Upper Rose Bar Salmonid Spawning Habitat Restoration Project

Initial Study/Mitigated Negative Declaration

Public Draft

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AFRP	Anadromous Fish Restoration Program
ARB	Air Resources Board
CalEPA	California Environmental Protection Agency
cbec	cbec eco-engineering
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CV	Central Valley
CCV	California Central Valley
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFS	Cramer Fish Sciences
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
DBH	Diameter-at-Breast-Height
DO	Dissolved Oxygen
DPS	Distinct Population Segment
DWR	Department of Water Resources

EA	Environmental Assessment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ERP	Ecosystem Restoration Program
ESA	Environmental Species Act
ESU	Evolutionarily Significant Unit
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FRAQMD	Feather River Air Quality Management District
GHG	Greenhouse Gas
HAPC	Habitat Areas of Particular Concern
IS	Initial Study
ISRAP	Invasive Species Risk Assessment and Planning
LYR	lower Yuba River
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendant
MND	Mitigated Negative Declaration
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System

NTU	Nephelometric Turbidity Units
OHWM	Ordinary High-Water Mark
PM	Particulate Matter
PBF	Physical and Biological Features
ROD	Record of Decision
RM	River Mile
RMT	River Management Team
SWPPP	Stormwater Pollution Prevention Plan
SYRCL	South Yuba River Citizen's League
Corps	United States Army Corps of Engineers
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
VELB	Valley Elderberry Longhorn Beetle
YCWA	Yuba County Water Agency
YWA	Yuba Water Agency

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1 INTRODUCTION

1.1 OVERVIEW

California Department of Fish and Wildlife (CDFW), South Yuba River Citizen's League (SYRCL), Yuba Water Agency (YWA), and Yuba County have proposed the Upper Rose Bar Salmonid Spawning Habitat Restoration Project (Proposed Action) to rehabilitate and enhance spawning habitat for Central Valley (CV) fall run and spring run Chinook Salmon (*Oncorhynchus tshawytscha*) and California Central Valley (CCV) Steelhead (*O. mykiss*) in the Yuba River downstream of Englebright Dam. The Proposed Action design, permitting and pre-Proposed Action monitoring was funded by the Prop 1 - Watershed and Delta Ecosystem Restoration Grant Program and directly addresses CDFW restoration priorities by improving water quality and working to implement the salmon spawning and rearing habitat and riparian floodplain habitat objectives that exist within the State Wildlife Action Plan, the Sacramento Valley Salmon Resilience Strategy, and the California Biodiversity initiative. In addition, this Proposed Action will reduce the impacts of a changing climate by creating more spawning and rearing habitat within an area that supports spring run Chinook Salmon. The Proposed Action would also directly address the doubling goal of the United States Fish and Wildlife Service (USFWS) Anadromous Fish Restoration Program (AFRP), the National Marine Fisheries Service (NMFS) priority action YUR-2.4 to create and restore off-channel spawning areas in the Yuba River for CV Chinook Salmon and CCV Steelhead (NMFS 2014), and test hypotheses regarding the response of adult salmonids to restored spawning habitats.

2 PURPOSE OF DOCUMENT

This Initial Study (IS) has been prepared to satisfy the California Environmental Quality Act (CEQA; California Public Resources Code, Sections 1000 et seq.). The CEQA Lead Agency is Yuba County.

This document was prepared to identify the environmental resources in the Action Area, analyze the effects to the environment of the Proposed Action and a No Action Alternative, and propose avoidance, minimization, and mitigation measures to reduce any effects to less than significant levels.

This IS is an informational document used in the local planning and decision-making process and is not intended to recommend approval or denial of the Proposed Action. This IS has been prepared to determine whether the Proposed Action would have a significant effect on the environment. The purposes of this IS are to:

- provide the lead agencies with information to use in deciding whether to prepare an Environmental Impact Report (EIR), Mitigated Negative Declaration (MND), or a Negative Declaration;
- enable the lead agencies to modify the Proposed Action to mitigate adverse impacts before an EIR is prepared, thereby enabling the Proposed Action to qualify for a Negative Declaration; and,
- document the factual basis for the finding, in a Negative Declaration, that a Proposed Action would not have a significant effect on the environment.

As CEQA lead agency, Yuba County is required to circulate an IS for public review before adopting it. This document is being circulated for a 30-day review period. A notice will be posted at the Smartsville, CA post office that includes a Proposed Action description, the location where the document is available for interested parties to review, and contact information to request a copy of the document. The IS will be available from the Yuba County office (915 8th St, Marysville, CA 95901). Any comments should be returned attention Kevin Perkins. Additionally, a SYRCL representative anticipates attending a Yuba River Management Team (RMT) Meeting during the public review period, in which they will discuss the Proposed Action and provide 'notice of availability' and the location where the document is available. Yuba County intends to adopt a MND for the Proposed Action. The IS will be circulated by the State Clearinghouse so it may be reviewed by state agencies. Before adopting the Proposed Action, Yuba County must consider the proposed IS along with any comments received during the public review process. If the Yuba County finds, based on this IS and any comments received, that the study adequately addresses the environmental issues associated with the Proposed Action and that no substantial evidence indicates that the Proposed Action will have any significant effect on the environment, a MND will be adopted. Adoption of the proposed IS does not require implementation of the Proposed Action.

2.1 PURPOSE AND NEED FOR ACTION AND PROPOSED ACTION OBJECTIVES

The purpose of this Proposed Action is to design, implement, and monitor an in-channel habitat restoration that will improve spawning and rearing habitat for listed CV Chinook Salmon and CCV Steelhead on the Lower Yuba River (LYR). The term “restoration”, an accepted colloquial term, is used hereafter to refer to naturalization, enhancement and rehabilitation of rivers and streams. Within an approximately 43-acre Action Area, this Proposed Action will generate a restoration design that will create and improve existing salmonid habitats. The Proposed Action aims to create a variety of in-channel habitats that function under a variety of flow conditions present on the LYR.

The primary objectives of the Proposed Action are:

- Increase the amount of high-quality spawning habitat by modifying hydraulic (i.e., depth and velocity) and substrate conditions to within the ranges preferred by Chinook Salmon and Steelhead during typical spawning periods;
- Create backwater habitat that incorporates varying depths and low velocities to create juvenile salmonid rearing habitat over a range of flows;
- Create a design that mimics natural morphological features (e.g., riffle, pool) that would not erode significantly through typical non-flood control related operations; and
- Reduce bank erosion in the west gully that may be contributing mercury contaminated soil to the Yuba River.

The Proposed Action, including design, permitting, construction, and monitoring, is funded and directed by CDFW through the Proposition 1 grant program. The Proposed Action is being led by the South Yuba River Citizens League (SYRCL), cbec eco-engineering (cbec), and Cramer Fish Sciences (CFS). The success of the Proposed Action hinges on continued working partnerships with adjacent landowners, local and regional stakeholders, and state and federal agencies. The Proposed Action team will finalize the Proposed Action design plans, coordinate all regulatory compliance, conduct public outreach activities, implement the Proposed Action, and document Proposed Action success through a scientifically robust monitoring program. The Proposed Action team will also coordinate with adjacent landowners, resource agencies, stakeholders, and the local community to recover function habitat for salmonids, garner public support, and demonstrate benefits of river habitat restoration.

In addition to addressing goals outlined by state and federal resource agencies, the Proposed Action includes tracking physical and biological parameters in the restored ecosystem to answer critical questions about mechanisms and processes influencing spawning habitat quality for CV salmonids and the relative benefit of rehabilitating habitats. The monitoring plan will be designed to answer questions about the effects of habitat enhancement on physical conditions for spawning salmonids; redd density, size and depth; the effects of upland enhancement; native vegetation recruitment, growth, and survival; and the relationship of these factors to Proposed Action design and implementation. Cost-sharing opportunities will be pursued by partnering with property owners and volunteers. Ultimately, the Proposed Action aims to advance scientific understanding of spawning habitat restoration and to improve the effectiveness of future efforts in the LYR and other CV rivers.

2.2 PROPOSED ACTION LOCATION

The Proposed Action is located on private property owned by YWA along the LYR near the community of Smartsville in Yuba County, California (Figure 1). The Proposed Proposed Action encompasses an approximately 2,895-foot (ft) (882-meters [m]) segment of the LYR, a tributary to the Feather River, approximately 8.9 river miles (rm) downstream of Englebright Dam at the downstream end of the Narrows Reach, in the upstream portion of the Timbuctoo Bend Reach and at the base of the former Blue Point Mine, between 39°13'07.14"N, 121°18'09.84"W (downstream limit) and 39°13'22.28"N, 121°17'40.45"W (upstream limit) (Figure 2).

Elevations in the Action Area range from approximately 223 ft to 331 ft NAVD88 and contain a variety of terrestrial and aquatic habitats. The Yuba River flows from east to west below the southern boundary of the Action Area and is dominated by a large gravel bar with scattered stands of riparian vegetation, with two ephemerally flowing gullies that feed into the Yuba River. Surrounding land uses include rural community and natural resources, with remnant tail minings situated adjacent to the western portion of the Action Area.

The Action Area is characterized as having riparian scrub habitat of Willows (*Salix* spp.) and Ash (*Fraxinus* spp.) distributed along the edge of the Yuba River and scattered throughout the gravel bar. Valley foothill riparian habitat is distributed along the gentler slopes of both drainages with a canopy of Oak (*Quercus* spp.) and Cottonwood (*Populus* spp.) with an understory of extensive stands of invasive Himalayan Blackberry (*Rubus armeniacus*). Valley Interior Mixed Hardwood plant community covers approximately 1.5 acres along the upper boundaries and steep slopes of the Proposed Action Area. The dominant tree species are Interior Live Oak (*Quercus wislizeni*) and Blue Oak (*Q. douglasii*) with infrequent Ponderosa Pines (*Pinus ponderosa*).

The LYR in the Action Area includes vegetated lateral bar (alternate bar) comprised of predominately gravels, which is adjacent to the main Yuba River pool where spawning gravels will be placed. The southern end of the Action Area is comprised of mine tailings and overburden roughly 25-35 ft deep. Eroding this sediment are two gullies, one to the north and one to the south, with a lobe of mine tailings and overburden remaining between them. The southern gully is less active with dense woody vegetation in the upper portion of the gully and no defined head cut or nick-point. The northern gully, the larger of the two, has less dense woody vegetation in the channel bottom and head-cut migration is stopped by a bedrock outcrop located approximately 740 ft (220 m) from where the two gullies join. The confluence of the gullies is located approximately 70 ft (21 m) from the local floodplain creating an alluvial fan approximately 6 ft (2 m) deep and sloping to the water’s edge. The pool area in the main channel varies in elevation between approximately 198-237 ft mean sea level. The channel bottom is comprised of cobbles and boulders. An estimated 5.4 acres of main channel are available for enhanced spawning habitat and a gravel source area of approximately two acres are available within the Action Area on the lobe between the north and south gullies.

2.3 BACKGROUND

Since the mid-1800s, anadromous salmonid populations in the Yuba River have been adversely affected by anthropogenic factors, including hydraulic gold mining, channel manipulation (e.g., dam construction), water diversion, and flow regulation.

