JUVENILE SALMONID COLLECTION SYSTEM PILOT PROJECT

Initial Study/Proposed Mitigated Negative Declaration

Prepared for
California Department of Water Resources

May 2022

ESA

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Acronyms and Other Abbreviations

Acronym or Abbreviation	Definition
µin/sec	microinches per second
AB	Assembly Bill
ADCP	Acoustic Doppler Current Profiler
ADV	Acoustic Doppler Velocimeter
BAMM	Best Available Mitigation Measures
Basin Plan	Water Quality Control Plan
BMI	benthic macroinvertebrates
BMP	best management practice
CAL FIRE	California Department of Forestry and Fire Protection
CalOES	California Governor's Office of Emergency Services
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CCR	California Code of Regulations
CDEC	California Data Exchange Center
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGS	California Geological Survey
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	CO_2 equivalents
CRPR	California Rare Plant Rank
CVP	Central Valley Project
dB	decibels
dBA	A-weighted decibel
DIDSON	Dual Frequency Identification Sonar
District	Shasta County Air Quality Management District
DOC	California Department of Conservation
DTSC	California Department of Toxic Substances Control

Acronym or Abbreviation	Definition
µin/sec	microinches per second
DWR	California Department of Water Resources
ESA	Environmental Science Associates
FESA	Federal Endangered Species Act
FHSZ	fire hazard severity zone
FR	*Federal Register*
FRA	Federal Responsibility Area
GGERP	Greenhouse Gas Emissions Reduction Plan
GHG	greenhouse gas
HAZMAT	hazardous materials
HCP	habitat conservation plan
HDPE	High Density Polyethylene
HMMP	Hazardous Materials Management Program
I-5	Interstate 5
in/sec	inches per second
JSCS	Juvenile Salmonid Collection System
L_{eq}	equivalent sound level
$L_{eq[h]}$	A-weighted equivalent sound level
L_{dn}	day-night average sound level
L_{max}	maximum noise level
LWD	large woody debris
M&I	municipal and industrial
MBTA	Migratory Bird Treaty Act
NAHC	Native American Heritage Commission
NEIC	Northeastern Information Center
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOx	nitrogen oxide or oxides of nitrogen
NO2	nitrogen dioxide
PM10	particulate matter with aerodynamic diameter equal to or less than 10 micrometers
PM2.5	particulate matter with aerodynamic diameter equal to or less than 2.5 micrometers
PPV	peak particle velocity
Proposed project	Juvenile Salmonid Collection System Pilot Project
Reclamation	U.S. Bureau of Reclamation

Acronym or Abbreviation	Definition
µin/sec	microinches per second
RMS	root-mean-square
ROG	reactive organic gases
SLC	California State Lands Commission
SLF	Sacred Lands File
SMBMI	San Manuel Band of Mission Indians
SMM	Standard Mitigation Measures
SO2	sulfur dioxide
SOI PQS	U.S. Secretary of the Interior's Professional Qualifications Standards
SWAP	State Wildlife Action Plan
SWP	State Water Project
TCR	Tribal Cultural Resource
TMDL	Total Maximum Daily Load
UAIC	United Auburn Indian Community of the Auburn Rancheria of California
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	vibration decibels
VHFHSZ	Very High Fire Hazard Severity Zone
VMT	vehicle miles traveled
VOC	volatile organic compounds
WEAP	Worker Environmental Awareness Program
WSEL	water surface elevation
WWT	Winnemem Wintu Tribe
WWTCL	Winnemem Wintu Tribal Cultural Landscape
YDWN	Yocha Dehe Wintun Nation

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CHAPTER 1
Introduction

1.1 Introduction

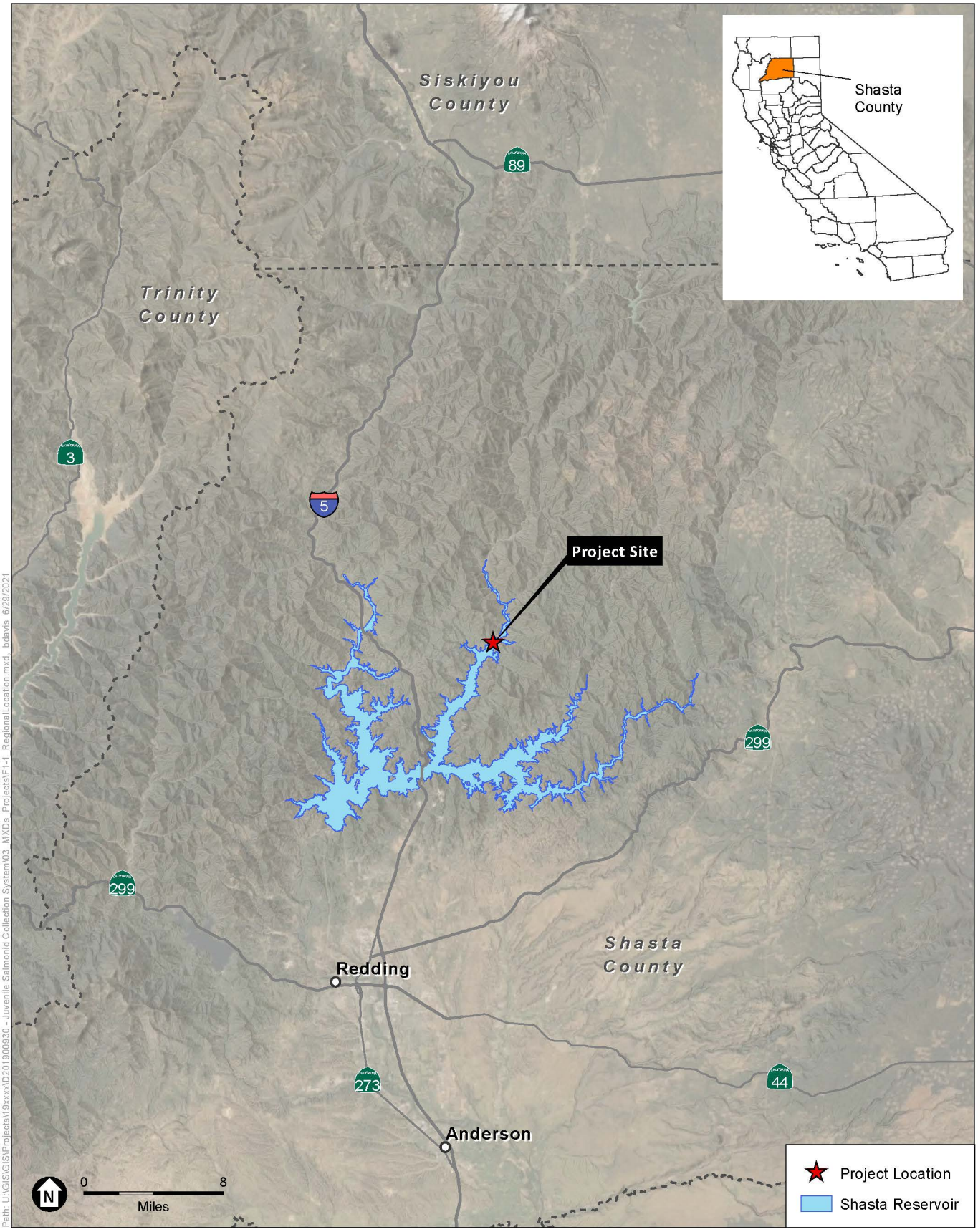
The Juvenile Salmonid Collection System (JSCS) is an experimental, adaptive, and mobile guidance and capture system designed to collect out-migrating juvenile salmonids at the head of a reservoir, just downstream from where rivers enter the reservoir. Given its adaptability, the JSCS may be considered for other reintroduction efforts above high-head dams in California.

The Department of Water Resources (DWR) with the assistance of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries), are developing the JSCS Pilot Project (proposed Project) to determine if the system can be a critical part of the effort to reintroduce native anadromous salmonids back into historical spawning and rearing tributaries of the upper Sacramento River system. DWR also acknowledges the Winnemem Wintu Tribe (WWT) as a key partner on the proposed Project and appreciates that the WWT have shared their knowledge and understanding of the value of revitalizing the salmon population, which has informed the development of this document and benefits the project through continued coordination and partnership.

NOAA Fisheries vulnerability assessments have determined that the future viability of anadromous migratory salmon is at high risk due to impacts from climate change (Crozier et al. 2019). Thus, reintroduction into cold water habitats upstream of large Central Valley reservoirs is a high priority for long-term conservation and recovery of listed Central Valley salmon and steelhead, as outlined in NOAA Fisheries' Central Valley Recovery Plan, the State's 2016 Water Action Plan (referenced by the new 2020 Water Resilience Portfolio) and Sacramento Valley Salmon Resiliency Strategy, the California Department of Fish and Wildlife's (CDFW) State Wildlife Action Plan and associated California State Wildlife Action Plan (SWAP) and the WWT Salmon Restoration Plan.

The proposed Project would evaluate the feasibility and viability of collecting juvenile anadromous salmonids as they emigrate out of historical habitat upstream from Shasta Dam (**Figure 1-1**). The success of the proposed Project is an integral, yet independent, step in the reintroduction effort.

The proposed Project does not reintroduce fish; it aims to demonstrate the feasibility and viability of the JSCS to provide proper conditions for capturing juvenile salmonids by altering flow patterns and velocities and controlling water temperatures. If successful, a separate, subsequent project(s) would be implemented for additional testing to confirm the ability of the JSCS to capture fish and to determine which fish would be reintroduced.



SOURCE: Esri, 2015; ESA, 2021

Juvenile Salmonid Collection System Pilot Project

Figure 1-1
Regional Location

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As described in detail below, the proposed Project includes three JSCS system components (debris boom, guidance net, and temperature curtain) for initial testing, with up to two annual tests between 2022 and 2024. DWR is the California Environmental Quality Act (CEQA) lead agency for the proposed Project.

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CHAPTER 2
Project Description

2.1 Project Description

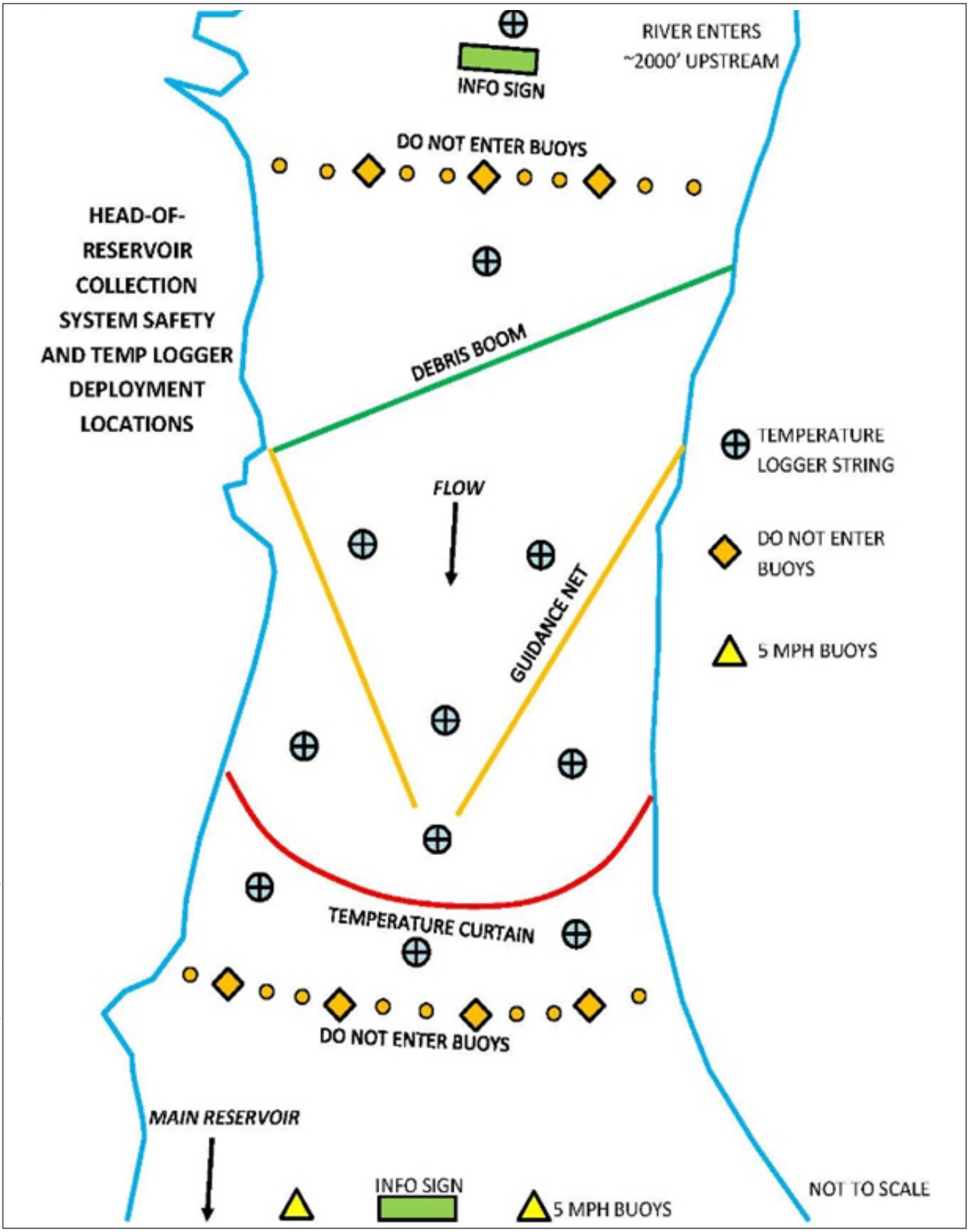
The proposed Project system components include a debris boom, guidance net, temperature curtain (**Figure 2-1**); these components are described in greater detail, below. Overall, the proposed Project would investigate how well the temperature curtain works at keeping the upstream reservoir pool cool (eventually for collecting juvenile salmonids), and how the hydraulics of the guidance net can be manipulated to improve the potential to capture fish. Annual testing for approximately six to eight weeks in September through November is proposed. Testing would occur in up to two years. The proposed Project's experimental evaluation approach for the first year would determine if the system creates required fish guidance conditions, water temperature control, and debris management to effectively and safely capture juvenile salmonids. Based on the results of that initial evaluation, additional testing in a second year and/or system modifications would be completed (if required) to address any issues of physical operations of each component of the system.

The debris boom would be installed in the McCloud Arm of the Shasta Reservoir and would keep floating debris from entering the area where the guidance nets are located. The guidance net would be installed downstream of the debris boom and to provide a barrier to fish and be oriented in a "v" shape to guide fish. Resident fish passage would be provided through resident fish passage devices in the guidance net at eight locations. An impermeable temperature curtain would be installed just downstream of the guidance net. Temporary anchoring systems would be installed for each component using large clump weights (large heavy chain and pieces of steel or concrete) laying on the channel bank near the water's edge and in some instances using also (temporary) soft nylon slings around rocks and/or large trees. The anchoring system would hold the debris boom, guidance net, and temperature curtain in-place.

A more detailed description of the proposed Project components is located below.

2.2 Study Area

The Study Area for the proposed Project is within the McCloud Arm of Shasta Reservoir (see **Figure 2-2**). The exact location for each year of the proposed Project (Project footprint) is not known because reservoir pool (water surface) elevations vary year to year in the September through November target time period for deployment. The actual location of the proposed Project would be determined based on: 1) the actual reservoir elevation estimated in the summer months—and refined in the weeks—prior to installation; 2) consideration for the specifics of installation feasibility and site geometries; 3) presence of biological resources; and 4) collaboration with the WWT, to avoid any sensitive cultural and/or biological resources in the area that are considered important to the tribal community.



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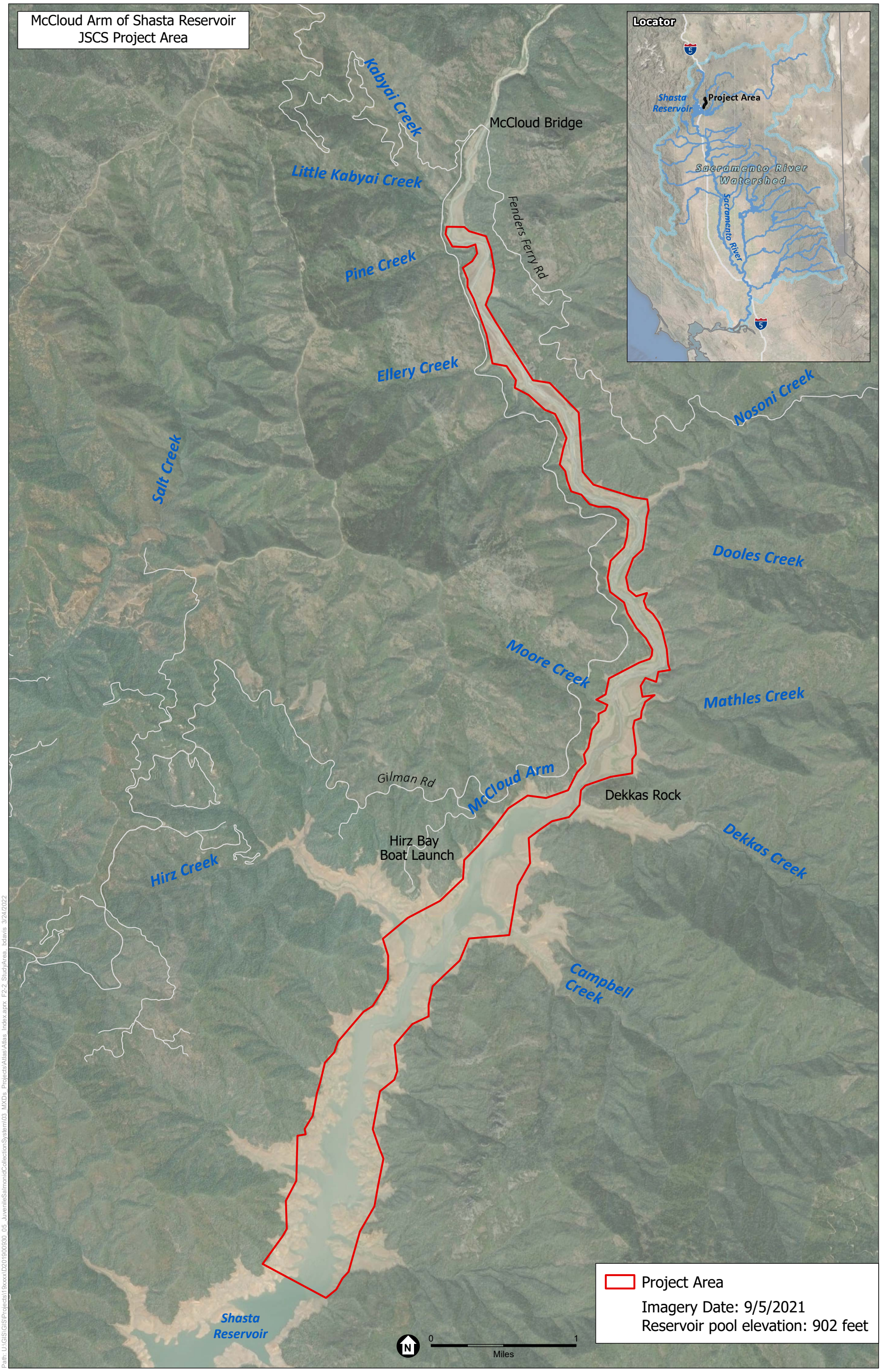
SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-1
The Juvenile Salmonid Collection System



SOURCE: Esri, 2022; DWR 2021; ESA, 2022

Juvenile Salmonid Collection System

ESA

Figure 2-2
Study Area
McCloud Arm, Shasta Reservoir

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The initial target reservoir water depth for installation would be approximately 40 feet, allowing the JSCS to be deployed for four to five weeks at a site before reservoir elevations drop to a point that requires movement downstream. Because reservoir elevation drops by typically two to four feet per week during September, the initial location may become too shallow and the JSCS would have to be relocated at a location downstream (yet still within the Study Area).

2.3 Project Objectives

DWR is working on the JSCS Pilot Project in partnership with the WWT and the participating agencies. The objective of the proposed Project is to provide information obtained through the deployment and monitoring of the JSCS to support the reintroduction effort; specifically, how well the temperature curtain works at keeping the upstream reservoir pool cool and how the hydraulics of the guidance net can be manipulated (and potentially improved) in order to collect juvenile salmonids.

2.4 Proposed Project System Components

2.4.1 Debris Boom

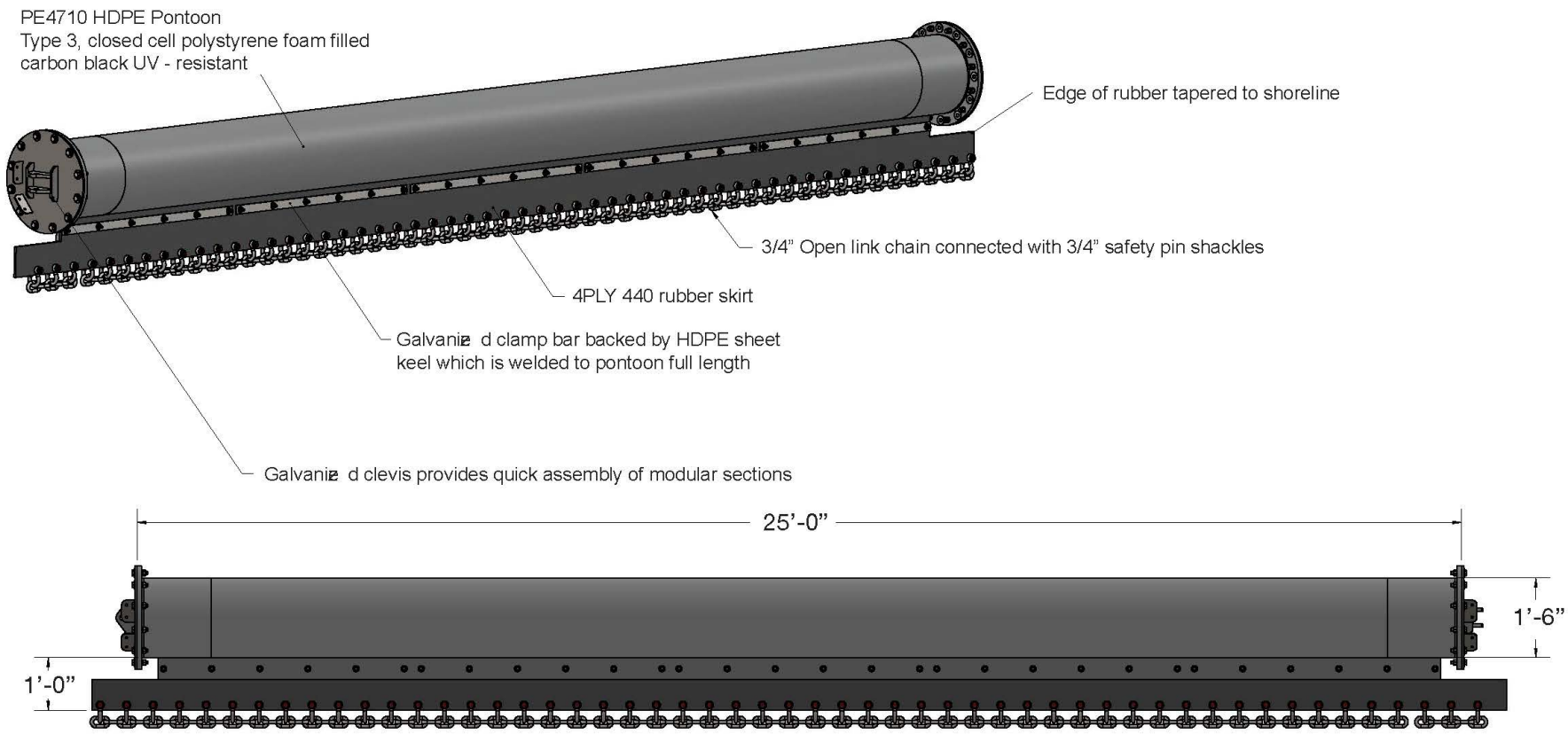
The debris boom (**Figure 2-3**) would span the entire McCloud Arm of Shasta Reservoir and has a one-foot-deep skirt that hangs from the bottom of 18-inch diameter pontoons to keep floating debris from entering the area where the guidance nets are located. The system would collect debris of varying size and composition and a debris handling protocol and methodology would be developed for handling and removal of debris from the river under various flow conditions.

2.4.2 Guidance Net

The guidance net (**Figure 2-4**) would be installed downstream of the debris boom, provide a barrier to fish from water surface to channel bottom and bank to bank, and be oriented at an angle to guide fish. Temporary impermeable panels would be placed in front of the netting to improve the hydraulics along the net, especially at lower flows. As flows increase, these impermeable panels can be removed. The guidance net would also be able to pass resident fish species upstream through a set of eight resident fish passage devices, described in the following section.

