsoni*), Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*), Bald Eagle (*Haliaeetus leucocephalus*), Loggerhead Shrike (*Lanius ludovicianus*), Osprey (*Pandion haliaetus*), Yellow

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Warbler (*Setophaga petechia*), California Central Valley Steelhead DPS (*Oncorhynchus mykiss irideus*), Central Valley spring-run Chinook Salmon ESU (*Oncorhynchus tshawytscha*), Southern DPS of the North American Green Sturgeon (*Acipenser medirostris*), vernal pool fairy shrimp (*Branchinecta lynchi*), monarch butterfly (*Danaus plexippus plexippus*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), western ridged mussel (*Gonidea angulata*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis californicus*), silver-haired bat (*Lasionycteris noctivagans*), and Yuma myotis (*Myotis yumanensis*).

Foothill yellow-legged frog (*Rana boylii*): Foothill yellow-legged frog, North Feather clade, is listed as threatened under CESA and is proposed threatened under FESA. The North Feather clade is primarily located in Plumas and Butte Counties and occupies the transition zone between the northern Sierra Nevada, Southern Cascade Foothills, and Tuscan Flows ecoregions (U.S. Fish and Wildlife Service 2021a). Foothill yellow-legged frogs are rough skinned grey, reddish, brown or olive, small to medium sized, frogs with faint dorsolateral folds. There is often yellow coloration on the ventral surface of the hind legs, and white with mottling on the chin, throat, and chest (Thompson et al 2016). Foothill yellow-legged frogs are found primarily in streams and rivers, and breed in the springtime in the shallow portions of rivers or streams, often near confluences with tributaries, characterized by cobblestone substrate which is used for egg deposition. Tadpoles metamorph before winter rains, in the late summer early fall. Metamorphs and adults will use various habitats within the rivers and streams, including riffles and runs, and will move into tributaries or upland habitat to avoid flooding events following heavy winter rains (Thompson et al. 2016). Little is known about upland habitat use.

Foothill yellow-legged frog has a low potential to occur within the Project area. The LFC provides suitable aquatic habitat in the Project area, but species are unlikely in the region. Nearby CNDDB occurrences were last observed more than 20 years ago and were either presumed locally extirpated or are more than 10 miles from the Project footprint.

California red-legged frog (*Rana draytonii*): California red-legged frog is listed as Threatened under FESA (U.S. Fish and Wildlife Service 2019b) and

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is identified as a California Department of Fish and Wildlife (CDFW) Priority One Species of Special Concern (CDFW 2019b, Thompson et al 2016). It is the largest California native frog, measuring 1.75 to 5.25 inches SVL, with smooth skin and prominent dorsolateral folds. Its coloration can vary from reddish-brown to gray or olive, often with a red lower belly and hindlegs (Nafis 2022). California red-legged frog is endemic to central California, with a range historically extending from southern Mendocino County southward along the interior Coast Ranges to northern Baja California, Mexico, and inland from the vicinity of Redding, Shasta County, California, along Sierra Nevada foothills south to Fresno County at elevations from sea level to approximately 5,000 feet (Nafis 2022, Thompson et al. 2016). It is found in a variety of aquatic habitats including permanent and ephemeral ponds, perennial and intermittent streams, seasonal wetlands, springs, seeps, marshes, dune ponds, lagoons, coastal dune drainages, and human-made aquatic features (Thompson et al 2016, Halstead and Kleeman 2017), and has been known to migrate as much as 1.7 miles into the upland. Upland habitat used includes woodlands, grasslands, and coastal scrub.

Breeding occurs from late November through late April, with earlier breeding generally occurring in southern localities. Females lay eggs in clusters up to 10 inches across, attached to vegetation two to six inches below the surface. Eggs hatch in 6-14 days, depending on water temperature (Thompson et al. 2016), with tadpoles undergoing metamorphosis in four to seven months, although in some locations they have been known to overwinter (Nafis 2022) completing metamorphosis the following spring.

California red-legged frog has a low potential to occur within the Project area since the species is unlikely in the region and the habitat provides marginal suitable aquatic habitat. The Project area is within the current species range, but the Project area only provides marginal suitable aquatic habitat as much of the substrate is comprised of cobble with limited emergent vegetation needed for species refugia. Additionally, there have been no observed CNDDB occurrences within 10 miles of the Project footprint indicating the species is unlikely in the region.

Western pond turtle (*Actinemys marmorata*): Western pond turtle is under review for listing under the FESA and is a CDFW Priority One Species of Special Concern (U.S. Fish and Wildlife Service 2015b, Thompson et al.

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2016). Western pond turtle is a small to medium-sized aquatic turtle, with a straight carapace that measures 6.5 to 7 inches long. It is brown, tan, or olive with a low, unkeeled carapace with a non-serrated rim (Nafis 2022, Stebbins 2003). Western pond turtle is found from the Pacific Coast inland to the Sierra Nevada foothills to elevations as high as 6,700 ft above sea level.

Western pond turtle is a highly aquatic species and can be found in a variety of habitat types including streams, rivers, sloughs, lakes, ponds, reservoirs, marshes, seasonal ponds, and other wetland habitats (Thompson et al. 2016). It requires basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks for thermoregulation, and access to suitable upland habitat with loose soils for nesting, dispersal, and overwintering (Thompson et al. 2016). It is active year-round in warmer locations but in colder climates will spend winter months in a state of dormancy, often burrowing into loose soil or leaf litter on land, or using undercut banks, snags, rocks, or bottom mud in ponds (Thompson et al. 2016). Western pond turtle diet consists of aquatic invertebrates, algae and other vegetation, small vertebrates, and carrion.

Breeding occurs from spring through fall, with nesting taking place from spring to early summer. Nest sites are usually within 100 meters of water, although nests have been reported as far away as 500 meters. Females lay from 1 to 13 eggs, which hatch in the fall, and the young remain in the nest until the following spring.

Western pond turtle has a high potential to occur within the Project area based upon presence of suitable aquatic habitat and upland refugia in the Project area and proximity to reported occurrences. There are multiple reported occurrences adjacent to the Feather River within 5 miles of the Project footprint.

Giant gartersnake (*Thamnophis gigas*): Giant gartersnake is listed as Threatened under FESA and as Threatened under CESA (U.S. Fish and Wildlife Service 2022, California Natural Diversity Database 2022). It is a large snake, reaching from 36 to 65 inches SVL. It ranges in coloration from olive drab to black with a dorsal and a side stripe that can range from bright to muted orange or yellow or in some cases be absent, a light-colored ventral surface, and keeled scales (Nafis 2022). Giant gartersnakes

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historically occurred throughout the Central Valley of California, although its current range has been reduced to fragmented populations from Glenn County to the edge of the Delta, and south from Merced to Fresno Counties. Giant gartersnakes are a highly aquatic, diurnal snake, relying on the presence of water throughout the summer months, and are found in marshes, sloughs, rice fields, and other water bodies with emergent vegetation, a suitable prey base and associated upland with burrows, crevices or rip-rap for use as refugia. While they are generally underground in refugia during the winter, they are not fully dormant during that time.

Breeding occurs shortly after emergence in March or April, depending upon the weather, with females giving birth to offspring between late July and early September.

Giant gartersnake has a moderate potential to occur within the Project area based upon presence of suitable aquatic habitat and upland refugia in the Project area and proximity to reported occurrences. There are several reported occurrences of giant gartersnake within the OWA, and the nearest occurrence to the Project footprint is within 2 miles on the Feather River. However, the only suitable upland refugia within the Project area is limited to the north bank of the Feather River on the eastern edge of the Project footprint.

Tricolored Blackbird (*Agelaius tricolor*): Tricolored Blackbird is listed as a Threatened under CESA and is currently under review for listing under FESA. Tricolored Blackbird is a medium-sized blackbird; males are larger than females with striking black plumage with red and white markings on the wings and females are dark brown with a whitish chin and throat (Beedy et al. 2017). The species is largely endemic to California, common locally throughout the Central Valley and along the coast. Preferred foraging habitats include crops such as rice, alfalfa, irrigated pastures, and ripening or cut grain fields, as well as annual grasslands and cattle feedlots. Tricolored Blackbirds also forage in remnant native habitats, including wet and dry vernal pools and other seasonal wetlands, riparian scrub habitats, and open marsh borders. Wintering Tricolored Blackbirds often congregate in large, mixed-species blackbird flocks that forage in grasslands and agricultural fields with low-growing vegetation. Breeding habitats include wetland and silage fields with tall, dense cover near open water. Nesting

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colonies range in size from 50 nests to over 20,000 in an area of 10 acres or less (Zeiner et al. 2008). Breeding usually occurs from mid-April into late July (Zeiner et al. 2008).

Tricolored Blackbird has a moderate potential to occur within the Project area based upon presence of suitable foraging habitat in the Project area and proximity to reported occurrences. The Project area primarily comprises of riparian scrub and woodland habitat that does not provide enough dense vegetative cover required for suitable breeding habitat but does provide suitable foraging habitat. Additionally, there are several reported occurrences within 5 miles of the Project footprint but there is no suitable nesting habitat within the Project area.

Great Blue Heron (*Ardea herodias*): Great Blue Heron is listed as a California Department of Forestry and Fire Protection Sensitive species. Great Blue Heron typically use rookeries (colonial nest sites) that often include interspecies nesting and roosting with other species in this group. These species are widely distributed across North America and are common throughout most of California year-round in estuaries and wetlands. Nesting habitat includes mature riparian trees and snags adjacent to water, and the species forage by stalking in aquatic habitats for fish, small birds, mammals, reptiles, and amphibians. Tree-nesting waterbirds tend to exhibit high fidelity to rookery sites. Breeding occurs between February to June or July at these rookeries, but some fledglings leave as late as September (California Department of Fish and Wildlife 2021).

Great Blue Heron has a high potential to occur within the Project area based on the presence of suitable foraging and nesting habitat in the Project area and proximity to reported occurrences. The Project area has mature trees suitable for nesting habitat and the LFC provides suitable foraging habitat. Additionally, there are several reported occurrences within 5 miles of the Project footprint and are known to nest in the Feather River area.

Western Burrowing Owl (*Athene cunicularia*): Western Burrowing Owl is a California Species of Special Concern. Western Burrowing Owl is a small, ground-dwelling owl with brown and cream plumage and yellow eyes. The species' range extends from Canada to Mexico and is found throughout California, except for high elevations (Poulin et al. 2011). It primarily

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inhabits grasslands with abundant ground squirrel populations, but also occurs in desert and open shrub habitats. Burrowing Owl uses burrows in areas with relatively short vegetation with sparse shrubs or taller vegetation for roosting and nesting and can persist in human altered landscapes. Individuals in agricultural environments nest along roadsides and water conveyance structures. Breeding occurs from February through September (Zeiner et al. 1999).

Western Burrowing Owl has a low potential to occur in the Project area due to limited potential habitat in the Project area and lack of reported nearby occurrences. Within the Project area, only the area adjacent to the haul route may provide low potential suitable burrow habitat for roosting and nesting. Additionally, the most recent CNDDB observation of burrowing owl within 10 miles of the Project footprint was over 20 years ago indicating the species is not likely present in the Project area.

Swainson's Hawk (*Buteo swainsoni*): Swainson's Hawk is listed as Threatened under CESA. Swainson's Hawk is a medium-sized hawk with tapered wings that have contrasting light wing lining and dark flight feathers (Bechard et al. 2020). It migrates from Central and South America to breed in western North America, primarily in California and the Great Basin. The Central Valley breeding population largely winters from Mexico to central South America (Hull et al. 2008). Foraging habitat includes hay and alfalfa fields, grassland, pastures, grain crops, and row crops; nesting occurs in mature riparian woodland, roadside or isolated trees near foraging habitat; trees in urban or rural neighborhoods are also used (Estep 1984, Schlorff and Bloom 1984, England et al. 1997). Swainson's Hawk forages in large open habitats, such as hay and alfalfa fields, pastures, grain crops, and row crops primarily for small mammals such as voles, but will opportunistically take invertebrates, small birds, and reptiles. The species is monogamous and exhibits strong site fidelity to nesting territories, occupying the same sites over many years (Hull et al. 2008). Breeding occurs from late March to late August, with peak activity from late May through July (Zeiner et al. 2006).

Swainson's hawk has a moderate potential to occur within the Project area based upon presence of suitable nesting habitat in the Project area and proximity to reported occurrences. The Project area has mature trees

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suitable for nesting habitat and suitable foraging habitat within 0.5 miles of the Project footprint in nearby orchards and barren fields east of the OWA. Also, there are several reported occurrences within 5 miles of the Project footprint.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*): Western Yellow-billed Cuckoo is listed as Threatened under FESA and Endangered under CESA. Western yellow-billed cuckoo is a slender bird with brown plumage on its back and white below, long tail with black and white spots, and a curved yellow bill. The species' historical breeding distribution extended throughout western North America, including the Central Valley, where it was considered common (Belding 1890). Currently, the only known populations of breeding Western Yellow-billed Cuckoo are in several disjunct locations in California, Arizona, and western New Mexico (Halterman 1991; Johnson et al. 2007; Dettling et al. 2015; Stanek 2014; McNeil SE and Tracy D 2015). Western yellow-billed cuckoos' winter in South America from Venezuela to Argentina (Hughes 2015; Sechrist et al. 2012). The Western Yellow-billed Cuckoo is a riparian obligate species, primarily willow-cottonwood riparian forest, but use other tree species such as white alder (*Alnus rhombifolia*) and box elder (*Acer negundo*) in some areas, including formerly occupied sites along the Sacramento River (Laymon 1998). Western Yellow-billed Cuckoo is a highly secretive species that forages for insects and requires large insects to feed their nestlings. Nests are primarily in willow (Salix spp.) trees; however, other tree species are occasionally used, including Fremont cottonwood (*Populus fremontii*) and alder. They arrive at California breeding grounds between May and July, but primarily in June (Gaines and Laymon 1984; Hughes 2015; U.S. Fish and Wildlife Service 2014); breeding occurs in mid-June to August (Zeiner et al. 1999).

Western Yellow-billed Cuckoo has a low potential to occur within the Project area due to the decline of species population in the Feather River region. The Project area provides suitable migratory habitat, but the riparian habitat is not large enough to provide suitable nesting habitat. However, the species is unlikely to occur in the Project area since individuals are rarely observed and anticipated in the Feather River region. There are no CNDDB documented occurrences within 10 miles of the Project footprint and the species population in California has been in decline with the closest consistent

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nesting pairs on the Sacramento River which is 14 miles away (U.S. Fish and Wildlife Service 2017a).

Bald Eagle (*Haliaeetus leucocephalus*): Bald Eagle is a California Endangered Species that is fully protected (California Natural Diversity Database 2022). It was delisted under the federal ESA and is protected under the federal Bald and Golden Eagle Protection Act. Bald Eagle is a large raptor found in all contiguous states of North America, including Alaska. Adults are dark brown with a distinctive pure white head and tail, while young/juvenile birds have mottled dark brown and white feathers. Bald Eagle can be found in a variety of habitats including mountains, forest, and woodland, primarily near bodies of water such as rivers, lakes, streams, and wetlands. Within the state, most breeding for this species occurs in northern California, but can occur in scattered locations in coastal and inland central and southern California. Breeding season in California typically occurs from January through July/August although resident pairs may overwinter, typically in the vicinity of their nesting territories.

Bald Eagle has a moderate potential to occur within the Project area based upon suitable nesting and foraging habitat in the Project area and proximity to reported occurrences. Species are present year-round in the Oroville and Feather River area with a well-documented overwintering Bald Eagle population in nearby Lake Oroville. The Feather River and OWA ponds are regularly used during the winter. While suitable habitat and occurrences are present in the Project area, based on yearly Bald Eagle surveys in the Feather River LFC, there are no known nests within and adjacent to the Project area.

Loggerhead shrike (*Lanius ludovicianus*): The Loggerhead Shrike is a California Species of Special Concern and a USFWS Bird of Conservation Concern. Loggerhead Shrike is a medium-sized passerine with gray plumage and a black mask around the eyes and forehead (Yosef 2020). This species is found throughout North America and is a common resident and winter visitor in lowlands and foothills in California. Loggerhead Shrikes use a variety of open grasslands across their range, including grasslands, desert scrub, shrub-steppe, open savannah, irrigated pasture, grain and hay crops, and alkali seasonal wetland (Yosef 2020, Pandolfino, and Smith 2011).

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Loggerhead Shrikes nest in shrubs and trees surrounded by open habitat. Breeding occurs from March through July (Zeiner et al. 1990a).

Loggerhead Shrike has a moderate potential to occur within the Project area based upon suitable nesting and foraging habitat in the Project area and proximity to reported occurrences. The upland habitat on the southern end of the Project area provides marginal grassland habitat for the species and there are several observed occurrences within 5 miles of the Project footprint.

Osprey (*Pandion haliaetus*): Osprey is a species on the CDFW Watch List (California Natural Diversity Database 2022). Osprey is a large raptor with a brown back and wings, white underparts, a white head with a brown line through the eye, and a hooked beak. The species' range includes all of North America; in California, it breeds primarily from the Cascade Range to Lake Tahoe and south to Marin County. Its year-round range includes the northern and western portions of the Central Valley (Zeiner et al. 1990b). Habitat includes riparian, lakes, and coastal. The species nests in large open forest trees and snags, and on man-made structures near open water. Osprey hunt for fish by diving into open water and clasping prey in their talons (Bierregaard et al. 2020). Breeding takes place from March through September (Zeiner et al. 1990b).

Osprey has a high potential to occur within the Project area based upon suitable nesting and foraging habitat and proximity to reported occurrences. Osprey are known to nest and forage along and in the Feather River with several reported observations of the species within 5 miles of the Project area.

Yellow warbler (*Setophaga petechia*): Yellow Warbler is a California Species of Special Concern and a USFWS Bird of Conservation Concern. Yellow Warbler is a small, bright yellow bird with yellow-green back, round head and beady black eyes; males have chestnut streaks on the breast. The species is a Neotropical migrant that breeds throughout the northern portions of North America, extending into southern mountain ranges; the species historically occurred throughout California, but is now largely restricted to the coast and Sierra Nevada (Heath 2008). Yellow Warbler is a riparian obligate species that uses willow shrubs and thickets, and other

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riparian plants including cottonwoods, sycamores, ash, and alders. The species was once a common breeder in the Central Valley, but is largely extirpated in the Sacramento Valley, the Delta and San Joaquin Valley because of widespread habitat loss (California Riparian Habitat Joint Venture 2004, Grinnell and Miller 1944). Recent breeding on the San Joaquin River National Wildlife Refuge is largely attributed to riparian habitat restoration (Dettling et al. 2012). Yellow Warblers consume insect prey by gleaning along slender branches and leaves of shrubs and small trees. The species is territorial; males sing from perches at the top of vegetation and will defend their territories from many species. Nesting occurs during June and July (Lowther et al. 2020).

Yellow Warbler has a high potential to occur within the Project area based upon suitable nesting and foraging habitat in the Project area and proximity to reported occurrences. The riparian scrub and woodland habitats provide suitable habitat for the species and there are several reported occurrences within 5 miles of the Project footprint.

California Central Valley Steelhead DPS (*Oncorhynchus mykiss irideus*): The California Central Valley (CCV) Steelhead evolutionarily significant unit (ESU) was listed as a threatened species under FESA on March 19, 1998 (NMFS 1998). In addition, the species is also listed as threatened under the CESA. On November 4, 2005, the National Marine Fisheries Service (NMFS) proposed that all west coast steelhead be reclassified from ESUs to Distinct Population Segments (DPSs) and proposed to retain CCV Steelhead as threatened (National Marine Fisheries Service 2005). On January 5, 2006, after reviewing the best available scientific and commercial information in a status review (Good et al. 2005), National Marine Fisheries Service (NMFS) issued its final rule to retain the status of CCV Steelhead as threatened and applied its hatchery listing policy to include the Coleman National Fish Hatchery and Feather River Hatchery steelhead programs as part of the DPS (National Marine Fisheries Service 2006b).

In its latest 5-year status review, NMFS determined that the CCV steelhead DPS should remain classified as threatened. While various habitat restoration efforts, such as those in Clear Creek, appear to be benefitting CCV steelhead, the concerns raised in the previous status reviews remain. These

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concerns include low adult abundances, loss of spawning and rearing habitat, and a higher proportion of hatchery produced fish. As such, CCV steelhead remain listed as threatened and are likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Mature CCV steelhead primarily migrates from the ocean to freshwater in the fall, then holds in suitable habitat until spawning during the winter and early spring (McEwan and Jackson 1996). Peak immigration seems to have occurred historically in the fall from late September to late October (Hallock 1989), with peak spawning typically occurring January through March (Hallock et al. 1961; McEwan and Jackson 1996). Females select sites with good intragravel flows usually with coarse gravel in the tail of a pool or riffle with preferred gravel sizes 6-100 mm (National Marine Fisheries Service 2014). Unlike Pacific salmon, steelhead are capable of spawning more than once before death (Busby et al. 1996). Most juvenile steelhead spend two years rearing, although some spending less and a very few spending more (Hallock et al. 1961). Central Valley steelhead typically spend two years in the ocean before returning to their natal stream to spawn. About 70% of CCV steelhead spend 2 years within their natal streams before migrating out of the Sacramento-San Joaquin system as smolts, with small percentages (29%) and (1%) spending 1 or 3 years, respectively (Hallock et al. 1961). Juvenile steelhead smolts emigrate primarily from natal streams in response to the first heavy runoff in the late winter through spring (Hallock et al. 1961). Emigrating CCV steelhead use the lower reaches of the Sacramento and San Joaquin Rivers and the Delta as a migration corridor to the ocean. Nobriga and Cadrett (2001) verified these temporal findings (spring migration) based on analysis of captures in USFWS salmon monitoring conducted near Chipps Island.

CCV Steelhead has a high potential to occur in the Project area since steelhead are known to be present in the Project area and the Project area is within CCV Steelhead critical habitat. Approximately 5.5 miles upstream of the Project footprint, the Feather River Hatchery produces CCV steelhead that are known to reproduce naturally in the LFC between RM 59 and 67 (National Marine Fisheries Service 2014). The majority of the LFC streambed consists mainly of armored cobble because of periodic flood flows and the absence of gravel recruitment. However, the LFC also has major riffles that

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were restored outside of the Project footprint in 2014 and again in 2017. These locations maintain suitable spawning size gravel for juvenile rearing and adult spawning which are mostly concentrated in small secondary channels within the LFC. While the area is within the CCV steelhead reproduction zone, the Project area is primarily composed of large gravel and cobble which are too large to be utilized for spawning habitat. There are limited areas along pockets of the north bank of the Project area where the smaller gravel size, slower flow, and shallow water depth provides suitable spawning and rearing habitat for the species. However, the Project area is unlikely to be utilized by CCV steelhead for spawning as spawning typically occurs the upper reaches and there have been no known CCV steelhead redds observed in more than 10 years of DWR annual steelhead redd surveys (Kindopp pers. comm May 3, 2022). CCV Steelhead will utilize the Project area for adult migration (August-January) and juvenile/ smolt emigration (October-June); and in the unlikely chance that spawning does occur in the Project area, the Project area may be utilized for egg incubation (May-December) and juvenile emergence and rearing (year-round).

Central Valley spring-run Chinook Salmon ESU (*Oncorhynchus tshawytscha*): The Central Valley (CV) spring-run Chinook Salmon ESU is listed as a threatened species under FESA. CV spring-run Chinook Salmon are also listed as threatened under CESA. The ESU includes all naturally spawned populations of spring-run Chinook Salmon in the Sacramento River and its tributaries in California, and the Feather River Hatchery spring-run Chinook program. As described in the latest NMFS 5-Year Review for Central Valley spring-run Chinook Salmon, the status of the ESU has probably improved since the previous status review. Both the Mill and Deer Creek independent populations have improved from high extinction risks to moderate extinction risks, while the Butte Creek population remains at low risk. Nevertheless, the ESU remains classified as threatened (National Marine Fisheries Service 2016b).