Constructed in 1941, the 280-foot Englebright Dam obstructs fish migration to the upper Yuba River watershed. As a result, spawning and rearing habitat for Yuba River salmonids is constrained to the LYR, a 24-mile stretch of river channel below the Englebright Dam and above the confluence with the Feather River in Marysville. The primary purpose of the Englebright Dam was to trap mine waste that would result from the resumption of hydraulic gold mining activities in the upper watershed, which had been curtailed by the Sawyer decision of 1884. Although no significant hydraulic mining occurred after its construction, the Englebright Dam has nevertheless acted to block the downstream transport of coarse sediment to the LYR. Cobble, gravel, and sand in the bedrock canyon just below the Englebright Dam have been washed out during mobilizing flows through time, leading to a lack of suitable spawning substrate. This condition extends about two miles downstream from the Englebright Dam to the area called “Rose Bar,” where smaller sediment sizes enter the river from the Blue Point Mine drainage on the south side of the canyon and from the continued erosion of historical terraces of hydraulic mine debris on the riverbanks, beginning here and extending downstream to the confluence with the Feather River. Like other CV rivers, native CV salmonid populations in the Yuba River have declined dramatically since European settlement. It has been estimated that approximately two million fall run Chinook Salmon returned annually to CV rivers and streams before the Gold Rush, of which about 15%, or up to 300,000 fish, returned to the Yuba River (Yoshiyama et al. 2001; CDFG 1993). Over the last 30 years, an average of about 12,500 fall run Chinook Salmon have returned to the Yuba River to spawn annually, a substantial reduction from historical numbers (CDFW 2021). Spring run Chinook Salmon have experienced more extreme declines. In recent years for which data are available (2015, 2018, and 2019), an average of only 439 spring run Chinook Salmon were estimated to have returned to the Yuba River annually (Poxon and Bratovich 2020).

As a result of these population declines, CCV Steelhead were listed by NMFS as a threatened species in 1998, and spring run Chinook Salmon were listed by NMFS as a threatened species a year later. The NMFS Recovery Plan (Plan) for CV spring run Chinook Salmon and CCV Steelhead identifies specific recovery actions for both species. Priority actions in the Plan include developing and implementing a program to reintroduce CV spring run Chinook Salmon and CCV Steelhead to historical habitats upstream of Englebright Dam, developing and implementing programs to promote natural river processes, including adding riparian habitat and instream cover, and improving spawning habitat in the river canyon below Englebright Dam (NMFS 2014). The gravel augmentation associated with the Proposed Action directly addresses the third component of the Plan.

There is an established need for augmentation of spawning gravels in the canyon below Englebright Dam (e.g., Pasternack 2008) and, since 2010, about 5,000 tons of gravel have been added to the river channel below the dam annually by the United States Army Corps of Engineers (Corps) (Corps 2012). Measurements of salmonid redd density on the newly installed gravels indicate that Chinook Salmon are actively using the new habitat; however, although the sediment is moving downstream and creating new landforms, it has not yet entered the gorge known as the Yuba Narrows, which starts about 1.2 miles downstream of the dam (Brown et al. 2013). Therefore, the benefits of the Englebright Dam gravel augmentation efforts do not extend through the entire two miles of degraded spawning habitat, which includes Rose Bar at the downstream end.

2.3.1 CENTRAL VALLEY PROJECT IMPROVEMENT ACT

There are a series of documents regarding the Yuba River that rely on analyses conducted and recommended in the broader programmatic review (CALFED 2000), which is used to guide specific projects. The AFRP is a component of a broader program, the Central Valley Project Improvement Act (CVPIA), which supports provisions for fish and wildlife habitat restoration. The CVPIA prepared a programmatic environmental impact statement (Reclamation 1999) and Record of Decision (ROD) (Reclamation 2001) in accordance with NEPA. A programmatic environmental document is frequently used to evaluate new programs, analyze a series of actions that are part of a larger project, or consider broad policy alternatives and programmatic mitigation measures. This document was prepared to address details and site-specific factors of the restoration actions in the Yuba River. This IS for the Proposed Action is consistent with the CALFED and CVPIA programs and adopts appropriate provisions of the CVPIA's ROD. This IS has been prepared to assess the impacts of the Proposed Action components as required by the State CEQA Guidelines.

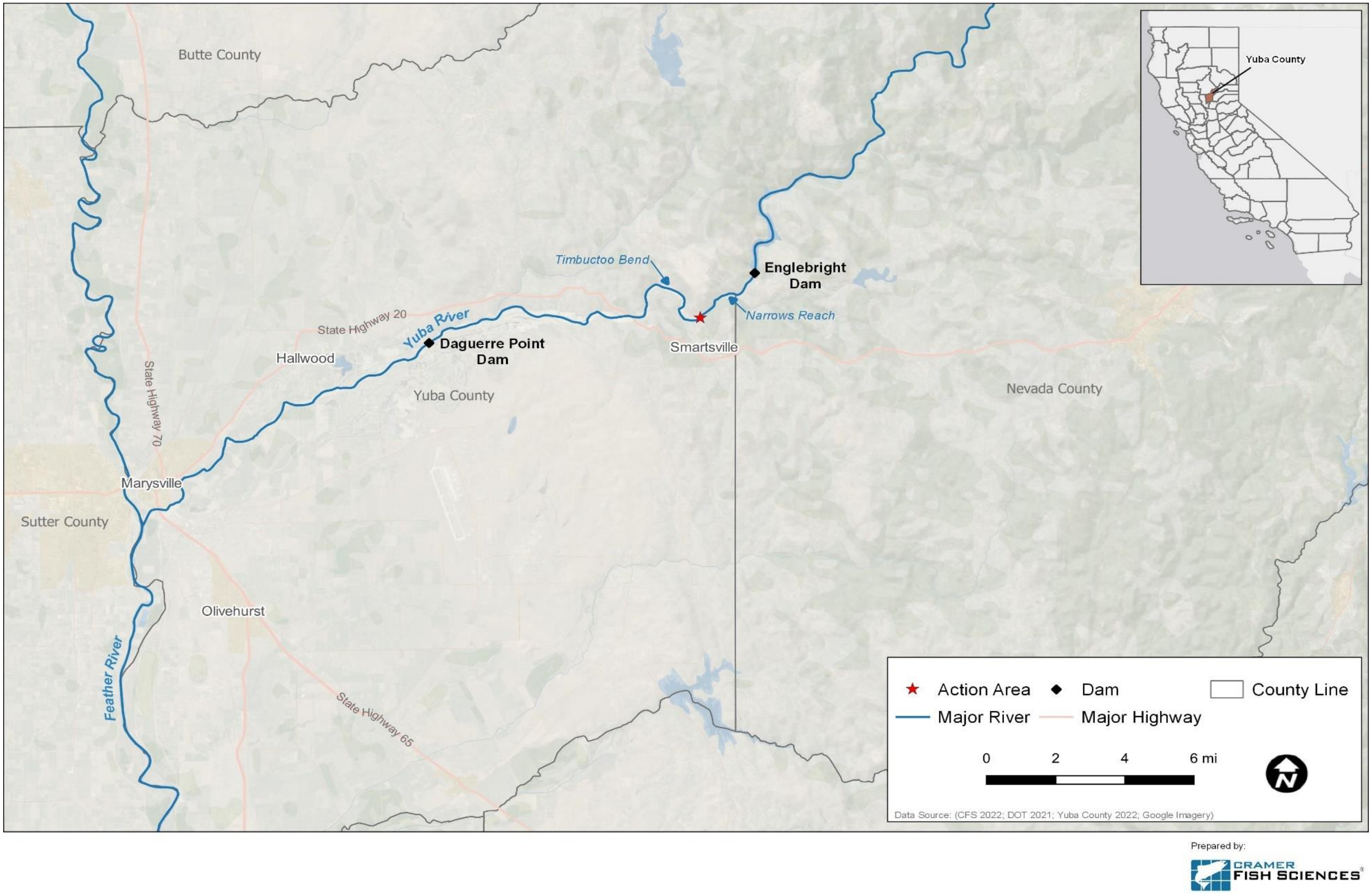

Figure 1. Upper Rose Bar Salmonid Spawning Habitat Restoration Project Location

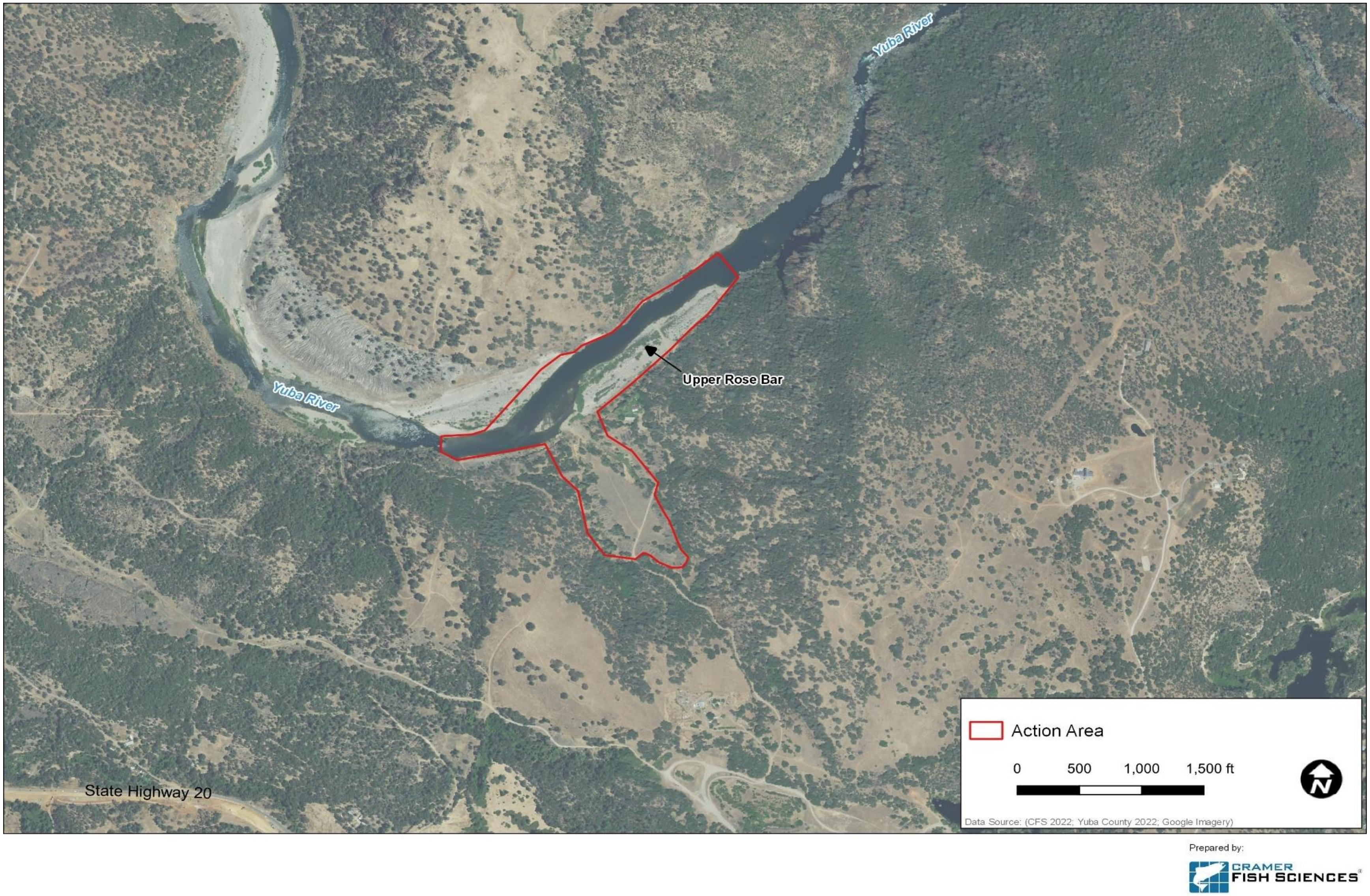

Figure 2. Upper Rose Bar Salmonid Spawning Habitat Restoration Project Action Area

2.4 PURPOSE AND NEED FOR ACTION AND PROPOSED ACTION OBJECTIVES

The National Environmental Policy Act requires that an EA include a discussion of the Proposed Action's need and CEQA Guidelines (Section 15124 (b)) require a statement of the Proposed Actions objectives. The following paragraphs address these requirements.