The guidance net would be monitored by equipment that may include acoustic, infrared, and visible light cameras to understand fish passage through and behavior near the net, and to evaluate maintenance needs. Details for the guidance net are below:

- Angle of net would change based on the width of the channel at the McCloud Arm installation location, or would be shortened/lengthened to keep same angle
- Netting is 1/8-inch ultra-high-molecular-weight polyethylene (Dyneema)
- Impermeable (vinyl) panels make up the outer areas of the guidance net near the banks (72 feet long on each side)
- Impermeable panels also make up the lower 15 feet of the guidance net



SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-3
Debris Boom
(one section shown)

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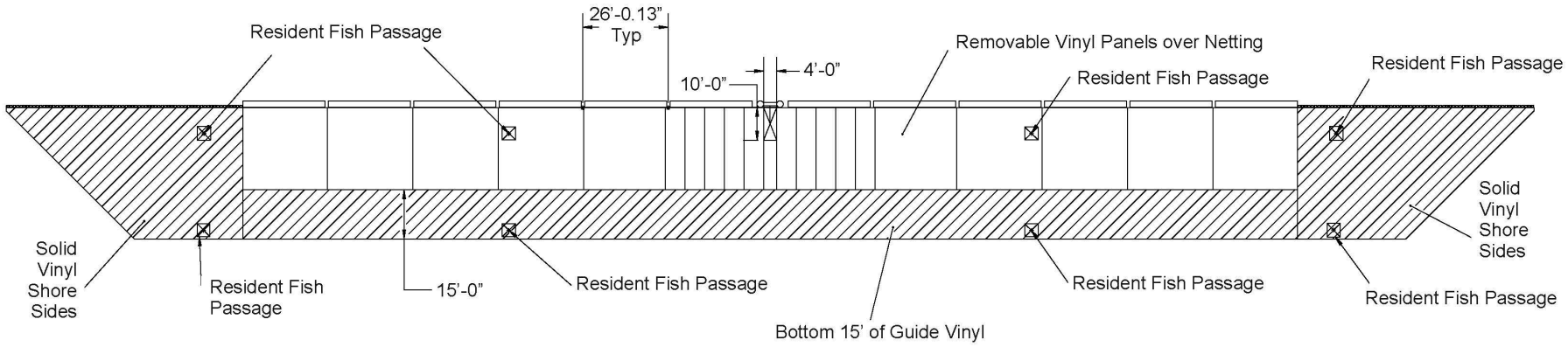

SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-4

Guidance Net with Removable Panels, 4' X 10' Notch, and Resident Fish Passage Tunnels

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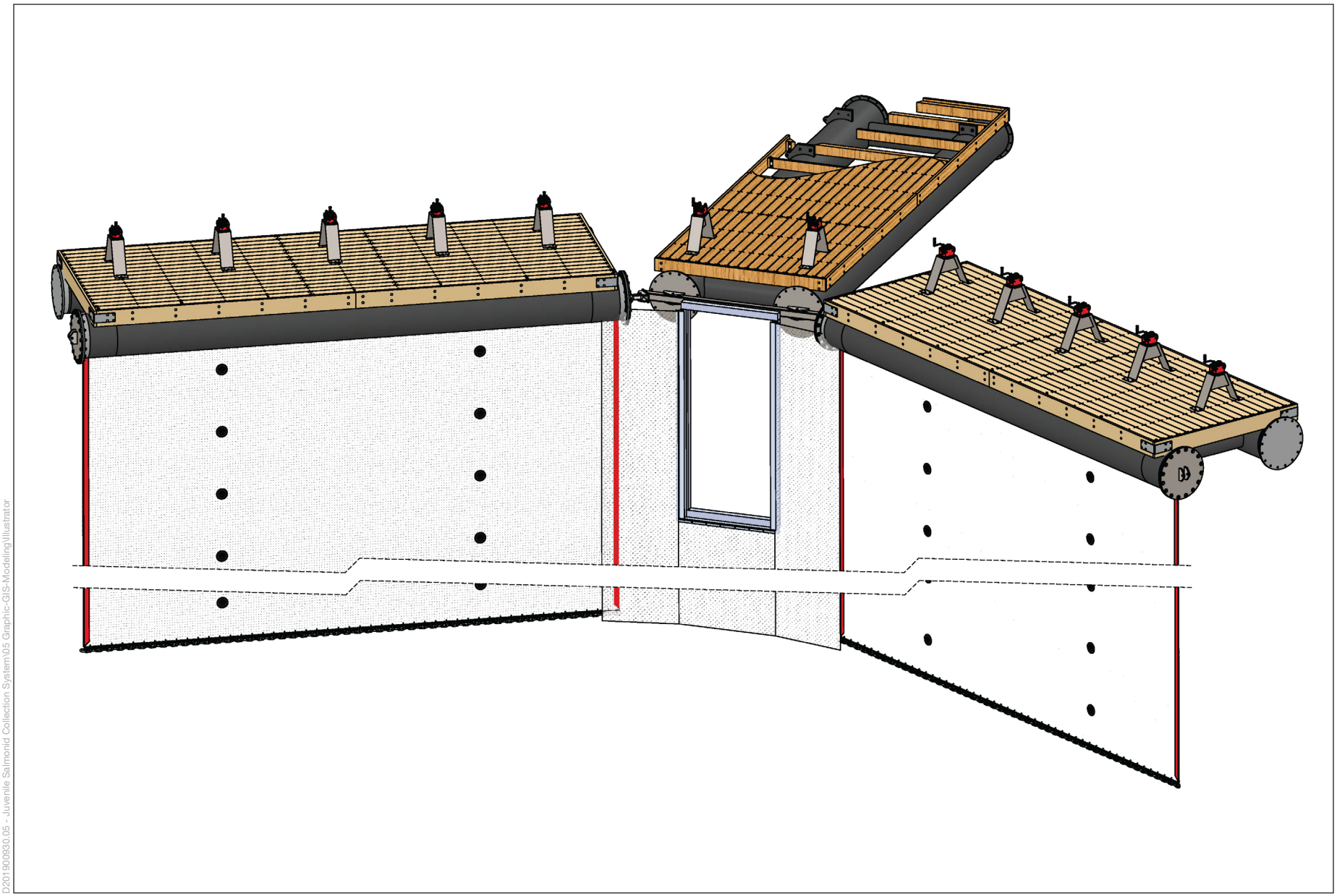
- Both netting and impermeable panels for upper 25 feet (impermeable panels can be removed to allow flow through the net)
- Four-foot-wide by 10-foot-high frame/notch (**Figure 2-5**) at apex of guidance net
- Eight-foot-wide by 25-foot-long walkways (platforms atop pontoons, suspending the nets) would extend 150 feet on each side of the notch along the alignment of the guidance net
- Eight-foot-wide by 25-foot-long walkway would extend downstream from the notch
- Winches are mounted on the walkways for assistance in deploying and retrieving net and impermeable panels
- Two 24-inch-diameter High Density Polyethylene (HDPE) pontoons support each walkway
- The upper 10 feet next to the notch is both netting and impermeable panels. The area below the notch is made up of only impermeable panels.
- For the net sections on either side of the notch, ~10-foot-wide impermeable panels are shingled to allow for detailed testing of hydraulics. These panels can be lowered from the top to allow for any opening depth.
- Near the banks, 18-inch by 30-inch floats would be used instead of HDPE pontoons to allow for easy retrieval from the bank after the reservoir drops in elevation.
- Resident fish passage would be provided through the guidance net (see next section).

2.4.3 Upstream Fish Passage

Eight resident fish passage devices (**Figure 2-6**) would be located in the guidance net to allow for upstream passage of resident fish. The devices would be of the same net material as the guidance net with their shape created by attachment to an aluminum frame. The devices are sized, located and configured so that juvenile fish moving downstream have a more-difficult time entering the narrow, upstream opening and passing downstream, and resident fish moving upstream can easily enter the wider openings to pass upstream.

- Four of the devices would be located on the bottom of the channel
- Four would have their top located at five feet under the water surface
- There would be two (upper and lower) located near the banks on each side (the upper one will be placed at the waterside edge of the impermeable side panel) and two (upper and lower) about halfway between the notch and banks on each side
- Each upper device has a four-foot by four-foot opening in the guidance net and a one-foot by one-foot opening at the upstream end
- Each lower device has a four-foot by four-foot opening in the guidance net and a two-foot by two-foot opening at the upstream end
- All devices are five feet long
- At least one Dual Frequency Identification Sonar (DIDSON) acoustic camera would monitor fish passage through and behavior near the lower devices



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SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-5
4’ X 10’ Notch at the Downstream End of the Guidance Net

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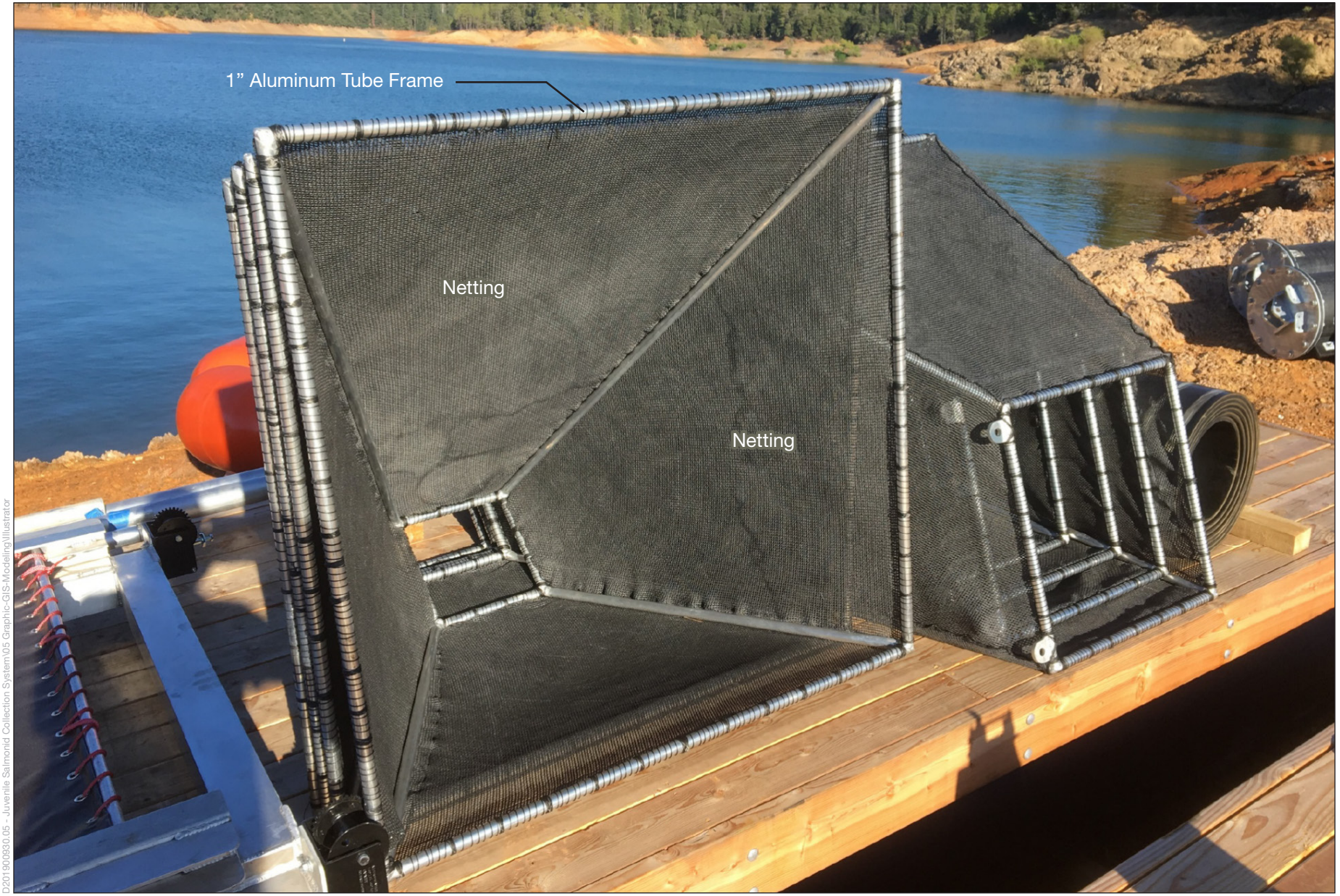

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SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-6
Resident Fish Upstream Passage Device

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- The DIDSON would be mounted on a temporary tower to be mounted and lowered from the downstream side of the walkway
- Visible light/infrared cameras would be used to monitor fish passage through and behavior near the upper devices

Additionally, the guidance net itself has an open 4-foot-wide X 10-foot-high notch at its apex that, during testing, can allow for upstream and downstream passage of resident fish.

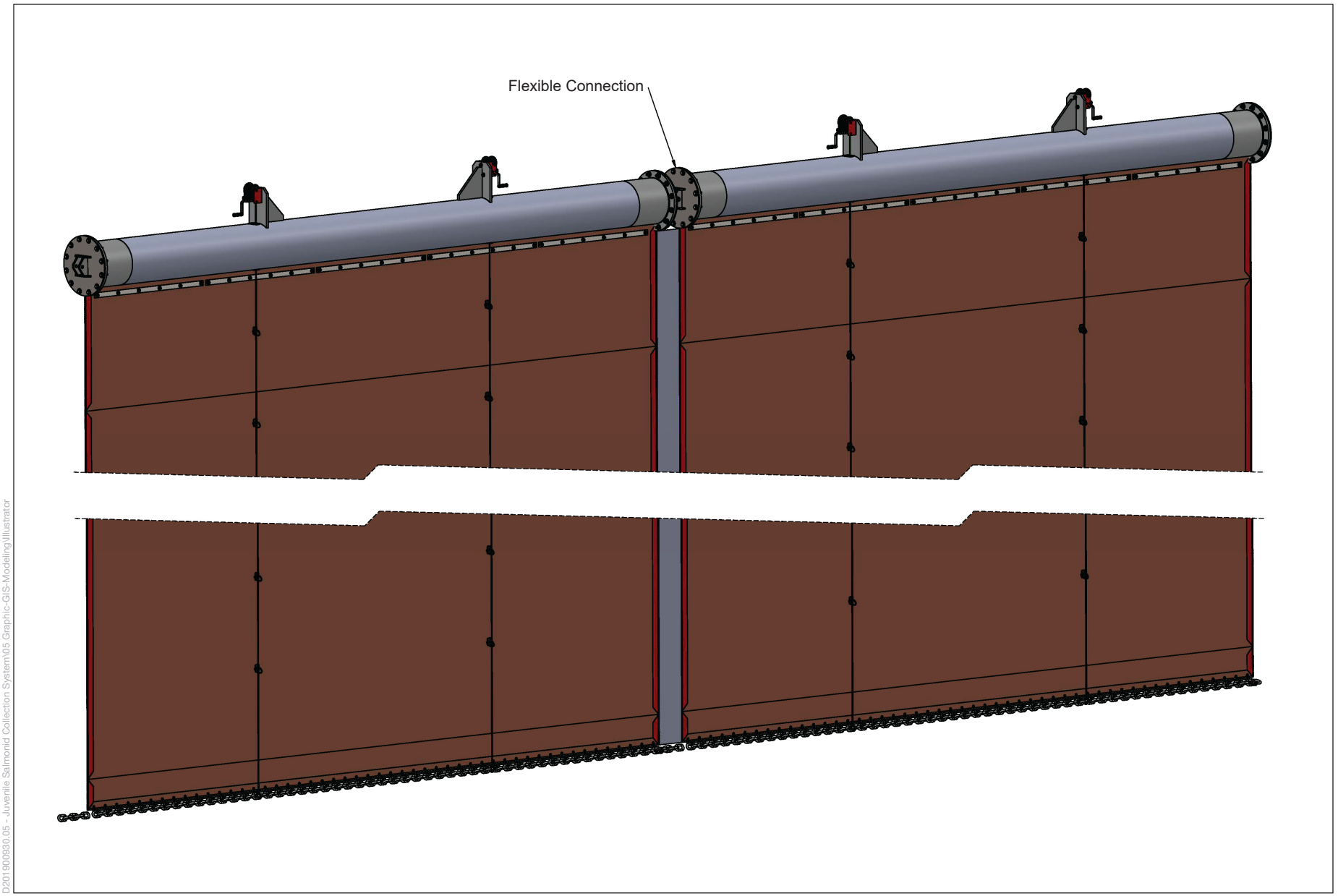
2.4.4 Temperature Curtain

An impermeable temperature curtain (**Figure 2-7**) would be tested to see how well it works to keep warm reservoir water downstream and cold river water upstream of the guidance net area and would be installed at a location downstream from the notch in the guidance net. The curtain is adjustable and would span the entire channel. It has an upper notch for hydraulic control and fish passage, and the curtain could be raised off the bottom to allow flow and fish passage under the curtain. Details for the temperature curtain are below:

- The temperature curtain would be separate from the guidance net
- The temperature curtain would extend to a maximum depth of 30 feet
- Material for the curtain is Seaman XR-3 geomembrane (30 mil polyester)
- 18-inch diameter HDPE pontoons
- 75-foot-wide by 10-foot-deep upper central notch, which can be fully opened, partially opened, or fully closed.
- The notch has coarse netting (for stability) with two-foot-wide by three-foot-high openings
- The temperature curtain would be lifted off the channel bottom to allow for both upstream and downstream fish passage.

2.4.5 Anchoring Systems

The proposed Project does not include the construction of permanent facilities; therefore, the anchoring systems would be temporary and not permanently impact the banks. The system would be anchored to large clump weights (large heavy chain, pieces of steel, or concrete) laying on the bank of the channel near the water's edge and/or to large trees (**Figure 2-8**). These clump weights would be brought in via boat or barge and placed on the shoreline by a barge-mounted excavator, telescoping forklift, crane, or similar machinery able to place the weights without being on shore; removal would use the same methods. As described in Section 3.4.2, cultural and tribal cultural resource inventories of specific anchoring locations (which include but are not limited to pedestrian surveys) will be completed prior to installation of anchoring systems. In one potential configuration, the clump weights would keep the anchoring lines to the proposed Project components nearly horizontal and rocks or large trees (>24-inch diameter) would be the main anchors. The trees would be protected by using wide soft straps. In other configurations, anchoring lines may be solely tethered to large weights at the water's edge, relying exclusively on the mass of the weight for the anchoring. Tension in the anchoring lines would be constantly monitored to make



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SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-7
Temperature Curtain (Two Panels Shown)

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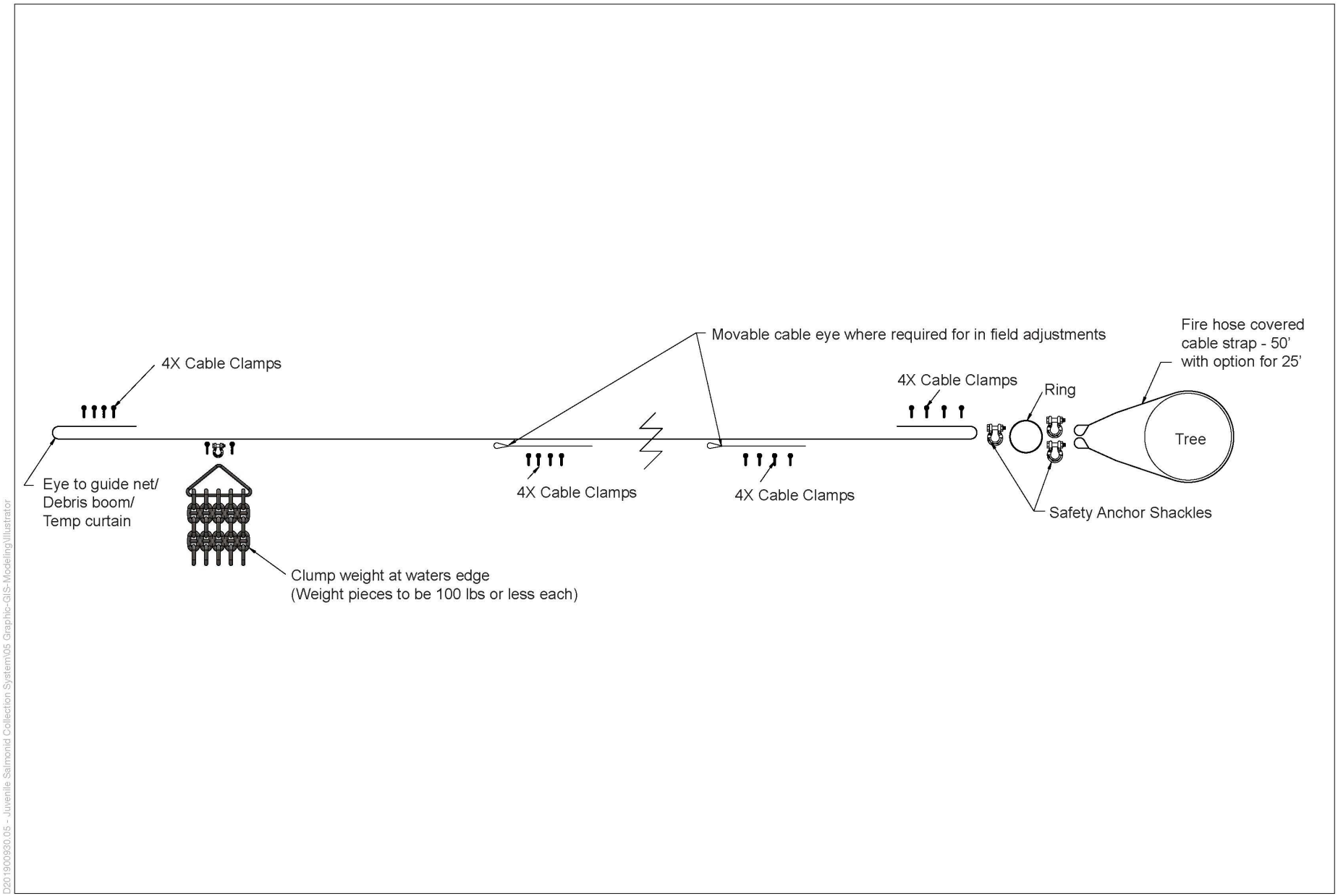

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SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-8
Clump Weight Anchoring System
(shown with Tree Backup)

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sure that the system is not overloaded. Heavy chain attached to the bottom of the guidance net would be used to keep the net on the bottom of the channel. Four hold-back anchors would be used, two downstream of the guidance net and two downstream of the temperature curtain (**Figure 2-9**).

Strings of temperature monitoring instruments would be attached to individual anchors (heavy weights) and buoys. Signs indicating the exclusion of boating (lighted) and other information signs would be on buoys attached to individual (heavy weight) anchors. Strings of "Caution" floats across the McCloud Arm would be anchored on the banks using clump weights.

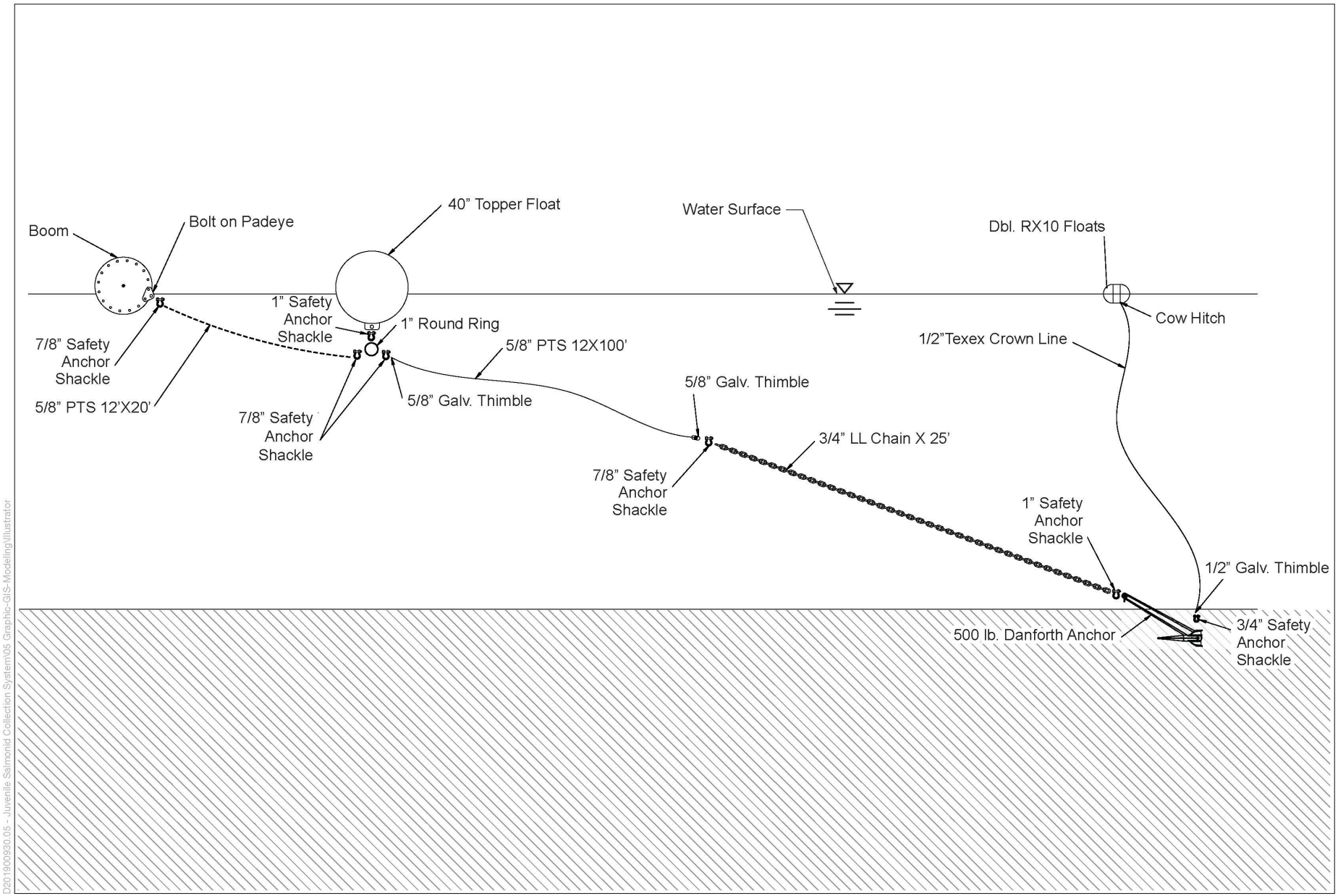
2.5 Deployment and Installation

Deployment of the proposed Project (the JSCS components) would occur from the boat ramp at either the Shasta-Trinity National Forest's Hirz Bay boat ramp (as shown on Figure 2-2 and **Figure 2-10**), the Holiday Harbor Marina, or the Bridge Bay Marina. Tractor trailer rigs would be loaded with proposed Project components in Red Bluff, California and driven to and staged in parking areas near the boat ramp. The individual pieces of the JSCS would be unloaded using a large, rough terrain forklift. The pieces would then be placed into the water using the forklift and assembled using hand tools. At Hirz Bay, the boat ramp includes three boat ramps at increasingly lower elevations. During dry years the JSCS may need to be deployed from beyond the third boat ramp. In this situation, deployment would occur on the exposed soil and the rough terrain forklift or crane would be used to facilitate deployment. The deployment crew of 5 or 6 individuals, as well as approximately three scientific teams (comprised of 3 to up to 5 persons each), would work with the public so there is minimal impact to the launching of boats during the deployment. For example, the United States Forest Service (USFS) who manages the Hirz Bay boat ramp and campgrounds in the Study Area, would be notified prior to construction, so they can post a notice of the construction and any closures at a variety of relevant locations such as information kiosks and at reservoir marinas and stores. In addition, DWR will also notify CDFW, NOAA, and local Tribes.

Deployment, assembly, and installation would take approximately seven days, starting in early to mid-September (most likely the day after Labor Day). After deployment and assembly of each component, the component would be towed to the initial testing location for installation, starting with the most upstream component (debris boom).