Chinook Salmon exhibit two generalized freshwater life history types (Healey 1991). Stream-type adults enter freshwater months before spawning and juveniles reside in fresh water for a year or more following emergence, or juveniles migrate to the ocean as fry or parr in their first year. Preferred spring-run Chinook Salmon spawning substrate is composed mostly of large gravel and small cobbles from 1-3 inches to 3-5 inches in diameter (National

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Marine Fisheries Service 2014). Adequate instream flows and cool water temperatures are more critical for the survival of Chinook Salmon exhibiting a stream-type life history due to over-summering by adults and/or juveniles. Spring-run Chinook Salmon are somewhat anomalous in that they have characteristics of both stream- and ocean-type races (Healey 1991). Adults enter fresh water in early-late spring, and delay spawning until late summer or early fall (stream-type). However, most juvenile spring-run Chinook Salmon migrate out of their natal stream after only a few months of river life (ocean-type), or they may remain for up to 15 months within their natal stream. This life-history pattern differentiates the spring-run Chinook from other Sacramento River Chinook runs and from all other populations within the range of Chinook Salmon (Hallock and Fisher 1985).

Spring-run Chinook Salmon emigration timing is highly variable, as they may migrate downstream as young-of-the-year or as juveniles or yearlings. The modal size of fry migrants at approximately 40 millimeters between December and April in Mill, Butte, and Deer Creeks reflects a prolonged emergence of fry from the gravel (Lindley et al. 2004). Studies in Butte Creek found that most CV spring-run Chinook Salmon migrants are fry occurring primarily during December, January, and February, and that fry movements appeared to be influenced by flow (Ward et al. 2002, 2003; McReynolds et al. 2005). Small numbers of CV spring-run Chinook Salmon remained in Butte Creek to rear and migrated as yearlings later in the spring. Juvenile emigration patterns in Mill and Deer Creeks are very similar to patterns observed in Butte Creek, with the exception that juveniles from Mill and Deer creeks typically exhibit a later young-of-the-year migration and an earlier yearling migration (Lindley et al. 2006). Peak movement of yearling CV spring-run Chinook Salmon in the Sacramento River at Knights Landing occurs in December, and is high in January, tapering off through the middle of February; however, juveniles were also observed between November and the end of February (Snider and Titus 2000).

CV spring-run Chinook Salmon are known to be present in the Project area and has a high potential to occur in the Project area. The Project area is within CV spring-run Chinook Salmon critical habitat and Chinook Salmon essential fish habitat. CV spring-run is present in the LFC year-round. The Feather River Fish Hatchery just 5.5 miles upstream of the Project area which raises and releases CV spring-run Chinook Salmon and a significant

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number of spring-run Chinook Salmon returning to the Feather River Hatchery. Most Feather River Chinook Salmon spawning occurs between the Fish Barrier Dam and the Thermalito Afterbay Outlet (National Marine Fisheries Service 2014). The Project area is within this spawning region and there are areas along the north bank of the Project area where the slower flow and water depth provides suitable spawning and rearing habitat for the species. However, these areas are unlikely to be utilized for CV spring-run Chinook for spawning as spawning typically occurs the upper reaches and there have been no known CV spring-run Chinook redds observed in more than 10 years of DWR annual CV spring-run Chinook redd surveys (Kindopp pers. comm May 3, 2022). CV spring-run Chinook Salmon will utilize the Project area for adult migration (March-September) and juvenile/ smolt emigration (November-April); and in the unlikely chance that spawning does occur in the Project area, the Project area may be utilized for egg incubation (September-December) and juvenile emergence and rearing (year-round).

Southern DPS of the North American Green Sturgeon (*Acipenser medirostris*): There are two DPSs of North American Green Sturgeon: the northern DPS, which includes fish spawned in the Eel River and northward; and the southern DPS, which includes all fish spawned south of the Eel River. The northern DPS currently spawns in the Klamath River in California and the Rogue River in Oregon and is listed as a Species of Concern (National Marine Fisheries Service 2004). Only the southern DPS, which is listed as a threatened species under FESA, is found in the Delta and the Sacramento River and its tributaries.

In its latest 5-year status review, NMFS determined that the Green Sturgeon should remain classified as threatened (National Marine Fisheries Service 2021b). Many of the principal factors originally cited when listing the Southern DPS green sturgeon as threatened have remained relatively unchanged such as spawning area remains small and spawning range generally remains in a limited portion of the mainstem of the Sacramento River apart from limited spawning in the Feather and Yuba rivers in some years. Additionally, most factors that posed a threat to southern DPS still exist such as threats by fishing/poaching, impassible barriers, climate change, and nearshore and offshore energy development. Green Sturgeon mentioned in the remainder of the document will only refer to the southern DPS.

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Adult Green Sturgeon are believed to spawn every 3 to 5 years but can spawn as frequently as every 2 years (National Marine Fisheries Service 2005) and reach sexual maturity at an age of 15 to 20 years, with males maturing earlier than females. Adult Green Sturgeon enter San Francisco Bay in late winter through early spring and migrate to spawning areas in the Sacramento River primarily from late February through April. Spawning occurs in deep pools (averaging 8-9 meters in depth) containing small to medium sized sand, gravel, cobble, or boulder substrate. Spawning primarily occurs April through late July although late summer and early fall spawning may also occur based on the presence of larvae in the fall (Heublein et al. 2017). It is unknown whether green sturgeon historically spawned in the Feather River either downstream or upstream of Oroville Dam or the Thermalito Afterbay outlet. Spawning is suspected to have occurred in the past due to the continued presence of adult green sturgeon in the river below the Fish Barrier Dam. This continued presence of adults below the dam suggests that fish are trying to migrate to upstream spawning areas now blocked by the dam, which was constructed in 1968. Although spawning has been reported in the Feather and Yuba rivers, continuous spawning in these rivers has not been observed and are associated during years of higher flow (Seesholtz et al. 2015, Beccio 2018, 2019).

Little is known about rearing, migratory behavior, and general emigration patterns of juvenile Green Sturgeon. Based on captures of juveniles in the Sacramento River near Red Bluff, it is likely that juveniles rear near spawning habitat for a few months or more before migrating to the Delta (Heublein et al. 2017). Juvenile green sturgeon exhibits nocturnal behavior beyond the metamorphosis from larval to juvenile stages. After approximately 10 days, larvae begin feeding and growing rapidly, and young green sturgeon appear to rear for the first 1 to 2 months in the upper Sacramento River between Keswick Dam and Hamilton City (CDFW 2002). Length measurements estimate juveniles to be 2 weeks old (24 to 34 millimeters [0.95 to 1.34 inch] fork length) when they are captured at the Red Bluff Diversion Dam (CDFW 2002; USFWS 2002), and three weeks old when captured further downstream at the Glenn-Colusa facility (Van Eenennaam et al. 2001). Growth is rapid as juveniles reach up to 30 centimeters (11.8 inches) the first year and over 60 centimeters (24 inches) in the first 2 to 3 years (Nakamoto et al. 1995). Juveniles spend 1 to 4 years in freshwater and estuarine habitats before they enter the ocean (Nakamoto

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et al. 1995). According to Heublein et al. (2009), in 2006 all tagged adult Green Sturgeon emigrated from the Sacramento River prior to September. Lindley et al. (2008) found frequent large-scale migrations of Green Sturgeon along the Pacific Coast. Kelly et al. (2007) reported that Green Sturgeon enter the San Francisco Estuary during the spring and remain until fall. Juvenile and adult Green Sturgeon enter coastal marine waters after making significant long-distance migrations with distinct directionality thought to be related to resource availability.

Green Sturgeon has a low potential to occur within the Project area. The Project area is within Green Sturgeon critical habitat and there are known occurrences within the Project area. However, in most years, Green Sturgeon have not been observed in the Feather River from Thermalito Afterbay Outlet to the Fish Barrier Dam where Green Sturgeon spawning habitat exists. These areas are only accessed by adult Green Sturgeon in years with high basin discharge (greater than 5000 cfs which occurs approximately every 5 years), and individuals often move downstream as the flow drops (National Marine Fisheries Service 2021b, Seesoltz pers. comm. Dec. 9, 2021). Additionally, the Project area does not provide suitable spawning habitat due to the shallow depth of the water. However, if present in the LFC, adults may migrate through the Project area during high flow events and juveniles may utilize the Project area during emigration primarily from May through November.

Monarch butterfly (*Danaus plexippus*): Monarch butterfly is a Candidate for listing under FESA but is not listed under CESA. It has a NatureServe ranking of G4T2T3 S2S3 and the population that overwinters in California is included on CDFW's Special Animals List. This species is a large, brightly colored butterfly whose larvae are restricted to host plants in the milkweed family (Asclepiadaceae), primarily in the genus Asclepias. This species occurs in many temperate and tropical regions around the world. Its western population breeds in North America west of the Rocky Mountains and overwinters along the California coast south into Baja California, Mexico (U.S. Fish and Wildlife Service 2020). Adult monarch butterflies feed on nectar from a variety of flowering plant species. Nectar and milkweed resources for the western monarch population are often associated with riparian corridors. Threats to the species include habitat loss, insecticide use,

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roadkill during migration, climate change, and predation (U.S. Fish and Wildlife Service 2020).

Monarch butterfly has low potential to occur within the Project area based on the presence of marginally suitable nectaring and breeding habitat. However, no milkweed host plants have been identified within the Project area, and the habitat is unlikely to support sufficient densities of milkweed to support breeding. The Project area is well outside the range of overwintering habitat for this species. Furthermore, the western population of monarch butterflies has been in decline since the late 1990s, making the species less likely to occur within the Project area.

valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*): Valley elderberry longhorn beetle is listed as Threatened under FESA but is not listed under CESA. It has a NatureServe ranking of G3T2S2 and is included on CDFW's Special Animals List. This species is a terrestrial, wood-boring beetle whose larvae feed exclusively on elderberry (Sambucus spp.). It is endemic to California, and its known range extends through the Central Valley. It typically occurs in riparian or other habitat that supports its elderberry host plants, typically below 500 feet in elevation. Adult beetles emerge in spring and summer and lay eggs on the elderberry leaves. Upon hatching, larvae bore into the stems and create feeding galleries in the pith, where they will reside for several months. Prior to pupation, the larva creates an exit hole, then returns to the gallery where it pupates. The adult beetle will then emerge approximately one month later. Threats to the species include agricultural conversion, urban development, stream channelization, and channel hardening, which eliminate habitat for the host plant (U.S. Fish and Wildlife Service 2017b).

Valley elderberry longhorn beetle has moderate potential to occur within the Project area based on the presence of suitable riparian habitat. However, while elderberry shrubs less than one inch in diameter have been observed within the Project area, no suitable elderberry host plants (with stems or branches that are equal to or greater than 1" in diameter) have been identified within the Project area.

western ridged mussel (*Gonidea angulata*): Western ridged mussel is not listed under FESA or CESA. It has a NatureServe ranking of G3Q S2? and

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is included on CDFW's Special Animals List. This species is a freshwater mussel that inhabits creeks, rivers, and sometimes lakes. This species once occurred throughout California and the Pacific Northwest but is now believed to be extirpated from Southern California and most of the Central Valley. This species requires aquatic habitats with stable substrates, perennial inundation, and protection from scour and deposition. Typical habitats include rivers with wide floodplains, low slope, large components of sand and gravel substrate, and large boulders. Threats to this species include habitat destruction or modification, degradation of water quantity and quality, changes in flow regimes, high temperatures, recreational harvest, disease, and predation (Belvins et al. 2020).

Western ridged mussel has low potential to occur within the Project area based on the presence of marginally suitable habitat. Substrates within the LFC in the Project Area are composed primarily of cobbles. Boulders and finer substrates that this species requires are mostly absent from the Project area. Furthermore, western ridged mussel has been in steep decline for several decades. There have been no observations of western ridged mussel in the Feather River since 1990, despite recent efforts to relocate historic populations (Belvins et al. 2020). Therefore, it is unlikely that this species will occur within the Project area.

Townsend's big-eared bat (*Corynorhinus townsendii*): Townsend's big-eared bat is a California Species of Special Concern and Western Bat Working Group high priority species. It is species with a simple face, relatively small eyes, bilateral nose lumps, and large ears (Western Bat Working Group 2017). Townsend's big-eared bat typically roosts in cave and cave-like roosting habitat in small clusters or groups of females and young (usually less than 100 individuals) (California Wildlife Habitat Relationships Program 2022). The species has also been reported to utilize buildings, bridges, rock crevices, and hollow trees as roost sites. Mating generally takes place between October and February, maternity colonies form between March and June, and females give birth to a single pup between May and July. Males remain solitary during the maternity period; but winter hibernating colonies are mix-sexed. The species forages on edge habitats along streams adjacent and within wooded habitats to feed primarily on moths. The species is most active in late evening and flies close to the roost (California Wildlife Habitat Relationships Program 2022).

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The Townsend's big-eared bat has a low potential to occur within the Project area due to a limited presence in the region. The Project area provides suitable foraging habitat within the LFC and adjacent riparian woodland habitat, and limited roosting habitat in potential hollow trees in the Project area. Additionally, the only CNDDB occurrence within 10 miles of the Project footprint was reported over 20 years ago indicating the species may not have a strong presence in the region.

western mastiff bat (*Eumops perotis californicus*): Western mastiff bat is a California Species of Special Concern and Western Bat Working Group high priority species. It is the largest species of molossid with a wingspan approaching 2 feet and has a "free" tail that is distinctive amongst the Mollosidae family (Western Bat Working Group 2017). The species can be found throughout California. Western mastiff bat typically roosts in cliffs up to 1400 meters, but can also be found in large boulders, buildings, and trees. Maternity colonies have adult males and females year-round with colonies of at least 30 and typically fewer than 100. The species mates in late winter to spring and each female gives birth to a single young in early to mid-summer. The species is active all year, does not undergo prolonged hibernation, and may change roost sites.

In California, the species emerges from roosts just after dark to forage in large open areas that includes dry desert washes, floodplains, chaparral, oak woodland, grassland, ponderosa pine forest, and agricultural areas (Western Bat Working Group 2017). The species can be found traveling and foraging in groups and regularly forage at 100 to 200 feet above the ground for moths, beetles, crickets, and katydids. Western mastiff bats must also have access to drinking water sources 100 feet or greater due to the bat's long wings (Bat Conservation International 2022a).

The western mastiff bat has a moderate potential to occur within the Project area based upon suitable roosting and foraging habitat in the Project area and proximity to reported occurrences. The riparian scrub and woodland habitats provide suitable habitat for the species and there are several reported occurrences within 5 miles of the Project footprint.

silver-haired bat (*Lasionycteris noctivagans*): Silver-haired bat is a Western Bat Working Group Medium priority species. Silver-haired bat is a

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medium size vespertilionid with silver-tipped black or dark brow hairs and short, rounded ears (Western Bat Working Group 2017). In California, the bat is primarily a forest bat typically associated with temperate conifer and mixed conifer/hardwood forests and prefers old growth forests (Western Bat Working Group 2017, Bat Conservation International 2022b). But during winter and seasonal migrations, the species can be found in lower elevations. The species feeds over streams, ponds, and open brushy areas feeding mainly on moths and other soft-bodied insects.

In California, the species mates in autumn where sperm is stored over the winter after the species fall migration to southern hibernation sites. In spring, the species migrates north where females form small nursery colonies of up to 70 individuals (Western Bat Working Group 2017). Maternity roosts almost exclusively in tree cavities or small hollows and both females and males change roosts frequently throughout the summer. Young are born in mid to late June after 50-60 days of gestation. Young require greater than 36 days to become volant.

The silver-haired bat has a moderate potential to occur within the Project area based upon suitable roosting and foraging habitat in the Project area and proximity to reported occurrences. The riparian scrub and woodland habitats provide suitable habitat for the species and there are several reported occurrences within 5 miles of the Project footprint.

Yuma myotis (*Myotis yumanensis*): Yuma myotis is a Western Bat Working Group Low-Medium priority species. Yuma myotis is a small gray or brown bat present throughout California from sea level to 3300 meters in elevation (California Wildlife Habitat Relationships Program 2022). The species prefers open forest and woodland habitat with water sources. The Yuma myotis mates in fall and a female gives birth to 1 young yearly sometime in mid-spring to summer. The species roosts in buildings, mines, caves, crevices, bridges, and trees. Maternity roosts consist of several thousand females and young, and the species may be found roosting and feeding with other bat species. Males roost singly in the summer. Yuma myotis emerges after sunset and typically forages close to bodies of water that they use for both foraging and drinking. The diet is primarily aquatic emergent insects and individual periodically rest at night roosts after feeding

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to digest (Western Bat Working Group 2017). The species hibernates, but wintering habitats are not well known.

The Yuma myotis has a Moderate potential to occur within the Project area based suitable habitat and known nearby occurrences. The LFC and adjacent riparian habitat provide suitable foraging habitat and trees within the Project area may provide suitable roosting habitat. Additionally, individuals have been observed roosting in DWR's Lake Oroville Flood Control Outlet Spillway approximately 8.4 miles of the Project footprint.

Special-Status Plants

This section includes species accounts for plant species that have the potential to occur in the Project area as described in Appendix A and discusses the effect determinations.

Special status plant species that have the potential to occur within the Project area include: Mexican mosquito fern (*Azolla microphylla*), big-scale balsamroot (*Balsamorhiza macrolepis*), valley brodiaea (*Brodiaea rosea* spp. *vallicola*), brassy bryum (*Bryum chryseum*), woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*), Red Bluff dwarf rush (*Juncus leiospermus* var. *leiospermus*), bristly leptosiphon (*Leptosiphon acicularis*), Ahart's paronychia (*Paronychia ahartii*), Sanford's arrowhead (*Sagittaria sanfordii*), and Brazilian watermeal (*Wolffia brasiliensis*).

Mexican mosquito fern (*Azolla microphylla*): Mexican mosquito fern has a California Rare Plant Rank (CRPR) of 4.2 but is not listed under FESA or CESA. This aquatic fern is found in the north and south High Sierra Nevada, Sacramento Valley, San Joaquin Valley, Central Coast, San Francisco Bay Area, San Bernardino Mountains, White and Inyo Mountains, and east of the Sierra Nevada at elevations under 1200 meters (Jepson Flora Project 2022). It grows in ponds, slow streams, marshes, and swamps (California Wildlife Habitat Relationships Program 2022, California Native Plant Society 2021, Smith and Murdock 2012, Jepson Flora Project 2022). Threats to Mexican mosquito fern include potential risk from aquatic weed management and maintenance activities (use/run-off of chemicals), and competition from invasive plants.

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Mexican mosquito fern has a high potential to occur in the Project area. There is potentially suitable slow moving aquatic habitat in the northwestern portion of the Project area, at least during low flow conditions. There is a known occurrence of this species approximately three miles from the Project area in the OWA (Calflora Database 2022).

Big-scale balsamroot (*Balsamorhiza macrolepis*): Big-scale balsamroot has a CRPR of 1B.2, but it is not listed under FESA or CESA. This species is a perennial herb in the sunflower family, and it blooms from March through June (CNPS 2022). Its current range includes the Sierra Nevada Foothills, central High Sierra Nevada, Sacramento Valley, Inner North Coast Ranges, and eastern San Francisco Bay Area (California Native Plant Society 2021; Jepson Flora Project 2022). It typically grows in chaparral, cismontane woodland, and valley and foothill grasslands (California Native Plant Society 2022). This species sometimes occurs on soils derived from serpentine (California Wildlife Habitat Relationships Program 2022). Current threats to this species include grazing, residential and recreational development, energy development, and non-native plants (California Native Plant Society 2021).

Big-scale balsamroot has moderate potential to occur in the Project area. There is potentially suitable habitat for this species within valley oak woodlands and grasslands in the southern portion of the Project area. The nearest CNDDB occurrence of this species is approximately ten miles north of the Project Area (California Department of Fish and Wildlife 2021).

Valley brodiaea (*Brodiaea rosea ssp. vallicola*): Valley brodiaea has a CRPR of 4.2, but it is not listed under FESA or CESA. This species is a perennial bulbiferous herb in the brodiaea family, and it blooms from April through May, and sometimes in June. This species is endemic to California, and its current known range includes the eastern Sacramento Valley. It typically grows in vernal pools and swales within valley and foothill grasslands. The microhabitat for valley brodiaea includes old alluvial terraces, and silty, sandy, or gravelly loam. Threats to valley brodiaea include urbanization (California Native Plant Society 2022).

Valley brodiaea has low potential to occur in the Project area. There is potentially suitable habitat for this species within grasslands in the southern

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portion of the Project area. However, soils within the Project area are composed of dredge tailings that are likely inappropriate for this species. The nearest known occurrence of valley brodiaea is approximately seven miles north of the Project area (Calflora Database 2022).

Brassy bryum (*Bryum chryseum*): Brassy bryum has a CRPR of 4.3, but it is not listed under FESA or CESA. This species is a moss in the bryum family. The current known range of this species in California includes Amador, Butte, Fresno, Madera, Mendocino, and San Bernardino counties. It typically grows in openings within chaparral, cismontane woodlands, and valley and foothill grasslands. Brassy bryum is known to occur at elevations ranging from 165 to 1970 feet above mean sea level.

Brassy bryum has low potential to occur in the Project area. There is potentially suitable habitat for this species within valley oak woodlands and grasslands in the southern portion of the Project area. However, the Project area is slightly below the known elevation range of this species. The nearest known occurrence of this species is approximately eight miles northwest of the Project area (Calflora Database 2022).

Woolly rose-mallow (*Hibiscus lasiocarpos var. occidentalis*): Woolly rose-mallow has a CRPR of 1B.1 but is not listed under FESA or CESA. This species is a perennial rhizomatous herb in the mallow family, and it blooms from June to September (California Native Plant Society 2022). It is endemic to California, and its current range includes the Cascade Range Foothills, central and southern Sacramento Valley, and the Sacramento-San Joaquin Delta region of the Central Valley (California Native Plant Society 2022, Calflora Database 2022). It typically grows in marshes and swamps (California Native Plant 2022). The microhabitat for woolly rose-mallow includes moist, freshwater-soaked riverbanks and low peat islands in sloughs. It can also occur on riprap and levees (California Wildlife Habitat Relationships Program 2022). Threats to this species include habitat disturbance, development, agriculture, recreational activities, and channelization of the Sacramento River and its tributaries. It is also threatened by weed control measures and erosion (California Native Plant Society 2022).

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Woolly rose-mallow has moderate potential to occur in the Project area. There is potentially suitable habitat for this species along the margins of the LFC. The nearest CNDDB occurrence of this species is approximately eight miles north of the Project area (California Department of Fish and Wildlife 2021).

Red Bluff dwarf rush (*Juncus leiospermus var. leiospermus*): Red Bluff dwarf rush has a CRPR of 1B.1 but is not listed under FESA or CESA. This species is an annual herb in the rush family, and it blooms from March to June (California Native Plant Society 2022). It is endemic to California, and its current range includes the Inner North Coast Ranges, Cascade Range Foothills, northern Sierra Nevada foothills, and the northern Sacramento Valley (California Native Plant Society 2022, Calflora Database 2022). It typically grows in chaparral, valley and foothill grassland, cismontane woodland, vernal pools, and meadows and seeps. Microhabitat for this species includes vernally mesic sites, sometimes including the edges of vernal pools (California Native Plant Society 2022). Threats to this species include development, grazing, vehicles, industrial forestry, and agriculture (California Native Plant Society 2022).

Red Bluff dwarf rush has low potential to occur in the Project area. There is potentially suitable habitat for this species within valley oak woodlands and grasslands in the southern portion of the Project area. However, these habitats within the Project area do not include vernal pool complexes or vernally mesic sites and are therefore unlikely to support this species. The nearest CNDDB occurrence of this species is approximately eight miles north of the Project area (California Department of Fish and Wildlife 2021).

Bristly leptosiphon (*Leptosiphon acicularis*): Bristly leptosiphon has a CRPR of 4.2, but it is not listed under FESA or CESA. This species is an annual herb in the phlox family, and it blooms from April through July. This species is endemic to California, and its current known range includes the Inner South Coast Ranges, San Francisco Bay Area, North Coast, North Coast Ranges, northern Sacramento Valley, and northern Sierra Nevada foothills (California Native Plant Society 2022). It typically grows in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland at elevations ranging from 180 to 4920 feet above mean sea level.

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Potential threats to bristly leptosiphon include road widening (California Native Plant Society 2022).

Bristly leptosiphon has low potential to occur in the Project area. There is potentially suitable habitat for this species within valley oak woodlands and grasslands in the southern portion of the Project area. However, the Project area is slightly below the known elevation range of this species. The nearest known occurrence of bristly leptosiphon is approximately eight miles southeast of the Project area (Calflora Database 2022).