The LYR ecosystem has been affected by European-American activities for more than a century, beginning with extensive gold mining in the 1850s. Since that time, riparian and instream habitats have been modified or converted for uses such as agriculture, gravel and gold mining, increased water diversions, and flood protection using levees and dams to regulate streamflow. These major impacts have led to the deterioration of riparian and instream habitat conditions on the LYR. Despite extensive habitat degradation, CV Chinook Salmon and Steelhead populations are still present in the lower reaches of the LYR downstream of Englebright Dam. The LYR still produces one of the largest fall-run Chinook Salmon populations and supports CV spring-run Chinook Salmon and Steelhead, which are federally listed as threatened. From 2009-2010, spawning in the Yuba River made up 14-20% of all salmonid spawning in Sacramento River tributaries (Yuba RMT 2013). The LYR is designated as critical habitat for the CV spring-run Chinook Salmon Evolutionary Significant Unity (ESU) (70 FR 52488) and the CCV Steelhead Distinct Population Segment (DPS) (70 FR 52488) between its confluence with the Feather River and Englebright Dam. The Action Area occurs within this reach. Thus, restoring habitat in the Yuba River provides an opportunity for management actions that will directly support natural production.

2.5 PREVIOUS ENVIRONMENTAL DOCUMENTATION

Spawning, floodplain, riparian, and side channel habitat rehabilitation and enhancement for the LYR have been identified as priority actions in USFWS's Working Paper (USFWS 1995) and the AFRP Final Restoration Plan (USFWS 2001); in the NMFS Central Valley Salmon and Steelhead Recovery Plan (NMFS 2014), by the LYR Fisheries Technical Working Group (LYRFTWG 2005), in the Habitat Expansion Plan for CV spring-run Chinook Salmon and Steelhead (DWR and PG&E 2010), and, in several California Department of Fish and Game publications (CDFG 1990, 1993, 1996) as part of the effort to improve spawning and rearing habitat for CV spring- and fall-run Chinook Salmon and Steelhead in the LYR. In addition, the following environmental documents have addressed the issues being considered within the Action Area:

- **CDFW.** Habitat rehabilitation is recommended in the Yuba River as part of the fisheries management strategies in several CDFW reports including Salmon and Steelhead Restoration and Enhancement Plan (CDFG 1990), LYR Fisheries Management Plan (CDFG 1991), Restoring Central Valley Streams - A Plan for Action (CDFG 1993), and Steelhead Restoration and Management Plan (CDFG 1996), and Strategic Plan for Trout Management (CDFG 2003). The Proposed Action aligns with CDFW's California Water Action Plan objectives to (1) protect and restore important ecosystems and (2) increase flood protection by creating functioning floodplain and riverine habitats that allow for improved water quality and functioning habitat for salmon. Restored floodplains attenuate floods and reduce the potential for flooding on downstream communities. The Proposed Action also addresses threats and conservation actions described in CDFW's State Wildlife Action Plan through the restoration of endangered Chinook spring run, fall run, and Steelhead habitat.

- **CVPIA and AFRP.** In Section 3406(b)1, the Secretary of the Interior is required to develop and implement a program that makes all reasonable efforts to double natural production of anadromous fish in CV rivers and streams by 2002. In response to this directive, USFWS prepared a draft plan for the AFRP and identified anadromous fish habitat deficiencies in each tributary within the CV (USFWS 2001). One of the High Priority actions was to "evaluate the benefits of restoring stream channel and riparian habitats of the Yuba River, including the creation of side channels for spawning and rearing habitat for salmonids" (USFWS 2001).

- **NMFS.** The Central Valley Salmon and Steelhead Recovery Plan recommended multiple actions in the LYR that would help contribute to recovery of CV spring run Chinook Salmon and Steelhead (NMFS 2014). In recovery action YUR-1.2, NMFS states the need to "Improve spawning habitat in the Englebright Dam Reach", where the Proposed Action will take place (NMFS 2014).

- **CALFED Bay-Delta Program.** This a cooperative state and federal effort which was established to reduce conflicts in the Delta by solving problems in ecosystem and water quality, water supply reliability, and levee and channel integrity. The goal of CALFED's Ecosystem Restoration Program (ERP) Plan is to improve and increase aquatic and terrestrial habitats and improve ecosystem functions in the Delta to support sustainable populations of diverse and valuable plant and animal species (CALFED 2000). In the CALFED Bay-Delta Program they state that "about 90% of historical salmon spawning habitat in the Sacramento-San Juaquin system is no longer available" (ERP 2014). One of the conservation priorities identified in the Ecosystem Restoration Program's Conservation Strategy for Restoration of the Sacramento-San Joaquin Delta, Sacramento Valley and San Joaquin Valley Regions is better management of sediment supplies to provide sufficient spawning habitat for salmonids (ERP 2014).

- **Federal Energy Regulatory Commission (FERC).** At present, there are six FERC licenses for hydroelectric projects on the Yuba River. Several of these licenses are currently undergoing relicensing (FERC Project No. 2266 – Yuba-Bear, FERC Project No. 2310 – Drum-Spaulding, and FERC Project No. 2246 – Yuba River Development). The first hydroelectric projects upstream from the confluence of the Yuba and Feather rivers is the Narrows I powerhouse and then the Narrows II powerhouse, which are both below Englebright Dam. The Narrows I powerhouse, FERC Project No. 1403, is owned and operated by YWA with its license effective until 2023. The Narrows II powerhouse is part of the Yuba River Development Project (FERC Project No. 2246). The Yuba River Development Project is owned by YWA and is in the relicensing process. The YWA received an initial license for the Yuba River Development FERC Project No. 2246 from FERC's predecessor, the Federal Power Commission effective May 16, 1963. On May 6, 1966, the Federal Power Commission amended the initial license and made the license effective from May 1, 1966 to April 30, 2016. The Narrows II powerhouse, FERC Project No. 2246, is located immediately below Englebright Dam in Yuba County and discharges into the LYR. The Narrows I and II powerhouses are responsible for the flows in the LYR during non-flood periods (Corps 2014).

- **Lower Yuba River Accord River Management Team Interim Monitoring and Evaluation Report.** In 2008, the Lower Yuba River Accord was approved which included a Fisheries Agreement containing in-stream flow schedules and creating a Monitoring and Evaluation Program. The RMT was created to oversee the Fisheries Agreement and guide the Monitoring and Evaluation Program and consists of representatives from YWA, NMFS, USFWS, CDFW, Pacific Gas and Electric, CDWR, Friends of the River, The Bay Institute, SYRCL, and Trout Unlimited. The Monitoring and Evaluation Program was designed to evaluate: 1) the effectiveness of the Accord in protecting anadromous salmonids, 2) the condition of fish resources in the LYR, and 3) the viability of spring- and fall-run Chinook Salmon and CCV Stealhead in the LYR. In collaboration with the Pacific States Marine Fisheries Commission and UC Davis, the RMT produced an Interim report in 2013 (Yuba RMT 2013).

- **Yuba County Integrated Regional Water Management (IRWM) Plan.** The goal to "Protect, restore, and enhance water quality for water users and in support of healthy watersheds" (IRWM 2018) by rehabilitating floodplain function and complying with water quality standards and monitoring required by the Regional Water Quality Control Board during construction activities. The Proposed Action also addresses the IRWM goal to "preserve and restore watershed health and promote environmental stewardship" by restoring wetland and riparian habitats, in particular floodplain and side channel rearing habitat for juvenile salmonids, reducing invasive predator habitat, and improving flood conveyance. Finally, the Proposed Action addresses the goal to "enhance regional economic development" by "promoting regional collaboration" among resource agencies, non-profit organizations, and private consulting and aggregate companies.

Spawning habitat restoration is recommended by the AFRP, ERP, NMFS, and CDFW. The actions undertaken at the Action Area could be substantially beneficial to anadromous fish in the LYR and its ecosystem.

2.6 PREVIOUS SALMONID HABITAT IMPROVEMENT EFFORTS

In recent years, LYR salmonid habitat improvement projects have included the on-going gravel augmentation below Englebright Dam, the completed Yuba Canyon Salmonid Habitat Restoration Project (2018), Hammon Bar Riparian Enhancement Project (2012), and the Hallwood Side Channel and Floodplain Restoration Project (ongoing). Additionally, the Lower Long Bar Juvenile Salmonid Habitat Restoration Project has been funded by USFWS and is currently in the permitting phase. This project will be constructed in 2022.

Since 2007, gravel augmentation in the LYR below Englebright Dam has been used to rehabilitate the natural gravel delivery process impeded by dam construction and enhance spawning grounds for Chinook Salmon and CCV Steelhead in the Yuba River. The LYR gravel augmentation is being funded and performed by the Corps (Corps 2014). A gravel/cobble augmentation implementation plan for the Englebright Dam reach of the LYR was produced (Pasternack et al. 2010). In 2007, 453 short tons of gravel/cobble were placed in the Narrows II pool followed by about 5,000 short tons being injected just downstream of the Narrows I powerhouse in 2010/2011 (Brown and Pasternack 2013). In 2012, 2013, and 2014 about 5,000 short tons per year were injected into the LYR just downstream of the Narrows I powerhouse, with yearly gravel injections of 5,000 to 15,000 short tons predicted to continue until 2024 (Corps 2014). The effectiveness of the 2010/2011, 2011/2012, and subsequent gravel injections has been monitored since installation (Brown and Pasternack 2012, 2013; Campos and Massa 2012; Campos et.al 2013, 2014; Stearman and Massa 2015; Stearman et al. 2017). Chinook Salmon spawn in the location of the gravel injection and in downstream locations to where added gravel has been redistributed during high flow events (Stearman et al. 2017). The Yuba Canyon Salmon Habitat Restoration Project was constructed in the summer of 2018 and enhanced approximately 3.35 acres of salmonid spawning riffles and created an approximately 0.86-acre seasonal side channel for juvenile salmonid rearing. The Hammon Bar Riparian Enhancement Project was implemented in 2011 and 2012 (SYRCL 2013). As part of the project 6,389 large cuttings of Willow (*Salix* spp.) and Fremont Cottonwood (*Populus fremontii*) were planted on five acres of Hammon Bar (SYRCL 2013). Phase 1 of the Hallwood Side Channel and Floodplain Restoration Project began in 2019 and was completed in 2020. Phase 1 included the creation/enhancement of 89 acres of side channel and floodplain habitat for juvenile salmonid rearing; when completed, the Hallwood project will ultimately restore 157 acres of off-channel rearing habitat. The Corps completed a pilot large woody material placement project at Lower Gilt Edge Bar in 2013 (Corps 2014). Several reports have also been completed to help guide LYR restoration efforts. These include a rehabilitation concept report from Parks Bar to Hammon Bar (cbec et al. 2010), a hydrologic and geomorphic analysis report from Parks Bar to Marysville (cbec 2013a), and habitat management and restoration plan for the Yuba River Canyon – Englebright Dam and Narrows Reaches (ESA 2015).