Testing and evaluation of the proposed Project is planned to begin in September and would be completed by the end of November. The proposed Project would be removed from the testing location in mid to late November. DWR would discuss with the USFS and Holiday Harbor Marina the possibility of storing the collection system at or near the marina. If that cannot be arranged, DWR would remove the system from the reservoir in November and store it in an area outside of USFS jurisdiction.

During the operation and monitoring of the proposed Project, all on-water public access would be closed to the McCloud Arm of the Shasta Reservoir within the location of the proposed JSCS deployment (approximately 700 feet). DWR would review the annual plan with the WWT through consultation, host public meetings, and deploy safety signage with lights both upstream and downstream of the proposed Project to warn the public of closure. Through continued collaboration with the WWT, boat passage through the proposed Project would be provided to allow the tribal community to freely paddle through the Project area so no interruption to Tribal cultural activities.



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SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-9
Anchoring System Downstream of Guidance Net and Temperature Curtain

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SOURCE: DWR

Juvenile Salmonid Collection System

Figure 2-10
Hirz Bay Boat Ramp

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2.5.1 Moving the Proposed Project

As stated above, because reservoir elevation drops by typically two or more feet per week during September, the initial location may become too shallow and the proposed Project may have to be relocated to a site downstream (yet still within the Study Area), most likely in early to mid-October. It is anticipated that the proposed Project would only need to be moved once during initial testing in the first year but may require up to two relocations in the second year of testing. As with JSCS installation, and as described in Section 3.4.2, cultural and tribal cultural resource inventories (which include but are not limited to pedestrian surveys) will be completed in relevant areas prior to movement and installation of the system.

To move the system, the same equipment and methods for installation would be utilized. The temperature curtain would be removed from the initial testing location first and moved to the downstream testing location where it would be stored in the water near the bank until it is installed. The guidance net would be removed next and moved downstream. Last to be removed from the initial testing location would be the debris boom. During removal of these main components, as access allows, the safety signs, safety buoys, and temperature monitoring strings would be removed in downstream to upstream order.

For installation at the downstream location, the debris boom will be installed first, then the guidance net, and finally the temperature curtain. During installation of these main components, as access allows, the safety signs, safety buoys, and temperature strings will be installed in upstream to downstream order.

2.6 Operation and Monitoring

During the operation and monitoring of the proposed Project, testing and evaluation would occur, and may include:

- Water quality testing: Continuous water quality testing for temperature, and daily water quality testing for dissolved oxygen, turbidity, conductivity and/or pH would be completed using temperature loggers and vertical moorings (e.g., 40-foot steel chain attached to 24-inch floats with 20-pound river anchors) and handheld instruments.
- Hydraulics testing: Water velocity data collected by an Acoustic Doppler Current Profiler (ADCP) using a remotely-controlled boat and/or hand-held Acoustic Doppler Velocimeter (ADV). In addition, a neutrally buoyant sphere experiment may be conducted by releasing 50 mini beach balls (five inches in diameter) released 300-feet upstream of the debris boom and 50 oranges released immediately downstream of the debris boom. This experiment allows a visual and quantitative assessment of the effectiveness of the guidance net and would indicate general surface velocity patterns. The spheres would be recovered after the testing.
- Debris and aquatic growth loading: Large woody debris (LWD) surveys (e.g., LWD jam observations) would be completed and small debris management would occur (e.g., cleaning of the guidance net or opening up the guidance net to allow debris to flow downstream).
- Predator fish monitoring: Predator fish species abundance and interaction with system components would be monitored visually by walking along the guidance net walkways or McCloud Bridge, daily reconnaissance surveys (e.g., kayaks), and/or snorkeling and angling.

- Resident fish species: Resident fish species upstream passage monitoring at the guidance net fish passage devices and temperature curtain would occur using underwater video (e.g., Visual Light/Infrared Light (Hybrid Light) and sonar (DIDSON) cameras.

An overview of the inspections and system checks that would occur during the operation and monitoring of the proposed Project is provided in **Table 2-1**.

TABLE 2-1
INSPECTIONS AND SYSTEM CHECKS

System Component	System Parameter	Timing
General	Record in-river flows	Daily
	in notch	Daily
	California Data Exchange Center (CDEC)	Daily
	Weather conditions (wind direction and speed, sky conditions)	Continually
Debris Boom	Visually inspect all anchoring connections at each shore connection to boom (for wear and possible vandalism)	Daily
	Record (pictures) of debris accumulation	Daily
	Remove debris	As needed
Guidance Net	Read and record tension on load cells	2X Daily or after any adjustments
	Visually inspect connections between walkway platforms	Daily
	Visually inspect manual winches, lubricate as required	Daily
	Record depth of net (at upstream edge of Panels 2, 5, 11, and 14; and at the downstream edge of Panels 7 and 9)	Daily
	Record flow control panels deployed and depth	Daily
	Inspect fish passage devices upstream fish openings	Weekly
	Visually inspect connections between notch and work platform	Daily
	Visually inspect all anchoring connections at each shore connection to net (for wear and possible vandalism)	Daily
	Visual overall alignment of system	Daily
	Tighten net by winching upper portion onto the walkways	As needed
	Visually inspect in-reservoir anchors, adjust for reservoir level change	Daily
Temperature Curtain	Visually inspect all anchoring connections at each shore connection (for possible vandalism)	Daily
	Visually inspect float to float connections	Weekly
	Visually inspect manual winches, lubricate as required	Weekly
	Record depth of temperature curtain	Daily
	Record if center drop panels are open	Daily
	Visual overall alignment of system	Daily
	Visually inspect in reservoir anchors, adjust for reservoir level change	Daily
	Make sure warning lights are on at night	Daily
	Inspect/test warning lights	Weekly

2.7 Protective Environmental and Cultural Resource Measures

The following protective environmental measures would be implemented as part of the proposed Project to minimize and avoid impacts on waters of the United States and other sensitive environmental resources:

2.7.1 Prepare and Implement a Water Quality Control Plan

A Water Quality Control Plan would be prepared before beginning construction activities that would cause ground disturbance. Site-specific erosion-control, spill-prevention, sedimentation control, and runoff measures would be developed and implemented during construction activities.

Applicable control measures would be utilized to manage the potential for erosion. Measures used at the project site would not include tightly woven cloth or monofilament meshes to ensure wildlife does not become trapped or entangled in the erosion control material. Coconut coir matting is an acceptable erosion control material. Where feasible, the edge of the material would be buried in the ground to prevent wildlife from crawling underneath the material.

2.7.2 Prepare and Implement a Spill Prevention and Control Program

A Spill Prevention and Control Program would be prepared before the start of construction to minimize the potential for hazardous, toxic, or petroleum substances to be released into the Study Area. The program would be implemented during construction and operation. In addition, DWR would place impervious ground barriers, sand bags or biologs berms, or other containment features around the areas used for fueling or other uses of hazardous materials to ensure complete containment. DWR would adhere to the standard construction best management practices (BMPs) described in the California Stormwater Quality Association (CASQA) – 2015 Construction BMP Handbook.

The Spill Prevention and Control Program would include procedures for mitigating potential spills caused by collision/stranding of vessel traffic with the JSCS during operation. Spill control materials would be kept on the vessels. Impediments to navigation would have clear signage with telephone contact details for DWR personnel as well as the Governor's Office of Emergency Services (CalOES) hazardous materials (HAZMAT) spill notifications contact number (1-800-852-7550).

2.7.3 Prepare and Implement a Hazardous Materials Management Program

A Hazardous Materials Management Program (HMMP) would be prepared and implemented to identify the hazardous materials to be used during construction; describe measures to prevent, control, and minimize the spillage of hazardous substances; describe transport, storage, and disposal procedures for these substances; and outline procedures to be followed in case of a spill of a hazardous material. The HMMP would require that hazardous and potentially hazardous substances stored on-site be kept in securely closed containers located away from drainage

courses, storm drains, and areas where stormwater is allowed to infiltrate. It would also stipulate procedures to minimize hazards during on-site fueling and servicing of construction equipment, including any over-water fueling for boats. Finally, the HMMP would require that adjacent land users be notified immediately of any substantial spill or release.

2.7.4 Conduct a Worker Environmental Awareness Program Training and Cultural Resources Awareness and Sensitivity Program Training

Construction workers would participate in a Worker Environmental Awareness Program (WEAP) training and a Cultural Resource Awareness and Sensitivities Program training that addresses, respectively, species under jurisdiction of the permitting agencies (CDFW) and the potential impact to cultural resources that may occur due to the cultural sensitivity and importance of the area. Workers would be informed about the potential presence of listed and other protected species, and habitats associated with such species, and that unlawful take of the species or destruction of their habitat is a violation of the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and/or Migratory Bird Treaty Act. Before the start of construction activities, a qualified biologist would instruct all construction workers about the life histories of the protected species and other regulatory permits that include biological resource protection measures. As part of DWR's Cultural Resources Awareness and Sensitivity Training Program described in Section 3.4.2, Mitigation Measure CUL-6, a qualified archaeologist, defined as one meeting the U.S. Secretary of the Interior's Professional Qualifications Standards (SOI PQS) for Archeology and with expertise in California archaeology, in coordination with the WWT, tribal partners will present a training to inform workers of the potential presence of cultural resources in the Project Area, how to identify cultural resources and properly report when they have been identified, and provide background of the area's cultural sensitivity and importance to the tribal community.

2.7.5 Conduct Biological Monitoring

A qualified biologist would conduct compliance inspections and monitoring during initial construction activities and when construction would occur within environmentally sensitive areas as determined by the biologist. The qualifications of the biologist(s) would be presented to the permitting agencies for review and approval before beginning Project activities at the Study Area. The complete set of permitting documents would be on-site during construction. The biologist(s) would be given the authority to stop work that could result in take of listed species.

In addition to monitoring during construction, daily spot-checks of the JSCS will be conducted during operation by a qualified biologist to look for any wildlife species that may have become trapped or have had their movement impeded by the guidance net. These reconnaissance surveys will include visual assessment of the guidance net by walking along the guidance net walkways and along the shoreline.

2.7.6 Limit Habitat Disturbance and Return Disturbed Areas to Pre-Project Conditions

DWR would limit habitat disturbance during Project-related construction activities to the minimum area necessary. Immediately following the completion of the JSCS field deployment, DWR would restore Project footprint to approximate pre-Project conditions.

2.8 Permits, Approvals, and Regulatory Requirements

Table 2-2 summarizes the permits and/or approvals that may be required before construction of the proposed Project.

TABLE 2-2
REGULATORY REQUIREMENTS, PERMITS, AND AUTHORIZATIONS FOR PROJECT SYSTEM COMPONENTS

Jurisdiction	Agency	Type of Approval
Federal Agencies	United States Forest Service	Special Use Permit Transportation and Utility Systems and Facilities on Federal Lands
Local Agencies	N/A	N/A

NOTE:
N/A = not applicable

SOURCE: Data compiled by Environmental Science Associates in 2021

2.9 Resources Not Considered in Detail

2.9.1 Agriculture and Forestry Resources

The proposed Project is located within the McCloud Arm of Shasta Reservoir and is not located on lands currently in agricultural use, or designated as Prime Farmland, Unique Farmland, or Farmland of Statewide importance, or zoned as Farmland, forest land, timberland, or timberland zoned Timberland Production. Therefore, no impact related to agriculture and Forest Resources would occur.

2.9.2 Energy

Construction of the proposed Project would result in fuel consumption from the use of tools and equipment, mobilization of equipment and materials, vehicle trips by workers traveling to and from the project sites, and the use of work boats. Deployment, assembly, and installation would take approximately seven days and would require approximately 5 or 6 workers. Construction activities and corresponding fuel energy consumption would be temporary and localized. Operations would involve testing and evaluation which would require minimal amounts of fuel for boat operation. With its relatively low consumption of fuel and short-term nature, the proposed Project would not result in inefficient, wasteful, or unnecessary energy use compared with energy use for other projects in the region. Vehicles used by Project workers during construction and operation would incorporate the applicable National Highway Traffic Safety Administration

standards and programs for heavy-duty and light-duty vehicles; therefore, the proposed Project would not impede the efficient use of fuel for light-duty vehicles. No impact would occur.

2.9.3 Land Use and Planning

The proposed Project is located within the McCloud Arm of Shasta Reservoir in Shasta County. The site is zoned public land and primarily includes the submerged area of Shasta Reservoir as well as the adjacent shoreline. The proposed Project is not located in a city or community and would be consistent with existing land uses, plans, policies, and regulations. Therefore, no impacts related to land use and planning would occur.

2.9.4 Mineral Resources

The proposed Project is located in an area zoned public land, within the McCloud Arm of Shasta Reservoir. The proposed Project would not result in the loss of availability of a known mineral resource and would not affect a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. No impacts on mineral resources would occur.

2.9.5 Population and Housing

The proposed Project would involve the temporary placement of JSCS system components to evaluate the feasibility and viability of collecting juvenile anadromous salmonids as they emigrate out of historical habitat upstream from Shasta Dam. The proposed Project would not include new homes or permanent facilities. Construction and operation would be short-term and would not require additional workers outside of the existing work force. Existing DWR workers would be responsible for operation of the proposed Project. The proposed Project site is located within the McCloud Arm of Shasta Reservoir and would not displace any housing or people. Therefore, no impacts related to population and housing would occur.

2.9.6 Public Services

The proposed Project would not result in the construction of any new facilities or population that would generate a need for new or physically altered government facilities. Therefore, demand for police and fire protection and for community amenities such as schools and parks would not change relative to existing conditions, and no impacts would occur.

2.9.7 Transportation

Construction activities would temporarily increase vehicle trips on area roadways. Because of the limited size of the proposed Project, the transport of materials and heavy equipment for construction would require a minimal number of truck trips; and most construction would take place in the water. Therefore, the proposed Project would not result in a substantial increase in traffic levels along the local roadways compared to existing conditions and would not result in decreased travel times on roads in the vicinity of the proposed Project. As such, the proposed Project would not conflict with a plan, ordinance, or policy addressing the circulation system, including transit, or designated bicycle and pedestrian facilities. The McCloud River arm of Shasta Reservoir would be inaccessible to boaters during Project operation which would reduce

the area of Shasta Reservoir accessible to boaters. However, the proposed Project would not have a long-term adverse effect on recreation because public notices would be posted, the vast majority of the reservoir would be available (approximately 0.1% of the reservoir would be closed), the mobile guidance and capture system associated with the proposed Project would not be permanent, and a reduction in reservoir access for vessels in the McCloud Arm of Shasta Reservoir would be temporary. Section 15064.3 of the State CEQA Guidelines establishes specific considerations for evaluating a project's transportation impacts. The State CEQA Guidelines identify vehicle miles traveled (VMT)—the amount and distance of automobile travel attributable to a project—as the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the Project on transit and nonmotorized travel. Deployment and removal of the proposed Project would last approximately 14 days (7 for deployment and 7 for removal) and would use existing construction crews. Operation of the proposed Project would not add a substantial amount of VMT to the Study Area. The proposed Project would not include any change to roadway design in the vicinity of the proposed Project or introduce incompatible uses. Project operation would not change any land uses, would not alter the compatibility of uses served by the roadway network, or result in hazardous conditions due to a geometric design feature or incompatible uses. The proposed Project would not impair or interfere with emergency access to local roads and would not result in traffic delays that could substantially increase emergency response times or reduce emergency vehicle access.

2.9.8 Utilities and Service Systems

The proposed Project does not include or require the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities as a result of the proposed Project. The proposed Project would also not require additional water supplies or expanded wastewater treatment capacity. Implementation of the proposed Project will comply with all the wastewater requirements of the Central Valley Regional Water Quality Control Board (refer to the Hydrology and Water Quality section for more information), as well as all federal, state, and local statutes and regulations related to solid waste. The proposed Project would also generate minimal solid waste. Therefore, there would be no impact.

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CHAPTER 3
Environmental Setting and Impacts

1. Project Title:	Juvenile Salmonid Collection System Pilot Project
2. Lead Agency Name and Address:	California Department of Water Resources Division of Regional Assistance Riverine Stewardship Program Engineering 715 P Street, 6th Floor, Sacramento, CA 95814
3. Contact Person and Phone Number:	Randy Beckwith (916) 873-5715
4. Project Location:	The McCloud Arm of Shasta Reservoir, Shasta County
5. Project Sponsor's Name and Address:	Same as above
6. General Plan Designation(s):	Public Land
7. Zoning:	National Recreation Area
8. Description of Project:	See Project Description
9. Surrounding Land Uses and Setting.	See Project Description

10. Other public agencies whose approval is required. See Table 2-2

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 that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

Yes

Environmental Factors Potentially Affected

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

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial study:

☐ 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 project have been made by or agreed to by the 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.

Randy Beckwith	5/18/2022
Signature	Date
Randy Beckwith	Senior Engineer/Project Manager
Printed Name	Title
Department of Water Resources	
Agency	

Environmental Checklist

3.1 Aesthetics

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
AESTHETICS — 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) 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 daytime or nighttime views in the area?	☐	☐	☒	☐

3.1.1 Environmental Setting

The proposed Project would be installed within the McCloud Arm of Shasta Reservoir. Deployment of the proposed Project would occur from the Shasta-Trinity National Forest's Hirz Bay boat ramp, the Holiday Harbor Marina, or the Bridge Bay Marina. The Study Area is rural in nature with most of the land adjacent to the Study Area being undeveloped.

There are no officially designated State Scenic Highways in the vicinity of the proposed Project. Interstate 5 (I-5) is eligible for designation in the segment from Redding to the southern shore of Shasta Reservoir (Caltrans 2018) and this segment is not viewable from the Study Area. No scenic corridors are in the vicinity of the proposed Project (Shasta County 2004).

3.1.2 Discussion

a) *Less-than-Significant Impact*. The Shasta County General Plan does not identify any scenic vistas or notable geographic features near the Study Area (Shasta County 2004). As a result, no impact on a scenic vista would occur.

b) *No Impact*. A review of the current California Department of Transportation (Caltrans) Map of Designated Scenic Routes indicates no officially designated state scenic highway in the vicinity of the proposed Project (Caltrans 2018). The proposed Project would not be visible to travelers on an officially designated state scenic highway. Therefore, no impact on scenic resources would occur.

c) *Less-than-Significant Impact*. For the same reasons described in Questions a) and b) above, the temporary construction activities associated with the proposed Project and

operation of the proposed Project would not substantially degrade the existing visual character or quality of public views of the project site or surroundings. Therefore, the impact would be less than significant.

d) *Less-than-Significant Impact.* DWR would deploy safety signage with lights both upstream and downstream of the proposed Project to advise the public about the presence of the JSCS. As discussed previously, there are no scenic vistas, notable geographic features or designated state scenic highways in the vicinity of the proposed Project. There is potential for travelers along area roads to notice the lights through the forest separating them from the channel, or for boaters near the Study Area to notice the lights. Given that the navigation lights would be limited to the immediate area of the JSCS, the impact would be less than significant. All Project-related construction activities would occur during the daytime. The proposed Project would not introduce new sources of glare.

3.2 Air Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
AIR QUALITY — Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon 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?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

3.2.1 Environmental Settings

The Study Area is located within the northern part of the Sacramento Valley air basin. Air pollutants with national air quality standards, known as "criteria air pollutants," include ozone, carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), and particulate matter with aerodynamic diameter equal to or less than 10 micrometers (PM10) and 2.5 micrometers (PM2.5). Under federal air quality standards, Shasta County is designated as attainment for all criteria pollutants. Under State air quality standards, Shasta County is designated as nonattainment for ozone and PM10 and is designated as attainment/unclassified for all other pollutants.

The Shasta County Air Quality Management District (District) is responsible for overseeing the air pollution control strategy for regions in four jurisdictions: cities of Anderson, Redding, and Shasta Reservoir, and the unincorporated areas of Shasta County. Construction activities could generate air pollutants that degrade air quality and increase local human exposure to air contaminants. The District has published guidelines for evaluating, measuring, and mitigating a project's air quality impacts under the California Environmental Quality Act (CEQA) (Shasta County 2004) that uses two levels of thresholds for construction emissions:

- Level A: 25 pounds per day of nitrogen oxide (NOx) or volatile organic compounds (VOC), 80 pounds per day of PM10
- Level B: 137 pounds per day of NOx, VOC, or PM10

The District recommends that projects apply Standard Mitigation Measures (SMM) and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds level A thresholds, and that projects apply SMM, BAMM, and special BAMM when a project exceeds level B thresholds. Projects that cannot mitigate emissions to levels below the level B thresholds are considered significant.

3.2.2 Discussion

a) *Less-than-Significant Impact*. The NSVPA Air Quality Attainment Plan (2018) designates Shasta County as an area of Nonattainment with respect to the ozone California ambient air quality standards. Nitrogen oxides (NOx) are a group of highly reactive gasses and are also known as "oxides of nitrogen." Because NOx is an ingredient in the formation of ozone, it is referred to as an ozone precursor. NOx is emitted from combustion sources such as cars, trucks and buses, power plants, and off-road equipment. Construction equipment and activities associated with excavation would generate air contaminants, including oxides of nitrogen (NOx), reactive organic gases (ROG), carbon dioxide (CO_2) and particulate matter (PM10), in the form of engine exhaust and fugitive dust.

Construction of the proposed Project would require use of light-duty vehicles for worker travel, heavy-duty vehicles for delivery of Project components. Hand tools would be used for assembly of the JSCS. Boats would be used by the deployment crew of 5 or 6 individuals for deployment, assembly, and installation. Construction activities are temporary and would only last for approximately 7 days per year during the testing period and removal would take a similar amount of time each year during the testing period. Therefore, given the short-term nature of construction and the limited use of vehicles during both construction and operation, the proposed Project would not conflict with or obstruct implementation of the NSVPA Air Quality Attainment Plan, and this impact would be less than significant.

b) *Less-than-Significant Impact*. Construction activities are short term and typically result in combustion exhaust emissions (e.g., vehicle and equipment tailpipe emissions), including ozone precursors (ROG and NOx), and PM from combustion and in the form of dust (fugitive dust). Emissions of ozone precursors and PM are primarily a result of the combustion of fuel from on-road vehicles and off-road equipment. Given the particularly short-term nature of construction, the minimal use of heavy- and light-duty vehicles and the Study Area being primarily located within the channel of Shasta Reservoir. Therefore, Project emissions would not result in a cumulatively considerable net increase of any criteria air pollutant. The proposed Project would have a less-than-significant impact on air quality and would not violate any air quality standard.

Normal operation of the proposed Project would involve testing and evaluation and would require minimal use of boats. However, the employee trips required for testing and evaluation would not be significantly more than existing employee trips and the boat use would be a negligible increase from current reservoir usage. As a result, the impact related to exposure of sensitive receptors to substantial toxic air contaminant emissions from the proposed Project operations would be less than significant.

c) *Less-than-Significant Impact*. The proposed Project is located in a rural area that does not have highly populated residential areas or other sensitive receptors. The nearest sensitive receptor is over 1 mile away. In addition, construction activities would be temporary and limited to the area where construction equipment would operate. Construction emissions from the proposed Project would be below the District's significance thresholds for

criteria air pollutants and their precursors. Therefore, during Project construction, residences and other sensitive receptor locations would not have limited short-term exposure to emissions from the construction activities. Once the construction is complete, operation of the proposed Project would involve testing and evaluation and would require minimal use of boats. However, the employee trips required for testing and evaluation would not be significantly more than existing employee trips and the boat use would be a negligible increase from current reservoir usage. As such, the proposed Project would not cause long-term exposure of sensitive receptors to air pollutants, and this impact would be less than significant.

d) *Less-than-Significant Impact.* Engine exhaust from construction equipment and boats can generate short-term, non-persistent odors. The Study Area is located in a waterway surrounded by rural areas with low population density. As discussed in response to Question c) above, the nearest sensitive receptor to either project site is over 1 mile away. Given the temporary nature of construction activity, the limited nature of Project operations and the distance of the Study Area from sensitive receptors, the proposed Project would have a less-than-significant impact with respect to creation of odors affecting a substantial number of people.

3.3 Biological Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
BIOLOGICAL RESOURCES — 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 or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
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?	☐	☐	☒	☐
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?	☐	☐	☐	☒

3.3.1 Environmental Setting

This section describes the biological resources in the Study Area including vegetation, terrestrial wildlife, and fisheries resources.

Shasta Dam and Shasta Reservoir are located on the upper Sacramento River in northern California. Shasta Dam is located about 9 miles northwest of the city of the Redding, and the dam and entire reservoir are within Shasta County. The Study Area includes only the McCloud Arm of Shasta Reservoir. The majority of the Study Area includes the associated aquatic habitats although terrestrial habitat falls within the Study Area along the reservoir banks and upland riparian area. These land cover types support several common and special-status wildlife species.

Aquatic Communities

The present composition and distribution of fish species inhabiting Shasta Reservoir are dominated by mostly introduced warm-water and cold-water species. The warm-water fish habitat of Shasta Reservoir occupies two ecological zones: the littoral (shoreline/rocky/vegetated) and the pelagic (open water) zones. The littoral zone lies along the reservoir shoreline down to the maximum depth of light penetration on the reservoir bottom and supports populations of spotted

bass (*Micropterus punctulatus*), smallmouth bass (*M. dolomieui*), largemouth bass (*M. salmoides*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), and other warm-water species. Warm-water fish species are generally structure oriented and mostly occupy the littoral zone, however, some warm-water species like spotted bass will forage in the pelagic zone of Shasta Reservoir.

The primary factors affecting warm-water fish abundance and production in Shasta Reservoir include seasonal reservoir fluctuations, availability of high-quality littoral habitat, and annual climate variations (Ratcliff 2006). Reservoir level fluctuations, associated shoreline erosion, and suppression of shoreline and emergent vegetation are thought to generally be the most significant factors affecting warm-water fish production in reservoirs, including Shasta Reservoir (Moyle 2002, Parkos and Wahl 2002, Ratcliff 2006). Water level variations influence physical, chemical, and biological processes, which in turn affect fish populations. Reservoir drawdowns reduce water depths and influence thermal stratification and the resulting temperature, DO, and water chemistry profiles.

Shasta Reservoir and the lower reaches of the tributaries draining to the reservoir provide productive habitat for cold-water fish species such as rough sculpin (*Cottus asperrimus*), riffle sculpin (*Cottus gulosus*), white sturgeon (*Acipenser* medirostris), hardhead (*Mylopharodon conocephalus*), rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*). These species do not spawn in the reservoir, but prefer the cooler water, less than 70 degrees Fahrenheit, of the tributaries.