Ahart's paronychia (*Paronychia ahartii*): Ahart's paronychia has a CRPR of 1B.1 but is not listed under FESA or CESA. This species is an annual herb in the pink family, and it blooms from February to June (California Native Plant Society 2022). It is endemic to California, and its current range includes the Cascade Range Foothills and the Sacramento Valley (California Native Plant Society 2022, Calflora Database 2022). It typically grows in valley and foothill grassland, vernal pools, and cismontane woodland. Microhabitat for this species includes stony, nearly barren clay of swales and higher ground around vernal pools (California Native Plant Society 2022). Potential threats to this species include habitat loss, grazing, trampling, and vehicles (California Native Plant Society 2022).

Ahart's paronychia has low potential to occur in the Project area. There is potentially suitable habitat for this species within valley oak woodlands and grasslands in the southern portion of the Project area. However, these habitats within the Project area do not include vernal pool complexes, and soils within the Project area are likely inappropriate for this species. The nearest CNDDB occurrence of this species is approximately three miles north of the Project area (California Department of Fish and Wildlife 2021).

Sanford's arrowhead (*Sagittaria sanfordii*): Sanford's arrowhead has a CRPR of 1B.2 but it is not listed under FESA or CESA. This species is a perennial rhizomatous herb in the water-plantain family, and it blooms from May through November (California Native Plant Society 2022). It is endemic to California, and its current range includes the northern North Coast, Klamath Ranges, Cascade Range Foothills, Central Valley, and northern South Coast (California Native Plant Society 2022; Jepson Flora Project 2022). However, it is presumed extirpated from the South Coast region,

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including Orange and Ventura Counties. It typically grows in shallow freshwater marshes and swamps (California Native Plant Society 2022). The microhabitat for Sanford's arrowhead includes standing or slow-moving freshwater ponds, marshes, and ditches (California Department of Fish and Wildlife 2021). Sanford's arrowhead is threatened by grazing, development, recreational activities, non-native plants, road widening, channel alteration, and maintenance (California Native Plant Society 2022).

Sanford's arrowhead has moderate potential to occur in the Project area. There is potentially suitable habitat for this species along the margins of the LFC. However, this species typically occurs in shallow, slow-moving water bodies. This type of habitat is minimal and marginal within the Project area. The nearest CNDDB occurrence of this species is approximately three miles west of the Project area within a vegetated portion of Thermalito Afterbay (California Department of Fish and Wildlife 2021).

Brazilian watermeal (*Wolffia basiliensis*): Brazilian watermeal has a CRPR of 2B.3 but is not listed under FESA or CESA. This species is a perennial floating aquatic herb in the arum family. Its known range within California includes the Sacramento Valley and San Francisco Bay Area (Jepson Flora Project 2022). It typically occurs in shallow freshwater marshes, swamps, and ponds (California Native Plant Society 2022, Jepson Flora Project 2022). Threats to Brazilian watermeal include competition from invasive plant species.

Brazilian watermeal has a high potential to occur in the Project area. There is potentially suitable slow moving aquatic habitat in the northwestern portion of the Project area, at least during low flow conditions. There is a known occurrence of this species approximately 0.6 mile north of the Project area in the OWA (Calflora Database 2022).

2.1.4.2 Discussion

a) Would the project 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, the U.S. Fish and Wildlife Service, or the National Marine Fisheries Service?

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Less than Significant with Mitigation Incorporated. As discussed above, the Project area provides potentially suitable habitat for 34 special-status species. Implementation of Mitigation Measures Bio-1 through Bio-7 (below) will reduce impacts to special-status plant and animal species to less than significant. The potential project impacts and mitigation measures to reduce those impacts are discussed in more detail below. Any potential project impacts to the species will be reduced to less than significant with the implementation of Mitigation Measures Bio-1 through Bio-10. Therefore, project impacts are less than significant with mitigation incorporated.

Mitigation Measure Bio-1 Avoid and minimize potential impacts to special-status plants and wildlife

The avoid and minimize the potential impacts to plants and wildlife that may occur within the Project area, the following measures will be implemented:

1. A qualified biologist will conduct pre-construction surveys no more than two weeks prior to the start of construction for any special-status plants or wildlife that have the potential to occur within the Project area.
2. Prior to the start of construction, boundaries of the work site shall be delineated by flagging and staking or other similar method to show the exact location of work. No work shall occur outside the delineated area. If flagging is disturbed or removed, it shall be replaced immediately. Environmentally sensitive areas within the Project footprint may be marked with either large, flagged stakes connected by cord, or survey laths or wooden stakes prominently flagged with survey ribbon or fencing. All flagging shall be removed upon project completion.
3. To the extent practicable, construction activities causing disturbances to environmental resources will be minimized, and best efforts shall be used to avoid removing or damaging trees, vegetation, and other habitat.
4. Project activities shall be performed during daylight hours and will not occur prior to 7AM or after 7PM.
5. Prior to beginning work, a Worker Environmental Awareness Program (WEAP) training will be provided by a qualified biologist. All personnel who will be at the work site during construction activities are required to complete the training prior to beginning work at the site. The

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training will be given at or near the work site. The WEAP training will consist of briefing sessions developed by biologists, archaeologists, and others familiar with environmental, cultural, and tribal resources at the work site. At a minimum, the environmental portion of the training shall include a description and discussion of the importance of avoiding impacts to special-status wildlife, the general measures that are being implemented to conserve these species as they relate to the Project and Project area, and procedures to follow should they encounter wildlife during work. New personnel are required to attend the training prior to beginning work. A refresher WEAP training will be provided if needed to present additional topics pertaining to the above subjects.

6. A Biological Monitor will be either present or on-call during construction activities and will have the authority to halt work activities if concern over environmental resources becomes apparent.
7. The qualified biologist shall be notified if wildlife is encountered in the project site. Wildlife shall be given the opportunity to escape during construction activities and construction personnel shall avoid harming wildlife within the construction site. Construction personnel shall not move, handle, or harass wildlife on site. If federally or State-listed species are observed on site, all work will halt, and the animal will be allowed to leave the Project area on their own. In the event wildlife is harmed or killed, the qualified biologist shall be notified of the incident. If the specimen is a State or federally listed species, the Department will notify the appropriate agency (i.e., USFWS, NMFS, CDFW).
8. The worksite shall be kept clean and trash-free at all times. All trash shall be properly contained, removed from the worksite, and disposed of properly to prevent attracting wildlife.
9. Construction related vehicles within the Project area are prohibited from exceeding 15 miles per hour on straight and level roads, or 10 miles per hour in areas with curves or steepness. Speed signs shall be installed along project roadways at a maximum of 500 feet apart. Vehicle speeds may be required to be further reduced in the event of reduced visibility conditions including, but not limited to, fog, rain, snow, mud, or twilight or dark conditions.

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10. Construction vehicles and equipment are restricted to existing roads and designated haul routes. No off-road parking or vehicle or equipment staging is allowed in areas not previously delineated.
11. Motorized equipment will be kept clean and in good working condition and will not be left idling while not in use for more than 5 minutes. All fueling and maintenance of vehicles or other equipment shall occur on established staging areas and at least 50 feet away from any on-site water feature.
12. Absorbent materials will be available on-site. Any accidental leaks or spills will be immediately cleaned up, and the equipment will not be able to return to the Project area until it has been repaired sufficiently to prevent further leaks or spills.
13. Erosion control measures shall be the appropriate type for the site conditions and will not harm or entrap wildlife.

2.1.4.2.1 Special-Status Wildlife

The Project could have potentially adverse effects on special-status wildlife species. Impacts to special-status wildlife by the Project are described in the follow sections.

2.1.4.2.2 Amphibians and Reptiles

Foothill yellow-legged frog and California red-legged frog have a low potential to occur at the Project area. In the unlikely event that foothill yellow-legged frog and California red-legged frog occurs within the Project area, the Project may impact these species. The Project would create noise and visual disturbance, but these impacts are temporary and short term. Additionally, the Project will impact habitat through trimming and vegetation removal, but vegetation in temporarily impacted areas are anticipated to return to pre-project conditions and the 0.003 acres of permanent impacts are minimal compared to the adjacent available habitat for species. The Project may impact foothill yellow-legged frog and California red-legged frog through direct mortality or impacts to burrows, but implementation of Mitigation Measures Bio-1 and Bio-2 will reduce impacts to less than significant.

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Mitigation Measure Bio-2: Avoid and minimize impacts to special-status amphibians and reptiles

To avoid and minimize the potential impacts to special-status amphibians and reptiles that may occur within the Project area, the following general measures will be implemented:

1. In areas with the potential for special-status reptiles and amphibians to occur, prior to the onset of project activities, a qualified biologist will conduct pre-activity surveys to determine whether any such species are present. A qualified biologist must, at a minimum, have experience conducting surveys to identify foothill yellow-legged frog, California red-legged frog, western pond turtle, and/or giant garter snake and their associated habitat.
2. Any active rodent burrows or suitable cracks identified by a qualified biologist during the pre-activity survey will be flagged so that they can be avoided.
3. Any burrows, cracks, or fissures suitable for rodents that cannot be avoided and will be temporarily impacted by the movement and placement of equipment or other project activities will be covered with plywood to avoid burrow collapse.
4. If any special-status reptiles or amphibians are observed within an active work area, the on-site biologist will determine if the work can continue without harm to the individual(s). If the biologist determines that it is not safe to continue work, all work will cease until the animal has left the work area. Once the individual(s) is determined by the on-site biologist to have left the work area and is out of harm's way, work may resume.

Western pond turtles have a high potential to occur in the Project area and the Project may impact the species. During construction, western pond turtles may occur within and adjacent to the LFC and construction may impact turtles by impeding passage or, although very unlikely, through direct mortality. The weir will be designed with passage openings along the sides of the weir and incorporating hardware cloth to reduce impediments to turtle passage across the weir during operations. Implementation of Mitigation Measure Bio-1, Bio-2, and Bio-3 will reduce impacts to western pond turtles to less than significant.

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Mitigation Measure Bio-3: Avoid and minimize impacts to western pond turtle

To avoid and minimize the potential impacts to western pond turtle that may occur within the Project area, the following general measures will be implemented:

1. Pre-activity presence/absence surveys for Western Pond Turtle shall occur within 48 hours prior to the onset of project activities in areas where construction will occur.
2. If western pond turtles are observed on land during the pre-activity surveys, the upland area within 100 meters of the boundary of the aquatic habitat will be flagged and avoided if feasible.
3. If Western Pond Turtles are observed during a pre-activity survey or during project activities, they will be relocated outside of the Project area to appropriate aquatic habitat by a qualified biologist.

Additionally, giant gartersnake has a moderate potential to occur in the Project area and the Project may affect the species through direct mortality or impact to burrows. Giant gartersnake habitat is identified in the north bank of the Feather River along the east edge of the Project area where signs will be placed. Construction may impact species by direct take of habitat or individuals while installing signs. During operations, staff will enter potential giant gartersnake habitat to repair the signs only as needed, and giant gartersnakes are not likely to be impacted by this activity. Implementation of Mitigation Measures Bio-1 and Bio 2 will reduce impacts to giant gartersnakes to less than significant.

2.1.4.2.3 Birds

Tricolored Blackbird, Great Blue Heron, Western Burrowing Owl, Swainson's Hawk, Western Yellow-billed Cuckoo, Bald Eagle, Loggerhead Shrike, and Osprey all have a potential to occur in the Project area. Project construction will be conducted during nesting season and may impact nesting species through visual and noise disturbance. Additionally, the Project involves vegetation removal which may impact nesting and foraging habitat. However, Project impacts to foraging habitat would be less than significant since there is alternative available foraging habitat surrounding the Project area that individuals can use during the short-term construction period. Nesting habitat may also be impacted by construction and impacts to certain bird species are addressed below. Operations of the Project will be

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conducted year-round, but operations are not anticipated to impact birds as visual and noise disturbance would be short term (an hour every other day) and minimal (small number of staff primarily using hand tools and boats or trucks for transportation).

Western Yellow-billed Cuckoo and Tricolored Blackbird have the potential to occur in the Project area and the species may forage the Project area, but no nesting habitat exists. As described above, the Project has less than significant impacts to these species.

Western Burrowing Owl have a low potential to occur in the Project area. The marginal Western Burrowing Owl nesting habitat is adjacent to the haul road that is heavily use by commercial trucks. Should Western Burrowing Owl be present during Project activities, the Project would utilize this haul road and could impact individuals potentially nesting adjacent to the road due to direct injury. Visual and audio disturbance from project haul route activities will not exceed baseline conditions so would not impact potential nesting individuals. Implementation of Mitigation Measures Bio-1 will reduce impacts to Western Burrowing Owl to less than significant.

Loggerhead Shrike has the potential to nest and forage in the Project area and can be disturbed by project activities. Construction activities may disturb nests and nesting activities for sensitive species as described above. Implementation of Mitigation Measures Bio-1 and Bio-4 will minimize impacts to Loggerhead Shrike and other special-status nesting passerine birds to less than significant.

Mitigation Measure Bio-4: Avoid and minimize impacts to nesting birds

To avoid and minimize the potential impacts to nesting birds (non-raptor or non-rookery) protected by the MBTA and Fish and Game Code Section 3503 that may occur within the Project area, the following general measures will be implemented:

1. If construction activities occur between March 15 to August 31, a qualified biologist will conduct a preconstruction survey for actively nesting birds in the Project footprint and 50-foot buffer surrounding the Project footprint within 72 hours prior to the onset of project activities. The qualified biologist(s) must, at a minimum, have experience

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conducting surveys to identify the specific species and associated habitat that could occur on site.

2. If any active nests are identified within or adjacent to the Project area, an appropriate buffer will be put in place to ensure that no take (as defined by MBTA), and no take, possession, or needless destruction (as prohibited under the Fish and Game Code) occurs. This buffer will be up to 50 feet, but can be smaller, dependent upon on-site conditions and at the discretion of the qualified biologist.

Great Blue Heron has a high potential to occur in the Project area and may utilize the Project area for nesting and foraging. If this species or other rookery birds are present, construction may impact nesting activities as described above through noise and visual disturbance. Implementation of Mitigation Measure Bio-1 and Bio-5 would mitigate impacts to Great Blue Herons and other rookery birds to less than significant.

Mitigation Measure Bio-5: Avoid and minimize impacts to rookery birds

To avoid and minimize the potential impacts to special-status rookery birds that may occur within the Project area, the following general measures will be implemented:

1. If construction activities occur between February 1 and August 31, a qualified biologist will conduct a pre-activity survey for active rookeries in the Project footprint and 500-foot buffer surrounding the Project footprint within 72 hours prior to the onset of project activities. The qualified biologist(s) must, at a minimum, have experience conducting surveys to identify the specific rookery bird species and associated habitat that could occur on site.
2. If any active rookeries are identified within or adjacent to the Project area, an appropriate buffer will be put in place to ensure that the birds are not disturbed during work activities. This buffer will be up to 500 feet, but can be smaller, dependent on-site conditions and at the discretion of the qualified biologist.

Swainson's Hawk has a moderate and Osprey has a high potential to occur in the Project area and may utilize the Project area for nesting and foraging. If these species or other raptors are present, construction may impact nesting activities as described above through noise and visual disturbance.

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Implementation of Mitigation Measure Bio-1 and Bio-6 would mitigate impacts to Swainson's Hawk, Osprey, or other raptors to less than significant.

Mitigation Measure Bio-6: Avoid and minimize impacts to raptors

To avoid and minimize the potential impacts to raptors that may occur within the Project area, the following general measures will be implemented:

1. If construction activities occur between February 1 and August 31, a qualified biologist will conduct a pre-activity survey for actively nesting raptors in the Project footprint and the 500-foot buffer surrounding the Project footprint within 72 hours prior to the onset of Project activities. The qualified biologist(s) must, at a minimum, have experience conducting surveys to identify the specific species and associated habitat that could occur on site.
2. If any active raptor nests are identified within or adjacent to the Project footprint during the preconstruction survey or during work activities, an appropriate buffer will be put in place to avoid disturbance to raptors as a result of work activities. This buffer will be up to 500 feet, but can be smaller, dependent on-site conditions, individual bird behavior, and at the discretion of the qualified biologist.
3. Actively nesting raptors will be monitored by a qualified biologist during construction activities for signs of distress or disturbance as a result of project activities. Should the birds show signs of distress, work will cease at that location until the birds have resumed normal behavior and it is determined by the on-site biologist that work can be resumed.

Bald Eagles have a high potential to occur in the Project area and may utilize the Project area for nesting and foraging. If Bald Eagles are present, construction may impact nesting activities as described above through noise and visual disturbance. Implementation of Mitigation Measure Bio-1 and Bio-7 would mitigate impacts to Bald Eagles to less than significant.

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Mitigation Measure Bio-7: Avoid and minimize impacts to Bald Eagles

To avoid and minimize the potential impacts to Bald Eagles that may occur within the Project area, the following measures will be implemented:

1. If construction activities occur between February 1 and August 31, a USFWS/CDFW- approved biologist will conduct a pre-activity survey for actively nesting Bald Eagles in the project footprint and 660-foot buffer surrounding the Project footprint within two weeks prior to the onset of Project activities.
2. No work will occur within 330 feet of the active nest.
3. If an active eagle nest is located within 660 feet of the project footprint, the USFWS and CDFW will be consulted and activities within 660 feet of an active nest must be evaluated and approved by a USFWS/CDFW approved biologist before work commences.

2.1.4.2.4 Fish

CCV Steelhead, CV spring-run Chinook Salmon, and Green Sturgeon are known to occur in the Project area and can migrate and/or pass through the Project area. Impacts to fish are discussed below.

Construction Impacts

Construction of the project may impact CCV Steelhead, CV spring-run Chinook Salmon, and Green Sturgeon, but impacts are less than significant. The Project area is located in migratory, spawning, and rearing habitat for these species.

In-water construction is planned to occur in either spring and/or summer to fall and may occur when CCV Steelhead and CV spring-run Chinook Salmon are present in the area. For March-April in-water construction, work would occur during the end of CCV Steelhead juvenile peak emigration (typically from October-April); beginning of CV spring-run Chinook peak migration and holding (typically May to August); end of the CV spring-run Chinook Salmon juvenile peak emigration (typically from December-March); end of the CCV steelhead peak egg incubation (typically from Jan-April); beginning of CCV Steelhead peak juvenile emergence and rearing (typically April-September); and after the CV spring-run Chinook Salmon peak juvenile emergence and rearing (typically November-February but there year-round) in this portion

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of the LFC. During this period, emigrating juvenile CCV steelhead and CV spring-run Chinook salmon may be present in the Project area. However, adult CCV steelhead and CV spring-run Chinook Salmon are less likely to be present if in-water construction occurs in spring since this construction period would avoid peak adult migration for the species (typically from September-November for adult CCV Steelhead and May-June for CV spring-run Chinook Salmon). There are small, limited areas along the north bank of the LFC in the Project area that provide suitable CCV Steelhead and CV spring-run Chinook spawning and rearing habitat. However, CCV Steelhead and CV spring-run Chinook redds have not been observed in the Project area in more than 10 years of redd surveys so the Project is highly unlikely to impact eggs, rearing juveniles, or spawning adults. In the unlikely chance that rearing and spawning habitat is utilized, impacts to eggs and spawning and rearing individuals should be less than significant. Spawning and rearing locations are limited in the Project footprint along small, intermittent portions of the north bank where there is minimal, short-term in-water work, so direct impacts to CCV Steelhead eggs, emerging and rearing CCV Steelhead juveniles, and rearing CV Spring-run Chinook juveniles by project activities are unlikely. Spring-run Chinook juveniles are unlikely to be impacted by in-water work since juveniles would have emerged from the redds in the Project area with most leaving the area or rearing in the upstream side channels. Also, implementation of Mitigation Measure Bio-8 would mitigate impacts to CCV Steelhead to less than significant.

Mitigation Measure Bio-8: Avoid and minimize impacts to CCV Steelhead

To avoid and minimize the potential impacts to CCV Steelhead that may occur within the Project area, the following measures will be implemented:

1. If DWR plans to conduct in-water work prior to July 1, DWR will perform CCV Steelhead redd surveys of the Project footprint in Jan-March prior to in-water work.
2. If an active CCV Steelhead redd is located within the Project footprint, in-water work will not start until July 1 and construction activities will avoid active CCV Steelhead redds.

For July-September in-water construction, work may occur during the beginning of CCV Steelhead adult peak migration, CV spring-run Chinook adult migration and holding, CCV steelhead juvenile emergence and rearing, beginning of CV spring-run peak adult spawning (typically September-

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October), and beginning of CV spring-run Chinook peak egg incubation (incubating typically September-November) in this portion of the LFC. During this time, migrating CCV Steelhead may be present in the Project area. Although rare, adult CV spring-run Chinook typically holding in the upper LFC will fall back downstream, so an adult may be present in the Project area. Juvenile CCV steelhead and CV spring-run Chinook Salmon are less likely to be present if in-water construction occurs in summer to fall since this construction period would avoid juvenile emigration for these species. As stated above, there are small, limited areas along the north bank of the LFC in the Project area that provide suitable CCV Steelhead and CV spring-run Chinook spawning and rearing habitat, but it is unlikely that these areas be utilized. In the unlikely chance that rearing and spawning habitat is utilized, impacts to eggs and spawning and rearing individuals should be less than significant. The implementation of Mitigation Measure Bio-8 will ensure the area avoids construction in CCV steelhead redds so CCV steelhead juveniles emerging, and rearing should not be impacted by construction activities. For CV spring-run Chinook spawning adults and incubating eggs, in-water construction will likely occur before September when CV spring-run Chinook begin spawning so spawning adults and eggs will likely not be impacted.

During any time of the year, Green Sturgeon adults and juveniles have a low potential to occur in the Project area during construction. The LFC of the Feather River is only accessed by adult Green Sturgeon for migration and in years with high basin discharge (5000 cfs or higher which occurs approximately every 5 years and flows at the Project area are typically around 600 - 700 cfs). Construction cannot take place at these flows and juveniles would only be present in years of high basin discharge if adult Green Sturgeon have accessed upstream habitat and successfully spawned. Therefore, at any time of the year, there is a low potential of green sturgeon adults migrating and juveniles emigrating in the area.

If individuals are present during project construction, construction may impact CCV Steelhead, CV spring-run Chinook Salmon, and Green Sturgeon by delaying fish passage and degrading water quality, but these impacts are less than significant. The Project area has very limited spawning and rearing habitat and is primarily used by these fish for migration/emigration, and the installation of in-water project components will likely avoid adequate spawning habitat. So, impacts to habitat are not significant. Additionally,

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direct injury or mortality to individuals is not anticipated since work will be conducted during the daylight hours when fish are least likely to be migrating and/or emigrating in and out of the area; the Project is localized and small in area; and in-water work will be done by hand and without heavy equipment allowing fish to more easily avoid specific localized work areas and/or harm. Construction may very briefly delay fish passage and degrade water quality, but these impacts to fish species would be less than significant since impacts are temporary and short term. These impacts to sensitive fish species are discussed in further detail below.

Short-Term Delay in Fish Passage

While construction may delay fish passage, these impacts are less than significant. The Project will minimize the time spent in the water to construct the weir (approximately 11 days) which will substantially reduce the potential effects to fish passage. Work will also occur only in daylight hours which would minimize the potential to disturb sensitive fish species by allowing them to migrate during the early morning and night when they are most active. Work will not close off the entire channel and will be conducted for short periods of time in specific, localized areas, allowing fish the opportunity to move up and downstream of the work, if needed. Therefore, these construction impacts to sensitive fish species would be less than significant.

Short-term Degradation in Water Quality Resulting from an Increase in Sedimentation and Turbidity

Construction may minimally increase turbidity within the Project area at the point of substrate rail and fixed picket installation. The degradation of the water quality could impact feeding, movement, distribution, and habitat of fish located very close to the activity. Avoidance is the most common result of increases in turbidity and sedimentation. Fish will not occupy areas that are not suitable for survival, unless they have no other option. The Project would only minimally and temporarily increase turbidity during the short term in-water construction activities. In-water construction is not anticipated to increase sedimentation since the coble substrate should protect the riverbed during in-water work and sandbags will be placed on the upstream and downstream side of the of the substrate rail to prevent scouring during

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construction. Also, in-water work will be conducted manually (without use of heavy equipment), and hand tools will significantly minimize sediment disturbance. Additionally, the Project will implement the BMP-3: Water Quality Management Plan (Section 1.2.4) to minimize impacts to water quality, so these construction impacts would be less than significant.