2.7 REQUIRED PROPOSED ACTION PERMITS AND APPROVALS

The following local, state, and federal permits and/or approvals are required prior to implementation of the Proposed Action:

Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act

The Corps is authorized to issue permits for discharges of dredged or fill material into waters of the United States. Application will be made for a Letter of Permission for the restoration of wetland and riverine habitats.

Section 401 of the Clean Water Act (CWA)

State water quality standards cannot be violated by the discharge of fill or dredged material into waters of the U.S. The State Water Quality Control Board, through the Central Valley Regional Water Quality Control Board (CVRWQCB), is responsible for issuing water quality certifications, or waivers thereof, pursuant to Section 401 of the CWA.

Federal Endangered Species Act (ESA)

The Federal ESA (16 USC 1531 et seq., 50 CFR 17, 22) grants protection over species that are formally listed as threatened, endangered, or proposed. Section 7(a)(1) requires Federal agencies to use their authorities to further the conservation of listed species. Section 7(a)(2) requires Federal agencies to consult (or confer for proposed species) with the Services to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. In addition to Section 7 requirements, Section 9 of the ESA prohibits the taking of endangered species of fish and wildlife. Take is broadly defined as those activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect [a protected species], or attempt to engage in any such conduct." An activity can be in violation of take prohibitions even if the activity is unintentional or accidental. Significant modification or degradation of occupied habitat for listed species, or activities that prevent or significantly impair essential behavioral patterns, including breeding, feeding, or sheltering, are also considered "take" under the ESA. Section 10 provides exceptions to Section 9 take prohibitions. The USFWS and NMFS can issue permits to take listed species for scientific purposes, or to enhance the propagation or survival of a listed species. The USFWS and NMFS can also issue permits to take listed species incidental to otherwise legal activity. The Secretary of Commerce, acting through NMFS, is involved with Proposed Actions that may affect marine or anadromous fish species listed under the ESA. All other species listed under the ESA are under USFWS jurisdiction.

California Endangered Species Act, California Fish and Game Code 2081 and 2090

The California Endangered Species Act (CESA) allows CDFW the ability to authorize, by means of an incidental take permit, incidental take of state-listed threatened, endangered or candidate species if certain conditions are met. For species that are both federally and state listed, CDFW can perform a consistency determination process to decide whether the federal biological opinion can also serve as the state incidental take permit. The Proposed Action is exempt from CESA since it is entirely federally funded.

The Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 661 et seq.), amended 1946, 1958, 1978, and 1995, requires Federal agencies to coordinate with USFWS, or in some cases with NMFS, and with State fish and wildlife resource agencies before undertaking or approving Proposed Actions that control or modify surface water. This coordination is performed to ensure that wildlife resources held in public trust receive appropriate consideration in and are coordinated with water resource development Proposed Actions. Federal agencies undertaking water Proposed Actions are required to fully consider recommendations made by USFWS, NMFS, and State fish and wildlife resources agencies in Proposed Action documents, such as NEPA and CEQA, and to include measures to reduce impacts on fish and wildlife in Proposed Action plans. The AFRP will work to ensure the Proposed Action complies with the Fish and Wildlife Coordination Act.

Magnuson-Stevens Fishery Conservation and Management Act of 1996 (reauthorized in 2007)

The Magnuson-Stevens Fishery Conservation and Management Act (MSA; Public Law 94-265) is the primary law governing management of marine fisheries in federal waters of the U.S. (within 200 nautical miles of shore). Pacific coast salmon species are subject to the MSA. Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect essential fish habitat (EFH). The MSA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". Adverse effects mean any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of or injury to benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Fish and Game Code Section 1600 et. seq., Streambed Alteration Agreement

California Department of Fish and Wildlife has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource, pursuant to Fish and Game Code Section 1600 et seq. Authorization is required for proposed actions prior to any activities that could substantially divert, obstruct, result in deposition of any debris or waste, or change the natural flow of the river, stream, or lake, or use material from a stream or lake. The Proposed Action is exempt from Section 1600 (memo to CDFW 6/5/2020).

Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703 et seq.)

The MBTA implements various treaties and conventions between the United States and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the Act, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action will comply with the MBTA. Migratory birds will be protected by implementation of specific EC's, including pre-construction surveys and impact avoidance measures that are part of the Proposed Action.

Central Valley Flood Protection Board Encroachment Permit

The Flood Protection Board issues permits to maintain the integrity and safety of flood control Proposed Action levees and floodways that were constructed according to flood control plans adopted by the Board of the State Legislature. An encroachment permit is not needed for the Proposed Action as it is outside of CVFPB jurisdiction.

State Water Resources Control Board

The State Water Resources Control Board requires Proposed Actions that disturb one or more acres of soil to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity as part of the National Pollution Discharge Elimination System (NPDES). The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must list BMPs the discharger will use to protect storm water runoff and the placement of those BMPs. The contractor will work with CFS to ensure the Proposed Action has compliance. The contractor will be contractually required to implement the BMPs in the SWPPP.

National Historic Preservation Act, Section 106

Proposed Actions must coordinate with the State Historic Preservation Office and the Advisory Council on Historic Preservation regarding the effects that a Proposed Action may have on properties listed, or eligible for listing, on the National Register of Historic Places. Section 106 also requires Federal agencies to evaluate the effects of Federal undertakings on historical, archaeological, and cultural resources. The AFRP will work to ensure the Proposed Action has compliance with Section 106 of the National Historic Preservation Act (NHPA).

Feather River Air Quality Management District

The Feather River Air Quality Management District (FRAQMD 2010) requires that all portable equipment registrations are obtained for all Proposed Action equipment. Portable equipment used in Proposed Action is registered by the contractor.

The following Executive Orders and Legislative Acts have been reviewed as they apply to the Proposed Action, and the following permits/authorizations are required to implement the proposed action:

National Environmental Policy Act

National Environmental Policy Act provides a commitment that Federal agencies will consider environmental effects of their actions. The Corps is the federal lead agency for this Project. If, after certain key permits are obtained and the Corps finds that the Proposed Action has no significant environmental effects, a FONSI will be filed.

Floodplain Management - Executive Order 11988

Executive Order 11988 requires that all Federal agencies take action to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. The Proposed Action is within the 100-year floodplain. The Proposed Action supports the preservation and enhancement of the natural and beneficial values of floodplains and is in compliance with Executive Order 11988.

Protection of Wetlands - Executive Order 11990

Executive Order 11990 requires Federal agencies to follow avoidance, mitigation, and preservation procedures with public input before proposing new construction on wetlands. The IS has identified that the restoration actions will not result in the net loss of any wetlands. Implementation of the proposed restoration could enhance wetlands or increase their area and is in compliance with Executive Order 11990.

Environmental Justice in Minority and Low-income Populations-Executive Orders 13007 and 12898

Executive Order 12898 requires Federal agencies to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies, and activities on minority and low-income populations. The Proposed Action has considered the environmental, social, and economic impacts on minority and low-income populations and is in compliance with Executive Order 12898.

Indian Trust Assets, Indian Sacred Sites on Federal Land-Executive Order 13007, and American Indian Religious Freedom Act of 1978

These laws are designed to protect Indian Trust Assets, accommodate access and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites, and protect and preserve the observance of traditional Native American religions, respectively. The Proposed restoration activities and their associated mitigation measures will not violate these protections.

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act of 1975 (SMARA) provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized, and mined lands are reclaimed to a usable condition. The State Mining and Geology Board provides oversight for implementation of SMARA. The Proposed Action goals are to rehabilitate habitat that was subject to historic mining, but it is not a mining action.

3 ALTERNATIVES

Two alternatives are considered in this document: the No Action Alternative and the Proposed Action Alternative.

3.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no implementation of restoration activities and no change to existing conditions would occur.

If the Proposed Action is not implemented, existing spawning habitat would continue to be limited and non-existent. Spawning habitat in the LYR is limited by several anthropogenic factors, which are described in Section 2.2 above. These factors will continue to limit salmonid spawning habitat through the lack of gravels of a sufficient size to encourage spawning salmonids.

3.2 PROPOSED ACTION ALTERNATIVE

3.2.1 OVERVIEW

The Proposed Action Alternative (Proposed Action) would create and restore (i.e., rehabilitate and enhance) critical spawning habitat for salmonids and stabilize gullies adjacent to the LYR. The Proposed Action is a collaborative effort by CDFW, YWA, SYRCL, CFS, cbec, Yuba RMT, and local stakeholders. The Proposed Action would directly address the CV Chinook Salmon population doubling goal of the USFWS AFRP and test hypotheses regarding a variety of habitat enhancement techniques and subsequent utilization by salmonids.

The Proposed Action will include excavation of adjacent mine tailings, sorting and washing of excavated material, and the addition of suitably sized gravels into the Yuba River to create spawning habitat for CV Chinook Salmon and CCV Steelhead. The material to be excavated is adjacent to the Yuba River and is currently being eroded through two gullies within the Action Area. The mine tailings located between the two gullies will be excavated and sorted by size. Material of an appropriate size for CV Chinook Salmon spawning will be washed and placed in the Yuba River to create as many as three spawning riffle habitat features. The sides of the gullies will be excavated to a stable slope angle and planted with riverine and upland plant species as appropriate for the location. Within the excavation area, existing native vegetation will be preserved as much as possible. Riparian vegetation on the gravel bar adjacent to the proposed spawning riffle will also be undisturbed to the extent possible. A monitoring program would document the success of the implementation, the effectiveness of the Proposed Action to recover suitable salmonid spawning habitat, and a validation component to test hypotheses about the function of the recovered habitats. As the Project Manager, SYRCL will direct local outreach activities and Proposed Action participation by stakeholders, landowners, and other interested parties.

One of the primary objectives of the Proposed Action is to restore/enhance spawning habitat for CV Chinook Salmon and CCV Steelhead. Currently, there is no spawning habitat within the area the Proposed Action Area. The Action Area is one of the upstream-most locations where viable spawning habitat could exist before Englebright Dam prevents further upstream migration to historical spawning habitat. The Proposed Action would create new spawning habitat over an area of up to 6.5 acres through the placement of gravels to create a series of riffles within the Yuba River. Riffle crests will be designed such that during most flow conditions, including Schedule 4 and 5 drought years, water depth and velocities will be within the optimal range for spawning.

3.2.2 ASSUMPTIONS FOR DEVELOPING PROPOSED ACTION

Basic assumptions that influenced the development of the Proposed Action include:

- Stream flow in the Action Area is suitable for CV spring run and fall run Chinook Salmon and CCV Steelhead. Stream flow is controlled by YWA via releases from Narrows I and II powerhouses directly below Englebright Dam.

- Existing Land Use: The Action Area is owned by YWA who supports and contributes to the Proposed Action.

- The degraded channel currently provides low fisheries benefits.