Climate conditions and reservoir storage volume are the two most influential factors affecting cold-water habitat and primary productivity in Shasta Reservoir (Bartholow et al. 2001). Cold-water habitat provided by Shasta Reservoir is a function of the total storage and associated surface area provided by Shasta Reservoir. This relationship is influenced by variation in the water surface elevation (WSEL) throughout the year. Variation in WSEL is a function of water demand and downstream instream flow releases, water quality requirements, and inflow. WSEL can change within and among years based on hydrology within the watershed, based on the water year type. Typically, primary production in reservoirs is associated with storage volumes when all other factors are held constant (Stables et al. 1990). Increased storage and the corresponding increases in surface area and aquatic habitat results in a greater total biomass and a greater abundance of plankton and fish, because available aquatic habitat area is increased.

Aquatic macroinvertebrates provide an important food base for many fish and wildlife species. Benthic macroinvertebrates (BMI) consist primarily of the larvae and nymphal forms of aquatic insects, mollusks, and worms, and serve as an important element of ecological communities and food chains for aquatic invertebrates, such as fish and amphibians. These organisms possess a wide array of life histories and preferences and tolerance of poor water quality. In Shasta Reservoir, seasonal fluctuations in phytoplankton biomass regulate the abundance of the zooplankton, which form the base of the food chain for the reservoir's fisheries.

Vegetation Communities

The Shasta Reservoir and vicinity area is characterized by a variety of vegetation types typical of transitional mixed woodland and low-elevation forest habitats. Forests and woodlands are dominated by Knobcone pine, ponderosa pine, blue oak, black oak, canyon live oak, Douglas-fir and a high shrub diversity. Vegetation in each of these series varies, with dramatic changes often occurring in relation to aspect, slope, geologic substrate, or juxtaposition with other habitats.

Methods

Environmental Science Associates (ESA) reviewed publicly available data and subscription-based biological resource data. Data sources that assisted in this analysis included:

- Aerial imagery (Google Earth 2021);
- The CDFW California Natural Diversity Database (CNDDB) list of plant and wildlife species documented on the following 4 quadrangles: Minnesota Mountain (4012272), O'Brien (4012273), Bollibokka Mountain (4012282), and Hanland Peak (4012283) (CDFW 2021);
- The California Native Plant Society (CNPS) online database of plant species documented on the following 12 quadrangles: Minnesota Mountain, O'Brien, Bollibokka Mountain, and Hanland Peak (4012283) (CNPS 2021); and
- The U.S. Fish and Wildlife Service (USFWS) list of species that may occur in the vicinity of the Study Area (USFWS 2021).

The USFWS, CDFW CNDDB, and CNPS lists are provided in **Appendix A**. The CDFW CNDDB and CNPS lists include special-status species documented on the following 4 quadrangles:

- Minnesota Mountain
- O'Brien
- Bollibokka Mountain
- Hanland Peak

Special-Status Species

Special-status species are legally protected under the California Endangered Species Act (CESA) and Federal Endangered Species Act (FESA) or other regulations or are considered sufficiently rare by the scientific community to qualify for such listing. These species fall into several categories:

(1) Species listed or proposed for listing as threatened or endangered under the FESA (Code of Federal Regulations Title 50, Sections 17.12 [listed plants] and 17.11 [listed animals], and various notices in the *Federal Register* [FR] [proposed species]).

(2) Species that are candidates for possible future listing as threatened or endangered under the FESA (FR Title 61, No. 40, February 28, 1996).

(3) Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (California Code of Regulations Title 14, Section 670.5).

(4) Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).

(5) Animal Species of Special Concern to CDFW.

(6) Animals fully protected under the California Fish and Game Code (Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

(7) Species that meet the definitions of rare and endangered under CEQA. CEQA Section 15380 provides that a plant or animal species may be treated as rare or endangered even if the species is not on one of the official lists (State CEQA Guidelines Section 15380).

(8) Plants considered by CDFW and CNPS to be rare, threatened, or endangered in California (California Rare Plant Ranks [CRPRs] 1A, 1B, 2A, 2B, 3, and 4).[1]

Species recognized under these terms are collectively referred to as "special-status species."

A list of special-status plant and wildlife species considered to potentially occur within the project sites and staging areas (i.e., Study Area) was developed using information queried from USFWS, the CNPS, and the CNDDB (**Appendix A**). This list of species includes those species that can be found or are known to have occurred historically in the Study Area or vicinity. These species were ranked by their likelihood of occurrence within the Study Area. These rankings were assigned based on the following criteria:

- *None:* The species' required habitat is lacking or is outside of the known species range.
- *Low:* Habitat is of low quality for the species and there are no suitable migration corridors between documented occurrences and the project site and/or staging areas.
- *Moderate:* The species' required habitat occurs in the Study Area and and/or suitable migration corridors exist.
- *High:* The species has been documented in the area of impact.

Only those special-status species that have been determined to have at least moderate potential to occur in the Study Area, and/or have officially designated critical habitat or essential fish habitat that overlaps with the project footprint, are summarized in **Table 3.3-1** and analyzed in further detail in this analysis.

[1] CDFW works in collaboration with CNPS to maintain a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. These species are categorized by their rarity in the CRPR system. For further information about the CRPR system and the specific ranks, see "California Rare Plant Ranking System" in Section 3.4.3, *Regulatory Setting.*

TABLE 3.3-1
SPECIAL-STATUS SPECIES CONSIDERED IN THE STUDY AREA

Organism	Type	Common Name *Scientific Name*	Status (Federal/ State/CRPR)	Habitat Requirements	Bloom/Breeding Period	Potential to Occur
Plants	NA	Blushing wild buckwheat *Eriogonum ursinum* var. *erubescens*	NL/NL/1B.3	Chaparral, lower montane coniferous forest; 2,460 to 6,235 feet elevation.	June–September	**Low.** Marginal habitat could occur in the Study Area. Potential is low because most of the study area is below species known elevation range.
		Broad-lobed leptosiphon *Leptosiphon latisectus*	NL/NL/4.3	Broadleafed upland forest, and cismontane woodland; 560 to 4,920 feet elevation.	April–June	**Moderate.** Marginal habitat could occur in the Study Area.
		Butte County fritillary *Fritillaria eastwoodiae*	NL/NL/3.2	Openings and sometime serpentine areas in chaparral, cismontane woodland, and lower montane coniferous forest; 165 to 4,920 feet elevation.	March-June	**Moderate.** Marginal habitat could occur along the McCloud tributary of Shasta Reservoir.
		Cantelow's lewisia *Lewisia cantelovii*	NL/NL/1B.2	Mesic granite sites within broadleafed upland forest, chaparral, cismontane woodland, and lower montane; 1,000 to 4,500 feet elevation.	May–October	**Moderate.** Could occur in the Shasta Dam area, though the primary study is towards the lower range of the species known elevation range.
		Canyon Creek stonecrop *Sedum paradisum*	NL/NL/1B.3	Granitic, rocky areas in broadleafed upland forest, chaparral, lower montane coniferous forest, and subalpine forest; 985 to 6,235 feet elevation.	May–June	**Moderate.** Marginal habitat could occur in the Study Area.
		Heckner's lewisia *Lewisia cotyledon* var. *heckneri*	NL/NL/1B.2	Lower montane coniferous forest; 740 to 6,890 feet elevation.	May- July	**Moderate.** Marginal habitat could occur in the Study Area.
		Howell's lewisia *Lewisia cotyledon var. howellii*	NL/NL/3.2	Broadleafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest; 490 to 6,595 feet elevation.	April-July	**Moderate.** Marginal habitat could occur in the Study Area.
		Northern clarkia *Clarkia borealis ssp. borealis*	NL/NL/4.3	Chaparral, cismontane woodland, and lower montane coniferous forest; 1,310 to 5,135 feet elevation.	June-September	**Low.** Marginal habitat could occur in the Study Area. Potential is low because most of the Study Area is below species known elevation range.
		Oval-leaved viburnum *Viburnum ellipticum*	NL/NL/2B.3	Chaparral, cismontane woodland, lower montane coniferous forest; 700 to 5,000 feet elevation.	May-June	**Moderate.** Marginal habitat is present in the Study Area.
		Shasta ageratina *Ageratina shastensis*	NL/NL/1B.2	Rocky carbonate outcrops in chaparral and lower montane coniferous forest; 1,300 to 5,000 feet elevation.	June-October	**Low.** Could occur near project if suitable outcrops are present. Potential is low because most of the Study Area is below species known elevation range.

TABLE 3.3-1 (CONTINUED)
SPECIAL-STATUS SPECIES CONSIDERED IN THE STUDY AREA

Organism	Type	Common Name *Scientific Name*	Status (Federal/ State/CRPR)	Habitat Requirements	Bloom/Breeding Period	Potential to Occur
Plants	NA	Shasta County arnica *Arnica venosa*	NL/NL/4.2	Cismontane woodland and lower montane coniferous forests; often in disturbed areas and roadcuts; 1,100 to 4,900 feet elevation.	May-July	**Low.** Could occur along the Study Area. Potential is low because most of the Study Area is below species known elevation range.
		Shasta fawn lily *Erythronium shastense*	NL/NL/1B.2	Cismontane woodland and lower montane coniferous forest; 1,150 to 3,345 feet elevation.	February-April	**Moderate.** Habitat could occur in the Shasta Dam area, though the primary study is towards the lower range of the species known elevation range.
		Shasta huckleberry *Vaccinium shastense*	NL/NL/1B.3	Chaparral, cismontane woodland, lower montane coniferous forest, riparian forest, and subalpine coniferous forest; 1,065 to 4,005 feet elevation.	June-September	**Moderate.** Marginal habitat could occur in the Study Area.
		Shasta limestone monkeyflower *Erythranthe taylorii*	NL/NL/1B.1	Cismontane woodland and lower montane coniferous forest; 1,165 to 3,215 feet elevation.	February-May	**Moderate.** Marginal habitat could occur in the Study Area.
		Shasta maidenhair fern *Adiantum shastense*	NL/NL/4.3	Lower montane coniferous forest; 1,085 to 5,035 feet elevation.	April-August	**Moderate.** Marginal habitat could occur in the Study Area.
		Shasta snow-wreath *Neviusia cliftonii*	NL/CSC/1B.2	Carbonate substrates in cismontane woodland, lower montane coniferous forest, and riparian woodland; 1,000 to 1,900 feet elevation.	April-June	**Moderate.** Marginal habitat is present in the Study Area.
Wildlife	Invertebrates	Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT/NL/NL	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus nigra* ssp. *caerulea*). Prefers to lay eggs in elderberries 2–8 inches in diameter.	Adults emerge in spring until June. Exit holes visible year-round	**Low**. The Study Area is not considered to provide suitable habitat.
		Conservancy Fairy Shrimp *Branchinecta conservatio*	FE/NL/NL	Conservancy fairy shrimp inhabit rather large, cool-water vernal pools with moderately turbid water.	November-early April	**Low**. The Study Area is not considered to provide suitable habitat.
		Vernal Pool Fairy Shrimp *Branchinecta lynchi*	FT/NL/NL	Habitat primarily occurs in vernal pools, seasonal wetlands, and stagnant ditches that fill with water during fall and winter rains and dry up in spring and summer.	Wet season, November-early April	**Low**. The Study Area is not considered to provide suitable habitat.
		Vernal Pool Tadpole Shrimp *Lepidurus packardi*	FE/NL/NL	Vernal pool tadpole shrimp occur in a wide variety of ephemeral wetland habitats.	Wet season, November-early April	**Low**. The Study Area is not considered to provide suitable habitat.

TABLE 3.3-1 (CONTINUED)
SPECIAL-STATUS SPECIES CONSIDERED IN THE STUDY AREA

Organism	Type	Common Name *Scientific Name*	Status (Federal/ State/CRPR)	Habitat Requirements	Bloom/Breeding Period	Potential to Occur
Wildlife	Amphibians	California red-legged frog Rana draytonii	FT/NL/NL	Requires aquatic habitat for breeding; also uses a variety of other habitat types, including riparian and upland areas.	January-March	**Low.** The Study Area is considered to be outside the current species range.
		Foothill yellow-legged frog *Rana boylii*	NL/CE/NL	Found in rocky streams in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, and mixed chaparral.	Breeding season mid-March-May	**Low**. The Study Area is not considered to provide suitable habitat. May occur in stream habitats.
		Pacific tailed frog *Ascaphus truei*	NL/CSC/NL	Preferred habitat is fast-moving streams. They are mostly aquatic but adults may emerge during cool, wet conditions to forage terrestrially.	Breeding occurs May through September.	**Low**. The Study Area is not considered to provide suitable habitat. May occur in stream habitats.
		Shasta salamander *Hydromantes shastae*	NL/CT/NL	Habitat consists of mixed conifer, woodland, and chaparral habitats, especially near limestone.	Late summer-late fall.	**Low**. The Study Area is not considered to provide suitable habitat. May occur in woodland habitats or near limestone.
	Reptiles	Western pond turtle *Emys marmorata*	FU/CSC/NL	Uses ponds, wetlands drainage canals, streams, marshes sloughs, lakes and other aquatic habitat with basking habitat and adjacent upland habitat with suitable soils for nesting.	Active typically February–November. Can be active year-round depending on temperatures.	**Moderate.** Suitable aquatic and upland habitat within the Study Area.
	Fish	Rough Sculpin *Cottus asperrimus*	NL/CT/NL	Prefers sand or gravel substrate in cool streams or reservoirs. Spawns in streams.	Variable; fall through spring.	**High**. Potential to occur along reservoir banks and substrate in Study Area.
		Riffle sculpin (*Cottus gulosus*)	NL/CSC/NL	Prefers cool, rocky, fast flowing headwater streams	February-April	**Low:** The Study Area is unlikely to encompass high velocity, rocky stream habitat
		Rainbow trout *Oncorhynchus mykiss*	NL/NL/NL	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries.	January–June	**High.** Occurs in Shasta Reservoir.
		Bull trout *Salvelinus confluentus*	FT/CE/NL	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries.	September-October	**None.** Previously found in the McCloud River. Now considered extirpated from California.
		White Sturgeon *Acipenser transmontanus*	NL/CSC/NL	White Sturgeon are native to the West coast of North America. Sturgeon are benthic oriented species.	February to June	**High.** Occurs in Shasta Reservoir

TABLE 3.3-1 (CONTINUED)
SPECIAL-STATUS SPECIES CONSIDERED IN THE STUDY AREA

Organism	Type	Common Name *Scientific Name*	Status (Federal/ State/CRPR)	Habitat Requirements	Bloom/Breeding Period	Potential to Occur
Wildlife	Fish	Hardhead *Mylopharodon conocephus*	NL/CSC/NL	Hardhead are often found in small aggregations in streams in pools and runs, primarily in the benthic zone.	April-May	**High.** Occurs in Shasta Reservoir
	Birds	Bald eagle *Haliaeetus leucocephalus*	FD/CE/NL	Occur in riverine and lacustrine habitats. Adults typically build large, stick nests in tall trees.	Year-round; breeding in California lasts from January through August.	**High**. The Study Area occurs within the known distribution range of this species and suitable nesting habitat is present. Common at Shasta Reservoir and nests known to occur in vicinity.
		Osprey *Pandion haliaetus*	NL/NL/NL	Occur in riverine and lacustrine habitats. Found near water. Usually nest on top of large trees.	Year round	**High**. Suitable habitat occurs in the Study Area.
		Purple Martin *Progne subis*	NL/CSC/NL	Habitat found in forest and woodland areas at low to intermediate elevations.	Spring	**Moderate.** Potentially occurring in conifer, woodland, and riparian habitats. Foraging habitat occurs throughout Shasta Reservoir and vicinity. Nests along the Pit River Arm. Shasta Reservoir is one of the few known breeding sites in interior northern California.
		Clark's Grebe *Aechmophorus clarkia*	NL/NL/NL	Clark's Grebes nest on large freshwater lakes and marshes whose edges have emergent vegetation such as reeds and rushes.	June - August	**High**. Suitable habitat occurs in the Study Area.
		Northern spotted owl *Strix occidentalis caurina*	FT/NL/NL	Habitat found in forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops.	February- June	**Low.** The Study Area provides only marginally suitable habitat since this species prefers wider older growth forests**.**
		Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT/CE/NL	Yellow-billed cuckoo use a riparian habitats. Cottonwood and willow trees are an important foraging habitat.	June-August	**Low.** The Study Area provides only marginally suitable habitat since this species prefers wider riparian corridors**.**
	Mammals	Townsend's big-eared bat *Lasiurus blossevillii*	NL/CSC/NL	Townsend's big-eared bats have been reported in a wide variety of habitat types including coniferous forests, mixed meso-phytic forests, riparian communities, active agricultural areas, and others. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat. They prefer open roosting areas and do not tuck themselves into cracks and crevices like many bat species do.	Year-round	**Moderate**. There is potential roosting habitat for this species in the riparian trees in and around the Study Area.

TABLE 3.3-1 (CONTINUED)
SPECIAL-STATUS SPECIES CONSIDERED IN THE STUDY AREA

Organism	Type	Common Name *Scientific Name*	Status (Federal/ State/CRPR)	Habitat Requirements	Bloom/Breeding Period	Potential to Occur
Wildlife	Mammals	Silver-haired Bats (*Lasionycteris noctivagans*)	NL/NL/NL	Feeds less than 6 m (20 ft) above forest streams, ponds, and open brushy areas. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark. Reproduction: Females may form nursery colonies or occur as solitary individuals in dense foliage or hollow trees. Water: Needs drinking water. Primarily a forest dweller, feeding over streams, ponds, and open brushy areas.	Mates in autumn, beginning in late August.	**Moderate.** Potential for suitable habitat to occur in the Study Area.
		Gray wolf (Canis lupus)	CE/FE/NL	Gray wolves are generalist species that live in a variety of habitats in California, included mixed wooded areas in northern California. The Shasta pack was last detected in 2015.	January - March	**Low**. The Study Area is not considered to provide suitable habitat. May occur in upland woodland habitats.
		Fisher *Pekania pennanti*	NL/CSC/NL	Mature and late-successional coniferous or mixed forests that contain key habitat and structural components provide the most suitable fisher habitat.	Late February – late April	**Moderate.** Potential for suitable habitat to occur in the Study Area.

KEY TO STATUS CODES:

Federal

FE = federal endangered
FT = federal threatened
FC = candidate
PT = proposed threatened
FPD = proposed for delisting
FD = delisted
FSC = federal species of concern (USFWS or NMFS)
FU = Under Review for Listing
EFH = Essential Fish Habitat
NL = not listed

California

CE = California State endangered
CT = California State threatened
CR = California State rare
CSC = California species of special concern
CCT = California State threatened candidate
CFP = California fully protected
NL = not listed

CNPS

Rank Categories:

1A = Plants presumed extirpated in California and either rare or extinct elsewhere
1B = Plants Rare, Threatened, or Endangered in California and elsewhere
2A = Plants presumed extirpated in California, but more common elsewhere
2B = Plants Rare, Threatened, or Endangered in California, but more common elsewhere
3 = Plants about which more information is needed - A Review List
4 = Plants of limited distribution - A Watch List

Code Extensions:

.1 = Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 = Fairly endangered in California (20–80% occurrences threatened)
.3 = Not very endangered in California (less than 20% of occurrences threatened or no current threats known)

Sources: CNPS 2021; USFWS 2021; CDFW 2021

3.3.2 Discussion

a) *Less-than-Significant Impact with Mitigation.* Impacts on special-status species with moderate or high potential to occur are discussed below. The proposed Project may result in potentially significant impacts on special-status species. With implementation of the applicable mitigation measures listed below, the proposed Project's impact on special-status species would be less than significant.

Special-Status Plants

The plant species described in Table 3.3-1 have potential habitat present in the Study Area. The shoreline in many portions of the Study Area is subject to pedestrian traffic, limiting the potential for the establishment of these special-status species. Nonetheless, these plant species still have a potential to be present along the shoreline and be trampled by construction equipment or personnel during the installation and removal of the JSCS. This is a potentially significant impact. With implementation of **Mitigation Measure BIO-1** listed below, which include conducting a focused botanical survey and, if found, avoiding them to the extent feasible, the impact on special-status plants would be less than significant.

> **Mitigation Measure BIO-1**: A focused botanical survey shall be conducted for special-status plant species prior to the commencement of construction activities.
>
> If any of the non-listed special-status plants are found, they shall be avoided to the extent feasible. If the plants cannot be avoided, a mitigation plan shall be prepared prior to the commencement of construction and/or maintenance activities. The mitigation plan shall include the development and implementation of a replanting plan (collection of seeds, revegetation, and management and monitoring of the habitat to ensure success) for any individuals of the species that cannot be avoided.

Special-Status Invertebrates

While special-status invertebrates may be present in the Shasta Reservoir basin, they are not expected to be present within the reservoir in the Study Area. Therefore, no impact is expected due to the proposed Project.

Special-Status Reptiles and Amphibians

While Pacific Tailed Frogs and Foothill Yellow-Legged Frogs may be present in the Shasta Reservoir Basin nearby, they are not expected to be present in the reservoir or immediately adjacent to the reservoir at the Study Area. Likewise, Shasta Salamanders are expected to be present in adjacent woodland habitats but are not expected to be present in the Study Area.

Western Pond Turtle

Open water habitat and adjacent habitat within the Study Area provides suitable habitat for western pond turtle. The JSCS installation, maintenance, and removal process could result in disturbance of open water habitat. This impact is expected to be minimal since the turtles are expected to be able to easily swim away from the construction activity.

As described in the Protective Environmental Measures section of the Project Description, construction personnel will participate in a worker environmental awareness program, which would inform them about the potential presence of western pond turtles, as well as their life history. Furthermore, with implementation of **Mitigation Measure BIO-2** listed below, which involves the installation of exclusion fencing to prevent western pond turtles from entering into work areas, the potential impact on western pond turtles would be reduced to a less-than-significant level.

> **Mitigation Measure BIO-2**: Pre-construction surveys for western pond turtle shall be conducted within 48 hours prior to any ground disturbance activities. If any western pond turtles are observed on land during the pre-construction survey, to avoid potential nests, suitable upland habitat within 100 feet of aquatic habitat shall be flagged and avoided. An on-site biological monitor shall be present for any on-land construction activities, to conduct morning surveys before the start of the construction work for the day for western pond turtle within the project site as well as check the conditions of the exclusion fence daily and make any necessary repairs. If any western pond turtles are observed during construction, work shall stop until the turtle moves away from construction zone on its own accord. If the turtle does not move on its own volition, the monitor may request permission from CDFW to relocate the turtle to suitable aquatic habitat out of harm's way. Vehicles parked overnight on-site shall be checked before they are moved for the presence of western pond turtles that may be taking shelter under the vehicle. To avoid the loss of western pond turtle nests and eggs as a result of construction, exclusion fencing shall be installed along the landward perimeter of the work areas to minimize the potential for turtles to nest in these areas. The exclusion fencing shall extend down the channel bank. A small gap in the exclusion fencing may be present to facilitate ingress and egress of construction equipment and personnel into the work areas from nearby roadways, however this opening shall be minimized to the maximum extent feasible. The exclusion fencing shall consist of silt fence material. Fences shall be installed up to a depth of 6 inches below the ground surface to prevent turtles from going under the fence. Fences shall be installed between May 1 and October 1 and remain in place until after the barrier and associated equipment and material are completely removed.

Special-Status Birds

Purple Martin

Although riparian habitat within the Study Area could represent suitable habitat for western Purple Martin, the likelihood that this species is using habitat within the project footprint or in the vicinity of the Study Area is minimal because riparian habitat in the project vicinity is limited. However, potential impacts on Purple Martin that might use riparian habitat adjacent to the Study Area during migration would be significant. As described in the Protective Environmental Measures section of the Project Description, construction personnel will participate in a worker environmental awareness program, which would inform them about Purple Martin life history and habitat. Given implementation of **Mitigation Measure BIO-3—**which includes conducting pre-construction surveys and establishing appropriate buffers if any are observed nesting—the impact on Purple Martin would be less than significant with mitigation incorporated.

Mitigation Measure BIO-3: If construction activities begin during the nesting season (February 1 to August 31), a qualified biologist shall conduct pre-construction surveys within the staging areas or in-water work. The biologists shall survey a 500-foot buffer around the work areas. The pre-construction surveys shall be conducted within 72 hours prior to the commencement of ground-disturbing activities. If construction does not commence within 72 hours of the pre-construction surveys, or halts for more than 72 hours, additional pre-construction surveys shall be conducted if work is expected to resume during the nesting season.

If any active nests of birds protected under the Fish and Game Code and/or MBTA are located within or in the vicinity of the staging areas or in the vicinity of the in-water work areas, an appropriate buffer zone shall be established around the nests, as determined by the project biologist. The biologist shall mark the buffer zone with construction tape or pin flags and maintain the buffer zone until the end of the breeding season or until the nest is no longer active. Buffer zones are typically 100 feet for migratory bird nests and up to 500 feet for raptor nests.

Clark's Grebe

Open freshwater habitat within the Study Area provides potential suitable foraging and nesting habitat for Clark's Grebe. Noise disturbance could be disruptive to nesting behavior if nest sites are established before JSCS installation and operation. In such a circumstance, it could result in the diminished likelihood of nesting success. Adherence to Mitigation Measure BIO-3, described previously, will establish appropriate nest buffer zones if active nests of species protected by the Migratory Bird Treaty Act (MBTA) are found and will reduce the impact on nesting bird species to less than significant.

Bald Eagle and Osprey

The riparian habitat in the Study Area provides potential habitat for nesting birds protected by the MBTA, including raptors such as the Bald Eagle and Osprey. Noise disturbance could be disruptive to nesting behavior if nest sites are established before JSCS installation and operation. In such a circumstance, it could result in the diminished likelihood of nesting success. Adherence to Mitigation Measure BIO-3, described previously, will establish appropriate nest buffer zones if active nests of species protected by the MBTA are found and will reduce the impact on nesting bird species to less than significant.

Special-Status Mammals

Townsend Big-Eared bat

Townsend's Big-Eared Bat roost in mines or caves outside of the Study Area and therefore are unlikely to be impacted by the proposed Project.

Silver-haired bat

Silver-haired Bats have the potential to roost in the trees within the Study Area. However, tree removal is not anticipated with the proposed Project, therefore direct take will not occur due to the proposed Project. With implementation of **Mitigation Measure BIO-4**, which calls for a pre-construction survey for special-status bats, the establishment of an avoidance buffer if bats are found, and authority to a qualified biologist to stop work if it

is determined to be causing adverse effects on special-status bats, the impacts on Silver-haired Bats would be reduced to less than significant with mitigation incorporated.