Short-Term Degradation of Water Quality and Fish Habitat from Accidental Spills or Seepage of Hazardous Materials during Construction

Construction may degrade water quality and fish habitat through accidental spills and seepage of hazardous materials. Various contaminants, such as fuel, oils, grease, and other petroleum products used by the boat, hydraulic post pounder, and generator, could be introduced into the water system either directly or through surface runoff. Contaminants may be toxic to fish or cause altered oxygen diffusion rates and acute and chronic toxicity to aquatic organisms, thereby reducing growth and survival. In-water work will be conducted manually (without use of heavy equipment) and with hand tools which should minimize spills or seepage of hazardous materials. The Project will implement the BMP 3: Water Quality Management Plan (Section 1.2.4) to minimize impacts to water quality impacts, so these construction impacts to sensitive fish species would be less than significant.

Operation Impacts

The operations of the Project may impact sensitive fish passage, but impacts are less than significant. Typically, the weir will operate to minimize impacts to fish passage. The underwater passage chutes will be open for both upstream and downstream passage of individuals. The trap and fykes at the upstream exit of the passage chute will also only be installed when needed and removed when not in use to minimize impacts to individuals and maximize the chutes capabilities for downstream passage. When the traps and fykes are installed, daily checks to measure, mark and/or release fish will be conducted to ensure individuals are not harmed. Additionally, juvenile fish passing downstream will be able to readily pass between the pickets of the weir panels or use the passage chutes. The weir panels are spaced 1” apart and the emigrating juvenile Chinook Salmon (typically smaller than 50mm in length) and the majority of juvenile and smolt steelhead

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(50-300 mm in length) would be able to easily pass through the pickets with little or no risk of injuring themselves.

Fish passage behavior will be regularly monitored through snorkel surveys, boat observations, acoustic tracking, and DIDSON surveys to determine if the weir is significantly delaying fish passage compared to typical migration periods. If significant migration delays are detected, modifications to the weir and operations will be made to allow relatively unimpeded passage.

If fish are being delayed or a downstream passage chute is closed, DWR will facilitate downstream migration by modifying weir panels or installing an additional chute and associated camera. One or more weir panels will be modified to be partially submerged to create a funneling effect of water flow that will attract down-migrating fishes to pass through this open section. The panels will have a fyke on the downstream end to prevent fish from migrating upstream without being counted. DWR will monitor the modified weir panels to determine if the modifications have improved fish passage. A 12” x 16” x 48” aluminum chute with an attached camera box may be installed in addition to modifying the panels. The chute and camera box will have adjustable legs attached to allow for height differences when flows and the weir panels move up and down. The camera box will contain the same type of underwater cameras and lights as those in the upstream camera boxes and the video images from these cameras will be processed in the same manner described for upstream migrating fishes. If it is determined that kelts (post-spawn) and down-migrating fish are not finding the downstream chutes, then additional measures will be taken to improve the passage rate of down-migrating individuals and create emigration opportunities without outmigration delays or stress. Methods could include adding an additional passage chute or adding river gravel near the downstream chutes to funnel additional water toward the chutes to attract emigrating fish. If additional measures are implemented, there will be careful observation and testing of these methods.

While Green Sturgeon are likely not present most years when flows are below 5000cfs, the weir will operate to minimize sturgeon fish passage issues. The weir will be submerged when sturgeon are likely present at high flows, and sturgeon would have completely unimpeded passage to the upper LFC. If Green Sturgeon are observed near the weir at typical flows, DWR will

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remove the passage chute divider panels thereby creating two 16- by 32-inch "Sturgeon Chutes" to allow relatively unimpeded upstream sturgeon passage through the weir. If sturgeon pass upstream of the weir, DWR will implement temporary operating protocols to ensure down-migrating individuals are not delayed by the structure, and temporary protocols may include removing panels in the weir or installing downstream passage chutes. Therefore, impacts from operations of the Project to Green Sturgeon fish passage are less than significant.

In addition, the overall benefit to the salmonid populations (both CV spring-run Chinook Salmon and steelhead) anticipated to result from the data collected from operations of the Project outweigh salmonid fish passage issues. The Project will enumerate the number of CV spring-run Chinook Salmon, CV fall-run Chinook Salmon, and steelhead and make estimates of Feather River hatchery and natural origin fish. The Project will help DWR understand the temporal separation between CV spring-run and CV fall-run Chinook Salmon to aid future resource management to abate the CV spring-run population stressors of superimposition and hybridization created by the two populations currently co-occurring in the LFC. Additionally, the Project will help DWR better understand Chinook Salmon and steelhead movement and counts in the LFC. Origin estimates will help DWR understand the potential impacts of the Feather River Fish Hatchery on local populations. The better understanding of movement, counts, and origin will aid DWR, CDFW, and NMFS in making future resource management decisions in the Feather River and Oroville Facilities to help benefit salmonid populations.

The Project is not anticipated to impact sensitive fish species significantly during construction or operations as described above. Therefore, the Project impacts to sensitive fish species are less than significant.

2.1.4.2.5 Invertebrates

As discussed above, the Project area provides potentially suitable habitat for three special-status invertebrate species. Project activities have minimal potential to adversely affect monarch butterfly and western ridged mussel, based on the low probability of these species to occur within the Project area and the negligible impacts the Project will have on their potential habitats. Impacts to monarch butterfly and western ridged mussel will be less than significant.

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While there was no appropriate Valley Elderberry Longhorn Beetle habitat (elderberry shrubs with stems >1" DBH) observed during site visits, project activities have the potential to adversely affect valley elderberry longhorn beetle if appropriate shrubs are present in the Project area at the time of construction. Implementation of Mitigation Measures Bio-1 and Bio-8 (below) will reduce potential impacts to valley elderberry longhorn beetle to less than significant.

Mitigation Measure BIO-9: Valley Elderberry Longhorn Beetle

To avoid and minimize the potential impacts to Valley Elderberry Longhorn Beetle (VELB) that may occur within the Project area, the following measures will be implemented:

1. When feasible, project activities shall be sited at least 50 meters from elderberry shrubs with stem diameter greater than 1-inch.
2. If activities must be conducted within 50 meters of an elderberry shrub with stem diameter greater than 1-inch, the following measures will apply:
    A. activities will be conducted outside of VELB flight season (March 1-July 31) as feasible;
    B. a biological monitor will be present to monitor all project activities within 50 meters of the elderberry shrub;
    C. and all ground disturbing activities (boring, post pounding, staking, or vegetation removal) will be located at least 6 meters from the dripline of the elderberry shrub; and high visibility fencing or flagging will be installed to delineate the 6-meter avoidance buffer.

2.1.4.2.6 Mammals

Townsend's big-eared bat, western mastiff bat, silver-haired bat, and Yuma myotis all have a potential to occur in the Project area and may utilize the Project area for roosting and foraging. Project construction and operation activities are not likely to impact these species since activities will be conducted during daylight hours when bats are least active and in roosts. Additionally, project construction and operations would not impact bats roosting or roosting habitat since the trees providing potential roosting habitat will not be impacted by activities. Therefore, impacts to Townsend's

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big-eared bat, western mastiff bat, silver-haired bat, and Yuma myotis are less than significant.

2.1.4.2.7 Special-Status Plants

As discussed above, the Project area provides potentially suitable habitat for 10 special-status plant species. Project activities have the potential to adversely affect these species if they are present within the Project area. Implementation of Mitigation Measures Bio-1 and Bio-9 (below) will reduce potential impacts to special-status plant species to less than significant.

Mitigation Measure Bio-10: Avoid and minimize impacts to special-status plants

To avoid and minimize the potential impacts to special-status plants that may occur within the Project area, the following measures will be implemented:

1. A qualified biologist will conduct surveys prior to the start of construction during the appropriate seasons for any special-status plant species that have the potential to occur within the Project area. If any are identified, they will be flagged and avoided, if feasible.
2. If special-status plants are identified within the Project area and cannot be avoided, DWR will coordinate with USFWS/CDFW, and an attempt will be made to transplant the individuals or collect and disperse seeds.

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

Less than significant. Riparian scrub and valley oak woodland occur within the Project and have minimal potential to be adversely affected by project activities. Project impacts to these habitats will be minimal since vegetation removal in these habitats will only occur as needed along the floodplain junction box and conduit impacting only 0.026 acres of vegetation, only vegetation less than 3” DBH will be removed, and vegetation is anticipated to grow back to preconstruction conditions. No other sensitive natural communities identified in local or regional plans, policies, or regulations occur within the Project area based on site surveys and review of the CDFW CNDDB, USFWS iPaC, and CNPS On-line Inventory Rare and Endangered

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Plants (California Department of Fish and Wildlife 2021, U.S. Fish and Wildlife Service 2021b, California Native Plant Society 2021). Therefore, project impacts are less than significant.

c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No impact. No State or federally protected wetlands are located within the Project footprint; thus, no wetlands would be affected by the Project. An aquatic resources delineation was completed in December 2021 and no State or protected wetlands are delineated within the Project footprint. The only delineated aquatic resource within the Project footprint is the Feather River. Therefore, the Project will have no impact on wetlands.

d) 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?

Less than significant with mitigation incorporated. The Project would not substantially interfere with the movement of any sensitive fish or wildlife species, wildlife corridor, or impede on the use of wildlife nursery sites.

Sensitive fish utilize and migrate through the LFC in the Project area, but the Project will not substantially impede on their movement or use of the LFC as a migratory corridor. The portion of the Feather River within the Project area is within Chinook Salmon essential fish habitat (EFH) and Critical Habitat for green sturgeon, CCV steelhead, and CV spring-run Chinook salmon. As discussed in the environmental setting section, the Project area provides very limited habitat for fish spawning or rearing that is unlikely to be utilized since CCV Steelhead and CV spring-run Chinook redds have not be observed in the over 10 years of DWR monitoring of redds in the LFC. Also, these areas are in small, intermittent portions of the north bank of the channel that is unlikely to be impacted by project activities, so spawning and rearing habitat and, although very unlikely, potential spawning and rearing individuals are not likely to be impacted. Primarily, these sensitive fish may

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utilize the area for adult and juvenile migration. Construction activities are isolated in area and duration in the LFC, and as discussed in the Fish section in section a) above, the weir will be constructed and has been designed to operate without significantly blocking, altering, or degrading waterways that these species use for movement or migrations. Therefore, the Project will not substantially interfere with sensitive fish movement or the ability for the area to act as a fish corridor.

Western pond turtles are also known to utilize and migrate through the LFC in the Project area, but the Project will not impede significantly on their movement or use of the LFC as a migratory corridor with the incorporation of Mitigation Measure Bio-1 and Bio-3. As discussed in the Environmental Setting section, western pond turtles may utilize the LFC as aquatic habitat and the adjacent upland for refugia. Construction activities are isolated in area and duration, and as discussed in the Amphibians and Reptile section in section a) above, the weir will be constructed and has been designed to operate without significantly blocking, altering, or degrading waterways that these species use for movement or migrations. Therefore, the Project will not substantially interfere with western pond turtle movement.

Activities will occur during the nesting bird and bat roosting season, but the Project would not substantially interfere with the movement of sensitive bird or bat species. As discussed in the environmental setting, sensitive birds may nest and forage in the Project area and bats may roost in trees or forage in the Project area. However, as discussed in question a), project activities are temporary and will impact a relatively small area of the overall habitat available for sensitive bird or bat species. Bat species movement and use of the Project area as migratory corridor will likely not be impacted as project activities will be conducted during daylight hours when bats are less active, and trees potentially used as roosts will not be impacted. Bird movement and use of the Project area for nesting and migration may be impacted by project activities, but, as discussed in question a), implementation of Mitigation Measures Bio-1 and Bio-4 through Bio-7 would reduce these impacts to less than significant for bird species.

The Project will not interfere with established native resident or migratory wildlife corridors. Activities will impact a relatively small and discrete terrestrial area in highly disturbed habitat, and where habitat is minimally

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disturbed or removed, vegetation is anticipated to return to pre-project conditions. The Project will install a resistance board weir, upstream passage complex, and pit tag array within the LFC, but these structures will not interfere with the LFC to act as a wildlife corridor since the structures have been designed to limit migration impediments as discussed above in question a). Implementation of Mitigation Measures Bio-1 through Bio-7 would minimize any species or migratory impacts to species by the Project.

Therefore, project impacts are less than significant with mitigation incorporated.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No impact. The Project area is covered by the following policies and ordinances protecting biological resources: the 2030 General Plan for Butte County Conservation Open Space Element- Biological Resources Goals, Policies and Actions; the 2030 General Plan for the City of Oroville; and the Butte County Oak Woodland Mitigation Ordinance. The Project would not conflict with the biological goals and policies within the County and city plans. Additionally, the OWA is covered by the Butte County Oak Woodland Mitigation Ordinance, but the Project does not include trimming or removal of oaks and will not conflict with this ordinance. Therefore, the Project will have no impact.

f) Would 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?

No impact. The Project area is located within the planned Butte County Regional Conservation Plan (BRCP) which is a both a federal Habitat Conservation Plan and Natural Community Conservation Plan. DWR is not a Permit Applicant under the BRCP and the Project is not a covered activity under the BRCP. Although the adoption and permitting of the BRCP has yet to occur, there are no anticipated conflicts related to the Project with any provisions of the to-be-adopted BRCP. Therefore, the Project will have no impact.

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2.1.5 Cultural Resources

Environmental Issues	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

2.1.5.1 Regulatory Setting

This chapter examines the potential impacts of the Project on cultural resources. Cultural resources are the tangible and intangible remains of our past and may include prehistoric and historic archaeological sites, built environment resources, structures, objects, cultural landscapes and human remains. Tribal Cultural Resources are discussed in Chapter 2.1.18 Tribal Cultural Resources.

Under CEQA, cultural resources include historical resources, which are:

1. Resources listed in or determined eligible for listing in the California Register of Historical Resources (CRHR);
2. Resources included in a local register of historical resources, or ones that have been identified as significant in an historical resource survey; and

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3. Resources that are deemed by a lead agency to be historically or culturally significant, with regards to California's past (CEQA Guidelines Section 15064.5 (a)).

To be considered *historically significant*, a resource must meet one or more of the following criteria as described in PRC 5024.1:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with lives of persons important in California's past;
3. 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
4. Has yielded, or may be likely to yield, information important in California prehistory or history.

2.1.5.2 Environmental Context

The Project is in and adjacent to the lower Feather River in the northern Sacramento Valley on the western slope of the Sierra Nevada foothills within the OWA. The topography within the Project area is nearly level within the floodplain of the river, with a steep bank associated with the levee along the east side. Elevations range from approximately 125 to 150 feet above mean sea level, with the terrain generally sloping southeast toward the levee. Climate in the area follows the Central Californian trend for hot, dry summers and cool, wet winters. The temperature usually reaches its apex in July and its lowest point in January, with most of the area's rain falling in the winter months (Delacorte and Basgall 2015). Before industrial development, the landscape consisted of grassland prairies encompassing a number of native grasses, including maygrass (*Phalaris*), fiddleneck (*Amsinkia*) and goosefoot (*Chenopodium)*. Fauna in the area includes river otters, musk rats, raccoons, squirrels, waterfowl, and fish such as the Chinook salmon and steelhead trout the Project will assist. Soils are of the Dunstone-Loafercreek series, which are gravelly loams ranging from 15 to 37-inches deep (Natural Resources Conservation Service 2021).

2.1.5.3 Prehistoric Context

Information summarized here is gathered from Delacorte and Basgall (2015) as well as Meyer and Rosenthal (2008). Knowledge of the prehistoric

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background of the northern Sacramento Valley extends back to 7000 years before present and is divided up into six phases, the Early Holocene, the Middle Holocene, Mesilla Complex, Bidwell Complex, Sweetwater Complex, and Oroville Complex. Each are summarized below. Delacorte and Basgall's 2015 report suggests that examples from the Early and Middle Holocene are quite rare, and as a result, they have been combined into a single discussion.

The Early Holocene (pre-7000 BP) and Middle Holocene (7000 – 4000 BP) are described as being better recorded in regions surrounding the Project footprint but are lacking diagnostic examples within it. In fact, Delacorte and Basgall (2015) state that no examples of the Early or Middle Holocene have been found in the region, although the earliest finds from the Mesilla Complex may extend into the time period given for the Middle Holocene. Delacorte and Basgall suggest the lack of available information may be due to a bias in the radiocarbon and obsidian hydration from the samples taken from the region (Delacorte and Basgall 2006). The existence of both the Early and Middle Holocene has been confirmed in other areas of California such as the North Coast Range and the western part of the Great Basin.

The Mesilla Complex (4000 – 2000 BP) is the earliest phase with enough abundant examples to securely date and outline within the Oroville area, although knowledge regarding it is incomplete. Artifacts from this complex include heavy stemmed and side-notched slate and basalt projectile points, bone tools such as pins and spatulae, and the introduction of ground stone stations and material. Worked pestles and stone bowl mortars have also been reported but are very rare. Another change in this period is an abundance of abalone shell, suggesting its use as a plentiful food source.

The Bidwell Complex (2000 – 1200 BP) is characterized by a shift from basalt projectile points to large corner-notched points as well as smaller arrowhead-sized points. The largest change is the widespread use of acorns discerned from the abundance of milling and hand stones for use in wooden mortars. Additionally, the introduction of grooved or notch sinkers used for fishing is concurrent with the presence of freshwater mussel shell in archaeological deposits, which suggests an increase in fishing to the subsistence economy.

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The Sweetwater Complex (1200 to 500 BP) manifests mostly through the elaboration or refinement of previous phases' material culture, although the use of a bow for hunting likely became prevalent at this stage. This new tool led to smaller, more finely-worked basalt points. Bone artifacts also seem to have increased in abundance as well as variety, including the previous pins and spatulae but also flakers, awls, and ornamental objects. Mortars and pestles also become the preferred grindstone technology.

The Oroville Complex (450 – 120 BP) coincides with the arrival of Euro-American settlers in the area. Written records indicate that most of the artifacts found from this period can be linked directly with the Konkow Tribe. Projectile points are further refined to smaller triangular points while bedrock mortars become the primary milling strategy. This period is also noted for structures. Two different types of houses were favored, along with a large, circular structure that served as a meeting place, ceremonial dance house, and residence for a village headman.

2.1.5.4 Historic Context

Information summarized here is pulled from Selversten et al (2015), Selversten (2011), and Herbert et al (2004). The region's historical record may be divided into three broad categories, the Early Mexican American Period, the Gold Rush, and the development of the State Water Project.

The earliest recorded European venture in the region was the 1820-21 expedition of Luis Arguello, a Spanish officer who also gave the Feather River its current name (*Rio de las Plumas*, in Spanish). Additionally, fur trappers began making annual forays into the area from Oregon. Infectious diseases from the first Euro-American expeditions had a catastrophic effect on the Native American populations, resulting in losses of nearly 75% of the population. As a result, when Mexico began granting large land grants under the rancho system, much of northern California appeared to be uninhabited.

The United States acquired California from Mexico in 1848, and gold was discovered at Sutter's Mill in the same year. The following Gold Rush saw a huge influx of immigrants from around the world. California's population quadrupled in the first decade after the discovery and increased at a steady 40% every decade afterward for thirty years (Herbert et al, 2004). The influx of new settlers and fortune-seekers led to further disruptions of Native

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American populations, and the industrialization required for mining lead to major degradation of the surrounding landscape. While mining declined in 1848 when hydraulic mining was made illegal, practices continued for the next 100 years in some form. Gold mining had a major resurgence in the form of dredge mining in 1898 until 1916. More recently, the region has shifted towards a reliance on tourism and recreation, especially boating, since the Oroville Dam was completed in 1968 (Delacorte and Basgall 2006).

California's population increase consolidated around urban centers which were occasionally far from adequate, natural sources of water. The rise of agriculture in the Central Valley also required irrigation to keep an arid region growing crops, which diverted water away from rivers and lakes. While some federal and State legislation attempted to regulate water transfer, disputes over water rights marked much of California's early 20th century. Edward Hyatt authored a plan including a state-wide system of canals, dams, pumping plants, powerplants, and reservoirs in 1931 that was met with immediate opposition. The dual crises of The Great Depression and the United States' entry into the Second World War halted any water-transportation policy until the war had ended and economic recovery began. California prepared several studies between 1920 and 1955 with the goal of developing the State's water, including a 1951 report by State Engineer A.D. Edmonston. Due to opposition, it was not until the catastrophic flooding in the winters of 1955 and 1956 that the State government acted, with funds for the construction of the Oroville Dam beginning in 1957, although construction proper wouldn't begin until 1961. This marked the beginning of the State Water Project's construction, the first phase of which was completed in 1974 (Selverston et al 2011).

2.1.5.5 Methodology

The cultural resources study for this Project included a literature review, including a records search from the California Historical Resources Information System's (CHRIS) Northeastern Information Center (NEIC) as well as other sources available, including previous DWR reports, technical reports submitted for the Federal Energy Regulatory Commission (FERC)'s Project No. 2100 relicensing project, General Land Office plat maps, aerial photographs, and U.S. Geological Survey (USGS) topographic quadrangles. Finally, the Project footprint was visited several times by DWR archaeologists to ensure as much of the Project area was surveyed as could be accessed.

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2.1.5.5.1 Literature Review

The NEIC was contacted on September 15, 2021, with a records search request. The NEIC's results were returned on October 15, 2021. The search area included the whole of the Project area as well as a ¼-mile buffer around it. Results from the NEIC show elements of two historic districts, the Oroville Dredge Tailing Piles (P-04-001345) and the Oroville Facilities (P-04-004289) in the Project footprint.

As part of the FERC Project No. 2100 relicensing studies, crews with the Anthropological Studies Center (ASC) and the Archaeological Research Center (ARC) performed archaeological survey of the area above 690 feet above mean sea level (amsl) between 2002 and 2003. In 2009, with the lake at historically low levels, ASC and ARC crews performed additional survey of the newly exposed areas between 660 and 690 feet amsl. Crew members were spaced at 25-meter intervals, which was maintained through pacing and visual cues, and survey areas were oriented parallel to the shoreline. Using similar methods, additional surveys were conducted within the Project area in 2014 by DWR archaeologist Wendy Pierce (2014).

A review of available USGS topographic quadrangles show no development in the area from 1885 to 1993, with the closest recorded structures being Pacific Heights, a small hamlet at what is today the intersection between Hilgers Road and Pacific Heights Road. It appears to have been abandoned completely between 1970 and 1993.

A review of available USGS topographic quadrangles show no development in the area from 1885 to 1993, with the closest recorded structures being Pacific Heights, a small hamlet at what is today the intersection between Hilgers Road and Pacific Heights Road. It appears to have been abandoned completely between 1970 and 1993. Additionally, USGS maps of the Project area have been marked with the label "Tailings" or "Tailings Piles" in recent years.

2.1.5.5.2 Site Visit

The Project has been visited three times by DWR cultural resources staff, first on a project overview site visit on September 17, 2021. The second visit occurred on September 27, 2021, during which the southern bank of the Project footprint was covered with an intensive pedestrian survey where

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possible, although dense vegetation meant that some areas were inaccessible.

Staff returned to the Project footprint a third time on March 14, 2022, this time by boat, in order to survey the north bank. The dense vegetation led to this attempt being abandoned. The bank was instead covered with a cursory survey from the boat, with each of the post sites being studied from just offshore.

Both site visits along the southern bank of the Project area noted a heavily disturbed area covered in river cobbles, thought to be the remains of dredge tailing piles based on the proximity to the nearby site P-04-0001345. However, no intact dredge tailing piles were discovered, only the scattered river cobbles, suggesting the piles in this area have been completely dispersed. The Project area appears to be made up of river cobbles that were likely the highly disturbed remnants of historic mining activities. Due to the long history of large-scale mining and grading in the region, the sensitivity for intact subsurface archaeological resources is very low within the Project footprint. No cultural resources of any sort were identified or recorded during any of the site visits.

2.1.5.6 Cultural Resources

Studies for this Project identified two cultural resources, P-04-001345 and P-04-004289, within the Project footprint. Both are geographically expansive resources.