- Proposed Action construction activities would have minimal temporary impacts to the active channel, stream corridor, riparian vegetation, and any sensitive habitats.

3.2.3 PROPOSED ACTION DESCRIPTION

3.2.3.1 Site Selection

The Action Area was chosen as a key restoration location on the LYR. The following factors were important in determining site selection:

- Salmonid spawning is heavily skewed towards the upstream reaches of the LYR and currently there is little or no salmonid spawning activity within the Action Area.

- Degraded existing habitat condition (e.g., reach-scale incision, sediment evacuation at a rate faster than replacement, even considering gravel augmentation conducted by the Corps).

- Potential for enhancement (suitable hydrologic conditions across a wide range of flows suggest gravel will remain relatively stable).

- Physical access to the site to allow equipment entrance that would have minimal impacts on the stream corridor, riparian vegetation, any sensitive species habitat, and local community.

- Landowner collaboration [YWA].

3.3 PROPOSED ACTION DESIGN

3.3.1 SALMONID SPAWNING AND REARING DESIGN

The Proposed Action would meet the primary objectives by enhancing the two existing spawning riffles, creating a rearing bench, excavating a spawning bench, and developing an access road to the bar (Figure 3). Both riffles are augmentations of existing riffles, but the upstream riffle requires significantly more sediment fill to develop suitable hydraulic conditions that are appropriate for spawning. The upstream spawning rifle is approximately 525 ft long, spans the width of the channel, and requires approximately 29,600 CY of fill, with fill up to 13 ft in depth. The downstream spawning riffle is located approximately 750 ft downstream of the tail of the upstream riffle and requires approximately 9,300 CY of fill. The downstream riffle is approximately 575 ft long and adds approximately 300 ft on the upstream end of an existing riffle and spans the width of the main channel.

The upstream faces of both riffles were designed with concave-upstream entrance edges and 3:1 slopes. The relatively steep faces and concave-upstream shape of the entrances is intended to promote hyporheic flow through the riffles to improve intergravel water quality conditions. While a more gradual slope would be desired, the upstream slope reflects the expected resultant slope based on construction using conventional equipment such as front-end loaders and bulldozers. Both riffles are designed with large foundation material and 2 ft of spawning-sized sediment as a top layer.

The downstream crest of the upstream riffle was designed with a two-stage exit grade to reduce sediment mobility. The downstream riffle was designed with a mildly sloping downstream transition to reduce shear as flow departs the riffle. Additionally, larger material (9-inch D_{50}, minimum) was specified for approximately 100 ft at the downstream ends of the riffles to help resist erosion during flows up to 10,000 cfs. A mild exit slope was incorporated in the riffle design to the expected water depth that construction equipment is expected to be operable. On the upstream riffle, a similar resultant slope to the upstream face was added downstream of this where it is expected that sediment will be placed by simply pushing it over the edge of the riffle. Water depths during construction are anticipated to be shallower over the downstream riffle, allowing equipment operation to the end of the riffle, and a longer, milder exit slope was included.

Fill will be placed in a side channel and deep backwater area contiguous with the downstream riffle to further increase spawning habitat area. In the existing condition, the area provides suitable hydraulics for spawning, but the existing substrate is too coarse, limiting its utilization for spawning. For a portion of the side channel, the top 2 ft of existing material will be removed and replaced with spawning-sized sediment. The deeper backwater at the downstream end of the side channel was designed with large foundation material and 2 ft of spawning-sized sediment as a top layer. Approximately 1,600 CY of existing material will be removed, and 3,300 CY of material will be placed on this portion of the downstream riffle, with fill depths of up to 6 ft.

A 1.2 ac rearing bench was included along the margin of the pool separating the two riffles to provide rearing habitat for juvenile salmonids. The rearing bench was designed with a gentle slope towards the main channel to provide optimal Chinook salmon and steelhead juvenile rearing depths over the flow range of 900 to 5,000 cfs, and to reduce stranding potential as flows recede. The rearing bench is designed to inundate from approximately 1.5 ft depth at the lower side of the bench at 900 cfs to approximately 2.4 ft depth on the high side at 5,000 cfs. The bench is designed with large foundation material and approximately 2,600 CY of spawning-sized sediment as a 2 ft top layer. The rearing bench also provides suitable steelhead spawning habitat at flows ranging from 2,000 to 5,000 cfs.

The spawning bench adjacent to the downstream riffle provides approximately 1.3 ac of steelhead and Chinook salmon spawning habitat that is intended to function between 2,000 and 5,000 cfs to function at the upper end of the anticipated spawning flow range. The bench is designed to inundate to 1.25 ft depth at 2,000 cfs and to 2.75 ft depth at 5,000 cfs.

The design is estimated to require approximately 42,200 CY of sediment in the main channel. This volume consists of both spawning-sized sediment used to construct the top 2 ft of the riffles, larger foundation material, and material with a 9-inch D_{50} at the downstream portions of the riffles to reduce sediment mobility.

3.3.2 ACCESS ROAD DESIGN

The Action Area is currently inaccessible by conventional construction equipment and an access road must be developed to gain access to Upper Rose Bar. The Proposed Action also includes a constructed access road that serves three purposes: provide access to the site, flatten the side slopes of the east gully to reduce erosion, and generate material for riffle construction and future replenishment. Side slopes of the road cut will be laid back to 3H:1V slopes to reduce runoff erosion potential. The excavation will generate a large volume of material that will be sorted and washed locally to produce appropriately sized spawning material for riffle construction. Excess sorted material will be stockpiled for future riffle enhancements. The access road will facilitate access to the site for the Proposed Action and for future coarse sediment augmentation efforts. The 100% design has an estimated excavation (cut) volume of approximately 115,600 cubic yards (CY) in the access road and 11,900 CY in the spawning bench area. SYRCL (2016) estimated that 54% of the excavated access road material would be suitable for spawning sediment, once sorted and washed. It is estimated that approximately 62,400 CY of spawning sediment will be produced from road excavation.

3.3.3 PROPOSED ACTION CONSTRUCTION

The Proposed Action will require the operation of construction equipment (e.g., rubber-tired front-end loaders, excavators, articulated haulers, dozers, etc.) within the Action Area. Construction equipment shall be clean and use biodegradable, vegetable-based lubricants and hydraulic fluids. To minimize any potential negative effects on salmonids, any in-water work will occur from 15 July to 15 October when flows are typically and comparatively low (approximately 200 cfs or less) and active salmonid spawning is not occurring. Off-channel construction may occur between 16 April and 31 October; mitigation measures to avoid impacts to special status species will be implemented, as appropriate, given life history considerations of particular species.

3.3.3.1 Access and Staging

Access to the Action Area would likely be from the YWA entrance gate at the intersection of Krista Trail and Smartsville Road (Figure 3). As discussed in Section 2.3.2, the site is currently inaccessible by conventional construction equipment and an access road must be developed to gain access to Upper Rose Bar. The access road will facilitate access to Upper Rose Bar and for future gravel augmentations.

Staging and stockpiling areas will be restricted to the land adjacent to the southeastern portion of the Action Area, to would avoid any significant impacts to sensitive natural resources, as required by BMPs (see Section 2.3.2 below).

3.3.3.2 Proposed Action Implementation Time Frame

Construction is anticipated to occur in 2023 and require only one year to complete. Site stabilization would occur immediately after construction activities are complete, and revegetation planting would commence at the beginning of the rainy season, which would presumably begin in November and continue through February. Construction activities would take place during normal working hours, 7:00 am to 5:00 pm, Monday through Friday.

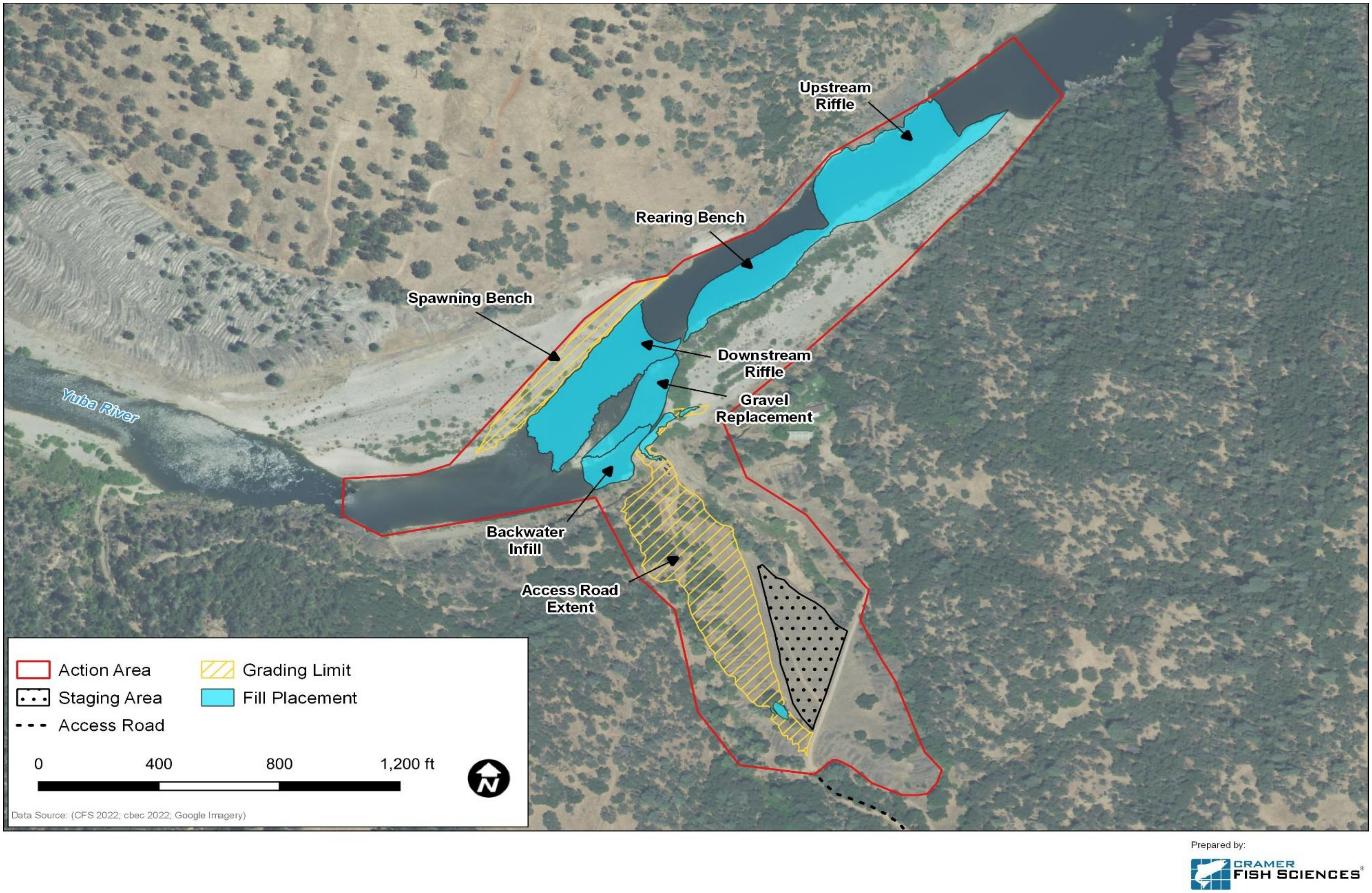

Figure 3. Upper Rose Bar Salmonid Spawning Habitat Restoration Project Habitat Features, Access, and Staging Area.