Gray Wolf

Gray wolf prefer upland wooded forests. The Shasta pack has not been documented in the area since 2015. They are unlikely to be present within the Study Area.

Fisher

Fishers prefer thick coniferous or mixed coniferous and hardwood forests habitats with ample tree cover and lots of hollow trees for dens. They are unlikely to be present within the Study Area.

> **Mitigation Measure BIO-4**: Within 48 hours prior to project activities within 100 feet of suitable bat roosting trees (larger than 24 inches in diameter at breast height and trees with deep bark crevices, snags, or holes), a qualified biologist shall conduct a pre-construction survey for special-status bats. If no special-status bats are observed roosting, the qualified biologist shall provide a letter report documenting the results of the survey, and no additional measures are recommended.
>
> If bats are found in the area where construction-related activities will occur, a minimum 100-foot avoidance buffer shall be established around the roost/maternity area until it is no longer occupied, as determined by a qualified biologist. High-visibility construction fencing shall be installed around the buffer and shall remain in place until bats no longer occupy the tree. The tree shall not be removed or modified and the buffer shall remain in place until a qualified biologist has determined that the bats are no longer occupying the roost. If maternity roosts are found, they shall be avoided until the offspring have fledged.
>
> If construction activities must occur within the avoidance buffer, CDFW shall be notified. A qualified biologist shall monitor the work either continuously or periodically, as determined by the biologist. The qualified biologist shall be empowered to stop activities that, in the biologist's opinion, threaten to cause unanticipated and/or unpermitted adverse effects on special-status bats. If construction activities are stopped, the qualified biologist shall consult with CDFW to determine appropriate measures that DWR will implement to avoid adverse effects.

Special-Status Fish

The Study Area provides habitat for two California Species of Special Concern including Hardhead, White Sturgeon, Rough Sculpin, and Riffle Sculpin. The installation and removal of the JSCS have the potential to harass and displace fishes present in the general area of the construction activity. General disturbance could startle fish away from in-water activity areas, making them more susceptible to predation if predators have not also been startled. Increased anthropogenic noise could make fish more susceptible to predation by elevating stress (reducing startle responses because of reduced locomotor activity or attention), increasing distraction, or masking acoustic cues indicating the approach of a predator.

Installation and removal of the JSCS anchoring system have the potential to affect special-status fish because of brief sediment disturbance/turbidity. Fish could be affected by brief increases in turbidity, increased suspended sediments, and increased water column concentration of contaminants that would otherwise be located in the substrate. The potential effects of these activities would be minimized for special-status fish for the following reasons:

- The in-water installation/removal work would be temporary (e.g., only occur over the course of seven days).
- No underwater construction noise effects are expected since the JSCS will be temporarily anchored, with no permanent structures that would require noise-generating activities (e.g., pile driving).
- Most fish would be expected to move away from the area of disturbance.

Therefore, the potential disturbance of special-status fish is considered less than significant.

b) *Less-than-Significant Impact.* Overall, the potential impacts on sensitive natural communities, including riparian habitat, are expected to be minimal. Most of the shoreline area of Shasta Reservoir is barren of vegetation and is characterized as exposed soil and/or rock. When the reservoir is not near capacity, most of the wetted shoreline is far removed from any woody vegetation. The operation of Shasta Dam produces increasing flow volumes during the period of cottonwood seed dispersal (rather than flow volume decreasing during this period), largely precluding establishment of cottonwoods (and to a lesser extent willows) throughout much of the riparian zone. In addition to limited existing riparian vegetation, the proposed Project is not expected to remove or alter any riparian plant species.

c) *Less-than-Significant Impact*. Discussion of impacts on State or federally protected waters is provided below. Based on the very minor temporary impacts on the bed of Shasta Reservoir, the impact on State or federally protected waters would be less than significant.

There would be a temporary loss of benthic habitat because of the guidance net, temperature curtain, and anchoring system, which would result in a temporary reduction in benthic habitat for native fish species, such as White Sturgeon, Hardhead, Sacramento Sucker, Tui Chubs, and Riffle Sculpin that feed in the benthic zone. Given the small-scale loss of habitat and the fact that the placement of the JSCS would occur for only a few months out of the year (and be removed completely after the completion of the study), the proposed Project would have a less-than-significant impact on waters of the United States and the habitat functions provided by those waters.

d) *Less-than-Significant Impact.* Discussion of impacts on migratory corridors of native resident or migratory fish and wildlife species is provided below. Based on the rationale provided below, the impact on migratory habitat is considered to be less than significant.

Operation of the JSCS could temporarily interfere with the local movement of native resident or migratory fish species. The JSCS guidance net may hinder the upstream movement of native fish species, such as Rainbow Trout, Sacramento Sucker, Sacramento Pikeminnow, White Sturgeon, Rough Sculpin, Hardhead, Sacramento Blackfish, Riffle Sculpin, Tule Perch, and Tui Chub. In particular, Rainbow Trout have been observed to migrate upstream into Shasta Reservoir tributaries during the spring and fall months and their migration may be delayed by the JSCS structure.

However, the potential impacts to fish movement and migration would be minimized due to the inclusion of eight openings across the guidance net structure to allow upstream movement of fish past the JSCS. Eight fish passage devices will be located in the guidance net, four located on the reservoir bottom and four located five feet below the water surface. The variability in depth of openings will facilitate passage of native fish species with a range of habitat preferences from benthic oriented species such as White Sturgeon, Hardhead, Rough Sculpin, Riffle Sculpin, Sacramento Sucker, and Tui Chubs, to more pelagic oriented species such as Rainbow Trout, Sacramento Pikeminnow, Sacramento Blackfish, and Tule Perch. In addition to guidance net openings, the installation and operation of the JSCS will be temporary (September through November), limiting impact to fish movement.

Operation of the JSCS could also temporarily interfere with the local movement of Western Pond Turtle or other reptile and amphibian species. However, the impacts to wildlife movement would be minimized for the following reasons:

- Western Pond Turtle and other reptile and amphibian species are not migratory and only localized movement would be impeded.
- The placement of the JSCS would be chosen to avoid large woody debris or other in-water structures that would create suitable habitat for Western Pond Turtle or other reptile or amphibian species.
- The mesh size of the JSCS guidance net is 1/8 inches, and therefore is too small to impinge juvenile or adult Western Pond Turtles or other wildlife species.
- Daily spot-checks of the guidance net will be performed by a qualified biologist to look for trapped wildlife species as described in the biological monitoring measure of the Protective Environmental Measures section of the Project Description.

The Shasta Reservoir basin provides nesting and migration habitat for numerous native resident and migratory birds. Noise disturbance could be disruptive to nesting behavior if nest sites are established before JSCS installation and operation. In such a circumstance, it could result in the diminished likelihood of nesting success. Adherence to Mitigation Measure BIO-3, described previously, will establish appropriate nest buffer zones if active nests of species protected by the MBTA are found and will reduce the impact on nesting bird species to less than significant.

Overall, the proposed Project is expected to have minimal effects on the movement patterns or migration of non-target species. As such, the impact is considered to be less than significant.

e) *No Impact*. The proposed Project is not expected to conflict with any local policies or ordinances protecting biological resources. The proposed Project is constrained to in-water work within Shasta Reservoir, and will have minimal impact to the shoreline, with no trees or vegetation expected to be removed that may conflict with local policies or ordinances.

f) *No Impact*. The proposed Project is not expected to conflict with any habitat conservation plans (HCPs). Shasta County does not have an approved HCP in the region.

3.4 Cultural Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
CULTURAL RESOURCES — Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

3.4.1 Environmental Setting

This section examines the potential impacts of the proposed Project on cultural resources. Tribal cultural resources are addressed in Section 3.11, *Tribal Cultural Resources*. For the purposes of this analysis, the term *cultural resource* is defined as follows:

> Native American and historic-era sites, structures, districts, and landscapes, or other evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or another reason. These resources include the following types of CEQA-defined resources: historical resources, archaeological resources, and human remains.

Records Search

In June 2021, ESA conducted a cultural resources records search for the Study Area and vicinity at the Northeastern Information Center (NEIC) at Chico State University. The records search was amended with additional information following the expansion of the Project Area in April 2022.

The NEIC maintains the official California Historical Resources Information System (CHRIS) records of previous cultural resources studies and recorded cultural resources for the Study Area Limit and vicinity. The Study Area for the records search consisted of the Study Area with a 0.25-mile buffer (**Table 3.4-1**).

Fifteen archaeological sites; nearly all of which are indigenous or have an indigenous component are within 0.25-mile radius. An additional 22 sites are on file at the NEIC as being within the Study Area (NEIC 2021, 2022). In addition, the project area is within the proposed Winnemem Wintu Tribal Cultural Landscape (WWTCL), a potential Tribal Cultural Resource (TCR) that contains some 600+ archaeological, natural, and spiritual resources known and mapped by the WWT. The locations of these resource and their nature are known only to the WWT. Further consultation with the WWT when specific deployment locations of the JSCS are chosen will be necessary to further define the presence of cultural resources.

TABLE 3.4-1
RESULTS OF RECORDS SEARCH

P Number	Trinomial	Description
P-45-000001	CA-SHA-000001	Lithic scatter, habitation debris
P-45-000002	CA-SHA-000002	Lithic scatter, bedrock milling features, habitation debris, historic-era deposit
P-45-000003	CA-SHA-000003/H	Lithic scatter, historic-era deposit, burials
P-45-000004	CA-SHA-000004	Indigenous habitation deposit, house pit, burials
P-45-000005	CA-SHA-000005	House pits, habitation debris
P-45-000006	CA-SHA-000006	Housepits, burials
P-45-000023	CA-SHA-000023/H	Indigenous habitation deposit, house pits, historic-era deposit
P-45-000024	CA-SHA-000024	House pits, human bone
P-45-000025	CA-SHA-000025/H	House pits, historic-era deposit
P-45-000026	CA-SHA-000026	Village site
P-45-000027	CA-SHA-000027	Lithic scatter, habitation debris, house pits
P-45-000030	CA-SHA-000030	Housepits
P-45-000031	CA-SHA-000031	Lithic scatter, indigenous habitation debris, bedrock milling feature
P-45-000869	CA-SHA-000869	Lithic scatter, bedrock milling feature
P-45-001761	CA-SHA-001761	Lithic Scatter, historic-era retaining walls

Shipwrecks Databases

The California State Lands Commission (SLC) maintains a Shipwrecks Database that currently identifies approximately 1,550 recorded shipwrecks in California. In June 2021, ESA accessed the SLC Shipwrecks Database website and obtained the current Shipwrecks Database. The Shipwrecks Database has no record of any shipwrecks in Shasta County, including within the Study Area.

Also, NOAA maintains an online interactive database of shipwrecks derived from historic nautical charts at https://wrecks.nauticalcharts.noaa.gov/viewer/. ESA conducted a search of this database for the Study Area in June 2021, in which no shipwrecks were identified in or adjacent to the Study Area.

Ethnographic Literature Research

A summary of WWT culture and history is presented in Section 3.11.

Native American Correspondence

DWR contacted the California Native American Heritage Commission (NAHC) in May 2021 in request of a search of the NAHC's Sacred Lands File (SLF) and a list of Native American Tribes that may have interest in the proposed Project. The NAHC reply stated that the SLF has records of sacred sites in the Study Area. The reply also included a list of point of contact individuals, representing five California Native American Tribes, to contact regarding these resources and who may be interested in the proposed Project.

In support of required Native American consultation for the proposed Project pursuant to Public Resources Code Section 21080.3, as well as in accordance with the California Natural Resources Agency's *Final Tribal Consultation Policy* and DWR's *Tribal Engagement Policy*, DWR sent letters on May 26, 2021 via certified mail, to the following Native American representatives: Art Bunce, Barona Band of Mission Indians Tribal Attorney; Genevieve Jones, Big Pine Paiute Tribe of the Owens Valley Chairperson; Jairo Avila, Fernandeño Tataviam Band of Mission Indians Tribal Historic and Cultural Preservation Officer; Sara Dutschke Setshwaelo, Ione Band of Miwok Indians Chairperson; Alex R. Watts-Tobin, Karuk Tribe Tribal Historic Preservation Officer; Dennis Ramirez, Mechoopda Indian Tribe of Chico Rancheria Chairperson; Stephanie L. Reyes, Middletown Rancheria of Pomo Indians of California Tribal Historic Preservation Officer; Katherine Erolinda Perez, North Valley Yokuts; Agnes Gonzalez, Pit River Tribe Chairperson; Cami Mojado, San Luis Rey Band of Mission Indians Cultural Resources Manager; Jessica Mauck, San Manuel Band of Mission Indians (SMBMI) Director of Cultural and Site Preservation Officer; Leo Sisco, Santa Rosa Rancheria Tachi Yokut Tribe Chairperson; Regina Cuellar, Shingle Springs Band of Miwok Indians Chairperson; Colin Rambo, Tejon Indian Tribe Cultural Resource Technician; Gene Whitehouse, United Auburn Indian Community of the Auburn Rancheria of California (UAIC) Chairperson; Herbert (Lou) Griffin, Wilton Rancheria Director of Cultural Resources; Anthony Roberts, Yocha Dehe Wintun Nation (YDWN) Chairperson; John Hayward, Nor-Rel-Muk Wintu Nation Chairperson; Tracy Foster-Olstad, Nor-Rel-Muk Wintu Nation Cultural Resources Officer; Jack Potter, Redding Rancheria Chairperson; Roy Hall, Shasta Nation Chairperson; Caleen Sisk, WWT Chief; Mark Miyoshi, WWT Tribal Historic Preservation Officer; and Wade McMaster, Wintu Tribe of Northern California Chairperson. These letters provided information on the proposed Project and requested that the recipients notify DWR if they would like to consult pursuant to Public Resources Code Section 21080.3.

To date, DWR has received responses from three of the Tribes contacted. Mark Miyoshi, THPO for WWT, formally requested to have Assembly Bill (AB) 52 consultations with DWR in a letter dated July 9, 2021. DWR responded on August 17, 2021 acknowledging that WWT was a consulting Tribe under AB 52 for the Project. Jamie Nord, SMBMI Cultural Resources Technician, sent an email to DWR on June 8, 2021, stating that the proposed Project is outside of SMBMI's ancestral territory and the SMBMI does not wish to consult on the proposed Project. Anna Starkey, UAIC Cultural Regulatory Specialist, sent an email to DWR on June 8, 2021, stating that the UAIC does not have any comments on the proposed Project at this time. Victoria Delgado, YDWN Administrative Assistant sent an email with an attached letter to DWR on June 11, 2021, stating that the YDWN would like to consult with DWR on the proposed Project.

Tribal consultation is ongoing. No other Tribal correspondence on the proposed Project has been conducted to date. Documentation of the proposed Project correspondence with Native American representatives to date is included in **Appendix B**.

3.4.2 Discussion

The following analysis provides responses to checklist questions a), b) and c). Response a) focuses on impacts to architectural resources that qualify as historical resources according to CEQA Guidelines Section 15064.5. Response b) describes archaeological resources, both as

historical resources, as well as unique archaeological resources, as defined in Public Resources Code Section 21083.2(g). Response c) focuses on the for potential Project-related activities to impact human remains through installation of equipment, access routes, and operations.

a) *Less-than-Significant Impact with Mitigation.* No architectural resources were identified in the Study Area through background research. Project-related activities have the potential to impact architectural resources through installation of equipment, access routes, and operations. However, the actual Project Footprint, where proposed Project activities with potential to impact cultural resources would occur, has yet to be defined and would be much smaller than the Study Area. Therefore, it is not known whether implementing the proposed Project would impact any historical resources. Factors necessary to identify specific impacts on historical resources are the precise location of proposed Project activities and equipment, and the type and location of operational activities. Project implementation could result in significant impacts on historical resources in several ways: direct physical alteration of historical resources; ground-disturbing construction and operations activities could alter existing landscapes; and vibration generated during construction or operations could physically damage or alter nearby historical resources.

If proposed Project activities were to result in either a direct impact (e.g., physical modification, damage, or destruction) or an indirect impact (e.g., alteration to setting, including visual) on any architectural resources that qualify as historical resources as defined in CEQA Guidelines Section 15064.5, the impact would be potentially significant.

Such potentially significant impacts to historical resources would be reduced to less than significant with mitigation incorporated by implementing **Mitigation Measure CUL-1**.

Mitigation Measure CUL-1: Conduct Inventory of Architectural Resources and Avoid Any Identified in Project Footprint

Before implementation of the proposed Project and after selection of specific project footprints, an architectural resources sensitivity assessment, including a review of the NEIC records search results, and cultural resources pedestrian survey shall be conducted for the proposed Project footprint. The assessment and survey shall be done by or under the direct supervision of a qualified architectural historian, defined as one who meets the U.S. Secretary of the Interior's Professional Qualifications Standards for Architectural History or Historic Architecture, and shall include the following:

- Map(s) and verbal description of the project footprint that delineates both the horizontal and vertical extents of where the project could result in impacts, including both direct and indirect, on architectural resources.
- A review of the NEIC records search results and other archival research, such as with the U.S. Forest Service, for the project footprint.
- Background research on the land use history of the project footprint, including a review of maps and aerial photos to see if existing buildings, dams, levees, roads, or other architectural resources are in the project footprint.

- An architectural resources pedestrian survey of the project footprint in areas within 1,000 feet of deployed equipment or related staging areas will be conducted.
- If architectural resources older than 45 years are identified in the project footprint and verified through the field survey, they shall be recorded on the appropriate California Department of Parks and Recreation 523 forms (i.e., site record forms).
- A technical report meeting U.S. Secretary of the Interior's Standards for Architectural History technical reporting. This report will document the mitigation measures taken and any study results, and shall be reviewed and approved by DWR.

If any architectural resources older than 45 years are identified in the project footprint the project shall be revised so that the project footprint avoids the identified architectural resources.

b) *Less-than-Significant Impact with Mitigation.* thirty seven (37) archaeological resources—fifteen (15) within the Project Area, an additional twenty two (22) within 0.5 mile—have been identified within or near the project area. The WWT has potentially many more resources within their own files that will be considered when a specific location for JSCS deployment is determined. Archeological sites within the project area may have archaeological values; however, these values are independent of any values these sites may have as contributing elements to the WWTCL (see Section 3.11.1, below).

Project-related activities have the potential to impact archaeological resources through installation of equipment, access routes, and operations. However, the actual Project Footprint, where proposed Project activities with potential to impact cultural resources would occur, has yet to be defined and would be much smaller than the Study Area. Therefore, it is not known whether implementing the proposed Project would impact any archaeological resources. Factors necessary to identify specific impacts on archaeological resources are the precise location of proposed Project activities and equipment, and the type and location of operational activities. Project implementation could result in significant impacts on archaeological resources through direct physical alteration from project-related construction and operations activities.

If proposed Project activities were to result in either a direct impact (e.g., physical modification, damage, or destruction) or an indirect impact (e.g., alteration to setting, including visual) on any archaeological resources that qualify as historical resources, as defined in CEQA Guidelines Section 15064.5, or unique archaeological resources, as defined in Public Resources Code Section 21083.2(g), the impact would be potentially significant.

Such potentially significant impacts to archaeological resources would be reduced to less than significant with mitigation incorporated by implementing **Mitigation Measures CUL-2 to CUL-4**.

Mitigation Measure CUL-2: Conduct Inventory of Archaeological Resources and Avoid Any Identified in Project Footprint

Before implementation of the proposed Project and after selection of specific project footprints, and prior to any on-shore activities in areas without prior pedestrian survey/areas not available for prior survey (e.g., underwater areas) an archaeological resources sensitivity assessment, including a review of the NEIC records search results, and cultural resources pedestrian survey shall be conducted for the proposed Project footprint. The assessment and survey shall be done by or under the direct supervision of a qualified archaeologist, defined as one who meets the U.S. Secretary of the Interior's Professional Qualifications Standards for Archeology, and shall include the following:

- Map(s) and verbal description of the project footprint that delineates both the horizontal and vertical extents of where the project could result in impacts, including both direct and indirect, on archaeological resources.
- A review of the NEIC records search results and other archival research, such as with the U.S. Forest Service, for the project footprint.
- Background research on the land use history of the project footprint, including a review of maps and aerial photos to see if existing buildings, dams, levees, roads, or other architectural resources were formally in the project footprint.
- An archaeological sensitivity analysis of the project footprint based on mapped geologic formations and soils, previously recorded archaeological resources, previous archaeological studies, and previous Native American consultation.
- An archaeological resources pedestrian survey of the project footprint in areas within 1,000 feet of deployed equipment or related staging areas will be conducted with WWT representatives and the STNF Shasta Lake District archeologist will be invited to participate.
- If the archaeological sensitivity analysis suggests a high potential for buried archaeological resources in the project footprint, a subsurface or remote survey may also be conducted. These survey efforts could include the use of human remains detection dog teams, LIDAR, ground-penetrating radar, or subsurface auguring, soil cores, or test excavation. Prior to such effort, WWT will be consulted.
- If previous archaeological field surveys no more than two years old have been conducted for the project footprint, a new field survey is not necessary, unless the previous field methods do not conform to those required above (e.g., no subsurface survey was conducted but project footprint has high potential for buried archaeological resources).
- If archaeological resources are identified in the project footprint, they shall be recorded on the appropriate California Department of Parks and Recreation 523 forms (i.e., site record forms). Records will be shared with the Shasta Trinity National Forest, whose property is adjacent to the project, and with the CHRIS Northern Information Center. All records will be reviewed by WWT before submitted as final.

- A technical report meeting U.S. Secretary of the Interior's Standards for Archeology technical reporting. This report will document the mitigation measures taken and any study results, and shall be reviewed and approved by both DWR and WWT.

If any archaeological resources, including submerged resources, are identified in the project footprint, the project shall be revised so that the project footprint avoids the identified archaeological resources.

Mitigation Measure CUL-3: Follow Unanticipated Discovery Protocol for Archaeological Resources Identified During Project Implementation

If archaeological resources are encountered during project implementation, including construction and operation, all activity within 100 feet of the find shall cease and the find shall be flagged for avoidance. A qualified DWR 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 a WWT representative, shall be immediately informed of the discovery. The qualified archaeologist and WWT representative shall inspect the discovery. Native American archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (midden) containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls, and deposits of metal, glass, and/or ceramic refuse. If the qualified archaeologist determines that the resource is or is potentially Native American in origin, DWR shall contact culturally affiliated California Native American Tribes to assess the find and determine whether it is potentially a tribal cultural resource.

If DWR determines, based on recommendations from the qualified archaeologist and culturally affiliated California Native American Tribes, if the resource is of Native American origin, that the resource may qualify as a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in Public Resources Code Section 21074), the resource shall be avoided. Avoidance means that no activities associated with the proposed Project that may impact cultural resources shall occur within the boundaries of the resource or any defined buffer zones.

If avoidance is not feasible, DWR shall consult with its qualified archaeologist, culturally affiliated California Native American Tribes, if the resource is of Native American origin, and other appropriate interested parties to determine treatment measures to minimize or mitigate any potential impacts to the resource pursuant to Public Resources Code Section 21083.2 and CEQA Guidelines Section 15126.4.

Any treatment measures implemented shall be documented in a professional-level technical report (e.g., Archaeological Testing Results Report, Archaeological Data Recovery Report, Ethnographic Report), authored by a qualified archaeologist, to be filed with the NEIC. Project construction work at the location of the find may commence upon completion of the approved treatment, notification of the WWT and

authorization by DWR. Work may proceed in other parts of the project footprint while the mitigation is being carried out.

If, during proposed Project implementation, DWR determines that portions of the project footprint may be sensitive for archaeological resources or tribal cultural resources, DWR may authorize paid construction monitoring of these locations by an archaeologist and Native American monitor. Any monitoring by a Native American monitor shall be done under agreements between DWR and culturally affiliated California Native American Tribes.

Mitigation Measure CUL-4: Follow Unanticipated Discovery Protocol for Submerged Cultural Resources Identified During Project Implementation

If a shipwreck, and associated artifacts, or other cultural resource on or in the tide and submerged lands of California is encountered during proposed Project construction or operation, Mitigation Measures CUL-2 and CUL-3 shall be implemented, in addition to the following:

- DWR shall initiate consultation with California State Lands Commission (SLC) staff within 2 business days of the discovery.
- Per Public Resources Code Section 6313(c), any submerged cultural resource remaining in State waters for more than 50 years is presumed to be archaeologically or historically significant. However, DWR has determined that Native American archaeological sites are exempt from the Freedom of Information Act and would not be subject to PRC 6313(c).
- The qualified archaeologist shall have expertise in maritime archaeology if the find is a maritime archaeological resource.
- DWR shall consult with the SLC regarding assessment of the find and development of any treatment measures to minimize or mitigate potential impacts on the resource, pursuant to Public Resources Code Section 21083.2 and CEQA Guidelines Section 15126.4.
- DWR shall submit to the SLC any report prepared for the resource as part of the assessment of the find and implementation of treatment measures to minimize or mitigate potential impacts.

c) *Less-than-Significant Impact with Mitigation.* Project-related activities have the potential to impact human remains through installation of equipment, access routes, and operations. However, the actual Project Footprint, where proposed Project activities with potential to impact human remains would occur, has yet to be defined and would be much smaller than the Study Area. Therefore, it is not known whether implementing the proposed Project would impact any human remains. Factors necessary to identify specific impacts on human remains are the precise location of proposed Project activities and equipment, and the type and location of operational activities. Project implementation could result in significant impacts on human remains through disturbance or damage from project-related construction and operations activities. Since the nature of the proposed Project involves ground-disturbing activities, it is possible that such actions could unearth, expose, or disturb previously unknown human remains. In the event that

human remains are discovered during proposed Project implementation, impacts on the human remains resulting from the proposed Project would be significant if those remains are disturbed or damaged.

Such potentially significant impacts to human remains would be reduced to less than significant with mitigation incorporated by implementing **Mitigation Measures CUL-5 and CUL-6**.

Mitigation Measure CUL-5: Follow Unanticipated Discovery Protocol for Human Remains

If human remains are uncovered during project construction, all work shall immediately halt within 100 feet of the find and the Shasta County Coroner shall be contacted to evaluate the remains and follow the procedures and protocols set forth in CEQA Guidelines Section 15064.5(e)(1). If the County Coroner determines that the remains are Native American, the County shall contact the NAHC, in accordance with Health and Safety Code Section 7050.5(c) and Public Resources Code Section 5097.98. Per Public Resources Code Section 5097.98, DWR shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until DWR has discussed and conferred with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. If the project is determined to extend onto USFS land, and human remains, funerary items, or items of cultural patrimony are found, DWR will consult with the WWT and STNF about appropriate actions under the Native American Grave Protection and Repatriation Act of 1990.