P-04-0001345 is a huge site (8,000 acres according to the 2002 site record) comprised of dredge tailing piles first recorded in 1995, although wire, pipes, ponds, drainages, roads, levees, and a fence line were included in some subsequent records for the resource. As early as its first recording, the site is described as heavily disturbed, a trend that each re-recording also notes. Evidence of both early (smaller piles 10 – 25 feet tall) and later (larger 25 – 75 feet tall) dredging activity is present throughout most of the site, although no intact tailings piles are within the current Project area. In 2004, the ASC re-recorded and evaluated the site, dividing it into loci of good, poor, and no integrity. Only a small segment the northern bank of the Project area is within the recorded site boundary, and it falls within a no integrity locus. A technical report describing the site was compiled in 2011

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as part of the FERC relicensing efforts, in which the site is recommended as eligible for the CRHR under Criteria 1, 2, and 3 and the NRHP under Criteria A, B, and C under its own merits and as a contributor to the proposed Feather River Historic District (Newland et al 2011). At time of writing, a concurrence letter has never been received from the California Office of Historic Preservation (OHP).

The Oroville Facilities of the State Water Project (Oroville Facilities) (P-04-004289) are a proposed historic built environment district with fourteen of the sixteen facilities contributing to the historic district status for a total area of 41,000 acres. Examples of contributing built-environment resources include the Oroville Dam, Oroville Reservoir, Edward J. Hyatt Power Plant, Feather River Fish Hatchery, and Thermalito Diversion Dam. The proposed district is one of the largest water and power systems in the world, providing 60% of storage capacity for the entire SWP. The Project footprint is not discussed in either the site record prepared for the district or the resulting evaluation report. The inclusion of the Project footprint and its surrounding region in the Oroville Facilities' boundary is likely an oversight. The Oroville Facilities have been proposed as eligible under the CRHR under Criteria 1, 2, and 3 and the NRHP under Criteria A, B, and C. However, a response from OHP has yet to be received. The current Project footprint is not located near any of the contributing elements of the district. There are no built environment features within the Project footprint. The closest contributing feature is located approximately four miles away from the Project and the Project would not be visible from other contributing elements to the district.

2.1.5.7 Discussion

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

Less than significant with mitigation incorporated. One historical resource as defined by CEQA has been identified partially within the Project area, P-04-0001345. However, the most comprehensive site record available for this resource places the Project area in a segment of the site described as "No Integrity," meaning the tailing piles that once made up this resource no longer exists within the Project footprint. This designation was confirmed by field surveys, including those by DWR specifically for this project.

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A second historical resource, the Oroville Facilities of the SWP (P-04-004289) is shown as encompassing the Project area on the CHRIS maps; however, no features of this built environment district are present within or adjacent to the Project area. The closest contributing feature is four miles away from the Project footprint, and the proposed work would not create a change in the viewshed of this resource.

No prehistoric archaeological resources have been identified in the Project area either by studies for this project or by past investigations. However, the presence of as-yet unknown subsurface cultural resources is always a possibility and is difficult to predict, especially near waterways. As a result, the following Mitigation Measures are proposed:

Mitigation Measure Cul-1: Adherence to Secretary of the Interior's Standards for the Treatment of Historic Properties

Should any unexpected cultural resources be exposed during project activities, all work would temporarily stop in the immediate vicinity (e.g., 100 feet) of the find until it can be evaluated by a qualified archaeologist, defined as one meeting the U.S. Secretary of the Interior's Professional Qualifications Standards for Archeology and with expertise in California archaeology, and an appropriate plan of action can be determined in consultation with DWR.

Mitigation Measure Cul-2: Discovery of Human Remains

Should human remains be discovered during the course of project activities, all work will stop immediately in the vicinity (e.g., 100 feet) of the finds until they can be verified. The coroner will be contacted in accordance with Health and Safety Code section 7050.5(b). Protocol and requirements outlined in Health and Safety Code sections 7050.5(b) and 7050.5(c) as well as Public Resources Code section 5097.98 will be followed.

Mitigation Measure Cul-3: Worker Awareness and Response for Undiscovered Historical Resources, Archaeological Resources, and Tribal Cultural Resources

Prior to the start of construction, DWR shall provide a worker environmental awareness program (WEAP) training to the construction contractor and DWR inspectors regarding the potential for cultural and tribal cultural resources that could be encountered during ground disturbance, the regulatory protections afforded to such finds, and the procedures to follow in the event

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of discovery of a previously unknown resource, including notifying DWR archaeologists.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less than significant with mitigation incorporated. The Project construction and operation of the finished Project is not anticipated to impact any archaeological resources pursuant to CEQA Guidelines Section 15064.5. However, it is possible that Project construction could disturb subsurface or unknown archaeological resources. This potential is reduced to less than significant by implementing Mitigation Measures Cul-1 through Cul-3.

c) Would the Proposed Project disturb any human remains, including those interred outside of formal cemeteries?

Less than Significant with Mitigation Incorporated. There are no known locations of human remains within the Project area. The Project would not disturb any known human remains, including those outside of formal cemeteries. Incorporating Mitigation Measures Cul-1 through Cul-3 would ensure any potential impacts to previously undiscovered human remains would be reduced to a less than significant impact.

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2.1.6 Energy

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

2.1.6.1 Environmental Setting

The energy chapter of the Butte County General Plan 2040 Update Settings and Trends Report discusses energy production, conservation, and the patterns of consumption with energy's growing importance. Due to energy price fluctuations over the last 3 decades and rolling blackouts, there is a larger interest in energy conservation. Butte County has been moving toward alternate forms of energy, specifically with energy conservation and efficiency standards implemented in new construction. Thus, the Butte County General Plan encourages the use of renewable fuel sources and promotion of reduced energy consumption through land use policies and zoning.

The Project would consume energy during construction in the form of gasoline and diesel used construction used to operate equipment, including the hydraulic post pounder, generator, tractor trailer, tractor with auger, jet boats, haul trucks, and construction personnel vehicles (passenger trucks and cars). The Project will efficiently use energy during construction, which conforms with the Butte County General Plan's conservation goals.

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The consumption of energy associated with operating the fish monitoring station involves use of an on-site solar power system. No external power source will be used to operate the fish monitoring station. The solar power system consists of a fenced power and controller area, junction box, and conduit. The system will provide 12-volt power to all the cameras and lights at the weir; 12-volt power to the security cameras at the solar array and weir; and 120-volt power for to the computers.

2.1.6.2 Discussion

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

No impact. The Project would only consume energy via fuel (gasoline and diesel) from the operation of construction equipment and personnel vehicles and would be temporary in nature. No other energy sources would be unnecessarily or inefficiently consumed or wasted during construction of the Project. Implementation of BMP-1: Air Quality Control Plan and BMP-2: Greenhouse Gas Emissions (Section 1.2.4) would ensure that equipment is kept in good working order, and idling time is minimized to reduce the unnecessary consumption of energy resources. Once operational, the Project will be solely powered by solar. This renewable energy source does not result in release pollutants or consume environmental unfriendly fuels. Therefore, the Project will have no impact.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No impact. The Project will result in an operational facility that will be solar powered, this renewable energy source does not result in release pollutants or consume environmental unfriendly fuels. The use of solar powered energy aligns with the County's General Plan of using alternative and renewable sources of energy. Additionally, the Project would be aiding the County in meeting the Low Carbon Fuel Standard. Therefore, the Project would not obstruct or conflict with any State or local plans regarding other renewable energy or energy efficiency. Therefore, the Project will have no impact to conflict with plans for renewable energy and efficiency.

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2.1.7 Geology and Soils

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause 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 California Geological Survey Special Publication 42.)	☐	☐	☐	☒
ii. Strong seismic ground shaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv. Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
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?	☐	☐	☐	☒

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Environmental Issues	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, as updated), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☒	☐

2.1.7.1 Environmental Setting

The Project area is in and adjacent to the LFC of the Feather River upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County. The Project area is entirely within the Sacramento Valley portion of the Great Valley Geomorphic Province, which is a narrow, elongated, asymmetrical, north-northwest trending basin that extends for about 450 miles between the Sierra Nevada and Coast Ranges Geomorphic Provinces. The valley floor is an alluvial plain of unconsolidated Holocene deposits that overlie more consolidated alluvial and lacustrine deposits of Quaternary to Jurassic age. Below these sedimentary deposits are shales and sandstones of the Cretaceous Great Valley Sequence and upper Jurassic bedrock of metamorphic and igneous rocks associated in the east with the Sierra Nevada and in the west with the Coast Ranges (California Department of Water Resources 2014). The Project area is primarily made up of Miocene to Pleistocene loosely consolidated sandstone, shale, and gravel deposits (California Department of Conservation 2022d), and is characterized by a low gradient within the LFC of the Feather River of equal or less than 0.01%.

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An "active" fault is one that shows displacement within the last 11,000 years and, therefore, is considered more likely to generate a future earthquake than a fault that shows no sign of recent rupture. The Project area has historically experienced relatively low seismic activity. The closest active fault to the project site is the Cleveland Hill Faults, which are a branch of the Foothills fault system, located over 7 miles east/southeast of the Project area. This fault experienced a local fault break in 1975 (California Department of Conservation 2022c, California Department of Water Resources 2014).

2.1.7.2 Discussion

a) Would the project directly or indirectly cause 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 California Geological Survey Special Publication 42.)

No effect. The Project would not consist of any activities or facilities that would directly or indirectly cause potentially substantial adverse effects due to a rupture of a known earthquake fault. The Project is located over 7 miles from the nearest active fault, the Cleveland Hills Fault, so would not rupture a fault and is located entirely within an undeveloped area so the risk of loss, injury, or death are minimal. Furthermore, the Project does not include any facilities that would be at risk of breakage or failure that would result in loss, injury, or death. Therefore, the Project will have no impact.

ii. Strong seismic ground shaking?

No effect. The Project would not consist of any activities or facilities that would directly or indirectly cause strong seismic shaking since the Project is located over 7 miles from the nearest active fault, the Cleveland Hills Fault. Also, the installation and operations of the facility will not have any effect on the fault resulting in strong seismic shaking. Therefore, the Project will have no impact.

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iii. Seismic-related ground failure, including liquefaction?

No effect. The Project would not consist of any activities or facilities that would directly or indirectly cause seismic related ground failure such as liquefaction as the installation and operations of the facility will not have any effect on the nearest fault and the area is not located in a liquefaction zone (California Department of Conservation 2022b). Therefore, the Project will have no impact.

iv. Landslides?

No effect. The Project would not consist of any activities or facilities that would directly or indirectly cause landslides as the topography within the Project area is nearly level within the floodplain of the river that is bordered by a steep levee bank along the east side. Elevations range from approximately 125 to 150 feet above mean sea level, with the terrain generally sloping southeast toward the levee. The Project is not located within a landslide zone (California Department of Conservation 2022b), and the Project footprint is in an area with landslide susceptibility ranging from VI to VII (where lowest susceptibility is III and highest is X) due to the combination of rock strength and slope class (California Department of Conservation 2022a). The Project has relatively low rock strength combined with low slope class. The installation and operation of the Project would not alter the rock strength or slope so would not change the susceptibility to landslide. Therefore, the Project will have no impact.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact. The Project consists of the installation and operation of a fish monitoring station made up of a resistance board weir, underwater video monitoring system, and a pit tag antenna array that will be located across the full width of the low flow channel of the Feather River. The presence of the structures could potentially change the way that sediment is moved in or out of the water column and could potentially result in erosion at the bank side edges of the structure. As part of the Project design, sandbags will be employed on the upstream and downstream sides

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of the substrate rail to prevent scouring during construction. Additionally, portions of the in-water structure will be removed during high-flow events, preventing them from contributing to either substantial erosion. Flows will be monitored so that when flows reach 1,500-2,500 cfs, a decision can be made depending upon the time of year, reservoir storage, and current data to remove elements of the structure. For flows anticipated to be over 5,000 cfs, the security enclosure will be removed, and for flows anticipated to be over 10,000 cfs, for more than a week, the PIT antenna and the weir panels will be removed as well. Land based installations will have a limited footprint and will not have any elements that would result in soil erosion or loss of topsoil. Vegetation removal will only consist of trimming and will not increase the amount of bare ground so will not result in soil erosion or loss of topsoil in rain events. Furthermore, implementation of the BMP-3: Water Quality Management Plan (Section 1.2.4) will minimize soil erosion and loss. Therefore, these project impacts would be less than significant."

c) Would the project 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?

No effect. The Project would not consist of any activities or facilities that would be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project. The in-water components will be designed to be removable and will not have any adverse effects on the soils beneath them. Also, the on-land components have a small footprint and will not consist of any components that could result in destabilization of the soils. Therefore, the Project will have no impact.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?

No effect. The Project would not consist of any activities or facilities that would be located on expansive soils. Expansive soils are generally made up of soils with clay components and the soils in the Project area are loosely consolidated sandstone, shale, and gravel deposits. Therefore, the Project will have no impact.

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e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No effect. The Project does not include the use of septic tanks or wastewater disposal systems. Therefore, the Project will have no impact.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant Impact. The Project is located in an area that overlaps portions of the Laguna Formation which in other places is known to contain vertebrate fossils. While it is possible unique paleontological resources could be located near the Project, there are no known occurrences of resources in the Project area and earth disturbance will be limited to a small footprint for the on-land facilities. In-water construction activities will not include the removal of large amounts of material and are unlikely to disturb resources that may be present deep within the soil. Furthermore, implementation of Mitigation Measures Cul-1 through Cul-3, will be employed to further reduce potential impacts. Therefore, these project impacts would be less than significant.

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2.1.8 Greenhouse Gas Emissions

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

2.1.8.1 Environmental Setting

To mitigate future climate impacts, DWR developed a Climate Action Plan (CAP) to guide DWR on how it will address climate change for its programs, projects, and activities (California Department of Water Resources 2022). The Climate Action Plan is divided into three phases: Greenhouse Gas Emissions Reduction Plan; Climate Change Analysis and Adaptation Scenario Selection and Guidance; and the Climate Change Vulnerability Assessment and Adaptation Plan.

Phase I: Greenhouse Gas Emissions Reduction Plan

In May 2012, DWR adopted the DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (2012 Plan), which details DWR's efforts to reduce its greenhouse gas (GHG) emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32). DWR also adopted the Initial Study/Negative Declaration prepared for the 2012 Plan in accordance with the CEQA Guidelines review and public process. The 2012 Plan provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g. building-related energy use) (California Department of Water Resources 2012). The

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2012 Plan specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

As it committed to in the 2012 Plan, DWR developed a Greenhouse Gas Emissions Reduction Plan Update 2020 (Update 2020) to review its GHG reductions since the 2012 Plan and to update strategies for further reduction consistent with legislative changes. For Update 2020, DWR prepared an addendum to the negative declaration pursuant to CEQA Guidelines Sections 15162(b) and 15164(b) which evaluated the changes to the 2012 Plan and changes in surrounding circumstances (including legislative, regulatory, and market changes). Update 2020 concluded that these changes would not cause any new significant environmental impacts that would require the preparation of a subsequent negative declaration or an environmental impact report.

DWR specifically prepared its 2012 Plan and Update 2020 as a "Plan for the Reduction of Greenhouse Gas Emissions" to meet the requirements of CEQA Guidelines section 15183.5. That section provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change is a global cumulative impact, an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." (See CEQA Guidelines, § 15064, subd. (h)(3)). More specifically, "later project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG emissions reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines § 15183.5, subd. (b)(2).)

Section 10 of Update 2020 outlines the steps that each DWR project will take to demonstrate consistency with Update 2020. These steps include:

1. Identify, quantify, and analyze the GHG emissions from the proposed project and alternatives using a method consistent with that described in DWR internal guidance, "Guidance for Quantifying Greenhouse Gas

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Emissions and Determining the Significance of their Contribution to Global Climate Change for CEQA Purposes," as such guidance document may be revised.

2. Determine that construction emissions levels do not exceed the Extraordinary Construction Project threshold of either 25,000 $mtCO_2e$ for the entire construction phase of the project or 12,500 $mtCO_2e$ in any single year of construction.
3. Incorporate into the design or implementation plan for the project all project-level GHG emissions reduction measures listed in Chapter VI or explain why measures that have not been incorporated do not apply to the project.
4. Determine that the project does not conflict with DWR's ability to implement any of the specific project GHG emissions reduction measures listed in Chapter VI.
5. If implementation of the proposed project would result in additional energy demands on the SWP system of 15 GWh/year or greater, the project must obtain a written confirmation from the DWR SWP Power and Risk Office stating that the Renewable Power Procurement Plan will be updated to accommodate the additional load resulting from the proposed project at such time as the proposed project is ultimately implemented.

Consistent with these requirements, a Greenhouse Gas Emissions Reduction Plan (GGERP) Consistency Determination Checklist documented that the Project has met each of the required elements.

Phase II: Climate Change Analysis Guidance

In 2018, DWR finalized the Climate Change Analysis Guidance which provides a framework and process for the consistent incorporation and alignment of climate change impact analyses for DWR's project and program activities (California Department of Water Resources 2018). This guidance was created to ensure DWR is consistent with AB 1482, AB 2800, and Executive Order B-30-15 which requires climate change impacts, adaptation, and opportunities for mitigation to be considered for all DWR activities. The guidance is a two-step process that DWR managers should follow to

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determine the appropriate level of climate analysis for their activity or project:

- Step 1: Completion and submittal of the DWR Climate Change Screening Analysis Form and Climate Change Vulnerability Checklist for DWR Activities form to screen a project's exposure and sensitivity to climate changes.
- If a project has a relatively low climate risk, then the manager does not need to proceed to Step 2. If the project has some level of climate change risk, then Step 2: Determine the most appropriate method and tool to use in evaluating the project's vulnerability to climate change.

Consistent with these requirements, a DWR Climate Change Screening Analysis Form and Climate Change Vulnerability Checklist for DWR Activities form documenting the Project's level of risk to climate changes. The results of the screening show the Project does not require additional analysis of climate change impacts.

Phase III: Climate Change Vulnerability Assessment and Adaptation Plan (VA/AP)

DWR finalized the Climate Change Vulnerability Assessment (VA) in 2019 which evaluates, describes, and quantifies the vulnerabilities of DWR facilities and activities performed to projected climate changes (including changes in temperature, wildfire, sea-level rise, hydrology, and ecosystems) (California Department of Water Resources 2019). The VA was written to align with the goals set in Executive Order B-30-15 and AB 1482 and focuses on mid-century impacts from climate change. DWR utilized the VA to finalize the first iteration of the Climate Change Adaptation Plan (AP) in 2020 which prioritizes DWR's climate resiliency efforts (California Department of Water Resources 2020b). The AP describes DWR's actions to reduce the vulnerabilities from the VA, other DWR efforts to implement local and regional climate adaptation, and additional efforts DWR will need to take to meet future climate change challenges.

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2.1.8.2 Discussion

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant impact. GHG emissions for the Project have been calculated to be 4.7 $mtCO_2e$, found in Appendix B. Based on the analysis provided in the 2012 Plan and Update 2020 and the demonstration that the Project is consistent with Update 2020. DWR as the lead agency has determined that the Project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs is less than cumulatively considerable; therefore, impacts due to Project activities would be less than significant.

b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than significant impact. CEQA Guidelines require environmental analyses to evaluate both the level of GHG emissions associated with the construction and operation of a proposed project and the proposed project's consistency with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

DWR developed the 2012 Plan to guide its efforts in reducing GHG emissions (California Department of Water Resources 2012). The GHG emissions reduction measures proposed in the 2012 Plan were developed to reduce emissions of GHGs in California as directed by Executive Order (EO) S-3-05 and AB 32. DWR established the following GHG Emissions Reduction Goals:

- Reduce GHG emissions from DWR activities by 50% below 1990 levels by 2020; and
- Reduce GHG emissions from DWR activities by 80% below 1990 levels by 2050.

In 2015, DWR achieved reduced GHG emissions by 50% below 1990 levels which was 5 years earlier than the 2012 Plan (California Department of Water Resources 2020a).

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In Update 2020, DWR updated DWR's GHG reductions from the 2012 Plan to further reduce GHG emissions consistent with the State's GHG emissions reduction targets (California Department of Water Resources 2020a). DWR added the following additional GHG Emissions Reduction Goals in Update 2020:

- Mid-term Goal: By 2030, reduce GHG emissions to at least 60% below the 1990 level.
- Long-term Goal: By 2045, supply 100% of electricity load with zero-carbon resources and achieve carbon neutrality.

BMPs for Construction and Maintenance from Update 2020 are designed to ensure that individual projects are evaluated, and their unique characteristics are taken into consideration when determining if specific equipment, procedures, or material requirements are feasible and efficacious for reducing GHG emissions from the Project. BMP-2: Greenhouse Gas Emissions (Section 1.2.4) lists the GGERP BMPs. All BMPs are potentially applicable to the Project.

The Project would not conflict with the AB 32 Scoping Plan, the SMAQMD CEQA guidelines, DWR CAP, or any other plans, policies, or regulations for the purpose of reducing GHG emissions. Based on the analysis provided in the 2012 Plan and Update 2020 and the Project's consistency with Update 2020, DWR as the lead agency determined that the Project's contribution to the cumulative impact of increasing atmospheric levels of GHGs is less than cumulatively considerable. Therefore, with the implementation of the Update 2020 BMPs, impacts due to Project activities would be less than significant.

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2.1.9 Hazards and Hazardous Materials

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
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?	☐	☐	☐	☒

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Environmental Issues	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 airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires	☐	☐	☒	☐

2.1.9.1 Environmental Setting

The Project area is situated within the Feather River floodplain and riverbed on state-owned land and is a low fire hazard zone (California Department of Forestry and Fire Protection 2020). The Oroville city limits is approximately two miles northeast of the Project area.

The Project footprint is not listed as a hazardous materials cleanup site, pursuant to Government Code Section 65962.5(a). Searches on the State Water Resources Control Board GeoTracker and the California Department of Toxic Substances Control EnviroStor online databases on December 13, 2021 (California State Water Resources Control Board 2021, California Department of Toxic Substances Control 2021) revealed no additional sites of potential hazardous material concerns within a 1-mile radius.

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2.1.9.2 Discussion

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than significant impact. Project activities would involve the routine transport, use, or disposal of hazardous substances such as diesel fuels, gasoline, hydraulic fluids, and lubricants. However, all hazardous material use would be required to comply with all applicable local, state, and federal standards associated with the handling, storage, and disposal of hazardous materials. Use of hazardous materials in accordance with applicable standards ensures that any exposure of the public or the environment to hazard materials would result in a less than significant impact.

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?

Less than significant impact. There is a possibility of accidental release of hazardous materials routinely used during construction activities. The implementation of BMP-3 Water Quality Management Plan (Section 1.2.4) will minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction activities. Therefore, these Project impacts would be less than significant.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No impact. The Project footprint is not located within 0.25 miles of any schools existing or proposed. Therefore, the Project will have no impact to an existing nearby school due to hazardous emissions or materials.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?

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No impact. The Project footprint is not located on or near a hazardous waste or border property as defined by the California Department of Toxic Substances Control (DTSC) Under Government Code Section 65962.5(a). Therefore, the Project would have no impact to creating a significant hazard.

e) Would the project, 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 airport, would the project result in a safety hazard for people residing or working in the project area?

No impact. There are no people residing within the Project footprint. The Project is not located within an airport land-use plan or in the vicinity of a private airstrip. The nearest public airport or public-use airport is the Oroville Municipal Airport, which is approximately 2 miles northwest of the Project footprint. While the project is within 2 miles of a public airport, the Project will not result in an airport-related safety hazard for people working in the Project area. Therefore, the Project would have no impact to the safety relating to airport operations or land use.

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No impact. The Project is not located within any major thoroughfares that may be used as an evacuation route, and it does not contain any essential facilities for emergency response. Therefore, the Project would have no impact to the implementation of an adopted emergency response or evacuation plan.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Less than significant impact. The Project is not in an area designated by California Fire Department as very high fire hazard severity zone (California Department of Forestry and Fire Protection 2020). Dry vegetation in the Project area poses a potential fire hazard if it were to be inadvertently ignited; however, site preparation measures will be taken to reduce the risk

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of fire that could be started due to construction activity (BMP.5- Fire Prevention and Control Plan, Section 1.2.4). Therefore, the risk of exposing people or structures to significant risk of loss, injury, or death due to fire would be less than significant as a result of the Project.