3.3.3.3 Revegetation

A revegetation plan will be developed for areas impacted during excavation and grading to create the new features and fill placement areas. Mitigation tree planting will occur in areas suitable for upland and riparian species within the Action Area (Appendix C). The native grass seeding areas include hydroseeding using a combination of an erosion control seed mix and a pollinator seed mix as shown on the design drawings. Tree species for the upland tree planting and riparian tree planting zones are based on direct replacement of native trees impacted by construction.

3.3.4 BEST MANAGEMENT PRACTICES

Proposed Action construction activities are expected to result in potential effects to sensitive natural resources. The Proposed Action would implement appropriate measures to minimize adverse effects (i.e., Best Management Practices). Preliminary BMPs have been included into the 100% Design Plans (Appendix B) and final measures will be developed after regulatory permitting coordination and included in the 100% Design Plans. These measures will be incorporated in construction documents prepared for the Proposed Action and will be contractually required of all construction contractors.

3.3.5 PROPOSED ACTION OPERATION AND MAINTENANCE

Following construction, post-Proposed Action monitoring activities will take place to ensure the Proposed Action was built to design standards and specifications. After construction and revegetation are complete, the planted trees will require management during the initial establishment period following planting. There is no municipal water for irrigation at the site; therefore, watering will need to be undertaken using a hands-on methodology. Monthly watering may be required and could be accomplished using a watering truck and hoses, or temporary slow-release water tubes that slowly release water but require refilling every few weeks. The Proposed Action team will coordinate to determine the most efficient approach for plant establishment and watering.

DETERMINATION:

On the basis of this initial evaluation:

	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	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.

Signature:	**Date:**
Printed Name:	

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents the affected environment and environmental consequences associated with each environmental issue area. The following guidance, adapted from Appendix H of the State CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000 – 15387; 27 July 2007) was followed. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required. "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). The analysis of each issue should identify: (1) the significance criteria or threshold used to evaluate each question; and (2) the mitigation measure identified, if any, to reduce the impact to less than significance.

The significance criteria used are based on Appendix G of the CEQA Guidelines and the Council on Environmental Quality NEPA Regulations (2016), and each impact category begins with a tabular summary of the criteria for determining significance and level of impact from the Proposed Action. Each subsection for which impacts are anticipated includes a description of existing conditions against which the potential for impacts is compared for each alternative. A discussion of the direct and indirect environmental consequences is followed with recommendations to avoid, minimize, and/or mitigate adverse effects. If no impact is anticipated for a particular impact category, a brief justification is provided.

This IS uses the following terms to describe the significance of environmental impacts.

No Impact: A no impact determination is made when the Proposed Action would not have any direct or indirect impacts on the environment. It means no change from existing conditions.

Less than Significant Impact: An impact is considered less than significant when the physical change resulting from the Proposed Action would not exceed the applicable significance criterion. A less than significant impact would not result in a substantial or potentially substantial adverse change in the physical conditions within the area affected by the Proposed Action.

Significant Impact: An impact is considered significant when the physical change from the Proposed Action would result in a substantial or potentially substantial adverse change in the physical conditions within the area affected by the Proposed Action. Significant impacts are identified by the evaluation of the physical change resulting from the Proposed Action compared to the applicable significance criteria.

Potentially Significant Impact: An impact is considered potentially significant when there is substantial evidence that an effect may be significant however, there is some uncertainty in conditions related to the Proposed Action or the affected environment. This document takes a conservative approach, treating a potentially significant impact as significant.

Cumulative Impact: A cumulative impact refers to two or more effects, when considered together, are considerable or which compound or increase other environmental impacts. A significant cumulative impact is when the cumulative adverse change in the physical conditions within the Action Area would exceed the applicable significance criterion and the Proposed Action's contribution is "cumulatively considerable".

Mitigation Measure: Mitigation measures to avoid, minimize, reduce, or compensate for significant and potentially significant impacts of the Proposed Action, in accordance with the State CEQA Guidelines (§15370) and with NEPA regulations (40 CFR §1508.20), are recommended where applicable.

Evaluation of the potential effects of the alternatives resulted in the determination that there would not be any adverse direct, indirect, or cumulative effects on many resources due to the scale, scope, and schedule of the Proposed Action. The resource categories which were determined to have no impact were the following: land use and planning, agricultural and forest resources, population and housing, transportation/traffic, mineral resources, hazards and hazardous materials, public services, and recreation. These resource categories are discussed in the environmental checklist for CEQA. The resource categories which were determined to have potential adverse effects are discussed in more detail below.

4.1 AESTHETICS

Except as provided in Public Resources Code Section 21099, would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Aesthetic or visual resources include the “scenic character” of a particular region and site. Scenic features can include both natural features, such as vegetation and topography, and manmade features (e.g., historic structures). Areas that are more sensitive to potential effects are usually readily observable, such as land found adjacent to major roadways and hilltops.

The Proposed Action is located on private property in unincorporated Yuba County north of the town of Smartsville. The Action Area is downstream of the Narrows Canyon and upstream of Timbuctoo Bend. No public viewpoints or areas (e.g., parks and recreation areas) are located adjacent to this portion of the Yuba River. There are some private residences in the vicinity of the Action Area, but no residences immediately adjacent to the Action Area. There are no designated scenic vistas or notable geographic features identified in the Action Area in the Yuba County General Plan (Yuba County 2011). The area is zoned as Rural Residential (Yuba County 2011).

4.1.1 DISCUSSION

No Action Alternative

Aesthetic or visual resources would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a) The Proposed Action would not adversely impact a scenic vista as defined by the state of California. The Action Area is not visible from any public roadways. Therefore, there would be **no impact.**

b, c) The Action Area is located on the Yuba River and on private property. During construction, there will be temporary changes to visual resources for private citizens living on adjacent properties and recreational users of the river, although this reach is not frequently accessed by the public. Impacts would be relatively short term, temporary, and with limited visibility. Therefore, there will be **a less than significant impact** to scenic resources or the visual character and quality of the site. When the Proposed Action is complete, the visual resources would be improved as river users would be able to see more spawning salmon during certain times of year and more stable uplands areas with less active erosion and more natural vegetation communities.

d) The Proposed Action would not create a new source of light or glare; therefore, the Proposed Action would have **no impact** on day or nighttime views.

4.2 AGRICULTURAL AND FORESTRY RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non- agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

4.2.1 DISCUSSION

No Action Alternative

Agriculture and forestry resources would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a-e) The Action Area is located on land designated as Grazing Land and Other land according to the Farmland Mapping and Monitoring Program (FMMP) (DOC 2018) and is not subject to Williamson Act contracts (DOC 2017). Proposed Action would take place within and along the immediate Yuba River channel corridor, access road, and private land and does not involve land conversion, conflict with existing zoning for agricultural use, or a Williamson Act contract. Therefore, **no impact** to agriculture would occur. The Proposed Action does not occur on forest land and would have **no impact** on any timber resources.

4.3 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:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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?	☐	☐	☒	☐

The Proposed Action is within the Sacramento Valley Air Basin. The FRAQMD is responsible for monitoring air quality in Yuba County. The Clean Air Act requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards to protect public health. National standards have been set for the following: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter (particulate matter less than 10 microns in diameter; PM_{10}), fine particulate matter (particulate matter less than 2.5 microns in diameter; $PM_{2.5}$), and lead. The air quality in Yuba County has been designated nonattainment-transitional by the California Air Resources Board (ARB) for ozone and nonattainment for PM_{10} (ARB 2017; Table 1). The federal Clean Air Act and the California Clean Air Act require areas that are designated nonattainment to reduce emissions until standards are met. Air quality is affected by a combination of air contaminants, meteorological conditions, and the topographical configuration of the valley. A primary factor responsible for the increase of air pollution is the increased amount of pollutants and PM produced by vehicles, industrial processes, mining operations, and agricultural activities such as burning and ground disturbance.

Table 1. Yuba County federal and state attainment status for criteria pollutants (ARB 2017, USEPA 2020b)

Pollutant	State Standards	Federal Standards
Ozone	Nonattainment	Nonattainment/Severe
Carbon Monoxide	Unclassified	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Respirable Particulate Matter (PM_{10})	Nonattainment	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Unclassified	Unclassified

Sensitive Receptors

Sensitive receptors include hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. The occupants of these facilities, children, elderly, and the infirm, are more sensitive to poor air quality and associated health effects than the general population. In addition, residential areas are considered sensitive receptors because the general public spends substantial amounts of time at home. The Action Area is quite remote, with only a few scattered rural residences within a 0.5-mile radius of the Action Area. The closest sensitive receptor to the project site, Vantage Point Charter School in Penn Valley, is over six miles east of the Action Area.

4.3.1 DISCUSSION

The FRAQMD has established criteria for determining local air basin impact significance. For the purpose of determining significance, the District's criteria for emissions from nitrous oxides (NO_x) and reactive organic gases (ROG) is 25 pounds per day (ppd) multiplied by project length (annual duration); not to exceed 4.5 tons per year (tpy), and 80 ppd for PM_{10} emissions (FRAQMD 2010). A threshold of significance has not been established by FRAQMD for $PM_{2.5}$ (FRAQMD 2010). Project emissions that exceed the threshold limits set forth by the District are considered significant and require mitigation. Criteria pollutant emissions were also compared to the federal General Conformity *de minimis* thresholds (USEPA 2020a) to determine whether pollutant emissions would have an adverse effect under NEPA. FRAQMD has not established a significance threshold for construction greenhouse gas (GHG) emissions. Therefore, to evaluate GHG emissions for the Proposed Action the Sacramento Metropolitan Air Quality Management District (SMAQMD) threshold of 1,100 metric tons (1,213 tons) of CO_{2e} was used for CEQA purposes.

A significance threshold amount of GHG emissions has not been established for NEPA (CEQ 2016). Exposure of sensitive receptors to substantial pollutant concentrations would be considered a significant impact.

No Action Alternative

Without the Proposed Action and under existing conditions, the air quality for the area would not be affected except for actions that take place under existing conditions; therefore, there would be **no impact**.

Proposed Action

The Proposed Action restoration activities would result in emissions which would have effects on air quality in the area, including the generation of dust and small particulates from the excavation and transportation of material from the floodplain grading, and operation of heavy equipment. The following heavy equipment is estimated to be used for the Proposed Action; two bulldozers, two hydraulic excavators, four articulated haulers, one grader, and one water truck (Table 2). The Proposed Action is expected to take one-to-two construction seasons (16 April – 31 October). Restoration activities are expected to require approximately 90 days to complete.

Table 2. Construction equipment number and total estimated use for the Proposed Action.