Mitigation Measure CUL-6: Conduct Pre-Construction Cultural Resources Awareness and Sensitivity Training.

Prior to project construction, a qualified archaeologist, defined as one meeting the U.S. Secretary of the Interior's Professional Qualifications Standards (SOI PQS) for Archeology and with expertise in California archaeology, in coordination with the WWT, shall develop a Cultural Resources Awareness and Sensitivity Training Program for all construction and field workers involved in project ground-disturbing activities. The program shall include a presentation that covers, at a minimum, the types of cultural resources common to the area, regulatory protections for cultural resources, and the protocol for unanticipated discovery of archaeological resources. Written materials associated with the program shall be provided to project personnel as appropriate. Personnel working in areas of project ground-disturbing activities shall receive the training prior to working in these areas. This training will be refreshed throughout the duration of the project on a schedule determined in consultation between DWR and WWT.

3.5 Geology and Soils

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
GEOLOGY AND SOILS — 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 Division of Mines and Geology 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?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), 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 geologic feature?	☐	☐	☐	☒

3.5.1 Environmental Setting

The Study Area is located in the Cascade Range Geomorphic Province of California. The Cascade Range, a chain of volcanic cones, extends through Washington and Oregon into California. It is dominated by Mt. Shasta, a glacier-mantled volcanic cone, rising 14,162 feet above sea level. The southern termination is Lassen Peak, which last erupted in the early 1900s. The Cascade Range is transected by deep canyons of the Pit River. The river flows through the range between these two major volcanic cones, after winding across interior Modoc Plateau on its way to the Sacramento River (CGS 2002).

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. The California Geological Survey (CGS) defines an active fault as one that has had surface displacement within Holocene time

(within the last 11,000 years; the U.S. Geological Survey [USGS] uses within the last 15,000 years). A Quaternary fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently active" is also sometimes used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (CGS 2007).

For the purpose of delineating fault rupture zones, the CGS historically sought to zone faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period (the last 1.6 million years). In late 1975, the State Geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning only if it was sufficiently active and "well defined."[2] Faults that are confined to pre-Quaternary rocks (more than 1.6 million years old) are considered inactive and incapable of generating an earthquake.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting in structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults and must be set back from the fault (generally 50 feet). Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture. The Study Area is not located within an Alquist-Priolo Special Studies Zone and there are no underlying active earthquake faults (DOC 2019). According to the California Department of Conservation (DOC) (2016) earthquake shaking potential for California, the project sites are located in areas distant from known, active faults and will experience lower levels of shaking less frequently.

The Study Area is not located in an area of the Shasta County known for liquefaction (Shasta County (2004). The Study Area is in an area with moderate potential for landslides (DOC 2021).

3.5.2 Discussion

a.i) *No Impact.* Damage from surface fault rupture is generally limited to a linear zone that is a few yards wide. No active faults have been mapped within or immediately adjacent to the Study Area. The closest Alquist-Priolo earthquake fault zone—the Rocky Ledge Fault Zone—is approximately 30 miles east of the Study Area (DOC 2019). Therefore, no impact related to rupture of a known earthquake fault would occur.

a.ii) *Less-than-Significant Impact.* The Working Group on California Earthquake Probabilities (2015) estimates there is a 0.56 percent probability that an earthquake with a magnitude greater than 6.7 will occur on the Battle Creek Fault Zone within the next 30 years. This

[2] A well-defined fault has a clearly trace detectable by a trained geologist as a physical feature at or just below the ground surface.

fault is located approximately 32 miles south of the Study Area, and strong seismic ground shaking could occur at the Study Area from seismic activity on the Battle Creek Fault Zone or on other faults in the region. However, the Study Area is located in an area with a lower earthquake shaking potential (DOC 2016). In addition, as described in Chapter 2, *Project Description*, the JSCS would be held in place using temporary anchoring systems which would be installed for each component using large clump weights laying on the channel bank near the water's edge and in some instances using also (temporary) soft nylon slings around large trees. Because the JSCS has been appropriately designed and engineered for stability in the event of strong seismic ground shaking, the impact would be less than significant.

a.iii) *Less-than-Significant Impact.* Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer that is saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. Saturated, Holocene-age, uncompacted fill material located close to an active fault has a higher potential to liquefy. Liquefaction poses a hazard to engineered structures. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on retaining walls, and slope instability.

The Study Area is not located in an area known for liquefaction. In addition, the JSCS would be held in place using temporary anchoring systems which would be installed for each component using large clump weights laying on the channel bank near the water's edge and in some instances using also (temporary) soft nylon slings around large trees. Therefore, this impact would be less than significant.

a.iv) *Less-than-Significant Impact.* The Study Area is located in an area with a moderate potential for landslides. However, the majority of the JSCS would be located within water of the channel of Shasta Reservoir and would not increase the susceptibility for landslides. The JSCS would be held in place using temporary anchoring systems which would be installed for each component using large clump weights laying on the channel bank near the water's edge and in some instances using also (temporary) soft nylon slings around large trees, which would not be anticipated to alter the susceptibility to landslides. Therefore, this impact would be less than significant.

b) *Less-than-Significant Impact.* As described in Chapter 2, *Project Description*, a Water Quality Control Plan, a Spill Prevention and Control Program, and a HMMP would be prepared before and would be implemented during all ground-disturbing construction activities. The plan and program would include site-specific best management practices to control erosion, sedimentation, runoff, and accidental spills from construction equipment such as over-water fueling. Therefore, the impact would be less than significant.

c, d) *Less-than-Significant Impact.* As described previously, the soils in the Study Area are not known to have liquefaction potential, and they have a slight shrink-swell potential. In addition, no new buildings or habitable structures would be constructed as part of the proposed Project. Therefore, no impact on life or property would occur.

e) *No Impact.* The proposed Project would not include the use of septic tanks or alternative wastewater disposal systems. Therefore, no impact would occur.

f) *No Impact.* No excavation would occur as part of the proposed Project. Anchoring systems would involve large clump weights on the bank of the channel near the water's edge and/or large trees and heavy chain attached to the bottom of the guidance net would be used to keep the net on the bottom of the channel. Due to the limited depth and scope of disturbance, the proposed Project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

3.6 Greenhouse Gas Emissions

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
GREENHOUSE GAS EMISSIONS — 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?	☐	☒	☐	☐

3.6.1 Environmental Setting

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters Earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. Infrared radiation (i.e., thermal heat) is absorbed by GHGs; as a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on Earth.

Global warming is the name given to the increase in the average temperature of Earth's near-surface air and oceans since the mid-20th century. Increases in the GHG concentrations in Earth's atmosphere are thought to be the main cause of human-induced climate change. As discussed above, some GHGs occur naturally and are necessary for keeping Earth's surface habitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature. GHG emissions from human activities are highly likely to be responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (IPCC 2013).

The principal anthropogenic (human-caused) GHGs are carbon dioxide (CO_2), methane, nitrous oxide, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. Each of the principal GHGs has a long atmospheric lifetime (1 year to several thousand years). In addition, the potential heat-trapping ability of each of these gases varies substantially from the others. For example, methane is 23 times as potent as CO_2, whereas sulfur hexafluoride is 22,200 times more potent than CO_2. GHGs have been reported as CO_2 equivalents (CO_2e). This approach takes into account the relative potency of non-CO_2 GHGs to convert their quantities to an equivalent amount of CO_2 so that all emissions can be reported as a single quantity.

The primary human-made processes that release these gases are the burning of fossil fuels for transportation, heating, and electricity generation; agricultural practices that release methane, such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high global warming potential gases, such as sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. Deforestation and land cover conversion also have

been identified as contributing to global warming by reducing Earth's capacity to remove CO_2 from the air and altering Earth's albedo (or surface reflectance), allowing more solar radiation to be absorbed.

3.6.2 Discussion

Any single project would be unlikely to create a significant GHG impact. However, the cumulative effect of human activities has been clearly linked to quantifiable changes in the composition of the atmosphere, which in turn have been shown to be the main cause of global climate change (IPCC 2013). Therefore, this section addresses the environmental effects of GHG emissions from the proposed Project cumulatively.

a) *Less-than-Significant Impact.* Currently there are no applicable quantitative thresholds for GHG emissions in the District's CEQA guidelines (County of Shasta 2003). Therefore, the impacts of GHG were evaluated based on whether GHG emissions from Project construction would hinder or conflict with State or local GHG reduction strategies and/or emission reduction goals. Construction activities are temporary and would only last for approximately 7 days per year during the installation and removal would take a similar amount of time each year during testing. GHG emissions from construction and operation equipment and vehicle tailpipe emissions would be negligible compared with the local and statewide GHG inventory given the particularly short-term nature of Project construction and the limited use of vehicles and equipment during both construction and operation. The minimal GHG emissions during Project construction and operation would not contribute substantially to the regional GHG emission inventory or contribute to global climate change. For these reasons, impacts from GHG emissions would be less than significant.

b) *Less-than-Significant Impact with Mitigation.* In May 2012, DWR adopted the Climate Action Plan Phase I: Greenhouse Gas Emissions Reduction Plan (GGERP), which details DWR's efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and AB 32 (DWR 2012). DWR also adopted the IS/Negative Declaration prepared for the GGERP under CEQA. In July 2020, DWR adopted the Update 2020 to the GGERP. Both the Update 2020 GGERP and the IS/Negative Declaration are incorporated herein by reference. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions for operations, construction, maintenance, and business practices (e.g., building-related energy use). The GGERP specifies aggressive goals for reducing GHG emissions by 2030 and 2045 and identifies a list of measures to achieve these goals.

   DWR prepared its GGERP as a "plan for the reduction of GHG emissions" in compliance with CEQA Guidelines Section 15183.5. That section provides that such a plan, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Global climate change, by its very nature, is a global cumulative impact; thus, 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 Section 15064[h][3].)

More specifically, "[l]ater 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 Section 15183.5[b][2].)

Section 10 of the GGERP outlines the steps that each DWR project will take to demonstrate its consistency with the GGERP:

(1) Analyze GHG emissions from construction of the proposed Project.

(2) Determine that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP.

(3) Incorporate DWR's project-level GHG emissions reduction strategies into the design of the project.

(4) Determine that the project does not conflict with DWR's ability to implement any of the "Specific Action" GHG emissions reduction measures identified in the GGERP.

(5) Determine that the project would not add electricity demands to the State Water Project (SWP) system that could alter DWR's emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

As discussed previously, GHG emissions from both construction and operation would be negligible given the particularly short-term nature of Project construction and the limited use of vehicles and equipment during both construction and operation. Because the proposed Project would not result in emissions that could adversely affect DWR's ability to achieve its GHG emissions reduction goals, it would be considered consistent with the GGERP if it implements the applicable measures in GGERP Construction Measure 1 (CO-1). Consequently, Mitigation Measure GHG-1, below, identifies the BMPs applicable to the proposed Project to ensure consistency with the GGERP. With implementation of Mitigation Measure GHG-1, the proposed Project would have a less-than-significant impact with respect to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. This impact would be less than significant with mitigation incorporated.

Mitigation Measure GHG-1: The following GGERP BMPs shall be implemented as part of construction activities associated with the project, as applicable.

- **BMP 1.** Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether specifications of 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.

- **BMP 2.** Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.
- **BMP 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.
- **BMP 4.** 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.
- **BMP 5.** 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 and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an Air Quality Control Plan prior to commencement of construction.
- **BMP 6.** 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.
- **BMP 7.** 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.

3.7 Hazards and Hazardous Materials

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
HAZARDS AND HAZARDOUS MATERIALS — 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 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?	☐	☐	☐	☒
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 or excessive noise 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?	☐	☐	☒	☐

3.7.1 Environmental Setting

Materials and waste may be considered hazardous if they are poisonous (toxic), can be ignited by open flame (ignitable), corrode other materials (corrosive), or react violently, explode, or generate vapors when mixed with water (reactive). The term *hazardous material* is defined in law as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment (California Health and Safety Code, Section 25501[o]). In some cases, past uses can result in spills or leaks of hazardous materials to the ground, resulting in soil and groundwater contamination. The use, storage, transportation, and disposal of hazardous materials are subject to numerous federal, state, and local laws and regulations.

Information about hazardous materials sites within the Study Area site was collected by reviewing the California Environmental Protection Agency's Cortese List data resources and the State Water Resources Control Board's GeoTracker list. The Cortese List data resources provide information regarding facilities or sites identified as meeting the requirements for inclusion on the Cortese List. The Cortese List is updated at least annually, in compliance with California regulations (California Government Code Section 65962.5, and includes federal Superfund sites,

state response sites, non-operating hazardous waste sites, voluntary cleanup sites, and school cleanup sites. The GeoTracker list shows underground storage tanks. Based on a review of the Cortese List conducted in June 2021, no active listed sites are located within 1 mile of the Study Area (DTSC 2021).

There are no schools within 1 mile of the Study Area. The nearest public airport, Benton Airpark, is approximately 21 miles southeast of the Study Area. The proposed Project is located within a Federal Responsibility Area (FRA) (CAL FIRE 2021).

3.7.2 Discussion

a) *Less-than-Significant Impact.* Construction activities associated with the proposed Project would be performed within approximately 7 days, and removal would take a similar amount of time each year. Construction activities would likely require the use of limited quantities of hazardous materials such as fuels for vehicles and/or equipment, oils, and lubricants. The improper use, storage, handling, transport, or disposal of hazardous materials could result in accidental release of hazardous materials, thereby exposing construction workers, the public, and the environment (including soil and/or ground or surface water) to hazardous materials contamination. The transportation of hazardous materials on area roadways is regulated by the California Highway Patrol (CHP) and California Department of Transportation (Caltrans), and the use of these materials is regulated by the California Department of Toxic Substances Control (DTSC), as outlined in Title 22 of the California Code of Regulations (CCR). DWR would obtain permits and comply with appropriate regulatory agency standards designed to avoid release of hazardous materials during any activities that would use or store hazardous materials. Compliance with these laws and requirements would ensure that potential impacts would be minimized. Also, as described in Chapter 2, *Project Description*, a Water Quality Control Plan, a Spill Prevention and Control Program, and a Hazardous Materials Management Program would be prepared before and implemented during all construction activities. DWR would adhere to the standard construction best management practices described in the California Stormwater Quality Association (CASQA) – 2019 Construction BMP Handbook. The Spill Prevention and Control Program would also be implemented during project operations to minimize the potential for hazardous, toxic, or petroleum substances to be released into the Study Area. Therefore, with adherence to regulations involving hazardous materials and the implementation of the protective environmental measures, the impact would be less than significant.

b) *Less-than-Significant Impact.* As noted under Question a) above, proposed Project activities would require the use of minor amounts of hazardous materials during construction. However, as described in Chapter 2, *Project Description*, a Water Quality Control Plan, a Spill Prevention and Control Program, and a Hazardous Materials Management Program would be prepared before and implemented during all construction activities. The plan and program would include site-specific best management practices to minimize the potential for hazardous, toxic, or petroleum substances to be released into

the Study Area during construction and Project operation. Therefore, the impact would be less than significant.

c) *No Impact.* No schools are located within one-quarter mile of the proposed Project site. Therefore, no impact on schools would occur.

d) *No Impact.* As discussed previously, based on a review of the Cortese List conducted in January 2021, no listed sites are located within 1 mile of the Study Area (DTSC 2021). Therefore, no impact related to being located on a listed hazardous materials site would occur.

e) *No Impact.* The proposed Project is not located within 2 miles of a public airport. The nearest public airport, Benton Airpark, is approximately 21 miles southwest of the Study Area. The JSCS would not create a safety hazard or excessive noise for people residing or working in the Study Area. Therefore, no impact would occur.

f) *Less-than-Significant Impact.* Some rural, local roads would be affected intermittently during the construction and removal of the JSCS by minimal truck traffic as workers or materials travel to the Study Area. Most of the construction activities would occur from Shasta Reservoir; therefore, traffic flow would not be substantially interrupted on any roadway. In-water navigation would not be substantially interrupted because public notices would be posted about the barriers, temporary boat transfer ramps would be provided to facilitate navigation, alternate routes would be available, and the proposed Project would be of limited size and short duration. Implementation of the proposed Project would not significantly impair or interfere with emergency access to local roads and evacuation routes, or significantly reduce emergency response. Therefore, the impact would be less than significant.

g) *Less-than-Significant Impact.* The California Department of Forestry and Fire Protection (CAL FIRE) classifies an area over which it has responsibility as a Very High Fire Hazard Severity Zone (VHFHSZ) or Non-VHFHSZ. The Study Area is located in Federal Responsibility Area (FRA) that are not within designated fire hazard severity zones (FHSZs) (CAL FIRE 2019). The proposed Project would not add structures that could be exposed to fire risk and construction of the proposed Project would not increase fire risk to surrounding areas (discussed in Section 3.12, *Wildfire*). Therefore, the impact would be less than significant.

3.8 Hydrology and Water Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
HYDROLOGY AND WATER QUALITY — 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:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☒	☐
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?	☐	☐	☒	☐

3.8.1 Environmental Setting

The Study Area is located within the McCloud Arm of the Shasta Reservoir, on the upper Sacramento River in northern California about 9 miles northwest of the City of Redding. The entire reservoir is within Shasta County. The reservoir controls runoff from about 6,421 square miles from four major tributaries including the Sacramento, McCloud, and Pit Rivers, Squaw Creek, and from numerous minor creeks and streams. Shasta Reservoir is California's largest constructed reservoir with a gross pool storage capacity of 4,552,000 acre-feet. Historically, essentially all outflow from Shasta Dam travels through northern California to the Sacramento-San Joaquin Delta southwest of Sacramento. The total drainage area of the Sacramento River at the Delta is about 26,300 square miles. The average annual runoff to the Delta from the Sacramento River watershed is about 17.2 million acre-feet. This represents about sixty-two percent of the total inflows to the Delta.

The Shasta Dam and Reservoir project was constructed by the U.S. Bureau of Reclamation (Reclamation) as an integral element of the Central Valley Project (CVP) from 1938 to 1945 for six purposes. They include: irrigation water supply, municipal and industrial (M&I) water supply,

flood control, hydropower generation, fish and wildlife conservation, and navigation. The project also supports vigorous water-oriented recreation at the reservoir, which is located within the Shasta Unit of the Whiskeytown-Shasta-Trinity National Recreation Area.

The Water Quality Control Plan (Basin Plan) for the Sacramento and the San Joaquin River Basins designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for protecting waters of the Basin. The beneficial uses of Shasta Reservoir include municipal and domestic supply, industrial supply, and agricultural supply; hydropower generation; water contact and non-contact recreation; aesthetic enjoyment; freshwater habitat; fish spawning; wildlife habitat; and preservation and enhancement of fish, wildlife, and other aquatic resources. The Basin Plan specifically prohibits the direct discharge of municipal and industrial wastes, including toilet wastes from houseboats, directly to Shasta Reservoir.

Three large drinking water systems, regulated by the California Department of Health Services, and five small drinking water systems, regulated by the Shasta County Environmental Health Department, have intakes in Shasta Reservoir. One unregulated private water system pumps water from the reservoir, treats, and uses it at their facility. Commercial and private houseboats also pump Shasta Reservoir water and use it as non-potable supply on their vessels. Water contact and non-contact recreation activities include: swimming, wading, water-skiing, fishing, picnicking, sunbathing, hiking, camping, boating, sightseeing, or aesthetic enjoyment in conjunction with the above. Tribal cultural activities are continued to be practiced throughout the year, and some of the activities will often times be opened to the public for recreational, educational and cultural sharing.

Shasta Reservoir is listed in the State Water Board's Total Maximum Daily Load (TMDL) program for mercury, zinc, cadmium, and copper (State Water Board 2021). The State Water Board's TMDL programs are implemented under the Clean Water Act Section 303(d) for impaired water bodies. TMDL programs are plans that describe how an impaired water body will meet federal water quality standards.

3.8.2 Discussion

a, d) *Less-than-Significant Impact*. During the construction phases, project construction equipment and materials would include fuels, oils and lubricants, which are all commonly used in construction. The routine use or an accidental spill of hazardous materials used in construction could result in inadvertent releases, which could adversely affect construction workers, the public, and the environment.

Construction activities would be required to comply with numerous hazardous materials regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials into the environment, including stormwater and downstream receiving water bodies, including Shasta Reservoir, the Sacramento River and the Delta.

In addition, as described in Chapter 2, *Project Description*, protective environmental measures would be implemented as part of the proposed Project, including a Water

Quality Control Plan, a Spill Prevention and Control Program, and a Hazardous Materials Management Program. These would be prepared before and implemented during all ground-disturbing construction activities. The Spill Prevention and Control Program would also be implemented during project operations to minimize the potential for hazardous, toxic, or petroleum substances to be released into the Study Area. DWR would adhere to the standard construction best management practices described in the California Stormwater Quality Association (CASQA) – 2015 Construction BMP Handbook. Therefore, with adherence to regulations involving hazardous materials and the implementation of the protective environmental measures, the impact would be less than significant.

b) *No Impact*. The proposed Project would not alter hydrology, pump groundwater, or reduce groundwater recharge such that the groundwater table would be altered. No impervious surfaces would be created as part of the proposed Project that would reduce surface area capable of percolation. Therefore, no impact would occur.

c) *Less-than-Significant Impact*. The proposed Project would include minimal land-based components. These would be the anchoring systems laying on the bank of the channel near the water's edge and/or large trees. The JSCS would not represent a substantial volume when compared to the river channel capacity, nor would either alter the course of the McCloud River arm of Shasta Reservoir or impede or redirect flood flows. As described in Chapter 2, *Project Description*, protective environmental measures would include the implementation of a Water Quality Control Plan. Therefore, this impact would be less than significant.

e) *Less-than-Significant*. The proposed Project would not use groundwater or involve dewatering. The proposed Project would not involve substantial impervious surfaces. The proposed Project would adhere to applicable regulations regarding water quality including a Water Quality Control Plan, a Spill Prevention and Control Program, a Hazardous Materials Management Program. Therefore, impacts related to conflict with or obstruction of implementation of a water quality control plan or sustainable groundwater management plan would be less than significant.

3.9 Noise

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
NOISE — 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 applicable standards of other agencies?	☐	☐	☒	☐
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?	☐	☐	☐	☒

3.9.1 Environmental Settings

Sound, Noise, and Acoustics

Sound is the mechanical energy of a vibrating object transmitted by pressure waves through a liquid, gaseous, or solid medium (e.g., air). Noise is generally defined as a sound that is loud, disagreeable, unexpected, or unwanted (Caltrans 2013).

The amplitude of pressure waves generated by a sound source determines the perceived loudness of that source. A logarithmic scale is used to describe sound pressure level in terms of decibels (dB). The threshold of human hearing (near-total silence) is approximately 0 dB. A doubling of sound energy corresponds to an increase of 3 dB. In other words, when two sources at a given location are each producing sound of the same loudness, the resulting sound level at a given distance from that location is approximately 3 dB higher than the sound level produced by only one of the sources. For example, if one automobile produces a sound pressure level of 70 dB when it passes an observer, two cars passing simultaneously do not produce 140 dB; rather, they combine to produce 73 dB.

The perception of loudness can be approximated by filtering frequencies using the standardized A-weighting network. A strong correlation exists between A-weighted sound levels (expressed as dBA) and community response to noise. All noise levels reported in this section are in terms of A-weighting. As discussed above, doubling sound energy results in a 3-dB increase in sound. In typical noisy environments, noise-level changes of 1 to 2 dB are generally not perceptible by the healthy human ear; however, people can begin to detect 3-dB increases in noise levels. An increase of 5 dB is generally perceived as distinctly noticeable and a 10-dB increase is generally perceived as a doubling of loudness. The following are the sound level descriptors most commonly used in environmental noise analysis:

- Equivalent sound level (L_{eq}): An average of the sound energy occurring over a specified time period. In effect, the L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour, A-

weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a 1-hour period.

- Maximum sound level (L_{max}): The highest instantaneous sound level measured during a specified period.
- Day-night average sound level (L_{dn}): The energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours (10 p.m. to 7 a.m.).

Sound from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern, and the sound level attenuates (decreases) at a rate of 6 dB for each doubling of distance from a point/stationary source. Roadways and highways and, to some extent, moving trains consist of several localized noise sources on a defined path; these are treated as "line" sources, which approximate the effect of several point sources. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. Therefore, noise from a line source attenuates less with distance than noise from a point source with increased distance.

Groundborne Vibration

Groundborne vibration is energy transmitted in waves through the ground. Vibration attenuates at a rate of approximately 50 percent for each doubling of distance from the source. This approach considers only the attenuation from geometric spreading and tends to provide for a conservative assessment of vibration level at the receiver.

Vibration is an oscillatory motion that can be described in terms of the displacement, velocity, or acceleration. Vibration typically is described by its peak and root-mean-square (RMS) amplitudes. The RMS value can be considered an average value over a given time interval. The peak vibration velocity is the same as the "peak particle velocity" (PPV), generally presented in units of inches per second. PPV is the maximum instantaneous positive or negative peak of the vibration signal and is generally used to assess the potential for damage to buildings and structures. The RMS amplitude typically is used to assess human annoyance to vibration and is expressed in decibel notation as vibration decibels (VdB). The typical range of interest for background vibration-velocity levels is approximately 50 VdB (general residential area vibration-velocity level) to 100 VdB (general threshold in which minor damage can occur in weak buildings).

Relevant Noise Regulations

California Department of Transportation

The California Department of Transportation has developed guidelines for assessing the significance of vibration produced by transportation and construction sources (**Table 3.9-1**). These thresholds address the subjective reactions of people to both short-term vibration (e.g., from temporary construction activities) and long-term/permanent vibration (e.g., from transit operations).

TABLE 3.9-1
CALIFORNIA DEPARTMENT OF TRANSPORTATION GUIDELINES ON POTENTIAL CRITERIA FOR VIBRATION ANNOYANCE

Human Response	Impact Levels, VdB re: 1 µin/sec (PPV, in/sec) Transient Sources	Impact Levels, VdB re: 1 µin/sec (PPV, in/sec) Continuous/Frequent Intermittent Sources
Barely perceptible	80 (0.040)	68 (0.010)
Distinctly perceptible	96 (0.250)	80 (0.040)
Strongly perceptible	107 (0.900)	88 (0.100)
Severe	114 (2.000)	100 (0.400)

NOTES:
µin/sec = microinches per second; in/sec = inches per second; PPV = peak particle velocity; VdB = vibration decibels

Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans 2013

3.9.2 Discussion

a) *Less-than-Significant Impact.* Construction noise would be temporary, and operation of heavy-duty construction equipment would be short-term and limited to the delivery of Project components. No permanent increase in ambient noise levels would result, as proposed Project operation would be over a period of multiple months each year over a five-year period.