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2.1.10 Hydrology and Water Quality

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
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 which would result in:	☐	☐	☒	☐
i. result in a 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;	☐	☐	☐	☒

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Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
iii. create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
iv. impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

2.1.10.1 Environmental Setting

The Project area is located within the Lower Feather River Hydrologic Area in the Marysville Hydrologic Unit of the Sacramento Hydrologic Basin and is within the jurisdiction of the Central Valley Regional Water Quality Control Board, Region 5. The Project footprint includes in-water based components in the LFC of the Feather River as well as land-based components on the adjacent floodplain and levee at RM61, upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County.

The Feather River is regulated by hydroelectric, water storage, and diversion projects upstream of the Project area. The Oroville Facilities Hydroelectric Project (OFHP) which consists of Lake Oroville and the Thermalito facilities, influences the flows in the Lower Feather River. Flow from Lake Oroville is released through the Thermalito facilities into the LFC of the Feather River or the Thermalito Power Canal. The minimum operational flows from OFHP to

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LFC are 600 cfs with typical flows into the LFC between 600-700 cfs. The LFC provides habitat for warm- and cold-water fish species, including four special-status species.

The LFC of the Feather River is one of two distinct river portions that make up the Lower Feather River segment and extends from the fish dam barrier at RM 67 to the Thermalito Afterbay Outlet at RM 59. The LFC has a low gradient of less than or equal to 0.01% and is characterized by features such as riffles, pools and glides over a large gravel and cobble substrate. Seesholtz et al. (2004) found the flow regime to be stable, exceeding 20 m^3/sec only during flood events and water temperatures to be lower than those found downstream, ranging from 7.8° C in winter/spring to 21.5° C in summer during the 1999-2001 sampling period.

2.1.10.2 Discussion

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than significant impact. The Project consists of the installation and operation of a fish monitoring station made up of a resistance board weir, underwater video monitoring system, and a pit tag antenna array powered via a solar power system located on the adjacent shore. The system will not have any waste discharge associated with it and will not contribute any substance that would adversely impact water quality. All the in-water project components are designed for use in natural aquatic systems during operations, and do not contain any substances that would violate water quality standards or discharge requirements or degrade surface or ground water quality.

Project construction will occur when flows are dictated by minimum operational flows of the OFHP, and significant rain events are unlikely. Therefore, scouring, excess sediment runoff and other potential sources of water quality degradation that could result from high flows are not expected. As part of the Project design, sandbags will be employed on the upstream and downstream sides of the substrate rail to prevent scouring during construction. In-water construction will impact the riverbed when stakes are driven into the riverbed by hand tools or from construction personnel

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walking through the riverbed. However, these riverbed impacts to water quality should be insignificant since the affected area is small, work is short-term and temporary, and the riverbed is covered in large cobble which should protect sediment from being disturbed and impacting water quality. Construction will utilize fuel and gas that could impact surface and ground water quality, but implementation of the BMP-3: Water Quality Management Plan (Section 1.2.4) will minimize these potential impacts to surface and ground water quality to less than significant.

Therefore, these project impacts would be less than significant.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No impact. The Project is located within the LFC of the Feather River and adjacent upland and will not utilize or impact any groundwater supplies during construction or operation. The Project will not have any components that would interfere with groundwater recharge and will not impede sustainable groundwater management of the basin. Therefore, the Project will have no impacts to groundwater supplies or recharge.

a) Would the project 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 which would result in:

i. substantial erosion or siltation on- or off-site

Less than Significant Impact. The Project consists of the installation and operation of a fish monitoring station made up of a resistance board weir, underwater video monitoring system, and a pit tag antenna array that will be located across the full width of the LFC of the Feather River. The in-water Project components have been designed to allow unobstructed flows other than a small velocity break just a few feet on the downstream side of the weir. The presence of the structures could potentially change the way that sediment is moved into or out of the water column and could potentially

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result in erosion at the bank side edges of the structure. As part of the Project design, sandbags will be employed on the upstream and downstream sides of the substrate rail to prevent scouring during construction. Additionally, in-water Project components will be removed during high-flow events, preventing them from contributing to either substantial erosion or siltation. Flows will be monitored so that when OFHP flows reach 1,500-2,500 cfs, a decision can be made depending on the time of year, reservoir storage and current data to remove in-water Project components. For flows anticipated to be over 5,000 cfs, the security enclosure will be removed; and for flows anticipated to be over 10,000 cfs for more than a week, the PIT antenna and the weir panels will be removed as well so scouring should be avoided. Furthermore, implementation of BMP-3 during construction will further reduce potential impacts caused by erosion or siltation. Therefore, these Project impacts would be less than significant.

ii. ubstantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite

No impact. The Project will not consist of any components that would increase non-permeable surfaces or lead to additional run-off that would result in flooding, on or off-site. Therefore, the Project will have no impact to surface runoff resulting in flooding.

iii. create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

No impact. The Project is in a non-developed area with no storm water drainage system; would not create or impact any storm water drainage system; and will not consist of any components that would create or contribute to runoff water. Additionally, no components of the Project would provide sources of polluted runoff. Therefore, the Project will not exceed the capacity of storm water drainage systems or create substantial polluted runoff, and there would be no impact.

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iv. impede or redirect flood flows

No impact. The Project will not impede or redirect flood flows as construction will be completed during the summer when flood flows are not anticipated. Additionally, the system is designed to be removed during high flow events as described above, so Project components that could be impacted by or impact the flow of flood waters will be removed when high flows are expected. Therefore, the Project will have no impact to altering drainage through impeding or redirecting flood flows.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No impact. The Project is not located in a tsunami zone and is not expected to be within a seiche zone. The nearest identified earthquake fault is the Cleveland Hill Fault which is located approximately 7.5 miles east/southeast of the Project area but has not been evaluated for liquefaction or landslide risk. Flows in the Feather River are regulated by hydroelectric, water storage, and diversion projects upstream of the Project area. The most influential project for flows in the lower Feather River is the Oroville Facilities Hydroelectric Project, which consists of Lake Oroville and the Thermalito facilities. Flow from Lake Oroville is released through the Thermalito facilities into the LFC of the Feather River or the Thermalito Power Canal. In-water Project components would be partially removed in the case of expected flooding and are by nature of the design always inundated by water. On land Project components could potentially be inundated by a severe flood, however, those components are made up of sealed batteries and electronics and would not release pollutants as a result of flooding inundation. Therefore, the Project would not release pollutants due to Project inundation, and there would be no impact.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No impact. The Project would not adversely affect groundwater or water quality and makes no use of groundwater in its construction or operation. Additionally, implementation of BMP-3 during construction will further reduce potential impacts to ensure the Project does not adversely impact surface or

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ground water quality. Therefore, the Project will not impact the implementation of a water quality control plan or sustainable groundwater management plan.

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2.1.11 Land Use and Planning

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

2.1.11.1 Environmental Setting

The Project is located along the LFR in the northern Sacramento Valley on the western slope of the Sierra Nevada foothills in southern Butte County. The surrounding foothills are composed of rolling to steep hills, low ridges, and narrow valleys. Vegetation communities vary from wetland and riparian vegetation along the river to grasslands and oaks at the lower elevations and dense stands of shrubs and hardwoods intermixed with conifers at higher elevations.

Land uses in the vicinity include rural development, recreation, agriculture, timber production, hydropower generation, and livestock grazing. The nearest urban uses occur along SR 70 in the communities of Oroville, Oak Grove, Palermo, and Biggs. Lake Oroville dam is approximately 11 miles upstream of the Project footprint. Butte County classifies the Project area and adjacent parcels as Natural Resource Zones, specifically Resource Conservation (40-acres) (Butte County 2021).

2.1.11.2 Discussion

a) Would the project physically divide an established community?

No impact. The Project footprint is located on State-owned property and currently part of the OWA. The Project would not alter the existing use of the

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site and would not divide an established community. Therefore, the Project will have no impact to established communities.

b) Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No impact. The Project footprint is owned and maintained by public agencies. The Project footprint is designated public/quasi-public in the Butte County General Plan and is zoned for resource conservation (Butte County 2021). No communities occur in the immediate vicinity of the Project footprint (within 0.5-mile). No habitat conservation plans have been implemented in the County. The Project would not alter or change the existing land use and thus would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, the Project will have no impact to land use plans, polices, or regulations.

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2.1.12 Mineral Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

2.1.12.1 Environmental Setting

The California Department of Conservation, California Geological Survey (CGS), conducts Mineral Land Classification surveys that designate land areas, such as mineral resources zones or aggregate resources zones. The CGS has mapped aggregate availability throughout the state, and no aggregate resources zones have been identified on or within the vicinity of the Project area (California Department of Conservation 2015). The mineral resources chapter of the Butte County General Plan 2040 Update Settings and Trends Report also outlines mineral resources goals and policies to protect these areas. The map provided in the County's general plan shows that the Project area is not located in or around an area of known significant mineral resource as described in the County's general plan 2040 update.

2.1.12.2 Discussion

a) Would the project 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?

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No impact. No known mineral resource recovery sites or aggregate resource zones are located within the vicinity of the Project area. The Project will not result in a loss of availability of mineral resources. Additionally, the Project footprint has not been designated by the CGS as an area of known mineral resources. Therefore, the Project will have no impact on the availability of known mineral resources.

b) Would the project 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?

No impact. Sand and gravel deposits occur along the Sacramento River and its tributaries in Butte County (Butte County, 2013). Mining occurs along the Feather River upstream and downstream of the Project area; however, no mining currently occurs in the Project area (California Department of Conservation 2018). Additionally, the Project area has not been delineated on a local general plan, specific plan, or other land use plan as having locally important mineral resources. Therefore, the Project will have no impact on the loss of availability of a locally important mineral resource recovery site.

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2.1.13 Noise

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
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 in other applicable local, state, or federal standards?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project 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?	☐	☐	☒	☐

2.1.13.1 Environmental Setting

Sound is defined as a disturbance that is created by a moving or vibrating source through a gas, liquid, or solid, and which can be detected by the hearing organs. Noise is defined as loud, unpleasant, unexpected, or undesired sound. As sound travels, it changes in level and quality. The way noise reduces over distance between a stationary source and a receiver depends on factors such as absorption by different ground surfaces (i.e. acoustically reflective surfaces such as parking lots or bodies of water versus

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absorptive surfaces such as grass or scattered shrubs); atmospheric conditions such as air temperature, humidity, turbulence, or wind direction; or shielding by large barriers such as buildings or tree lines, or topographic features such as hills. Impacts related to noise are evaluated by comparing the predicted noise level resulting from implementation of the project compared to the baseline noise level in the area. This evaluation considers the uniqueness of the setting, sensitivity of noise receptors, magnitude of noise increase, and the absolute noise level.

Existing sources of noise within the vicinity of the Project site include mobile sources such as airplanes accessing the Oroville Municipal Airport approximately 2 miles to the northwest, vehicle traffic noise from nearby roads and SR 70 which is 1 mile to the southeast, and boat traffic noise along the Feather River which is accessible via the Feather River Boat Launch. The closest stationary sources of noise include the Oroville Shooting Range approximately 1 mile to the northwest, and the Honker Bay Ranch wedding venue approximately 0.7 miles to the northwest. During periods of high flow, the Feather River itself is a significant source of noise.

The closest sensitive receptors to the project area include private residences located approximately 0.4 miles southeast from the project area, as well as the Honker Bay Ranch wedding venue which may be considered both a receptor and a potential source of noise.

Barriers to noise between the Project area and sensitive receptors consist primarily of trees and shrubs of varying density.

2.1.13.2 Discussion

a) Would the project result in 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 in other applicable local, state, or federal standards?

Less than significant impact. The Butte County Municipal Code (Section 41A-7; Ord. No. 4053, § 1, 3-26-13) established exterior noise thresholds for sensitive receptors (Table 6) and states it is unlawful to create any noise

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which causes the noise levels on an affected property to exceed these standards (Butte County 2020).

Table 6. Exterior noise standards for all sensitive receptors within Butte County.

Receptor	Urban Daytime	Non-Urban Daytime	Urban Evening	Non-Urban Evening	Urban Nighttime	Non-Urban Nighttime
Hourly Average Equivalent Sound Level (L_{eq})	55	50	50	45	45	40
Maximum Sound Level (L_{max})	70	60	60	55	55	50

Source: Butte County 2002.
Table notes: Daytime is 7 a.m. to 7 p.m., Evening is 7 p.m. to 10 p.m., Nighttime is 10 p.m. to 7 a.m.

The Project would utilize standard construction equipment, including a tractor or truck with auger, concrete mixer, hydraulic post pounder, and vehicles such as passenger trucks and boats propelled by jet or outboard motor. Use of these resources during construction would result in a temporary increase in ambient noise in the Project vicinity.

Table 7 provides noise emissions levels of typical construction equipment at 50 feet from the source. For a single point source, sound levels decrease approximately 6 dB (decibels) for each doubling of distance from the source (Cowan 1994). To determine the impact of noise from the project activities on sensitive receptors, a calculation called the inverse-square law may be used. This calculation factors in the measured noise level at a specified distance from the source and uses that value to extrapolate the noise level at a distant receptor. At 2000 feet from the point source, which is the approximate distance between the Project site and the closest sensitive receptor, the noise levels produced by equipment [roughly 85 weighted decibels (dBA)] would be attenuated to approximately 53 dBA.

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Table 7. Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level 50 feet from Source (in dBA)
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Loader	80
Paver	85
Pump	77
Roller	85
Saw	76
Scraper	85
Truck	84

Source: Federal Transit Administration 2018.

Based on this calculation, noise levels expected to result from the construction of the Project would not exceed the maximum noise level for non-urban receptors, except for the limit established for nighttime work. At this time, all noise-producing work is scheduled to occur during the 7 am to 7 pm period.

Once constructed, the operation of the fish weir would not be expected to cause a permanent increase in ambient noise, as there are no mechanical parts associated with the weir other than small electronics powered by solar panels. Personnel access to the weir via boat for monitoring purposes would be consistent with the baseline level of boat activity currently experienced on the waterway.

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Noise created during the construction of the Project would be below the exterior noise standards set by the County, once attenuated over the distance to the closest receptor. Therefore, impacts related to the construction and operation of the Project would be less than significant.

b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Less than significant impact. Project construction activities can result in varying degrees of temporary groundborne vibration and noise, depending on the equipment used and the operations involved. Vibration and noise generated by construction equipment can be a nuisance to the public and cause damage to structures, but it diminishes in magnitude with increased distance from the source (Federal Transit Administration 2018). The following discussion analyzes potential impacts of vibration generated by Project activities.

The Federal Transit Administration (FTA) reports vibration velocity data from typical heavy construction equipment operations which ranges from 0.003 to 0.21 in/sec peak particle velocity (PPV) at 25 feet from the source activity (Table 8) (Federal Transit Administration 2018).

Table 8. Vibration Levels for Typical Construction Equipment at 25 feet from Source

Equipment	PPV at 25 feet (in/sec)	Approximate Lv[1] at 25 feet
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: (Federal Transit Administration 2018).
[1] RMS velocity in decibels, VdB re 1 micro-in/sec

Human response to vibration is difficult to quantify. Ground vibration can be felt at levels that are well below those required to produce any damage to

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structures. The duration of the event has an effect on human response, as does the frequency. Typically, the longer the event and the higher the frequency, the more adverse the effect on human response. Table 9 below depicts the average human response to vibration that may be anticipated when the person is at rest, situated in a quiet surrounding.

Table 9. Average Human Response to Vibration, In a Quiet Setting

Average Human Response	Peak Particle Velocity (PPV) (in/sec)
Barely to distinctly perceptible	0.02–0.10
Distinct to strongly perceptible	0.10–0.50
Strongly perceptible to mildly unpleasant	0.50–1.00
Mildly to distinctly unpleasant	1.00–2.00
Distinctly unpleasant to intolerable	2.00–10.00

Source: California Department of Transportation 2020.

Excessive groundborne vibration can also result in damage to structures. Table 10 below shows construction vibration damage thresholds reported by the FTA (Federal Transit Administration 2018).

Table 10. Construction Vibration Damage Criteria

Building/Structural Category	PPV (in/sec)	Approximate L_v
Reinforced-concrete, steel or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: Federal Transit Administration 2018.

The nearest sensitive receptor to the Project is a group of residential houses approximately 0.4 miles (just over 2000 feet) from the Project site. The Project will use equipment that is smaller in size and similar in vibrational impact to the loaded trucks and jackhammer listed in Table 8. It can be reasonably assumed that at a distance of 2000 feet, the vibration velocities would be substantially less than at 25 feet.

Groundborne vibration or groundborne noise created during the construction of the Project would be below the level that would be distinctly perceptible to

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humans and would not cause vibration damage even to buildings that are extremely susceptible to vibration damage. Therefore, Project impacts would be less than significant.

c) For a project 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?

Less than significant impact. The Project is located approximately two miles southeast from the Oroville Municipal Airport. The public use airport is owned by the city of Oroville but is privately operated. The airport supports an average of 99 airport operations per day, which are limited to smaller non-commercial flights (AirNav, LLC 2022).

The Project would not result in an influx of people residing in the area, and work in the Project area would be temporary during construction and intermittent during operation. Therefore, the Project would not expose workers or residents to excessive noise, and impacts would be less than significant.

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2.1.14 Population and Housing

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned 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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

2.1.14.1 Environmental Setting

The Project is located within and adjacent to the LFC of the Feather River at RM 61 upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County, California. Land uses in the vicinity include rural development, recreation, agriculture, timber production, hydropower generation, and livestock grazing. The nearest urban uses occur along SR 70 in the communities of Oroville, Oak Grove, Palermo, and Biggs. Lake Oroville dam is approximately 11 miles upstream of the Project area. Much of the surrounding lands outside of the floodplain is disturbed and generally lacks vegetation. These lands have a high degree of human disturbance and include the levee, the levee crest road, and extensive gravel tailings. Butte County classifies the Project area and adjacent parcels as Natural Resource Zones, specifically Resource Conservation (40-acres) (Butte County 2012).

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2.1.14.2 Discussion

a) Would the project induce substantial unplanned 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 impact. The Project does not include construction of housing or businesses and does not propose extensions of roads or other forms of infrastructure. The Project will consist of temporary construction and long-term operation of a fish monitoring station and weir, and personnel that oversee the Project long term already reside and work locally. Therefore, the Project would have no impact on or induce population growth in the area.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No impact. The Project is in a Natural Resource zone classified by Butte County, the Project will take place in the Feather River, the adjacent floodplain, and levee. Therefore, the Project would not displace any existing people or housing, necessitating the construction of replacement housing elsewhere. In addition, the Project will consist of temporary construction and long-term operation by those that already reside and work locally. The Project will have no impact to existing people or housing.

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2.1.15 Public Services

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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?	☐	☐	☐	☒

2.1.15.1 Environmental Setting

The Butte County General Plan 2030's Public Facilities and Services Element Chapter 12 (the General Plan) discusses the goals Butte County (the County) has regarding Public Services such as, police, fire, schools and parks.

Fire Protection

Fire Protection service is provided by Butte County Fire Department and the California Department of Forestry and Fire Protection to the entire unincorporated County population, equaling over 1600 square miles, with the exceptions to the cities of Chico, Oroville, and the Town of Paradise. Services include but are not limited to fire control, emergency medical

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response and rescue, flood control, and vegetation management. The General Plan discusses the County's current fire protection demands and the plans in place for achieving those demands and goals. A goal being to provide fire protection and emergency medical response services to serve existing and new development. This goal will be achieved by supporting expansion of fire volunteer services, adopting Standards of Cover for fire protection, and the development of new fire stations located at accessible locations close to existing or future developments or fire hazards areas (Butte County 2019).

Police

The General Plan discusses the current Sheriff and Police enforcement services provided by the Butte County Sheriff's Office, California Highway Patrol and local police agencies in the Cities of Chico, Oroville, Gridley and Biggs, and the Town of Paradise. Law enforcement includes but is not limited to criminal investigations, crime prevention, traffic control, and protection of citizens and property. The General Plan discusses the County's police current demands and the plans in place for achieving these demands and future goals. A goal being to maintain a safe environment in the County through the enforcement of law. This goal will be achieved by supporting the expansion of volunteer services for law enforcement, and citizen efforts to strengthen and expand neighborhood and commercial watch programs (Butte County 2019).

School Districts

The County Office of Education, Butte Community College, California State University, Chico, and local school districts provide public education for the County. The General Plan discusses the County's current education demands and the plans in place for achieving those demands and goals. A goal being to support high-quality schools and education facilities for all County residents. This goal will be achieved in part by reviewing and coordinating with schools and their development proposals, designing schools, minimizing costs to the public of building schools, and pursing funding for safe routes to schools and improvements on existing schools (Butte County 2019).

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Parks

The County does not provide a parks and recreation program. There are 5 recreation and park districts, which includes most of the Count's land, operate as "independent" districts. These districts manage several parks in unincorporated Butte County. The districts are known as the following:

- Chico Area Recreation and Park District (CARD)
- Durham Recreation and Park District (DRPD)
- Feather River Recreation and Park District (FRRPD)
- Paradise Recreation and Park District (PRPD)
- Richvale Recreation and Park District (RRPD)

The General Plan discusses their current goal for park services, which is to support a comprehensive and high-quality system of recreational open space and facilities. This goal will be achieved in part by review of development proposals and coordination with public agencies to designate sites for new parks and recreational facilities, supporting national recreation events, and coordinating with districts to allow for park and recreation facilities on publicly owned land (Butte County 2019).

Other public facilities

The General Plan also discusses wastewater, solid waste and waste diversion, and library facilities and services. All of which are intended for public services in multi-faceted ways.

The County's goal for wastewater systems is to manage wastewater treatment facilities at every scale to protect the public health and safety of the County residents and the natural environment. This goal will be achieved in part by onsite wastewater treatment and disposal systems, new community sewerage systems and sewer collection and transmission systems (Butte County, 2012).

The County's goal for solid waste and waste diversion is to provide safe, sanitary, and environmentally acceptable solid waste management. This goal will be achieved in part by encouraging local residents and businesses to

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reduce of non-biodegradable materials, allowing use of solid waste as an alternative energy source, such as, biomass fuels, continued review and updating of the Recycling and Waste Facility Plan, and distribution of public education materials on solid waste source reduction, recycling, and composting (Butte County 2019).

The County is the only provider of a public library service in the County. The goal being to provide library services to meet the informational and social needs for each community. This goal will be achieved in part by funding of library operations, identifying opportunities for partnership with organizations that can help provide multi-faceted library services (Butte County 2019).

2.1.15.2 Discussion

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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?

No impact. The Project would not create any new demand for fire protection and would not adversely affect response times or alter any public services facilities or goals currently being addressed or achieved by Butte County. Therefore, no impacts are anticipated to fire protection services as a result of this Project.

Police?

No impact. The Project would not create any new demand for police and would not adversely affect response times or alter any public services facilities or goals currently being addressed or achieved by Butte County. Therefore, no impacts are anticipated to police services as a result of this Project.

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Schools?

No impact. The Project would not create any new demand for additional school construction, nor would it affect the operations of existing schools. Therefore, no impacts are anticipated to schools as a result of this Project.

Parks?

No impact. The Project currently resides under the management of the Feather River Recreation and Park District (Public Facilities and Service Element, 2012). However, the Project would not create or alter demand for recreational services. Nor would the Project interfere with public usage of existing recreational facilities, such as parks. Therefore, no impacts are anticipated to recreational services as a result of this Project.

Other public facilities?

No impact. The Project would not create any new demand for public services or alterations to existing public facilities. The Project would not require construction of new facilities or structures. Therefore, no impacts are anticipated to public services or facilities as a result of this Project.

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2.1.16 Recreation

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

2.1.16.1 Environmental Setting

The Project is in the LFC of the Feather River and adjacent OWA uplands. The public most easily accesses the Project area by boat through the LFC, since there are no publicly accessible roads or trails with direct access to the Project area and the gravel access road along the south of the Project footprint is closed to the public. The nearest publicly accessible road is the OWA public entrance (SR 70 and Pacific Heights Road) within 0.75 miles of the Project.