Type of Equipment	Number of Each Type	Estimated Total Use (days)	Estimated Total Use (hours)
Bulldozer	2	63	733
Hydraulic Excavator	2	63	663
Articulated Hauler	4	63	2012
Water Truck	1	63	250

Restoration activities may potentially result in localized, short-term emissions. Emissions may include hydrocarbons, nitrous oxides, sulfur oxides, carbon monoxide, and particulate matter. Activities are temporary, so any changes in air quality due to the Proposed Action would be limited in duration. Fugitive dust may be emitted during use of earth working equipment. Fugitive dust emissions during restoration activities would vary daily based on activity type and level, fines content of the sediment, and the weather. The areas of the site which would be impacted by restoration activities have low composition of fine sediment, generally only being found in areas with dense riparian vegetation that would not be impacted by the Proposed Action. The majority of restoration activities would occur on exposed alluvial bars where the sediment size is predominantly gravel and cobble sized with some sand sized particles included. Therefore, generation of high quantities of dust is not expected to occur during most restoration activities. However, quantities of dust could occasionally be produced and result in temporary increases in PM_{10} concentrations. Implementation of **AQ 1: Reduce Dust Impacts** would ensure that production of dust would be minimized and result in a **less than significant** impact. Heavy equipment used during construction is summarized in **Table 2**, and emissions estimates of criteria pollutants by phase compared with FRAQMD emissions thresholds are summarized in **Table 3**. The emission of criteria pollutants during restoration activities would not exceed the FRAQMD significance thresholds resulting in a **less than significant** impact.

Table 3. Criteria pollutant emissions estimates in pounds per day and tons per year and FRAQMD thresholds (FRAQMD 2010).

	NO_x (ppd/tpy)	ROG (ppd/tpy)	PM_{10} (ppd/tpy)	$PM_{2.5}$ (ppd/tpy)
Proposed Action emissions	9.38 / 0.62	3.72 / 0.23	30.84 / 2.01	7.00 / 0.44
FRAQMD Threshold	2.275 tpy[1]	2.275 tpy[1]	80 ppd	No Threshold
FRAQMD *de minimis* Threshold	25 tpy[2]	25 tpy[2]	100 tpy[3]	No Threshold

[1] The FRAQMD threshold for NO_x and ROG is calculated as 25 ppd x length of the Proposed Action (days); not to exceed 4.5 tpy.

[2] The FRAQMD *de minimis* threshold for NO_x and ROG is 25 tpy based on FRAQMD being in severe nonattainment for ozone.

[3] The FRAQMD *de minimis* threshold for PM_{10} is 100 tpy based on FRAQMD being in moderate nonattainment for PM_{10}.

The Proposed Action’s restoration activities would result in short term emissions of diesel particulate matter. The heavy equipment used for the Proposed Action all run on diesel and would produce diesel emissions during excavation, grading, and transport of material. The FRAQMD has not adopted a methodology for analyzing the impact of diesel particulate matter emission. Considering the limited construction season (16April through 31 October) and the distance from the nearest sensitive receptor to the Action Area, the Proposed Action would not expose sensitive receptors to substantial pollutant concentrations; therefore, this impact would be **less than significant**.

The only objectionable odor that may be produced by the Proposed Action would be from diesel exhaust from operation of the earth moving equipment. The closest residence to the Action Area where restoration would occur is approximately 0.25 miles north. Overall, there are a limited number of residences in the vicinity of the Proposed Action and the area is primarily rural residential. Diesel exhaust from restoration activities would be expected to be restricted to the construction season and would dissipate over time and distance. Therefore, diesel exhaust resulting from restoration activities would not be expected to create objectionable odors to which residents would be exposed, resulting in a **less than significant impact**.

4.4 BIOLOGICAL RESOURCES

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

Cramer Fish Sciences and South Yuba River Citizens League (SYRCL) biologists conducted multiple biological surveys from October to December 2020 and 2021 and March 2022. Surveys were conducted on foot to assess existing habitat types and the potential for the Action Area to support special-status species and their habitats. CFS biologists delineated waters of the U.S. within the Action Area on 8 October 2020. Vegetation and tree surveys of the Action Area were also performed on 8 October 2020, with no special status plant species observed (Vaghti 2020). Adult salmonid redd surveys were performed within the Action Area (CFS, unpublished data).

The potential presence of special-status species or other special habitats in the Action Area was investigated with a search of the USFWS, CDFW, and California Native Plant Society (CNPS) databases. Special status species are species that are classified as such based on the following categories:

- Species listed or proposed for listing on the federal ESA as threatened or endangered (animals: 50 CFR §17.11, plants: 50 CFR §17.12, and proposed species: federal register notices)
- Candidate species for possible future federal ESA listing as threatened or endangered (61 FR 40)
- Species listed or proposed for listing under the CESA as threatened or endangered (14 CCR §670.5)
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.)
- CDFW designated species of special concern (CDFW 2018)
- Animals designated as fully protected under California Fish and Game Code (birds: Section 3511, mammals: 4700, and reptiles and amphibians: 5050)
- Plants considered by the CNPS and CDFW to be rare, threatened or endangered in California (California Rare Plant Rank 1A, 1B, and 2) as well as California Rare Plant Rank 3 and 4 species (CNPS 2021)

An official species list was requested for the Action Area from the U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) database (USFWS 2022). The CDFW California Natural Diversity Database (CNDDB) was queried for records of protected species within 5 miles of the Action Area (CDFW 2022).

Several animal and plant species listed by state and federal agencies as threatened, endangered, or a species of concern occur on the Yuba River (CDFW 2022; USFWS 2022). **Table 4** lists the special status animal and plant species that may occur in the Action Area and may be affected by the Proposed Action. For the purposes of this document, species that are unlikely to occur in the Action Area are not discussed further in the sections below.

REGIONAL SETTING

The Action Area is located along the Yuba River, a tributary to the Feather River in the northern portion of California's CV. The river, which drains an approximately 1,300 square mile (mi^2) [3,367 square kilometer (km^2)] watershed, has three forks; north, middle, and, south, which each originate in the Sierra Nevada Mountain range. Elevations in the watershed range from 9,148 ft (2,788 m) on Mt. Lola at the crest of the Sierra Nevada to 60 ft

(18 m) at the confluence with the Feather River in Marysville. The Middle Fork flows into the North Fork downstream of New Bullards Bar reservoir, forming the main Yuba River which then flows into Englebright Reservoir. The South Fork of the Yuba River flows into Englebright Reservoir. The LYR begins below Englebright Dam and flows for ~24 miles before joining the Feather River near Marysville. The LYR has two major tributaries: Deer Creek, which flows in ~ 1 mile below Englebright Dam, and Dry Creek, which flows in near Hammon Grove Park. Long-term average annual unimpaired run-off of the LYR at Smartsville is 2,370,000 acre-feet (YCWA 2009) but this value is reduced by 534,000 acre-feet when out of basin transfers are considered (YCWA 2009). Similar to many rivers in California, the natural hydrologic processes within the Yuba River have been disrupted by the presence of dams (cbec 2013a). Englebright Dam, located on the Yuba River at river mile (RM) 23.9 (measuring from the confluence with the Feather River), lies upstream of the Action Area and serves as the upstream migration barrier to anadromous fish. Surrounding land uses include rural community and natural resources, with remnant mine tailings situated adjacent to the western portion of the Action Area.

PROPSED ACTION SITE SETTING

PLANT COMMUNITIES AND WILDLIFE HABITATS

The wildlife habitats described below are based on the California Wildlife Habitat Relationships in CDFW's Guide to Wildlife Habitats (Mayer and Laudenslayer 1988). Wildlife communities are correlated with vegetation communities. Vegetation communities within the Action Area were delineated using field surveys in combination with aerial photos. CDFW uses vegetation alliances to classify vegetation and the alliances are the unit for conservation of special status plant communities. The vegetation alliances within the Action Area were determined based on Sawyer et al. (2009). Vegetation alliances are typically a finer scale of vegetation classification than wildlife habitat relationships; therefore, CDFW provides "crosswalks" to correlate vegetation alliances with wildlife habitat, which are referenced in this document.

The Action Area is dominated by an unvegetated gravel bar. Three terrestrial vegetation habitat types were observed within the Action Area: Interior Mixed Hardwood, Valley Foothill Riparian and Riparian Willow Scrub. Despite the study area being in the northern Sierra Nevada Foothills floristic province, it is close to the border of the Sacramento Valley floristic province and riparian communities found in the Sacramento Valley extend into foothill riparian areas, particularly along major rivers. These terrestrial habitat types are further discussed below, as adapted from Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986) and Manual of California Vegetation (CNPS 2000). Just outside of the northern boundary of the study area the Fremont cottonwood woodland transitions into blue oak woodland.

Mining activities including channel confinement, dam construction, and water regulation have altered and impacted habitats within the LYR, including the Action Area.

TERRESTRIAL HABITATS

Vegetation Alliances

Vegetation alliances include Great Valley Interior Mixed Hardwood, Great Valley Mixed Riparian Hardwood, and Great Valley Willow Scrub.

Valley Interior Mixed Hardwood

The Valley Interior Mixed Hardwood plant community covers approximately 1.5 acres along the upper boundaries and steep slopes of the Proposed Action Area. The dominant tree species are Interior Live Oak (*Quercus wislizeni*) and Blue Oak (*Q. douglasii*) with infrequent Ponderosa Pines (*Pinus ponderosa*). Shrub species included California Buckeye (*Aesculus californica*), Poison Oak (*Toxicodenron diversilobum*), and Himalayan Blackberry (*Rubus armeniaucus*).

Valley Foothill Riparian

The Valley Foothill Riparian plant community is the second-most common plant community found within the Proposed Action Area, covering 4.1 acres. It is distributed along the gentler slopes of both drainages. The dominant tree species is Fremont Cottonwood (*Populus fremontii*) with occasional Interior Live Oak. Shrub species included California Buckeye, poison Oak, and Himalayan Blackberry.

Riparian Scrub

Riparian Scrub is the most common plant community found within the Proposed Action Area, covering 7.5 acres, and is distributed along the edge of the Yuba River and scattered throughout the gravel bar. This community is dominated by Narrowleaf Willow (*Salix exigua)*, Dusky Willow (*S. melanopsis)*, and Yellow Willow (*S. lasiolepis)* with scattered California Ash (*Fraxinus dipetala*).

CRITICAL PERIODS

The potentially significant impacts from the Proposed Action would be those associated with site construction, which include excavation of material from the drainage gullies, creating riffles within the main channel, and the placement of native sediment in the main and side channels to create spawning habitat. To avoid these impacts, in-water work would be conducted only during the period 15 July through 1 September, which is outside the critical periods for special status species (Table 5). However, some ground disturbing work in upland areas, including spawning gravel sorting, would be conducted as early as 16 April, and appropriate surveys would be performed, and buffers implemented around observed special status species to avoid impacts to these species, discussed in greater detail below.

Table 4. Special status species potentially occurring in the Action Area.