Project operation would be limited to noise from boats during testing and monitoring and would be similar to the existing environment. In addition, the Study Area is located within the McCloud Arm of Shasta Reservoir and the nearest sensitive receptor is over 4 miles away from the Study Area. Therefore, no substantial temporary increase in ambient noise levels resulting from temporary operation activities would occur.

b) *Less-than-Significant Impact.* Operation of the proposed Project would not include any activities that would generate significant levels of vibration. Therefore, it is not anticipated that Project operation would expose the nearest sensitive receptor or structure to vibration levels that would result in annoyance. For this reason, the following analysis of the proposed Project's vibration impacts evaluates only the effects of on-site construction activities.

For adverse human reaction, the analysis applies the "strongly perceptible" threshold of 0.9 inch per second (in/sec) PPV for transient sources. For risk of architectural damage to historic buildings and structures, the analysis applies a threshold of 0.12 in/sec PPV (Caltrans 2013). A threshold of 0.3 in/sec PPV is used to assess damage risk for all other buildings. There are no historic structures in the vicinity of the proposed Project site that could be adversely affected by vibration related to Project construction.

Construction of the proposed Project would involve the use of tractor trailer rigs, light- and heavy-duty vehicles would be used to deliver Project components, workers, and boats

to the Study Area. The pieces would then be moved into the water using the forklift and assembled using hand tools. Finally, boats would be used during installation of the JSCS. Given the distance of the nearest sensitive receptor being over 4 miles away and the fact that Project construction would not involve heavy-duty construction equipment or ground disturbance, the impact of the proposed Project with respect to vibration exposure would be less than significant.

c) *No Impact.* The Study Area is not located within vicinity of a private airstrip or an airport land use plan, or within 2 miles of a public or private airport. Because all Project activities would be located outside the Airport Comprehensive Land Use Plan area and would not introduce any new noise sensitive uses or involve any aircraft uses for installation, removal or operation activities, the proposed Project would not affect any airport or airstrip operations and would not expose people on- or off-site to excessive noise levels. Therefore, no impact would occur.

3.10 Recreation

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
RECREATION —				
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?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

3.10.1 Environmental Setting

Shasta Dam and reservoir are features of the Central Valley Project. Recreation at the reservoir is managed by the U.S. Forest Service under agreement with the Bureau of Reclamation, Northern California Area Office. Created by a dam across the Sacramento River, Shasta Reservoir is the largest reservoir in California with 370 miles of shoreline. Located 12 miles north of Redding, the reservoir provides excellent year-round bank or boat fishing. The reservoir holds 16 varieties of fish, including sturgeon. Other nearby activities at the reservoir include: hunting, hiking, water sports, recreational vehicles, picnicking, biking, boating, camping, interpretive programs, and wildlife viewing.

The Hirz Bay Boat Ramp could be utilized for deployment and assembly of the proposed Project. The Hirz Bay boat ramp is paved and has three ramps for varying reservoir levels. A three-lane ramp is in service until reservoir level reaches 75 feet of drawdown and a two-lane ramp until 95 feet of drawdown. The launch ramp parking lot has 61 paved spaces with lighting and a courtesy dock. This boat ramp is part of the Hirz Bay recreation complex which includes Hirz Bay campground, Hirz Bay trail and Hirz Bay group camps 1 and 2. The Holiday Harbor Marina could be utilized for deployment and assembly of the proposed Project and is a developed marina with paved and dirt parking areas and boat ramps. The Bridge Bay Marina could be utilized for deployment and assembly of the proposed Project and is a developed marina with paved and dirt parking areas and boat ramps.

3.10.2 Discussion

a) *No Impact.* Implementing the proposed Project would not cause physical deterioration of existing recreational facilities. The proposed Project would install and operate a guidance and capture system and associated monitoring equipment in in the McCloud Arm of Shasta Reservoir; it would not increase the population in the vicinity of the proposed Project by introducing new housing or employment opportunities, and thus it would not contribute to increased use of existing regional or local parks, marinas, or other recreational facilities, causing their deterioration. Therefore, no impact would occur.

b) *Less-than-Significant Impact.* As described in the Protective Environmental Measures section, safety signs and safety buoys would be installed upstream and downstream of the

JSCS to inform the public of the presence of the mobile guidance and capture system. Access to the McCloud Arm of Shasta Reservoir would be inaccessible to boaters during project operation which would reduce the area of Shasta Reservoir accessible to boaters. However, the proposed Project would not have a long-term adverse effect on recreation because public notices would be posted, the majority of the reservoir would be available, the mobile guidance and capture system associated with the proposed Project would not be permanent, and a reduction in reservoir access for vessels in the McCloud Arm of Shasta Reservoir would be temporary. Therefore, the impact would be less than significant.

3.11 Tribal Cultural Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
TRIBAL CULTURAL RESOURCES —				
a) Would the 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 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

3.11.1 Environmental Setting

This section examines the potential impacts of the proposed Project on tribal cultural resources. Much of the background context and methods used for the analysis of potential impacts from the proposed Project on tribal cultural resources and cultural resources are the same.

For the purposes of this analysis, the term *tribal cultural resource* is defined as follows:

> (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe that are listed, or determined to be eligible for listing, in the national or state register of historical resources, or listed in a local register of historic resources; or (2) a resource that the lead agency determines, in its discretion, is a tribal cultural resource (PRC 21074).

Records Search

In June 2021, ESA conducted a cultural resources records search for the Study Area and vicinity at the Northeastern Information Center (NEIC) at Chico State University. The records search was amended with additional information following the expansion of the Project Area in April 2022.

The NEIC maintains the official California Historical Resources Information System (CHRIS) records of previous cultural resources studies and recorded cultural resources for the Study Area Limit and vicinity. The study area for the records search consisted of the Study Area with a 0.25-mile buffer.

Fifteen archaeological sites; nearly all of which are indigenous or have an indigenous component are within 0.25-mile radius. An additional 22 sites are on file at the NEIC as being within the

Study Area (NEIC 2021, 2022). In addition, the project area is within the proposed WWTCL, a potential TCR that contains some 600+ archaeological, natural, and spiritual resources known and mapped by the WWT. The locations of these resources and their nature are known only to the WWT. Further consultation with the WWT when specific deployment locations of the JSCS are chosen will be necessary to further define the presence of cultural resources.

Ethnographic Literature Research

Introduction

Winnemem Wintu are a profoundly spiritual people, with deep, unbroken ancestral ties to the ancient homeland. The name Winnemem Wintu means "people of the middle river" or "people of the middle water," which is the McCloud River, between the Sacramento and Pit rivers south of Mt. Shasta in Siskiyou and Shasta counties (WWT 2021c; WWT 2021f). Within Tribal traditions, the Winnemem Wintu are of the river, they belong to it, are part of it, and the river is an extension of who Winnemem are physically, culturally, and spiritually. This is a core tenant of Winnemem cosmology and identity, a complex weaving of land, water, air, and life which form the Winnemem ancestral landscape (WWT et al. 2021:2). There are numerous elements that contribute to the whole of this tapestry—springs, waterways, landforms, sacred areas, plants, animals, trails, ancestral village sites, cemeteries, constellations, and locations of important events. The people themselves and the places where Winnemem live and conduct ceremony today all comprise this tapestry's design. Ancestral histories of Creator (*Olelbes*), Big Salmon (*Nur*), and other figures connect these elements thematically across time and space, reinforced by uninterrupted Winnemem spiritual and ceremonial traditions which continue to be conducted to this day. Within the Winnemem lifeway, plants, animals, waterways, landforms and more, all are not just elements of the natural world: they are relatives that from time immemorial have worked collaboratively with the Winnemem to ensure the health and wellbeing of all living things (WWT et al. 2021:2).

Cultural Overview

The Winnemem Wintu are a water and salmon Tribe (WWT 2021a). Salmon and water are part of the connection or relationship with the world and that communication occurs between large expansive areas or between mountains (WWT 2021e).

The Winnemem Wintu are one of many bands of Wintu along the Sacramento River (WWT 2021f). Chief Sisk's grandfather, Bill Curl, was considered chief of all Wintu people all the way down to SF Bay (WWT 2021g). Historically, the Tribes were all Wintu and they worked together, they could communicate and intermarry (WWT 2021h). Trading routes were extensive and far reaching throughout the Sacramento River corridor, from the McCloud River to Southern Tip of Sacramento Valley. Trails provided main travel routes for trade (WWT 2021j).

The WWT have strong relationships, and intermarry with, the Pit River, Colusa, and other Tribes (WWT 2021f, 2021g). The Miwok are a sister Tribe and kept a lot of things for the WWT when destruction came. The round house tradition was spread from WWT down south and into the valley, and the Tribes became connected that way (WWT 2021g).

WWT hold both family ceremonies and larger group ceremonies. There are unique sets of regalia worn that are specific to each seasonal ceremony (WWT 2021k). The Organization of the river salmon harvest is arranged at *Dekkas* during the *Winyupus* Ceremony. This was also a time to get together to keep family ties. During salmon season, there would be several of these ceremonies going on from the McCloud to Stillwater where the salt flats are, where Tribes would gather salt for ceremonial things. The winter run salmon coincides with acorns, pine nuts, and different medicinal herbs harvested at that time. Prayers also conducted for these activities and the groups going out to harvest each. These would also be gathered for *Winyupus* (WWT 2021j).

There are other ceremonies related to the Perseids meteor showers (WWT 2021e). The Run4Salmon ceremony is an important annual event for the WWT that last several weeks (WWT 2021c). The associated Salmon Dance is one that has been reintroduced to the WWT through the dreams of the WWT's head dancer and reflects a returning of the dance to the WWT by Big Salmon (*Nur*) (WWT 2021c; WWT 2021e). The Run4Salmon Ceremony extends from the spring at Panther Meadow, at the head of the McCloud River, to the Ohlone village of *Sogorea Te'* in the San Francisco Bay, where the salmon come in from the ocean (WWT 2021c). The Run4Salmon ceremonial route runs down the McCloud River to the Sacramento River, into the Delta, and out to the Bay. The entirety of the journey is a time of prayer and ceremony (WWT 2021i).

WWT perform the Fall Ceremony (*Coonrod)* in August--this ceremony is in part a world renewal ceremony. WWT have other nearby camps they conduct ceremony at within their ancestral territory. The Spring Ceremony gives thanks for everything needed to survive the harsh winter (WWT 2021k). The snow goose is part of this ceremony, which focuses on the elders post-winter to check the health of those who survived (WWT 2021h). This ceremony is done at *Dekkas* on the McCloud River. This ceremony is a "Big Fire" ceremony, *Dekkas* rock is a big spirit (WWT 2021k).

Trails

Trails are sacred and likely started as deer trails; there are songs that go along with these trails (WWT 2021e). The WWT has trails to sacred places like Mt Shasta and other places where the WWT can talk directly to the Creator (WWT 2021g). These trails are often now under freeways and old roads; the original trails served as arteries that connected the Penutian-speaking people. The freeways likely started as deer trails (WWT 2021h).

Overview of Tribal Culture Before Contact

Archaeological evidence supports a deep time base of at least 7,000 years BP for indigenous people here. While genocide, disease, and forced removal have robbed the Winnemem of legal ownership of their ancestral lands as a Tribe, Winnemem people continue to perform ceremony here, gather resources, pray, and take part in ancestral traditions that extend, unbroken, into the distant past. The Winnemem Wintu Tribe (WWT) "continues to assign cultural, historical, and spiritual meaning to this landscape and the biocultural resources therein" (Goodsell 2017).

Archaeological, ethnographic, and historical information indicate that Winnemem Wintu villages contained between 1-30 houses and had nearby cemeteries. Around the villages were places of power, hunting, gathering, and fishing locations, and trail networks (Goodsell 2017).

Wintu is a dialect of Northern Wintuan derived from the Penutian language family and was traditionally spoken in the northern portion of the Sacramento Valley, whose speakers extended north on the upper Sacramento River and associated tributaries, and west into the mountains on the drainages of the upper Trinity River (Golla, 2011:140; Lapena, 1978:324).

Around 1930, eight Wintu villages were identified along the upper reaches of the Sacramento River, Clear Creek, Trinity River, Hayfork Creek, and the McCloud River which included the Winnemem (Golla, 2011:141-142). Winnemem families created villages that formed the main political, social, and economic centers. Tribal Chiefs inherited their role patrilineally to the eldest son (LaPena, 1978:326). These families built conical bark dwellings, with roughly 150 people per village. They built the steam house and women's menstrual hut with domed roofs. WWT built circular, semi-subterranean earth lodges, approximately 15 to 20 feet in diameter, that were used as men's gathering places, sweat lodges, and shaman ceremonial places, that could accommodate 50 to 70 people (LaPena, 1978:325).

Individuals specialize in a craft because of inclinations or apprenticeship. WWT people created and used wooden digging sticks, poles, and baskets for gathering vegetal resources. They shaped stone mortars and used these to pulverize seeds and acorns, soften meat, and grind pigments. They made the bow and arrow from yew wood, reinforced with deer sinew and adhered with salmon-skin glue. They made arrow points primarily from obsidian, though wood and bone were also used. For hunting, WWT people used snares for deer and a bow and arrow for communal bear hunts (LaPena, 1978:336-338). For fishing, Tribal people made harpoons of fir equipped with a deer bone point. Tribal fishermen and women used soaproot and ginseng to stun fish in isolated pools. Basketweavers wove baskets using hazel, poison oak, skunkbush, *Xerophyllum* grass, pine root, willow, grapevine, redbud, and maidenhair. Tribal weavers wove cordage from iris gathered by women, but woven by men (LaPena, 1978:333).

Ancestral Territory and Area of Interest

The WWT has stated that the territorial boundaries delineated by C. Hart Merriam (n.d.) is the most accurate depiction of WWT ancestral boundaries (WWT 2021l). The boundaries consist of the entirety of the McCloud River Watershed and the south slope Mount Shasta (WWT 2021a). The McCloud River is sacred and begins at the spring at Panther Meadows (WWT 2021l). The Winnemem ancestral territory includes that of the Numtepom Wintu; Chief Sisk's mother was Numtepom and the WWT have stewardship responsibilities on both sides of the upper Sacramento River (WWT 2021f; 2021g). The entirety of the McCloud River watershed is considered part of what the WWT defines as the WWTCL.

Relationship with Flora

In WWT traditions, plants are relatives (WWT 2021e). Ancestral subsistence strategies revolve around seasonality, and their economy is based principally on the use of natural resources from the grasslands and riparian corridors adjacent to important drainages. Historically, Wintu people relied heavily on acorn for food. Women were primarily responsible for gathering vegetables, while men were typically responsible for obtaining meat, but acorn gathering specifically was a family activity. Food preparers pound acorn into meal, leach the meal in sand pits, and make the meal into soup and bread. Tribal gatherers harvest buckeye, manzanita berries, clover, miner's

lettuce, hazelnuts, pine nuts, sunflower, wild grapes, and cottonflower seeds. Tribal doctors and healers harvest pennyroyal, soaproot, Oregon grape, milkweed, and salt for medicine (Lapena, 1978:338-339).

Basket makers use products of those plants that grow along the river to create baskets, particularly willow; the WWT uses many types of willows for basket making (WWT 2021f). Native vegetation is part of the larger community that is part of the river all the way up to Mt. Shasta. Stretches of native vegetation are part of what makes the river important (WWT 2021f).

Tobacco is an important plant to the WW. Putting tobacco down and praying and talking to the fire is part of WWT ceremony. They use fire in ceremony and it is the only thing they use in ceremony that people can create or bring to life/wake up. Everything else they gather, such as tobacco or wood (WWT 2021g).

Redbud is an important trade item to the WW, it can be used to trade for abalone shell, bird feathers—bitterns and coons in particular—elk meat, and seaweed. As a weaving material, redbud is sturdier and lasts longer (WWT 2021j, 2021k).

Relationship with Fauna

Like plants, animals are relatives to the WWT (WWT 2021e). All of the animals are represented by the Big Animal (ancestral spirit) like the salmon, duck, or buck. Ceremonial songs bring big animals into the ceremony (WWT 2021g).

Regalia includes both otter and mink in the last part of the braid for all ceremonies, worn by women like hair extensions. The pelts are used in *Winyupus* and other ceremonies where there are elders, extended family members traveling a long distance, and marriage ceremonies (WWT 2021k).

WWT people hunted deer, brown bears, rabbits, and quail. Grasshoppers were historically also another important protein source and were often boiled or dried. Salmon was a principal protein source for the WWT and are discussed separately below. Communal drives included individuals with dipnets accompanied by a torchbearer. Baked fish, when not eaten, were ground into a salmon flour and mixed with roe and pine nuts and was a valuable trade commodity for the WW. Suckers were inferior to salmon, but also regularly taken in drives as they could be found in all streams and easily caught using a weir. The WWT also fished for trout, other whitefish, and mussels and clams were also collected (LaPena, 1978, 337-338).

Waterfowl

Migratory animals carry materials from other places and become important to ceremonies like the puberty ceremony-- they bring understanding, knowledge, and power, and WWT acknowledges that and incorporates their spirit into dance, their spirit become part of the ceremony (WWT 2021g)

Snow geese play a prominent role in the WWT spring ceremony that focuses on the health of the elders and the WWT following winter (WWT 2021h). Geese are also part of the puberty ceremonies as well, particularly because they mate for life. Honkers (geese that fly up the rivers) and other birds pass through WWT territory on their way north (WWT 2021j).

Relationship with Salmon

The salmon dance is done at that ceremony that came from the Big Salmon, from a dream from the head dancer. The dance shows how the Big Salmon is coming up and the people need to welcome the salmon and runs. *Coonrod* is the location where the ceremony is performed. The Salmon Dance is part of a ceremony that is trying to renew the whole world for everything to be in balance and harmony (WWT 2021h).

The WWT stated that salmon runs are Tribal Cultural Resources to all Tribal groups along the river, including WWT (WWT 2021m). When the salmon no longer comes up the river, WWT are extinct. It is not just WW, it is all people and the future. The world is so interconnected that the full repercussions of different actions is unknown (WWT 2021f). There is a connection between WWT and the ocean; salmon is part of that connection (WWT 2021e) Salmon and water connected WWT to all the Tribes out to the ocean (WWT 2021e). Salmon bring nutrients upstream—salmon health affects all upstream species and the ability of the environment to support the fish (WWT 2021a).

Relationship with Water

In traditional WWT culture, everything is tied to water— "This is a water planet; we are water beings" (WWT 2021e). These traditions hold that the WWT are responsible for caring for the waters of the upper watershed of the McCloud River. The sacred spring from Mt. Shasta flows down into the Central Valley and does not lose sacredness when it leaves the Tribe's territory (WWT 2021a, 2021j). Water is the sacred relative of all people (WWT 2021f). Continuity, flow, and water itself is a spirit that communicates and teaches people lessons (WWT 2021f). Rivers are spirit homes (WWT 2021f).

The spring at Panther Meadow is particularly important and the water from it has a significance and sacredness (WWT 2021k). The WWT stated that they have water that is sacred and has a separate name. Funerals are held in this location as well with sacred songs with white flower trail song and drop the flowers when the body in being placed. The flower trail will travel along the white trail to go back into the water, the sky, and the milky way (WWT 2021k).

Contemporary Tribal History

The data supporting this outline was provided by the WWT and supplemented by other documents recommended by the WWT and news articles. It was originally prepared as part of the Tribe's Salmon Restoration Plan (WWT n.d.) and has been adapted here.

1800–1870

The remoteness and distance from Spanish missions and Mexican-era ranchos spared the Winnemem Wintu from missionization and colonization. However, this changed as Canadian and American explorers and fur trappers made incursions into the Winnemem Wintu territory. With them came the devastating malaria epidemics of the early 1830s, which has been estimated to have killed 75% of Native American communities in California between 1830–1833. This was followed a few years later by the massive influx of miners and colonizers that flooded California with the onset of the Gold Rush in 1849 (Cook 1976). Tribes were attacked during this time as

part of state-sanctioned violence against indigenous people (WWT 2021j). In 1851, the Cottonwood Treaty between the WWT and the US government was written, calling for the establishment of a 35-square-mile reservation for the Wintu. Congress refused to ratify the treaty the following year, and the documents were sealed until 1905. To this day, the WWT continues to seek federal recognition and the return of lands from the federal government (WWT n.d. 32).

1870–1900

The important connections between Winnemem Wintu and salmon were first noted by non-Tribal people in the late 1800s. In his 1872 report of operations to the commissioner of the U.S. Commission of Fish and Fisheries, Livingston Stone, who established the Baird U.S. Fish Hatchery on the McCloud River in 1872, noted that the "McCloud Indians…are not obliged to resort to hunting and trapping at all," with speared salmon in summer and fall, and dried salmon in the winter, providing the main sustenance of the Winnemem Wintu people (Stone 1872:178). In 1875, President Grant set aside 280 acres of Winnemem land for the Baird Fish Hatchery. The Winnemem Wintu held a public war dance at the hatchery in 1887, after which the Winnemem Wintu performed their ceremonies in secret (WWT n.d.:34). In 1889, Wintu leader Norel Putus submitted a request to President Harrison for compensation and rectifying conditions among Wintuan peoples for the failed ratification of the Cottonwood Treaty and loss of Tribal lands (Putus 1890). In the letter, he described much of the Wintu territory (WWT 2021j). Four years later, President Cleveland authorized allotments of land to Winnemem Wintu, which allowed the Winnemem Wintu to stay on their ancestral land, a presence they maintain to this day. By the turn of the century, following nearly a century of disease and genocide, fewer than 400 Winnemem remained alive (WWT n.d.:32).

1900–1930

In 1907, Florence Violet Curl (later, Jones) (*Puilulimet)* was born along the McCloud River. At her birth, Tribal doctors recognized her as the future leader of the Tribe. Seven years later, in 1914, Horace Wilson of the US Department of the Interior submitted a letter to the Commissioner of Indian Affairs stating that lands should be purchased for the Winnemem Wintu. This was followed by efforts of Indian Agent John Terrell to purchase land for the Winnemem; these efforts were thwarted by local land owners refusing to sell ahead of the proposed construction of Shasta Dam. However, lands were to be set aside for the WWT following the Dam's construction. In 1928, Joe Campbell and Alfred Gillis of the WWT traveled to Washington D.C. to petition for investigations into the 1851 "lost" Treaties (WWT n.d. 32). WWT children, including Florence Curl, were taken and sent to the Indian schools in southern California during the early 1900s; children were able to make it home from the Indian schools due to help from Tribes along the way that sheltered the children. Florence Curl was one of those children who escaped and made it back to her ancestral homeland (WWT 2021h).

1930–1950

In 1937, the U.S. Government retook the land allotments of the Winnemem along the McCloud in preparation for the construction of Shasta Dam. The construction of Shasta Dam between 1938 and 1945 by the United States Bureau of Reclamation led to the loss of hundreds of traditional use areas and ceremonial sites significant to the Winnemem Wintu (WWT 2021h). The dam blocked

anadromous fish coming up the McCloud and other higher elevations, ending the presence of salmon in the McCloud watershed and eliminating major habitat for the salmon (WWT 2021c; 2021g). Many WWT villages were inundated under Shasta Dam (WWT 2021c). Florence Curl was forced to relocate to a village at the base of Bear Mountain, and later married the property owner, Andrew Jones. The village continues to be occupied by WWT (WWT n.d. 32).

In 1941, the Central Valley Project Indian Land Acquisition Act was passed, establishing a trust land cemetery for the WWT at Shasta Lake City. Florence located the cemeteries for removal, and the Bureau of Indian Affairs removed 843 bodies, including the body of William Curl and his wife Jenny. This is followed in 1943 by the removal of the WWT from their homelands along the McCloud within the reservoir footprint. The following year, the U.S. Court of Claims awarded $17 million to California Indians to compensate them for 18 unratified treaties, only $5 million of which was distributed, the other $12 million deducted for the existing rancherias and reservations. This amounted to $1.25/acre; the WWT fought against the conditions of this settlement for the next two decades (WWT 2021d).

1950–1980

Following the construction of the dam, hundreds of places important to the WWT were lost. It is during this time, in 1952, that the current leader of the Winnemem Wintu, Caleen Sisk, was born (WWT n.d.:32).

In the 1950s, Congress passed Resolution 108, declaring all Indians free of government control and eligible for the services of any citizen, transferring the responsibility for Indian policy to local and state agencies (WWT n.d.:32). The California Senate found that most Tribes are unprepared for termination and denounced the effort; however, Congress still passed the California Rancheria Bill in 1958, effectively terminating 41 rancherias.

The radicalism of the 1960s was taken up by WW, whose students returned from universities and vocational schools. The termination of the rancherias led to those same students subsequently being denied grants, as they were no longer part of federally recognized Tribes. In the 1970s, the WWT challenged this action in Malone vs. Morton. Tribal people occupied the Toyon Center, a housing facility built for the construction workers who built Shasta Dam, and they held the facility for nearly two decades until forcibly removed by federal agents. The buildings were destroyed (WWT n.d.:32).

In 1978, the American Indian Religious Freedom Act was passed, confirming Native Americans rights to conduct ceremony on federal lands. Florence Jones received the first use permit to conduct such ceremonies (WWT n.d.:32).

1980–2000

During this time period, a Memorandum of Understanding between the U.S. Forest Service and the Tribe, led to the protection of areas important to the Winnemem Wintu Tribe. The WWT began working with federal and state agencies to build education, housing, and health programs; however, due to the loss of federal recognition status, the Indian Health Service of the Bureaus of Indian Affairs terminated service to Tribal members. The Bureau of Indian Affairs terminated

their government-to-government relationship despite the WWT having agreements with other state and federal agencies (WWT 2017:32).

In 1995, Florence Jones retired as the leader of the WWT and began transition to her successor, Caleen Sisk. Chief Sisk received permission to hold and carry eagle feathers, an important component of WWT ceremonial practice, from U.S. Fish and Wildlife Service. The WWT gained easements and permits to continue traditional practices within their ancestral territory.