Managed by CDFW in partnership with DWR, OWA is primarily a primitive wildlife area that provides the public with a non-reservoir outdoor experience. OWA recreation activities include hunting; river- and pond-oriented fishing and boating; and wildlife observation and photography (DWR 2022). Several recreation activities occur within or adjacent to the Project footprint including boating, angling, and hunting. These recreation activities within the Project are discussed in more detail below:

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Boating

Motorized and many non-motorized boaters pass through the Project area. Boaters may use several boat ramps along the river to access the LFC and there are 3 formal LFC boat ramps. The Riverbend Park boat ramp in Oroville is located approximately 4.5 miles upstream of the Project footprint and the paved boat ramp has a boat dock. River Reflections RV Park & Campground is a private campground with a paved boat ramp access to the LFC which is approximately 2 miles upstream of the Project footprint. The OWA Thermalito Afterbay Outlet (TAO) boat ramp is located approximately 1.4 miles downstream of the Project footprint. The boat ramp is a graded and graveled boat ramp and is adjacent to OWA Thermalito Afterbay Outlet Camping/Day Use Area which provides a day use area, primitive campsites, toilet building, and shoreline access (DWR 2022). These boat ramps can accommodate vessels ranging from jetboats down to kayaks. Boaters may also use the several unimproved boat ramps along the west bank of the river downstream of the TAO.

Angling

The LFC in the Project area is one of the most popular seasonal fishing destinations in the region, most of whom are drawn by the well-known steelhead fishery. Anglers boat, wade, and use the riverbanks in the LFC. Fishing is permitted throughout the year in the river within the project area but catch limits for steelhead vary by season. Angler usage in the LFC booms when anadromous fish are present in the Feather River. A fishing hole is located approximately 250 feet downstream of the proposed fish monitoring station.

Hunting

The upland areas of the Project are open to public hunting. The OWA provides Sacramento Valley riparian habitat for over 100 species of birds and dozens of species of mammals. Common upland game includes mourning dove, California quail, ring-necked pheasant, and wild turkey. Hunting is allowed in season for all game species between September 1 and January 31, plus for Spring turkey season on certain days by special drawing.

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2.1.16.2 Discussion

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Less than significant impacts. Construction of the weir would likely cause short term and minimal impacts to recreational use of the river. Boaters and fisherman will need to avoid in-water construction and construction activities will deter game fish from the area. If boaters and fisherman approached the project area, in-water construction activities would temporarily stop until they pass through the project area to minimize recreational disturbance. Also, these in-water construction activities are short term and the temporarily impacted area is insignificant in size compared to the available fishing and boating in the LFC. During operations, the weir has been designed to allow boat access across the top of it, through a 12-foot-wide corridor of modified panels, and signs would be installed on the weir and along the river to notify boaters of where to go. Boaters can also pass over nearly any portion of the resistance board weir, though signs will guide them to the boat passage panels. So, weir operation impacts to boating would be negligible. Installation of the fish weir would also lead to a 250 foot "No Fishing Zone" immediately above and below the weir, which would decrease the available fishing area. However, DWR has worked with CDFW to keep the adjacent fishing hole open for use by strategically siting the weir and this "No Fishing Zone" would be a small decrease compared to the amount of area available for fishing along the remainder of the LFC. So, the Project would not substantially affect recreational use of the river.

Additionally, upland recreational use will be minimally impacted by the Project. Installation of the solar power system would temporarily impact hunting by short term visual and noise disturbance to potential game species. Once the solar power system is installed, human disturbance to game species will be limited to occasional solar panel system maintenance and weir data retrieval. The solar panel system should not reduce game habitat since the minor vegetation trimmed for installation should regrow and the Fenced Power and Controller Area will be installed in a disturbed gravel area which game species are unlikely to utilize. Also, the Project is not easily accessible for hunting since there are no publicly accessible roads

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to the project area. So, construction and operation of the Project should have nominal if any impacts to upland recreational use.

Therefore, these project impacts would be less than significant.

b) Would the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

No impact. The Project does not include the construction or expansion of recreational facilities. Therefore, the Project will have no impact to the physical environment caused by recreational facilities.

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2.1.17 Transportation

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian.	☐	☐	☐	☒
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

2.1.17.1 Environmental Setting

The Project is in and adjacent to the LFC of the Feather River at RM 61 in the OWA in Butte County, California. Construction access to the project site will utilize existing public paved roads; a private rocked and maintained access road only accessible by DWR and CDFW; and the Feather River. During construction of in-water components, transportation of construction personnel and materials will primarily be by boat. Within the vegetated and undisturbed areas, the project will be accessed by foot to reduce potential impacts. During construction of on-land components, transportation of personnel will utilize SR 70, Pacific Heights Road, and the private rocked access road. SR 70 provides a main thoroughfare through Butte County and travels east of the project area through Oroville. Pacific Heights Road and levee roads along the Feather River provide local access to the area by local residents, recreationists, other workers, and agency personnel.

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Transportation of materials, equipment, and personnel to the Project area would result in a minor and temporary increase in traffic on SR 70, Pacific Heights Road, and the levee roads during Project construction.

2.1.17.2 Discussion

a) Would the project conflict with a program, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian.

No impact. The main routes of traffic to and from the site include SR 70 and Pacific Heights Road. During construction, vehicle traffic to the Project site will increase for approximately two weeks to install the on-land Project components, including installation of the fenced power and controller area. Construction equipment will be transported to the Project site once and will be left at the staging area after each workday. Consequently, the Project will not impact any public parking. Public transit does not exist in the immediate vicinity of the Project site. While bicycle and pedestrian facilities exist in the area, the Project would not affect public use of any of these facilities. Worker commute trips would be minor during the construction. Ongoing operations of the weir would involve additional traffic for DWR biologists or other maintenance staff, but this increase in traffic would be minimal and would not substantially affect traffic conditions on the local roadways. No road closures or obstructions to standard roadway flow (including bicyclists and pedestrians) are included as part of the Project. Therefore, the Project will have no impacts to program, ordinances, or policies addressing the circulation system.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

No impact. The Project will not adversely impact any local or regional roads in the Project vicinity. The equipment will be stored at staging area adjacent to the private access road and hauled in and out before and after the Project components are completed. Traffic from the Project is not expected to increase substantially compared to existing conditions. Therefore, the Project will not conflict with CEQA Guidelines section 15064.3 subdivision (b), and there will be no impact.

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c) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No impact. Access to the Project area is via SR 70 and local roads and use of these roads during construction are short term, minimal, and will not increase hazards compared to existing traffic conditions The Project would not involve the creation of sharp curves, dangerous intersections, or incompatible uses. Therefore, the Project will have no impact on increasing hazards.

d) Would the project result in inadequate emergency access?

No impact. Construction equipment would not interfere with emergency access on Pacific Heights Road, SR 70, or any other local or regional roads within the vicinity of the Project site. The Project would not include any road or lane closures. Therefore, the Project will have no impact on emergency access.

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2.1.18 Tribal Cultural Resources

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
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 Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

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Tribal Cultural Resources (TCRs) are defined under PRC 21074 as sites, features, places, geographically defined cultural landscapes, sacred places, or objects with cultural value to a California Native American tribe. In order to qualify as a TCR under CEQA, the resource must be listed or eligible for listing in the California Register of Historical Resources (CRHR) or be determined to meet CRHR criteria by the lead agency after considering the significance of the resource to the tribe.

2.1.18.1 Ethnographic Context

Information from this section was taken primarily from Kroeber (1925), McCarthy (2009), and Riddell (1978). The Project footprint is within the ethnographic territory of the Konkow Maidu. Konkow is one of the three ethnolinguistic subdivisions of the Maidu language family. The name Konkow is derived from the anglicization of the term for meadowland in the native language (Riddel 1978). Konkow territory included the lower Feather River and Honcutt Creek watersheds, and in the Central Valley was focused on the Sacramento River near Chico and down the Feather River to the Sutter Buttes area.

The Konkow Maidu's prehistoric subsistence economy was based on a mix of hunting, fishing, and gathering, with dozens of plant and animal species gathered from throughout the territory. The Feather River was an important source of salmon, lamprey eel, and other desirable fish species, as well as shellfish. Resources that were not available within village community lands were obtained through trade with other village communities, their Mountain Maidu or Nisenan relatives, or others such as the Patwin to the southwest. An annual gathering cycle lead the Konkow to winter on the banks of the Feather, Yuba, and American Rivers, but leave for the mountains in summer where game was abundant in spring. Dried meat and other gathered resources were then returned to the settlements along the rivers during the colder months.

Settlements were divided into village communities consisting of a central village surrounded by other adjacent villages (Kroeber 1925). The central village housed a semi-subterranean earth-covered lodge, which served as an assembly and ceremony chamber. The lodge would also be the residence of a headman, the community's authority whose role was more to provide advice and serve as a spokesman rather than direct leadership. In fact, each

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of the surrounding villages were self-sufficient, without any control exercised by the central village. It's estimated that populations numbered 35 per village, with the whole community numbering no more than 200 (Riddell 1978).

Today, the Konkow's descendants number in several modern Tribal groups, including The Mooretown Rancheria of Maidu Indians, Mechoopda Indian Tribe, and the KonKow Valley Band of Maidu. All three retain active programs for Tribal members and take an active role in preserving their ancestral traditions. Programs on the instruction of the Konkow language is available for Tribal members, as well as gardens for local plants and a fishing program using traditional equipment and methods.

2.1.18.2 Methods

The Konkow Valley Band of Maidu participated in consultation under DWR's Tribal Engagement Policy for the current Project, as discussed below. This Tribe has since requested to receive AB 52 notifications from DWR.

DWR reached out to the Native American Heritage Commission (NAHC) on September 13, 2021, with the NAHC returning negative Sacred Lands File Search results on October 28, 2021. The NAHC also included a list of eleven Tribal representatives (See Table 11. Tribal Consultation) to contact regarding the Project, and under DWR's Tribal Engagement Policy, each Tribe was contacted by letter on February 18, 2022, with a follow-up email sent to each Tribal representative on February 23, along with an invitation to a virtual informational meeting scheduled for March 10, 2022. Follow-up phone calls were then made to all representatives. A summary of contacts can be found in Table 11 below.

The March 10 meeting was attended by four of the nine contacted Tribes (The Berry Creek Rancheria of Maidu Indians, Mooretown Rancheria of Maidu Indians, Estom Yumeka Maidu Tribe of the Enterprise Rancheria, and the Konkow Valley Band of Maidu), with the five others responding that the Project was outside of their area of concern or would defer to the judgement of other Tribes. The meeting consisted of presentations by DWR staff about the Project's purpose and construction methodology, followed by a question and answer session.

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Table 11. Tribal Consultation

Tribe	Responded to Letter	Contacted by Phone	Attended Informational Meeting
Berry Creek Rancheria of Maidu Indians	Yes	Yes	Yes
Mooretown Rancheria of Maidu Indians	No	Yes	Yes
Estom Yumeka Maidu Tribe of the Enterprise Rancheria	No	Yes	Yes
Greenville Rancheria	No	Yes	No
KonKow Valley Band of Maidu	Yes	Yes	Yes
Mechoopda Indian Tribe	No	Yes	No
Tsi Akim Maidu	No	Yes	No
United Auburn Indian Community of the Auburn Rancheria	Yes	Yes	No
Washoe Tribe of Nevada and California	No	Yes	No

Letters following up on the March 10 meeting and were sent out to the four participating Tribes on April 7, inviting those Tribes to a site visit of the Project area scheduled for April 19th. Three Tribal representatives were present at the site visit with a fourth calling in to report his absence. The Project footprint was toured with all three representatives. Each representative confirmed that they had no concerns about the Project and that consultation could be concluded.

No Tribal Cultural Resources have been identified within the Project footprint. There are no known prehistoric archaeological resources within the Project footprint (See Chapter 2.1.5 Cultural Resources).

2.1.18.3 Discussion

Would the Proposed Project 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

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and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is?

a) 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 5020.1 (k), or

b) 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 Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less than significant with mitigation incorporated. Tribal consultation and methodology discussed in Chapter 2.1.5 did not identify any cultural resources that could be potential TCRs in the Project footprint, but there is always the possibility for uncovering previously unknown TCRs during project construction. If a TCR were uncovered, it is possible a significant impact could occur. Implementation of Mitigation Measures CUL-1 through CUL-3 reduce this potential impact to less than significant.

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2.1.19 Utilities and Service Systems

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider that 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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reductions statutes and regulations related to solid waste?	☐	☐	☐	☒

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2.1.19.1 Environmental Setting

The Project area is located within the OWA and includes in-water-based components in the LFC of the Feather River as well as land-based components on the adjacent floodplain and levee at RM 61, upstream of the Thermalito Afterbay Outlet near the town of Oroville in Butte County. There is no existing above ground utility infrastructure in the Project area.

2.1.19.2 Discussion

a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications, the construction or relocation of which could cause significant environmental effects?

No impact. The Project does not include any elements during installation or operation that requires the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, or other utilities. The Project will be powered by a solar array and will not require any external electrical power, natural gas or telecommunications infrastructure, and will not interfere with existing infrastructure. Prior to any ground disturbing activities, USA will be called for utility clearance as stated in BMP-4: Underground Utility Plan (Section 1.2.4). Therefore, the Project will have no impact on the environment caused by the relocation or construction of new or expanded water, wastewater treatment, storm drainage, electric power, natural gas, or telecommunications facilities.

b) would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No impact. The Project does not include any elements during installation or operation that requires external water supplies. Therefore, the Project will have no impact on water supplies.

c) would the project result in a determination by the wastewater treatment provider that 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?

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No impact. The Project does not include any elements during installation or operation that will impact the service of wastewater treatment providers. Wastewater services for construction crews would be provided by temporary portable facilities, and the Project will not require relocation or construction of new water or wastewater treatment facilities. Therefore, the Project will have no impact on water treatment capacity.

d) Would the project 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?

No impact. The Project is small in scope and does not include any elements during installation or operation that will generate solid waste in excess of local landfill capacity or State or local standards. Therefore, the Project will have no impact on local infrastructure capacity or solid waste reduction goals.

e) Would the project comply with federal, state, and local management and reductions statutes and regulations related to solid waste?

No impact. The Project does not include any elements during installation or operation that would not comply with federal, State or local management or reductions statues and regulations to solid waste. Therefore, the Project will have no impact.

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2.1.20 Wildfire

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

2.1.20.1 Environmental Setting

In California, wildfire protection jurisdictions are separated and overseen by three areas of government: local, State, and federal. Each of the three areas have determined Fire Hazard Severity Zones (FHSZ) within each county. The

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zone classification is based on a multitude of factors: fire behavior models using vegetation density, adjacent wildland areas, and distance to wildland areas, another factor being the probability of a fire threatening nearby structures.

According to the California Department of Forestry and Fire Protection (CAL FIRE), the Project footprint, surrounding lands, and access roads are Local Responsibility Areas (LRA). The Project area is considered Non-VHFHSZ (Very High Fire Hazard Severity Zone) within this LRA. The zone classification is based on data and models of potential fuels over a 30- to 50-year time horizon and their associated expected fire behavior and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure, including firebrands, to buildings (California Department of Forestry and Fire Protection 2008).

The Project area is provided fire protection by Butte County Fire Department (Butte County, 2019). The Butte County Fire Station #72 is located five miles southeast of the Project location.

2.1.20.2 Discussion

a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

No impact. The Project is on State-owned land and will be accessed via existing roads off Pacific Heights Road. Butte County Fire Station #72 is located five miles southeast of the Project location. The Project will not impact public roads or highways; will not cause rerouting of traffic or road closures; and construction activities will not result in emergency vehicles or law enforcement delays. Staging is planned to be within the Project area and outside of public roads and highways. Safety and emergency response services will be covered in the Project's daily Job Hazardous Assessment (JHA) to ensure safe mobility while on the Project site and evacuation if necessary. Therefore, that Project will have no impact to local emergency response plans or emergency evacuation plans.

b) would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project

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occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

No impact. The Project is located within the r Feather River and small portions of adjacent floodplain. Vegetation primarily consisting of shrubs and low-lying grasses will need to be trimmed during construction; however, all vegetation removal will be completed with hand tools and will not exacerbate wildfire risk. During the operational period, electronic components will be housed in protective metal boxes and conduits or placed in areas that are graveled to eliminate the risk of wildfire. Therefore, the Project would not exacerbate wildfire risks and expose project occupants to pollution concentrations from a wildfire, and there would be no impact.

c) Would the project 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?

Less than significant impact. The Project includes the installation of electrical wiring and equipment including conduits, solar panels, security cameras, one 12-volt power junction box, and one solar power component box containing batteries. All electrical wiring and hardware will be contained within conduits or utility boxes to ensure no loose wiring is exposed and all vegetation will be trimmed to minimize the risk of fire hazards. To further alleviate the risk of wildfire, the BMP-5: Fire Prevention and Control Plan (Section 1.2.4) will be implemented to comply with the provisions of the California Fire Code (CFC) Chapter 33. The plan will include appropriate preventative measures and emergency procedures to be followed to prevent fires occurring on site during construction and procedures for controlling any potential fires. Therefore, the Project will have a less than significant impact.

d) Would the project 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?

Less than significant impact. The Project is located within the floodplain and has been designed and will operate to withstand high and fluctuating flows.

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The design and operation of the Project would not impact the functionality of the floodway, and therefore the Project would not expose people or structures to significant risks as a result of runoff or drainage changes. Additionally, the risk of fire and subsequent post-fire slope instability from the Project is low as the Project would take place within the river and floodplain and would not impact slopes. Therefore, the Project impacts will be less than significant.

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2.1.21 Mandatory Findings of Significance

Environmental Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project 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?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" meant that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of the other current projects and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

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2.1.21.1 Discussion

a) Does the project 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?

Less than significant with mitigation incorporated. As discussed in the Initial Study, the Project has the potential to impact Biological, Cultural, and Tribal Cultural Resources. With the implementation of mitigation measures, the Project would not 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, 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. The implementation of BMPs (Section 1.2.4) for Air Quality, GHG, Water Quality, Utility Services, and Wildfire would further ensure the Project will reduce construction-related emissions from heavy-duty equipment and vehicles; minimize hydrology and water quality impacts; prevent impacts to underground utilities; and prevent fires in Project area.

Due to the Project's incorporation of Mitigation Measures to offset potential impacts to Biological, Cultural, and Tribal Cultural Resources, the Project would have a less than significant impact on the quality of these environmental resources and it would preserve important examples of the major periods of California history or prehistory. Therefore, these project impacts are less than significant with mitigation incorporated.

b) Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" meant that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of the other current projects, and the effects of probable future projects)?

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Less than significant with mitigation incorporated. Cumulative effects, including the effects of past, current, and future State, tribal, local, or private actions that are reasonably certain to occur in or near the Project area are considered in this study.

Past and current projects:

Mining and dredging activities- Cumulative effects on geology and soils and surface water quantity and quality began during the 1849 California Gold Rush with extensive hydraulic, placer, and hard-rock mining activities. While hydraulic mining activities were stopped by court order before 1900, the activity led to major amounts of sediment and heavy metals moving into streams and other receiving waters. The downstream transport of sediment and metals from this and other historic and current mining activities continues today. Robinson Pit mine is an active mining of sand and gravel pit within 1 mile of the Project footprint.

Water agencies and irrigation district activities- Starting in the 1910s, the Feather River and its tributaries were diverted by water agencies and irrigation districts to supply urban communities and large-scale agricultural development along both sides of the lower Feather River and in the Sacramento Valley. Major engineering activities in the lower Feather River, including channel dredging, levee construction, and ongoing maintenance, have been undertaken by the U.S. Army Corps of Engineers (USACE), U.S. Bureau of Reclamation (USBR), and State and local agencies to provide nearby urban and agricultural areas with much-needed flood protection. Congress initially authorized the Sacramento River Flood Control Project in 1917, and most of the related lower Feather River channelization and levee construction was completed by 1940, prior to the construction of Oroville Dam.

Feather River Fish Monitoring Station (Project)- Installation of a fish monitoring station on the LFR. The Project is discussed and evaluated in this document. Proposed to begin in 2023.

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Probable future projects:

Feather River Salmon Improvement Project- Approximately 5 miles from the Project Area near the Feather River Fish Hatchery between RM 66 And 67. The Feather River Salmon Habitat Improvement Project will supplement the coarse sediment supply below Oroville Dam by adding clean gravel at multiple existing spawning sites, as well as improve salmonid spawning conditions and potential juvenile salmonid rearing habitat availability within two existing side channels. Proposed to begin in June 2023.

When viewed in connection with the above-mentioned past, current, and probable future actions, the Project impacts would not be cumulatively considerable because the Project would be short-term and localized. The Project will implement Mitigation Measures and BMPs to avoid and reduce impacts on environmental resources and/or mitigation measures to offset potential significant impacts to less than significant. Therefore, these project impacts are less than significant with mitigation incorporated.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than significant impact. Potential impacts from the Project would be short-term, temporary, and localized. Project activities will not have substantial direct or indirect adverse environmental impacts on humans. Therefore, these project impacts are less than significant.

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Appendix A. Biological Species Table

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Table A-1. Special-status species with potential to occur in the Project area

Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
AMPHIBIANS AND REPTILES							
foothill yellow-legged Frog (North Feather clade)	*Rana boylii*	FT/ST/-	BLM: S CDFW: SSC IUCN: NT USFS: S	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks for metamorphosis.	Low	Potential suitable aquatic habitat in the Project area but species are unlikely in the region. Nearby observed CNDDB occurrences are either presumed locally extirpated or are more >10 miles from the Project footprint and were last observed more than 20 years ago.	**Less than significant with mitigation measures incorporated.**
California red-legged frog	*Rana draytonii*	FT/-/-	CDFW: SSC IUCN: VU	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Low	The Project area is in the current species range and there is marginal suitable aquatic habitat, but no observed CNDDB occurrences within 10 miles of the Project footprint.	**Less than significant with mitigation measures incorporated.**
western spadefoot	*Spea hammondii*	-/-/-	BLM: S CDFW: SSC IUCN: NT	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are	None	No suitable habitat in the Project area.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				essential for breeding and egg-laying.			
western pond turtle	*Actinemys marmorata*	-/-/-	BLM: S CDFW: SSC IUCN: VU USFS: S	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	High	Suitable aquatic habitat in the Project area. Nearby CNDDB occurrences within 5 miles of the Project footprint adjacent to the Feather River.	**Less than significant with mitigation measures incorporated.**
coast horned lizard	*Phrynosoma blainvillii*	-/-/-	BLM: S CDFW: SSC IUCN: LC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	None	No suitable habitat in the Project area.	**No effect.**
giant gartersnake	*Thamnophis gigas*	FT/ST/-	IUCN: VU	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the gartersnakes in California.	Moderate	Potentially suitable aquatic habitat in the Project area and suitable upland habitat has been identified in the Project area. Nearest occurrence within 2 miles from the	**Less than significant with mitigation measures incorporated.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				Requires summer water with emergent vegetation, suitable prey base and upland with burrows, rip-rap or crevices for brumation.		Project area on the Feather River bank.	
BIRDS							
Tricolored Blackbird	*Agelaius tricolor*	-/ST/-	BLM: S CDFW: SSC IUCN: EN NABCI: RWL USFWS: BCC	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	High	Suitable potential foraging habitat in the Project area and species observed nearby within the low flow channel of the Feather River.	**Less than significant.** The Project may minimally impact foraging habitat, but impacts are less than significant.
Greater Sandhill Crane	*Antigone canadensis tabida*	-/ST/-	BLM: S CDFW: FP USFS: S	Nests in wetland habitats in northeastern California; winters in the Central Valley. Prefers grain fields within 4 miles of a shallow body of water used as a communal roost site; irrigated pasture used as loafing sites.	None	No suitable habitat in the Project area.	**No effect.**
Great Blue Heron	*Ardea herodias*	-/-/-	CDF: S IUCN: LC	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to	High	Suitable potential habitat in the Project area and species	**Less than significant with mitigation**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.		observed within 1 mile of the Project area.	**measures incorporated.**
Western Burrowing Owl	*Athene cunicularia*	-/-/-	BLM: S CDFW: SSC IUCN: LC USFWS: BCC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Low	No suitable habitat in the Project footprint but low potential suitable habitat adjacent to the haul road. Last observation of a Burrowing Owl within 10 miles of the Project footprint was over 20 years ago.	**Less than significant with mitigation measures incorporated.**
Swainson's Hawk	*Buteo swainsoni*	-/ST/-	BLM: S IUCN: LC USFWS: BCC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Moderate	Suitable nesting habitat in the Project area. Foraging habitat not directly adjacent or within the temporary construction limits, but within 0.5 miles of the temporary construction limits.	**Less than significant with mitigation measures incorporated.**
Northern Harrier	*Circus hudsonius*	-/-/-	CDFW: SSC IUCN: LC	Coastal salt & freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienegas. Nests on ground in	None	No suitable habitat in the Project area.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.			
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	FT/SE/-	BLM: S NABCI: RWL USFS: S USFWS: BCC	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Low	Potential suitable migratory habitat but no nesting habitat. With the decline in California populations, individuals are rarely observed and anticipated in the Feather River region. Of the 3 locations in California which support consistent nesting pairs, the nearest location to the Project is the Sacramento River which is greater than 45 miles away from the Project (USFWS 2017a).	**Less than significant.** Species is unlikely to be present and BMPs should minimize any project impacts.
Bald Eagle	*Haliaeetus leucocephalus*	-/SE/-	BLM: S CDF: S CDFW: FP IUCN: LC USFS: S USFWS: BCC	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	High	Suitable habitat in the Project area. Known to nest and forage around the Feather River and nearby Oroville Lake.	**Less than significant with mitigation measures.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Loggerhead Shrike	*Lanius ludovicianus*	-/-/-	CDFW: SSC IUCN: LC USFWS: BCC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub & washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Moderate	Suitable habitat in the Project area.	**Less than significant with mitigation measures.**
California Black Rail	*Laterallus jamaicensis coturniculus*	-/ST/-	BLM: S CDFW: FP IUCN: NT NABCI: RWL USFWS: BCC	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	None	No suitable habitat within the Project area.	**No effect.**
Osprey	*Pandion haliaetus*	-/-/-	CDF: S CDFW: WL IUCN: LC	Ocean shore, bays, freshwater lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	High	Suitable habitat within the Project area. Known to nest and forage around the Feather River and nearby Oroville Lake.	**Less than significant with mitigation measures.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Bank Swallow	*Riparia riparia*	-/ST/-	BLM: S IUCN: LC	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	None	No suitable nesting habitat in or adjacent to the Project area. During the Summer 2021 DWR bank swallow nesting habitat surveys, the LFC was surveyed and was determined to not support suitable bank swallow nesting habitat. Species typically forage up to 1 km away from nesting habitat and unlikely to During Nesting habitat is known to be present on the Feather River south of the Project but could forage in the Project area during migration (Garrison and Turner 2020).	**No effect.**
Yellow Warbler	*Setophaga petechia*	-/-/-	CDFW: SSC USFWS: BCC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	High	Suitable habitat in the Project area and several occurrences in within 5 miles of the Project footprint.	**Less than significant with mitigation measures.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Least Bell's Vireo	*Vireo bellii pusillus*	FE/SE/-	IUCN: NT NABCI: YWL	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, baccharis sp., mesquite.	None	Not within current species range (extirpated from the Central Valley with no breeding pairs since prior to 1986 (USFWS 2006))	**No effect.**
FISHES							
Delta Smelt	*Hypomesus transpacificus*	FT/SE/-	AFS: TH IUCN: EN	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait & San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.	None	No suitable habitat in the Project area.	**No effect.**
Green Sturgeon-Southern DPS	*Acipenser medirostris* pop. 1	FT/-/-	AFS: VU IUCN: NT	Spawning site fidelity. Spawns in the Sacramento, Feather and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Sacramento-San Joaquin	High	Known presence in the low flow channel of the Feather River. Project area is in Green Sturgeon southern DPS critical habitat.	**Less than significant impact.** Green sturgeon are unlikely to be present during construction and the project has incorporated design features facilitate fish passage so impacts are less than significant.

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				Delta estuary is important for rearing juveniles.			
California Central Valley Steelhead	*Oncorhynchus mykiss irideus pop. 11*	FT/-/-	AFS: TH	Populations in the Sacramento and San Joaquin Rivers and their tributaries.	High	Known presence in the low flow channel of the Feather River. Project area is in California Central Valley Steelhead critical habitat.	**Less than significant with mitigation measures.**
Central Valley spring-run Chinook Salmon	*Oncorhynchus tshawytscha pop. 6*	FT/ST/-	AFS: TH	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 C are lethal to adults. Federal listing refers to populations spawning in Sacramento River and tributaries.	High	Known presence in the low flow channel of the Feather River. Project area is in Central Valley spring-run Chinook Salmon critical habitat.	**Less than significant impact.** The project has incorporated design features facilitate fish passage, so impacts are less than significant.
INVERTEBRATES							
vernal pool fairy shrimp	*Branchinecta lynchi*	FT/-/-	IUCN: VU	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed	None	No suitable vernal pool habitat within the Project area.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				swale, earth slump, or basalt-flow depression pools.			
monarch butterfly	*Danaus plexippus*	CFT/-/-	USFS: S	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	Low	The Project area is within the spring/summer migratory path and blooming nectar plants are present. Project area is outside wintering range and does not provide quality breeding habitat.	**Less than significant impact.** Project will not impact wintering habitat. Potential impacts to nectar and breeding resources would be minimal.
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT/-/-		Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	Moderate	Host plants (elderberry shrubs) less than one inch in diameter occur within the Project area, but no mature host plants have been detected to date. With populations in decline (most recent CNDDB observation within 10 miles was over 15 years ago), individuals are unlikely to be present within the Project area.	**Less than significant with mitigation measures.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
western ridged mussel	*Gonidea angulata*	-/-/-		Primarily creeks and rivers and less often lakes. Originally in most of state, now extirpated from Central and Southern California.	Low	Historic occurrences in the Feather River but no recent (since 1990) observations.	**Less than significant impact.** Species is not likely to occur in Project area and impacts to habitat will be minimal.
vernal pool tadpole shrimp	*Lepidurus packardi*	FE/-/-	IUCN: EN	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	None	No suitable vernal pool habitat within the Project area.	**No effect.**
California linderiella	*Linderiella occidentalis*	-/-/-	IUCN: NT	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and total dissolved solids.	None	No suitable vernal pool habitat within the Project area.	**No effect.**
MAMMALS							

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Townsend's big-eared bat	*Corynorhinus townsendii*	-/-/-	BLM: S CDFW: SSC IUCN: LC USFS: S WBWG: H	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Low	No suitable roosting habitat in the Project area, but potential foraging habitat.	**Less than significant impact.** Project activities would occur during daylight hours when species are least active and would not impact roosting habitat.
North American porcupine	*Erethizon dorsatum*	-/-/-	IUCN: LC	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges. Wide variety of coniferous and mixed woodland habitat.	None	No suitable habitat in the Project area.	**No effect.**
western mastiff bat	*Eumops perotis californicus*	-/-/-	BLM: S CDFW: SSC WBWG: H	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Moderate	The Project area potential roosting habitat in trees, but there is potential foraging habitat. Reported occurrences within 15 miles of the Project footprint are over 20 years old.	**Less than significant impact.** Project activities would occur during daylight hours when species are least active and would not impact roosting habitat.
silver-haired bat	*Lasionycteris noctivagans*	-/-/-	IUCN: LC WBWG: M	Primarily a coastal and montane forest dweller, feeding over streams, ponds	Moderate	Within species range and there are trees within the Project area that may serve as	**Less than significant impact.** Project activities would occur

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				& open brushy areas. Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. Needs drinking water.		suitable roosting habitat. There are several reported occurrences within 9 miles of the Project footprint that are over 15 years old.	during daylight hours when species are least active and would not impact roosting habitat.
fringed myotis	*Myotis thysanodes*	-/-/-	BLM: S IUCN: LC USFS: S WBWG: H	In a wide variety of habitats, optimal habitats are pinyon-juniper, valley foothill hardwood & hardwood-conifer. Uses caves, mines, buildings or crevices for maternity colonies and roosts.	None	On the edge of the species range but no suitable habitat.	**No effect.**
Yuma myotis	*Myotis yumanensis*	-/-/-	BLM: S IUCN: LC WBWG: LM	Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	Low	No suitable roosting habitat in the Project area, but potential foraging habitat.	**Less than significant impact.** Project activities would occur during daylight hours when species are least active and would not impact roosting habitat.
fisher - west coast DPS	*Pekania pennanti*	-/ST/-	BLM: S CDFW: SSC USFS:S	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Uses cavities, snags,	None	Outside of species range.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				logs and rocky areas for cover and denning. Needs large areas of mature, dense forest.			
PLANTS							
depauperate milk-vetch	*Astragalus pauperculus*	-/-/4.3		Chaparral, cismontane woodland, valley and foothill grassland. Stony flats and shallow depressions, thin soils of red sand or clay of volcanic origin; vernally mesic. 60-1215 m.	None	No appropriate soils in the Project area.	**No effect.**
Mexican mosquito fern	*Azolla microphylla*	-/-/4.2		Marshes and swamps. Ponds and still water. 30-100 m.	High	Appropriate habitat in the Project area. Occurrence in the OWA.	**Less than significant with mitigation measures.**
big-scale balsamroot	*Balsamorhiza macrolepis*	-/-/1B.2	BLM: S USFS: S	Chaparral, valley and foothill grassland, cismontane woodland. Sometimes on serpentine. 35-1465 m.	Moderate	Appropriate habitat in the Project area.	**Less than significant with mitigation measures.**
valley brodiaea	*Brodiaea rosea* ssp. *vallicola*	-/-/4.2		Valley and foothill grassland (swales), vernal pools. Old alluvial terraces. Silty, sandy, and gravelly loam. 10-335 m.	Low	Habitat within the Project area is only marginally appropriate. Soils (dredge tailings) are likely inappropriate.	**Less than significant with mitigation measures.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Sierra foothills brodiaea	*Brodiaea sierrae*	-/-/4.3		Chaparral, cismontane woodland. Usually on gabbro or serpentine. Occasionally on other soil types where conditions limit cover of other plants. 50-945 m.	None	Soils within the Project area are inappropriate and Project area is outside the known range of this species.	**No effect.**
brassy bryum	*Bryum chryseum*	-/-/4.3		Cismontane woodland, valley and foothill grassland, chaparral. Openings. 50-600 m.	Low	The Project area provides appropriate habitat but is below the known elevation range of the species.	**Less than significant with mitigation measures.**
thread-leaved beakseed	*Bulbostylis capillaris*	-/-/4.2		Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest. 395-2075 m.	None	No suitable habitat in the Project area.	**No effect.**
Butte County calycadenia	*Calycadenia oppositifolia*	-/-/4.2	USFS: S	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, meadows and seeps. Dry, often stoney plains and rock outcrops, on serpentine or volcanic soils. 90-945 m.	None	Not within appropriate elevation for species.	**No effect.**
pink creamsacs	*Castilleja rubicundula*	-/-/1B.2	BLM: S	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland. Openings in	None	No serpentine soils in the Project area.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
	var. *rubicundula*			chaparral or grasslands. On serpentine. 20-915 m.			
Brandegee's clarkia	*Clarkia biloba* ssp. *brandegeeae*	-/-/4.2	BLM: S	Chaparral, cismontane woodland, lower montane coniferous forest. Often in roadcuts. 75-915 m.	None	Not within species range.	**No effect.**
Mosquin's clarkia	*Clarkia mosquinii*	-/-/1B.1	BLM: S SB: RSABG USFS: S	Cismontane woodland, lower montane coniferous forest. Usually on steep, rocky cutbanks and slopes. 215-1480 m.	None	Not within species range.	**No effect.**
recurved larkspur	*Delphinium recurvatum*	-/-/1B.2	BLM: S SB: UCSB	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. 3-790 m.	None	No alkaline soils in the Project area.	**No effect.**
shield-bracted monkeyflower	*Erythranthe glaucescens*	-/-/4.3		Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Wet places, often in rock crevices, and in serpentine seeps. 60-1240 m.	None	Not within species range.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Butte County fritillary	*Fritillaria eastwoodiae*	-/-/3.2	USFS: S	Chaparral, cismontane woodland, lower montane coniferous forest. Usually on dry slopes but also found in wet places; soils can be serpentine, red clay, or sandy 4550-1475 m.	None	Not within species range.	**No effect.**
adobe-lily	*Fritillaria pluriflora*	-/-/1B.2	BLM: S SB: RSABG SB: UCBBG	Chaparral, cismontane woodland, valley and foothill grassland. Usually on clay soils; sometimes serpentine. 45-945 m.	None	No suitable clay or serpentine soils in the Project area.	**No effect.**
hogwallow starfish	*Hesperevax caulescens*	-/-/4.2		Valley and foothill grassland, vernal pools. Clay soils; mesic sites. 0-505 m.	None	No suitable clay soils in the Project area.	**No effect.**
woolly rose-mallow	*Hibiscus lasiocarpos* var. *occidentalis*	-/-/1B.2	SB: RSABG SB: UCBBG	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks & low peat islands in sloughs; can also occur on riprap and levees. In California, known from the delta watershed. 0-155 m.	Moderate	Suitable habitat in the Project area.	**Less than significant with mitigation measures.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Ahart's dwarf rush	*Juncus leiospermus* var. *ahartii*	-/-/1B.2		Valley and foothill grassland. Restricted to the edges of vernal pools in grassland. 30-100 m.	None	No suitable vernal pool or grassland swale habitat.	**No effect.**
Red Bluff dwarf rush	*Juncus leiospermus* var. *leiospermus*	-/-/1B.1	BLM: S USFS: S	Chaparral, valley and foothill grassland, cismontane woodland, vernal pools, meadows and seeps. Vernally mesic sites. Sometimes on edges of vernal pools. 30-1255 m.	Low	Marginally suitable habitat in the Project area. No vernal pool complexes or mesic sites present.	**Less than significant with mitigation measures.**
bristly leptosiphon	*Leptosiphon acicularis*	-/-/4.2	BLM: S SB: UCBBG	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Grassy areas, woodland, chaparral. 55-1500 m.	Low	Marginally suitable habitat in the Project area. Species is not likely to occur on dredge tailings.	**Less than significant with mitigation measures.**
Humboldt lily	*Lilium humboldtii* ssp. *humboldtii*	-/-/4.2		Chaparral, lower montane coniferous forest, cismontane woodland. Yellow-pine forest, openings or open forest. 90-1280 m.	None	Not within species range.	**No effect.**
Butte county meadowfoam	*Limnanthes floccosa* ssp. *californica*	FE/SE/1B.1	SB: RSABG	Vernal pools, valley and foothill grassland. Wet or flowing drainages & depressions; often not in discrete vernal pools; soils	None	No suitable mesic grassland or vernal pool complex habitat within Project area.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
				are usually Redding clay with rocks. 35-370 m.			
woolly meadowfoam	*Limnanthes floccosa* ssp. *floccosa*	-/-/4.2	SB: UCBBG	Chapparal, cismontane woodland, valley and foothill grassland, vernal pools. Vernally wet areas, ditches, and ponds. 60-1335 m.	None	Unlikely to occur since closest observation is greater than 20 miles from the Project area and the species is typically associated in higher elevations.	**No effect.**
sylvan microseris	*Microseris sylvatica*	-/-/4.2		Chaparral, cismontane woodland, Great Basin scrub, pinyon and juniper woodland, valley and foothill grassland. Serpentine. 45-1500 m.	None	No serpentine soils in the Project area.	**No effect.**
Tehama navarretia	*Navarretia heterandra*	-/-/4.3		Vernal pools, valley and foothill grassland. Mesic sites in grassland or vernal pools. 30-1010 m.	None	No suitable mesic grassland or vernal pool complex habitat within Project area.	**No effect.**
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	-/-/1B.1		Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales; adobe or alkaline soils. 3-1680 m.	None	No adobe or alkaline soils in Project area.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
slender Orcutt grass	*Orcuttia tenuis*	FT/SE/1 B.1	SB: UCBBG	Vernal pools. Often in gravelly substrate. 25-1755 m.	None	No suitable vernal pool habitat in Project area.	**No effect.**
Ahart's paronychia	*Paronychia ahartii*	-/-/1B.1	BLM: S	Valley and foothill grassland, vernal pools, cismontane woodland. Stony, nearly barren clay of swales and higher ground around vernal pools. 45-500 m.	Low	Marginally suitable habitat in the Project area. Species is not likely to occur on dredge tailings.	**Less than significant with mitigation measures.**
wine-colored tufa moss	*Plagiobryoides vinosula*		-/-/4.2	Cismontane woodland, meadows and seeps, Mojavean desert scrub, pinyon and juniper woodland, riparian woodland. FNA says "damp, calcareous rock." Also known near hot springs. 240-670 m.	None	Not within appropriate elevation for species.	**No effect.**
Bidwell's knotweed	*Polygonum bidwelliae*	-/-/4.3		Chaparral, cismontane woodland, valley and foothill grassland. Bare open areas on flats and volcanic outcrops; often in clay soils. 60-1200 m.	None	Not within appropriate elevation for species.	**No effect.**

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Common Name	Scientific Name	Fed/ State/ CNPS	Other Status	Habitat	Potential to Occur	Justification for Potential to Occur	Effect Determination
Sanford's arrowhead	*Sagittaria sanfordii*	-/-/1B.2	BLM: S	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-605 m.	Moderate	Suitable habitat within Project area.	**Less than significant with mitigation measures.**
English peak greenbrier	*Smilax jamesii*	-/-/4.2		North coast coniferous forest, broadleafed upland forest, lower montane coniferous forest, upper montane coniferous forest, marshes and swamps. Along streams and lake margins, sometimes mesic depressions. 505-1975 m.	None	Not within appropriate elevation for species.	**No effect.**
Butte county golden clover	*Trifolium jokerstii*	-/-/1B.2	BLM: S SB: USDA	Valley and foothill grassland, vernal pools. Mesic sites in grassland. 45-400 m.	None	Not within appropriate elevation for species.	**No effect.**
Greene's tuctoria	*Tuctoria greenei*	FE/SR/1B.1		Vernal pools. Vernal pools in open grasslands. 25-1325 m.	None	No suitable vernal pool habitat in Project area.	**No effect.**
Brazilian watermeal	Wolffia brasiliensis	-/-/2B.3		Marshes and swamps. Shallow freshwater marshes. 15-110 m.	High	Suitable habitat within Project area. Occurrence nearby in OWA.	**Less than significant with mitigation measures.**

Table A-1 notes:
Status Key:
FE = Federally Endangered; listed as Endangered under the federal Endangered Species Act

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FT = Federally Threatened; listed as Threatened under the federal Endangered Species Act
CFT = California Federally Threatened; U.S. Fish and Wildlife Service proposed threatened under the federal Endangered Species Act
SE = State Endangered; listed as Endangered under the California Endangered Species Act
ST = State Threatened; listed as Threatened under the California Endangered Species Act
1B.1 = CNPS Rare Plant Rank (CRPR); listed as rare throughout their range. Seriously threatened in California
1B.2 = CNPS CRPR; listed as rare throughout their range. Moderately threatened in California
2B.3 = CNPS CRPR; listed as rare, threatened, or endangered in California but more common elsewhere. Not very threatened in California
3.2 = CNPS CRPR; lack the necessary information to assign them to one of the other ranks or to reject them. Moderately threatened in California.
4.2 = CNPS CRPR; limited distribution or infrequent throughout a broader area in California, and their status should be monitored regularly. Moderately threatened in California.
4.3 = CNPS CRPR; limited distribution or infrequent throughout a broader area in California, and their status should be monitored regularly. Not very threatened in California.
AFS: TH = American Fisheries Society (AFS)- Threatened
BLM: S= Bureau of Land Management (BLM) Sensitive
CDF: S= California Department of Forestry and Fire Protection (CDF) Sensitive
CDFW: FP = California Department of Fish and Wildlife (CDFW) Fully Protected
CDFW: SSC= CDFW Species of Special Concern
CDFW: WL= CDFW Watch List
IUCN: EN= International Union for Conservation of Nature (IUCN) Red List of Threatened Species-Endangered
IUCN: LC= IUCN Red List of Threatened Species- Least Concern
IUCN: NT= IUCN Red List of Threatened Species- Near Threatened
IUCN: VU= IUCN Red List of Threatened Species- Vulnerable
NABCI: RWL= North American Bird Conservation Initiative- Red Watch List
NABCI: YWL= North American Bird Conservation Initiative- Yellow Watch List
SB: RSABG= SB_RSABG-Rancho Santa Ana Botanic Garden
SB: UCBBG= SB_UCBBG-UC Berkeley Botanical Garden
SB: UCSB= SB_UCSB-UC Santa Barbara
SB: USDA= SB_USDA-U.S. Dept of Agriculture
USFS: S= U.S. Forest Service (USFS) Sensitive
USFWS: BCC= U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern
WBWG: H= Western Bat Working Group (WBWG)- High Priority
WBWG: LM= WBWG- Low-Medium Priority
WBWG: M= WBWG- Medium

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Appendix B. Air Quality and Greenhouse Gas (GHG) Emission Analyses

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Fish Monitoring Station — Inventory and Calculation of Greenhouse Gas Emissions

Table B-1. Emissions from Construction Equipment

Type of Equipment	Maximum Number per Day	Total Operation Days	Total Operation Hours[1]	Fuel Consumption Per Hour[2]	Total Fuel Consumption (gal. diesel)	CO_2e/gal diesel [3]	Total CO_2 Equivalent Emissions (metric tons)
Jet Boats (eqmt line 144)	3	13	39	5.71	223	0.010	2.32
Hydraulic Post Pounder and generator (eqmt line 72)	1	10	30	0.20	6	0.010	0.06
Low-boy tractor trailer (eqmt line 202)	1	1	2	11.51	23	0.010	0.24
Tractor with auger (eqmt line 175)	1	1	2	1.41	3	0.010	0.03
TOTAL					**255**		**3**

Table B-1 notes:
[1] An eight-hour workday is assumed. Some equipment not used for all eight hours, see Key Assumptions for details.
[2] California Air Resource Board Offroad 2007 Emissions Inventory fuel consumption factors.
[3] World Resources Institute-Mobile combustion CO emissions tool, June 2003 Version 1.2.

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Table B-2. Emissions from Transportation of Construction Workforce

Average Number of Workers per Day	Total Number of Workdays	Average Distance Travelled (round trip)	Total Miles Travelled	Average Passenger Vehicle Fuel Efficiency[4]	Total Fuel Consumption (gal. gasoline)	CO2e/gal Gasoline [3]	Total CO_2 Equivalent Emissions (metric tons)
7.153846154	13	50	4650	20.8	223.6	0.009	2

Table B-2 notes:
[3] World Resources Institute-Mobile combustion CO emissions tool, June 2003 Version 1.2.
[4] United States Environmental Protection Agency. 2008. Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2008. [EPA420-R-08-015]

Table B-3. Emissions from Transportation of Construction Materials

Trip Type	Total Number of Trips	Average Trip Distance	Total Miles Travelled	Average Semi-truck Fuel Efficiency	Total Fuel Consumption (gal. diesel)	CO2e/gal Diesel [3]	Total CO_2 Equivalent Emissions (metric tons)
Delivery	0	0	0	6	0	0.010	0
Spoils	0	0	0	6	0	0.010	0
TOTAL							0

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Table B-4. Construction Electricity Emissions

MWh of electricity	$mtCO_2e$/ MWh [5]	CO_2e emissions
0	0.277	0

Table B-4 note:
[5] eGRID2010 Version 1.0 CAMX-WECC sub-region.

Project Totals

Total construction emissions from construction equipment, transportation of construction workforce, transportation of construction materials, and electricity: 4.66 $mtCO_2$ equivalents

Total years of construction: 1

Expected start date of construction: March 1, 2022

Estimated project useful life: 1 year

Average Annual Total GHG Emission (short-term construction emissions amortized over life of project): 4.66 $mtCO_2$ equivalents.

Max. Year Construction GHG Emissions (total from single year of construction when emissions peak [for multi-year construction projects]): 4.66 $mtCO_2$ equivalents.

NOTE: The average annual total GHG emissions is not the same value as the maximum annual emissions (MAE) value that is required on the DWR GGERP Consistency Form for Projects Using Outside Labor and Equipment. The MAE is calculated to ensure that the project does not emit more than 12,500 $mtCO_2e$ in any given year.