The Winnemem Wintu Today

WWT people still hunt, gather, and fish from many of their ancestral areas. Today, WWT continue to gather willows from the McCloud River area to make dance regalia, baskets, and for healing with additional herbs and medicinal plants gathered in the Bear Mountain vicinity. Pine nuts and acorns are collected along the McCloud River, Pine Creek, Ellery Creek, and Moore Creek. Other locations associated with the collection of plants, branches, grapevines, and medicines continue to be known, used, and maintained by members of the WWT (Nilsson et al. 2008).

Since the early 2000s, the Winnemem Wintu have been staunch defenders of salmon habitat within the legal and regulatory realm, advocating for a permanent solution to fish passage around Shasta Dam in the hopes of restoring Chinook salmon populations to the river systems that were cut off by construction of Shasta Dam (Sisk 2018).

The Winnemem Wintu Tribal Cultural Landscape

The WWTCL has been presented by the WWT as a potential TCR (WWT, Davis-King, and Newland 2021). A formal position and evaluation by the WWT that defined the WWTCL was submitted to the California State Water Resources Control Board in 2021, based on an evaluation of the WWTCL as a Traditional Cultural Property by the U.S. Bureau of Reclamation draft documents in 2017 (Goodsell 2017). The draft Bureaus of Reclamation evaluation determined that the WWTCL was eligible under Criteria 1 and 2 of the National Register of Historic Places. The evaluation submitted to SWRCB reiterated the importance of the resources, stating values under Criterion 1 and 2 as well as additional support for Criteria 3 and 4 eligibility. SWRCB is currently reviewing the documents and is anticipated to make a decision regarding eligibility in 2022. The TCR includes all of the WWT and Numtepom ancestral Tribal territory and is comprised of over 600 known archaeological sites, trails, sacred areas, and natural resource locations in an over 800,000-acre area (WWT, Davis-King, and Newland 2021).

Native American Correspondence

DWR contacted the California Native American Heritage Commission (NAHC) in May 2021 in request of a search of the NAHC's Sacred Lands File (SLF) and a list of Native American representatives who may have interest in the proposed Project. The NAHC reply stated that the SLF has record of sacred sites in the Study Area. The reply also included a list of individuals, representing five California Native American Tribes, to contact regarding these resources and who may be interested in the proposed Project.

In support of required Native American consultation for the proposed Project pursuant to Public Resources Code Section 21080.3, as well as in accordance with the California Natural Resources Agency's *Final Tribal Consultation Policy* and DWR's *Tribal Engagement Policy*, DWR sent letters on May 26, 2021 via certified mail, to the following Native American representatives: Art Bunce, Barona Band of Mission Indians Tribal Attorney; Genevieve Jones, Big Pine Paiute Tribe of the Owens Valley Chairperson; Jairo Avila, Fernandeño Tataviam Band of Mission Indians Tribal Historic and Cultural Preservation Officer; Sara Dutschke Setshwaelo, Ione Band of Miwok Indians Chairperson; Alex R. Watts-Tobin, Karuk Tribe Tribal Historic Preservation Officer; Dennis Ramirez, Mechoopda Indian Tribe of Chico Rancheria Chairperson; Stephanie L. Reyes, Middletown Rancheria of Pomo Indians of California Tribal Historic Preservation Officer; Katherine Erolinda Perez, North Valley Yokuts; Agnes Gonzalez, Pit River Tribe Chairperson; Cami Mojado, San Luis Rey Band of Mission Indians Cultural Resources Manager; Jessica Mauck, SMBMI Director of Cultural and Site Preservation Officer; Leo Sisco, Santa Rosa Rancheria Tachi Yokut Tribe Chairperson; Regina Cuellar, Shingle Springs Band of Miwok Indians Chairperson; Colin Rambo, Tejon Indian Tribe Cultural Resource Technician; Gene Whitehouse, UAIC Chairperson; Herbert (Lou) Griffin, Wilton Rancheria Director of Cultural Resources; Anthony Roberts, YDWN Chairperson; John Hayward, Nor-Rel-Muk Wintu Nation Chairperson; Tracy Foster-Olstad, Nor-Rel-Muk Wintu Nation Cultural Resources Officer; Jack Potter, Redding Rancheria Chairperson; Roy Hall, Shasta Nation Chairperson; Caleen Sisk, WWT Chief; Mark Miyoshi, WWT Tribal Historic Preservation Officer; and Wade McMaster, Wintu Tribe of Northern California Chairperson. These letters provided information on the proposed Project and requested that the recipients notify DWR if they would like to consult pursuant to Public Resources Code Section 21080.3.

To date, DWR has received responses from three of the Tribes contacted. Mark Miyoshi, THPO for WWT, formally requested to have AB 52 consultations with DWR in a letter dated July 9, 2021. DWR responded on August 17, 2021 acknowledging that WWT was a consulting Tribe under AB 52 for the Project. Jamie Nord, SMBMI Cultural Resources Technician, sent an email to DWR on June 8, 2021, stating that the proposed Project is outside of SMBMI's ancestral territory and the SMBMI does not wish to consult on the proposed Project. Anna Starkey, UAIC Cultural Regulatory Specialist, sent an email to DWR on June 8, 2021, stating that the UAIC does not have any comments on the proposed Project at this time. Victoria Delgado, YDWN Administrative Assistant sent an email with an attached letter to DWR on June 11, 2021, stating that the YDWN would like to consult with DWR on the proposed Project.

Tribal consultation is ongoing. No other Tribal correspondence on the proposed Project has been conducted to date. Documentation of the proposed Project correspondence with Native American representatives to date is included in Appendix B.

3.11.2 Discussion

a.i, a.ii) *Less-than-Significant Impact with Mitigation.* The Project will take place entirely within the WWTCL, which spans the McCloud River Watershed. The WWT consider this landscape a TCR; the landscape encompasses 820,000 acres and includes over 600

archaeological sites, spiritual areas, natural resource locations, and trails, all of which the WWT considers contributing to the WWTCL (WWT, Davis-King, and Newland 2021).

To support the discussion and analysis for this project, the WWT shared information related to this potential TCR and we have incorporated it as background into this discussion and analysis.

The GIS database for these resources are on file with the WWT and are not datasets possessed by the CHRIS system or other agencies. The exact nature of these resources and their locations are known only to the Tribe. This information is confidential. When DWR determines the specific location of the installation of the JSCS, the agency will consult with WWT regarding the presence of any components of the WWTCL that might be affected and what forms of treatment may be necessary to mitigate the impacts of the project.

In addition, project-related activities (installation of the JSCS and operations) have the potential to unintentionally impact as-yet unidentified Native American archaeological resources that may also qualify as tribal cultural resources. Such impacts may result from the introduction of temporary new visual elements to landscapes associated with or comprising tribal cultural resources, or from ground-disturbing activities that could partially or completely destroy unknown tribal cultural resources. The actual Project Footprint, where proposed Project activities with potential to impact tribal cultural resources would occur, has yet to be defined and would be much smaller than the Study Area. Therefore, it is not known whether implementing the proposed Project would impact any as-yet unidentified potential Native American TCRs. Factors necessary to identify specific impacts on such resources are the precise location of proposed Project activities and equipment, and the type and location of operational activities. If the location of the proposed Project activities were to result in either a direct impact (e.g., physical modification, damage, or destruction) or an indirect impact (e.g., alteration to setting, including visual) on any potential TCRs the JSCS deployment would be moved to eliminate that impact. Such potentially significant impacts to tribal cultural resources would be reduced to less than significant with mitigation incorporated by implementing Mitigation Measures CUL-2 to CUL-5.

3.12 Wildfire

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
WILDFIRE — 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?	☐	☐	☒	☐

3.12.1 Environmental Setting

The Study Area is located in a Federal Responsibility Area (FRA) that is not within designated fire hazard severity zones (FHSZs) (CAL FIRE 2021).

3.12.2 Discussion

a) *Less-than-Significant Impact.* The proposed Project would use established land-based access routes, and the size of the construction area would be limited to the minimum area necessary to complete the project. As such, the proposed Project would not require any road closures and would not substantially increase traffic in the area that would substantially impair any adopted emergency response plan or evacuation plan. Therefore, the impact would be less than significant.

b–c) *Less-than-Significant Impact.* Proposed Project activities would require the use of vehicles and heavy equipment on-shore and boats off-shore, and these vehicles and equipment could spark and ignite flammable vegetation. However, the risk of igniting a wildfire would be low because deployment and assembly would at sites with boat ramps which are not vegetated and primarily covered with concrete. The installation of the JSCS would occur on the McCloud Arm of Shasta Reservoir. Therefore, the proposed Project would not exacerbate wildfire risk, and the impact would be less than significant.

d) *Less-than-Significant Impact.* The proposed Project includes the installation of guidance and capture system in the McCloud Arm of Shasta Reservoir in areas that have no immediate on-site residences or structures. Further, as described in Chapter 2, *Project Description*, erosion control measures would be implemented to manage the potential for

erosion. Therefore, the proposed Project would not expose people or structures to risk of downstream flooding or landslide, and the impact would be less than significant.

3.13 Mandatory Findings of Significance

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
MANDATORY FINDINGS OF SIGNIFICANCE —				
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" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

3.13.1 Discussion

a) *Less-than-Significant Impact with Mitigation*. The proposed Project would involve the installation and operation the JSCS within the McCloud Arm of Shasta Reservoir, annually. As described in the preceding impact discussions, the impacts related to the potential of the proposed Project to substantially degrade the environment would be less than significant with incorporated mitigation measures. As discussed in the analyses provided in this IS, adherence to federal and State regulations, protective environmental measures, and proposed mitigation measures BIO-1 through BIO-4, CUL-1 through CUL-5, GHG-1 would reduce all potentially significant impacts to biological, cultural, GHG, and tribal cultural resources, as well as to other issue areas analyzed, to less-than-significant levels with mitigation incorporated.

b) *Less-than-Significant Impact with Mitigation*. As noted throughout this document, the potential impacts of the proposed Project are largely restricted to temporary construction-related impacts and are site-specific. Other past, present, or probable future construction projects in the area whose effects could be viewed as cumulatively considerable, include road maintenance and repair, dam and bank repairs, and other maintenance activities. However, as noted above, all of the potential direct and indirect impacts of the proposed Project were determined to be fully avoided or reduced to less than significant with protective environmental measures and incorporation of mitigation measures BIO-1 through BIO-4, CUL-1 through CUL-5, GHG-1. As a result, the potential impacts of the proposed Project are not considered cumulatively considerable, and impacts would be less than significant with mitigation incorporated.

c) *Less-than-Significant Impact with Mitigation*. The potential impacts of the proposed Project are temporary and site-specific. These impacts are all localized to the Study Area and include limited adverse effects on biological resources, cultural resources, greenhouse gas emissions, and tribal cultural resources, which would be reduced to less than significant through implementation of mitigation measures. However, the proposed Project would not include any activities or uses that may cause substantial adverse effects on human beings, either directly or indirectly, or on the physical environment. Compliance with applicable State and federal standards, protective environmental measures, including Tribal Cultural monitoring as well as incorporation of project mitigation measures would result in less-than-significant impacts with mitigation incorporated.

CHAPTER 4
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Appendix A
Biological Resources Species Lists

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Minnesota Mtn. (4012272) OR O'Brien (4012273) OR Bollibokka Mtn. (4012282) OR Hanland Peak (4012283))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ageratina shastensis Shasta ageratina	PDASTBX0R0	None	None	G3	S3	1B.2
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Clarkia borealis ssp. borealis northern clarkia	PDONA05062	None	None	G4T4	S4	4.3
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum ursinum var. erubescens blushing wild buckwheat	PDPGN08632	None	None	G3G4T3	S3	1B.3
Erythranthe taylorii Shasta limestone monkeyflower	PDPHR01080	None	None	G2	S2	1B.1
Erythronium shastense Shasta fawn lily	PMLIL0U0V0	None	None	G2	S2	1B.2
Fluminicola seminalis nugget pebblesnail	IMGASG3110	None	None	G2	S1S2	
Fritillaria eastwoodiae Butte County fritillary	PMLIL0V060	None	None	G3Q	S3	3.2
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Helminthoglypta hertleini Oregon shoulderband	IMGASC2280	None	None	G3Q	S1S2	
Hydromantes shastae Shasta salamander	AAAAD09030	None	Threatened	G3	S3	
Lanx patelloides kneecap lanx	IMGASL7030	None	None	G2?	S2	
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G3G4	S3S4	
Lewisia cantelovii Cantelow's lewisia	PDPOR04020	None	None	G3	S3	1B.2
Lewisia cotyledon var. heckneri Heckner's lewisia	PDPOR04052	None	None	G4T3	S3	1B.2
Lower McCloud River/Canyon River Lower McCloud River/Canyon River	CARA2342CA	None	None	GNR	SNR	

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Monadenia churchi Klamath sideband	IMGASC7010	None	None	G2G3	S2	
Monadenia troglodytes troglodytes Shasta sideband	IMGASC7091	None	None	G1G2T1T2	S1S2	
Monadenia troglodytes wintu Wintu sideband	IMGASC7092	None	None	G1G2T1T2	S1S2	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Neviusia cliftonii Shasta snow-wreath	PDROS14020	None	Candidate Endangered	G2	S2	1B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti Fisher	AMAJF01020	None	None	G5	S2S3	SSC
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Salvelinus confluentus bull trout	AFCHA05020	Threatened	Endangered	G5	SX	
Trilobopsis roperi Shasta chaparral	IMGASA2030	None	None	G2	S1	
Vaccinium shastense ssp. shastense Shasta huckleberry	PDERI181Z1	None	None	G4T3	S3	1B.3
Vespericola shasta Shasta hesperian	IMGASA4070	None	None	G1	S1	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 34

Inventory of Rare and Endangered Plants of California

CALIFORNIA NATIVE PLANT SOCIETY

HOME ABOUT CHANGES REVIEW HELP

Search: Simple Advanced

Search for species and Go

Search Results

Back Export Results

16 matches found. Click on scientific name for details

Search Criteria: Quad is one of [4012272,4012273,4012282,4012283]

Scientific Name | Common Name | Family | Lifeform | Blooming Period | Fed List | State List | Global Rank | State Rank | CA Rare Plant Rank | General Habitats | Micro Habitats | Lowest Elevation | Highest Elevation | CA Endemic | Date Added | Photo

Search:

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
Adiantum shastense	Shasta maidenhair fern	Pteridaceae	perennial herb	Apr-Aug	None	None	G3	S3	4.3	 ©2015 Julie Kierstead
Ageratina shastensis	Shasta ageratina	Asteraceae	perennial herb	Jun-Oct	None	None	G3	S3	1B.2	 ©2011 Sierra Pacific Industries
Arnica venosa	Shasta County arnica	Asteraceae	perennial rhizomatous herb	May-Jul(Sep)	None	None	G3	S3	4.2	 ©2005 Dean Wm. Taylor
Clarkia borealis ssp. *borealis*	northern clarkia	Onagraceae	annual	Jun-Sep	None	None	G4T4	S4	4.3	No Photo Available
Eriogonum ursinum var. *erubescens*	blushing wild buckwheat	Polygonaceae	perennial herb	Jun-Sep	None	None	G3G4T3	S3	1B.3	 ©2008 Sierra Pacific Industries
Erythranthe taylorii	Shasta limestone monkeyflower	Phrymaceae	annual herb	(Feb)Apr-May	None	None	G2	S2	1B.1	No Photo Available
Erythronium shastense	Shasta fawn lily	Liliaceae	perennial bulbiferous herb	(Feb)Mar-Apr	None	None	G2	S2	1B.2	No Photo Available
Fritillaria	Butte County	Liliaceae	perennial	Mar-Jun	None	None	G3Q	S3	3.2	

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
eastwoodiae	fritillary	y	p bulbiferous herb							No Photo Available
Leptosiphon latisectus	broad-lobed leptosiphon	Polemoniaceae	annual herb	Apr-Jun	None	None	G4	S4	4.3	No Photo Available
Lewisia cantelovii	Cantelow's lewisia	Montiaceae	perennial herb	May-Oct	None	None	G3	S3	1B.2	No Photo Available
Lewisia cotyledon var. *heckneri*	Heckner's lewisia	Montiaceae	perennial herb	May-Jul	None	None	G4T3	S3	1B.2	No Photo Available
Lewisia cotyledon var. *howellii*	Howell's lewisia	Montiaceae	perennial herb	Apr-Jul	None	None	G4T4Q	S3	3.2	 © 2021 Scot Loring
Neviusia cliftonii	Shasta snow-wreath	Rosaceae	perennial deciduous shrub	Apr-Jun	None	CC	G2	S2	1B.2	No Photo Available
Sedum paradisum ssp. *paradisum*	Canyon Creek stonecrop	Crassulaceae	perennial herb	May-Jun	None	None	G4G5T3	S3	1B.3	No Photo Available
Vaccinium shastense ssp. *shastense*	Shasta huckleberry	Ericaceae	perennial deciduous shrub	(Jun-Sep)Dec-May	None	None	G4T3	S3	1B.3	No Photo Available
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	May-Jun	None	None	G4G5	S3?	2B.3	 © 2006 Tom Engstrom

Showing 1 to 16 of 16 entries

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

IPaC resource list

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

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

Location

Shasta County, California

Local office

Yreka Fish And Wildlife Office

(530) 842-5763
(530) 842-4517

1829 South Oregon Street
Yreka, CA 96097-3446

Endangered species

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

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

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

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

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

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

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

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

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

Birds

NAME	STATUS

Northern Spotted Owl Strix occidentalis caurina — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1123

Yellow-billed Cuckoo Coccyzus americanus — Threatened
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/3911

Amphibians

NAME	STATUS

California Red-legged Frog Rana draytonii — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/2891

Fishes

NAME	STATUS

Delta Smelt Hypomesus transpacificus — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/321

Longfin Smelt Spirinchus thaleichthys — Candidate
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9011

Insects

NAME	STATUS

Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus — Threatened
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/7850

Crustaceans

NAME	STATUS

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

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

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

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

THERE ARE NO MIGRATORY BIRDS OF CONSERVATION CONCERN EXPECTED TO OCCUR AT THIS LOCATION.

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

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

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

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

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

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

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

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

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

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

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

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

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

This location overlaps the following wetlands:

LAKE

L1UBHh

RIVERINE

R5UBF
R4SBC
R4SBA

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

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

Appendix B

Native American Correspondence

TRIBAL CONSULTATION LOG WITH WINNEMEM WINTU TRIBE AND DEPARTMENT OF WATER RESOURCES: JUVENILE SALMONID COLLECTION SYSTEM PILOT PROJECT, SHASTA COUNTY
(CHRONOLOGICAL ORGANIZATION)

Communication Type	Date	From Individual[1]	Individual Position	Individual Affiliation	To Recipient[2]	Recipient Position	Recipient Affiliation	Additional Participants, CCs Name, Affiliation	Topics Discussed	Confidential Information	Comments
Letter	7/9/2021	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	Anecita Agustinez	Tribal Policy Advisor	DWR	cc to: Native American Heritage Commission; Chief Caleen Sisk, WWT Chief and Spiritual Leader; Luisa Navejas, WWT Office of Historic Preservation Administrator	Request forAB52 consultation for all Department of Water Resources projects	No	Provided designated contact person for project notifications.
Letter	8/17/2021	Kristopher Tjernell	Deputy Director	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	none	Formal acknowledgement of the Tribe's desire to consult on the Juvenile Salmonid Collection System Pilot Project	No	
Email	8/19/2021	Randy Beckwith	Senior Engineer	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	cc to: Anecita Agustinez, DWR Tribal Policy Advisor	Provide Administrative Draft of IS/MND for review	No	DWR received comments back from the WWT on 10/1/2021
Email	1/14/2022	Gusty Minyard	Senior Administrator	ESA (Consultant)	Chief Caleen Sisk	Chief and Spiritual leader	Winnemem Wintu Tribe (WWT)	cc to: Mark Miyoshi, WWT Tribal Historic Preservation Officer; Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Michael Koller, DWR Supervising Engineer; Eric Ginney, ESA Director; Meredith Parkin, ESA	Provide agenda and send link to virtual AB52 Consultation Meeting #1	No	Meeting scheduled for 1/21/2022 at 4:00pm.
Email	1/20/2022	Anecita Agustinez	Tribal Policy Advisor	DWR	Chief Caleen Sisk	Chief and Spiritual leader	Winnemem Wintu Tribe (WWT)	cc to: Mark Miyoshi, WWT Tribal Historic Preservation Officer Luisa Navejas, WWT Office of Historic Preservation Administrator	Provide agenda for AB 52 Consultation Meeting #1, PowerPoint presentation with project information, and information on the Mccloud River and Shasta Stocking data	No	Meeting scheduled for 1/21/2022 at 4:00pm.
Meeting	1/21/2022	Anecita Agustinez	Tribal Policy Advisor	DWR	Chief Caleen Sisk	Chief and Spiritual leader	Winnemem Wintu Tribe (WWT)	Mark Miyoshi, WWT Tribal Historic Preservation Officer; Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Michal Koller, DWR Supervising Engineer; Eric Ginney, ESA Director; Meredith Parkin, ESA	AB 52 Consultation Meeting #1 between Winnemem Wintu Tribe and DWR to review Project components, timeline, and historical and current fish stocking. The Tribe presented concerns for TCRs and recommendations for appropriate environmental documentation.	Yes	The WWT stated there are TCRs in the area of the Project. The DWR Project Team needs to assess impacts to such resources to draft environmental appropriate environmental document. Meeting notes contain privileged and confidential information pertaining to cultural resources and are thus not available for distribution (notes containing confidential information are archived in a separate confidential appendix).
Meeting	2/1/2022	Anecita Agustinez	Tribal Policy Advisor	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Michal Koller, DWR Supervising Engineer; Eric Ginney, ESA Director; Meredith Parkin, ESA; Gusty Minyard, ESA Senior Administrator	AB 52 Consultation Meeting #2 between Winnemem Wintu Tribe and DWR to review previous ethnographic work conducted for the SWRCB for the WWT and the TCR evaluation criteria and process.	Yes	The WWT provided recommendation for the environmental document and identified particular resources as TCRs and character defining features of a TCL. Meeting notes contain privileged and confidential information pertaining to cultural resources and are thus not available for distribution (notes containing confidential information are archived in a separate confidential appendix).
Meeting	2/24/2022	Anecita Agustinez	Tribal Policy Advisor	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Mariko Falke, DWR Executive Tribal Liaison	AB 52 Consultation Meeting #3 between Winnemem Wintu Tribe and DWR to review previous ethnographic work conducted for the SWRCB/PG&E. Alzo discussed were the plans for continued tribal engagement and collaboration with the Tribe as a partner, the CEQA schedule, TRC evaluation criteria and process, and grant opportunities.	Yes	Concluded that an IS/MND can be the appropriate CEQA document including AB 52 text to designate Cultural Resources as identified by a local historic register. Meeting notes contain privileged and confidential information pertaining to cultural resources and are thus not available for distribution (notes containing confidential information are archived in a separate confidential appendix).

TRIBAL CONSULTATION LOG WITH WINNEMEM WINTU TRIBE AND DEPARTMENT OF WATER RESOURCES: JUVENILE SALMONID COLLECTION SYSTEM PILOT PROJECT, SHASTA COUNTY (CHRONOLOGICAL ORGANIZATION)

Communication Type	Date	From Individual[1]	Individual Position	Individual Affiliation	To Recipient[2]	Recipient Position	Recipient Affiliation	Additional Participants, CCs Name, Affiliation	Topics Discussed	Confidential Information	Comments
Email	4/15/2022	Mariko Falke on behalf of Anecita Agustinez	Executive Tribal Liaison on behalf of Tribal Policy Advisor	DWR	Chief Caleen Sisk	Chief and Spiritual Leader	Winnemem Wintu Tribe (WWT)	cc to: Mark Miyoshi, WWT Tribal Historic Preservation Officer; Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Eric Ginney, ESA Director;	Provide draft Juvenile Salmonid Collection System IS/MND document for 2nd review which includes comments provided from the Tribe from the 1st round of review.	No	Provided a 10-day review timeline to provide comments that could be incorporated into final document released for public review.
Email	4/28/2022	Mariko Falke	Executive Tribal Liaison	DWR	Chief Caleen Sisk	Chief and Spiritual Leader	Winnemem Wintu Tribe (WWT)	cc to: Mark Miyoshi, WWT Tribal Historic Preservation Officer; Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Eric Ginney, ESA Director;	Provide follow-up for the 2nd review period of the draft Juvenile Salmonid Collection System IS/MND document	No	Provided additional time to submit comments that could be incorporated prior to public review. Time extended from original Friday, April 29, 2022 deadline to Monday, May 2, 2022.
Phone call	5/4/2022	Mariko Falke	Executive Tribal Liaison	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	Luisa Navejas, WWT Office of Historic Preservation Administrator;	Follow-up call to provide additional support for Tribal review of the draft Juvenile Salmonid Collection System IS/MND document. Set up meeting with the Project team to determine timeline and next steps.	No	Set up meeting for 5/10/2022 at 11:30am.
Email	5/6/2022	Mariko Falke	Executive Tribal Liaison	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	cc to: Chief Caleen Sisk, WWT Chief and Spiritual Leader; Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Michal Koller, DWR Supervising Engineer; Eric Ginney, ESA Director; Meredith Parkin, ESA	Provide agenda and send link to virtual AB52 Consultation Meeting #4	No	Meeting scheduled for 5/10/2022 at 11:30am.
Meeting	5/10/2022	Anecita Agustinez	Tribal Policy Advisor	DWR	Mark Miyoshi	Tribal Historic Preservation Officer	Winnemem Wintu Tribe (WWT)	Luisa Navejas, WWT Office of Historic Preservation Administrator; Randy Beckwith, DWR Senior Engineer; Anecita Agustinez, DWR Tribal Policy Advisor; Amy Bailey, DWR Environmental Program Manager I; Michal Koller, DWR Supervising Engineer; Eric Ginney, ESA Director; Meredith Parkin, ESA; Gusty Minyard, ESA Senior Administrator Mariko Falke, DWR Executive Tribal Liaison	AB 52 Consultation Meeting #4 between Winnemem Wintu Tribe and DWR to review the Tribe's comments on the draft Juvenile Salmonid Collection System IS/MND document prior to public release. Plans for public release, the timeline, continued consultation, and closure of AB 52 consultation for the draft document were also discussed.	Yes	Both DWR and the Tribe concluded that the document represents the values and perspectives by both parties and can conclude AB 52 for the preparation of the environmental document, but consultation for the Project will continue. Meeting notes contain privileged and confidential information pertaining to cultural resources and are thus not available for distribution, but have been included in the confidential administrative record.

NOTES:

[1] Principal individual initiation communication.

[2] Principal individual receiving communication.