Common Name *(Scientific Name)*	Status[1] ESA	CESA	Other	Distribution and Habitat Association	Potential for Occurrence in the Action Area[2]
Invertebrates					
Monarch Butterfly *(Danaus plexippus)*	FC			Lay eggs on the Milkweed host plant (*Asclepias* spp.). Migrate to overwintering sites along the coast from Mendocino to San Diego Counties. Overwintering habitat includes Eucalyptus stands.	**Unlikely.** This species may occur on site during winter months but is unlikely to be present during the construction period.
Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)*	FT	--	--	Elderberry shrubs in riparian areas along rivers and streams in the Central Valley.	**Unlikely.** Elderberry shrubs are absent from the Action Area.
Vernal Pool Fairy Shrimp *(Branchinecta lynchi)*	FT	--	--	Species occurs in a ride variety of vernal pool habitats in the coast ranges and Central Valley of California as well as two locations in southern Oregon's Jackson County (USFWS 2006a).	**Unlikely.** Suitable vernal pool habitat is absent from the Action Area.
Vernal Pool Tadpole Shrimp *(Lepidurus packardi)*	FE	--	--	Species range in vernal pools from the north end of the Central Valley around Redding to the south Central Valley around Visalia, between the Coast Range and the Sierra Nevada. Distribution is patchy and consists of vernal pool complexes (King et al 1996).	**Unlikely.** Suitable vernal pool habitat is absent from the Action Area.
Fish					
Chinook Salmon – Central Valley spring run ESU *(Oncorhynchus tshawytscha)*	FT	ST	--	Sacramento-San Joaquin basin; San Francisco, San Pablo, and Suisun bays eastward to Chipps Island. Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries, and in the Delta.	**Present.** The Action Area overlaps the range and habitat of species and is known to occur in the Yuba River.
Delta Smelt *(Hypomesus transpacificus)*	FT			Delta Smelt are tolerant of a wide salinity range. They have been collected from estuarine waters up to 14 ppt (parts per thousand) salinity. For a large part of their one-year life span, Delta Smelt live along the freshwater edge of the mixing zone (saltwater-freshwater interface), where the salinity is approximately 2 ppt. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone. Most spawning happens in tidally-influenced backwater sloughs and channel edgewaters. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as Cattails, Tules, tree roots and submerged branches. Delta Smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties (USFWS 1995).	**None.** The Action Area does not overlap the range of the species or provide suitable habitat for the species.

Common Name (Scientific Name)	Status[1]			Distribution and Habitat Association	Potential for Occurrence in the Action Area[2]
	ESA	CESA	Other		
Green Sturgeon – southern DPS *(Acipenser medirostris)*	FT			Main-stream Sacramento River downstream of Keswick Dam (including the Yolo and Sutter bypasses), the Feather River below Oroville Dam, the Yuba River below Daguerre Point Dam, and the Sacramento-San Joaquin Delta (NOAA 2009)	**None.** The Action Area is outside of the geographical range of this species and there is a physical barrier to migration downstream from the Action Area
Steelhead – Central Valley DPS *(Oncorhynchus mykiss)*	FT	--	--	Sacramento-San Joaquin basin; San Francisco, San Pablo, and Suisun bays eastward to Chipps Island. Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries, and in the Delta. For anadromous *O. mykiss*, adult migration from the ocean to CV spawning grounds occurs during much of the year, with peak migration occurring in the fall or early winter.	**Present.** The Action Area overlaps the range and habitat of species and is known to occur in the Yuba River.
Birds					
Bald Eagle *(Haliaeetus leucocephalus)*	DL	SE	FP	Present year-round at higher elevation areas in California, winter resident in other parts of the state. Nest near lakes or flowing rivers for foraging (USFS 2008)	**Present.** Suitable nesting and foraging habitat are present within and adjacent to the Action Area.
Bank Swallow *(Riparia riparia)*	--	ST	--	Found primarily in riparian areas, which it uses for breeding and capturing the insects it feeds on. The Bank Swallow is a colonial breeder that digs a horizontal nest burrow in fine-textured banks or cliffs near water (CDFG 2005, BSTAC 2013). There are nesting colonies found throughout northern California but 70-90% of the population in California occurs along the Sacramento River and its tributaries (BSTAC 2013).	**Unlikely.** Suitable nesting habitat is absent from the Action Area.
Burrowing Owl *(Athene cunicularia)*	--	--	SSC	Widely distributed throughout the lowlands of California; breeds/nests in open, sandy areas with low vegetation and grasslands (Bates 2006; Small 1994; Klute et al. 2003)	**Unlikely.** Suitable nesting habitat is absent from the Action Area.
California Black Rail *(Laterallus jamaicensis coturniculus)*	--	ST	FP	A rare, secretive species that is a resident of saline, brackish, and fresh emergent wetlands (CDFG 2005). It is found along the coast from northern Baja California to Bodega Bay, in the San Francisco Bay, Sacramento-San Joaquin Delta, Salton Sea, along the lower Colorado River, and the northern Sierra Nevada foothills (CDFG 2005, Richmond et al. 2008, 2010). Generally selects wetland vegetation that is dense and tall and with shallow water depths (Tsao et al. 2009).	**Possible.** Marginally suitable nesting habitat is present within the Action Area.

Common Name *(Scientific Name)*	Status[1]			Distribution and Habitat Association	Potential for Occurrence in the Action Area[2]
	ESA	CESA	Other		
Grasshopper Sparrow *(Ammodramus savannarum)*	--	--	SSC	Occurs in California primarily as a summer resident from March to September (Shuford and Gardali 2008); the breeding season extends from mid-March to August. The winter status of this secretive species is obscure, though it is generally considered rare and appears with greatest frequency on the coastal slope of southern California (Shuford and Gardali 2008).	**Unlikely.** The Action Area overlaps the range of species, but it has not been observed within the Action Area.
Long-eared Owl *(Asio otus)*	--	--	SSC	Resident throughout the state except it is scarce in the Central Valley, where it breeds irregularly (CDFG 2005, 2008). Typically nests in Conifer, Oak, or riparian woodlands that are open or next to grasslands, meadows, or shrublands (Shuford and Gardali 2008). They forage at night over open ground and eat mostly small mammals (Shuford and Gardali 2008). Long-eared Owl breeds from early March to late July (CDFG 2005).	**Unlikely.** The Action Area overlaps the range of species.
Northern Harrier *(Circus hudsonius)*	--	--	SSC	Prefers open habitats, such as fields, meadows, and marshes, but is also found in agricultural areas and riparian zones (Wheeler and Clark 1987; Macwhirter and Bildstein 1996). The Northern Harrier nests in loose colonies and breeding occurs from April through September. Nests are built on the ground on raised mounds (Limas 2001).	**Possible.** The Action Area overlaps the range of species.
Swainson's Hawk (*Buteo swainsoni*)	--	ST	--	Often nests adjacent to riparian systems of the valley and in lone trees or groves of trees in agricultural fields. Valley Oak, Fremont Cottonwood, Black Walnut and large Willows are the most commonly used nest trees in the CV. This species also requires large open grasslands with suitable nest trees and abundant prey. Migrating individuals move south through the southern and central interior of California in September and October, and north March through May.	**Possible.** The Action Area overlaps the range of species.
Tricolored Blackbird (*Agelaius tricolor*)	--	ST	SSC	Northern California to upper Baja California, Mexico. Nests and forages in freshwater marshes with Cattails and Bulrushes (CDFW 2016).	**Unlikely.** The Action Area does not contain freshwater marsh habitat.
Yellow Warbler (*Setophaga petechia*)	--	--	SSC	Primarily a migrant and summer resident in California and is present from late March through early October and breeds from April to late July (Shuford and Gardali 2008). Breeding populations are found throughout California except for in the Mojave Desert and are nearly extirpated in the CV (Shuford and Gardali 2008). They are found breeding up to 8,500 ft in the Sierra Nevada mountains (Shuford and Gardali 2008). Yellow Warbler primarily occupies open riparian woodlands, including Cottonwoods, Willows, and Alders, close to streams and in wet meadows (Shuford and Gardali 2008).	**Unlikely.** The Action Area contains only sparse riparian trees.
Yellow-breasted Chat *(Icteria virens)*	--	--	SSC	Occurs in California as a migrant and summer resident from late March to late September, breeding April - August (Garrett and Dunn 1981, Unitt 2004, Eckerle and Thompson 2001). Nesting restricted to narrow borders near streams with thick vegetation and large trees (Grinell and Miller 1944)	**Possible.** the Action Area overlaps the range of species.
Reptiles					

Common Name *(Scientific Name)*	Status[1]			Distribution and Habitat Association	Potential for Occurrence in the Action Area[2]
	ESA	CESA	Other		
Giant Gartersnake *(Thamnophis gigas)*	FT	ST	--	Species range from Glenn County to the southern edge of the San Francisco Bay-Delta and from Merced County to northern Fresno County. Species is found in small, isolated patches of highly modified agricultural wetlands as 93% of historical wetlands in the Central Valley have been lost (Wood et. al 2015) Species prefers marsh and wetland type habitat including sloughs, drainage canals and irrigation ditches associated with rice cultivation (Halstead et al. 2013).	**None.** Habitat for this species is not present in the Action Area and it has not been observed in this reach.
Western Pond Turtle *(Emys marmorata)*	--	--	SSC	Coast ranges north of Santa Cruz and in the CV west of the Sierra crest, and there are also isolated populations near Susanville and in the Truckee, Carson, and East Walker rivers (Spinks et al. 2014). typically found at elevations from sea level to 5,000 ft in a wide variety of aquatic habitats including rivers, streams, lakes, ponds, and marshes as well as human created habitat such as irrigation ditches and sewage treatment ponds. Structures such as logs, rocks, bedrock outcrops, and exposed banks are required for basking. prefer aquatic habitats with access to deep, slow water containing underwater refugia (Ashton et al. 1997).	**Possible.** The Yuba River provides marginally suitable habitat for this species.
Amphibians					
Foothill Yellow-legged Frog *(Rana boylii)*	--	SE	SSC	Coast ranges from Monterey County north and in the foothills of the Sierra Nevada from Kern County north. It is found from near sea level to around 6,000 ft, typically in or near rocky streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows (Zeiner et al.1990).	**Possible.** There is suitable riparian and aquatic habitat within the Action Area.
Mammals					
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	--	--	SSC	Throughout California; this species requires caves, mines, tunnels, buildings or other human-made structures for roosting (CDFW 2016)	**Unlikely.** Action Area and habitat overlaps species range.
Western Red Bat *(Lasiurus blossevilli)*	--	--	SSC	Common in some areas of California, occurring from Shasta County to the Mexican border, west of the Sierra Nevada/Cascades Crest, and deserts. Roosting habitat includes forests and woodlands between sea level and mixed coniferous forest. Preferred roost sites are in edge habitat adjacent to streams, fields, or urban areas.	**Possible.** Action Area and habitat overlaps species range.

Common Name (Scientific Name)	Status[1] ESA	CESA	CNPS	Distribution and Habitat Association	Potential for Occurrence in the Action Area[2]
Plants					
Ahart's Dwarf Rush *(Juncus leiospermus var. ahartii)*	--	--	1B.2	Annual grass-like herb found in the northeastern and southeastern Sacramento Valley Vernal Pool regions. Typically found growing in acidic clays around the edges of vernal pools, particularly on gopher and ground squirrel mounds, and in the bottom of intermittent drainages (USFWS 2005). Elevation range between 100 and 300 ft.	**None.** Suitable vernal pool habitat is absent from the Action Area.
Brandegee's Clarkia *(Clarkia biloba ssp. brandegeeae)*	--	--	4.2	Below 2,800 ft in elevation in dry habitats in six northern Sierra counties (Corps 2014). Typically grows in foothill woodland habitat, often in roadcuts and gravelly slopes above creeks and rivers. Blooms May through July.	**Unlikely.** Suitable vernal pool habitat is absent from the Action Area.
Brazilian Watermeal *(Wolffia brasiliensis)*	--	--	2B.3	Tiny perennial herb that grows in mats on the surface of calm waterbodies including ponds, marshes, and swamps (CNPS 2021). In California it has only been observed along the Sacramento River at elevations from 66 to 328 ft (CNPS 2021). Blooms April through December.	**Unlikely.** Suitable vernal pool habitat is absent from the Action Area.
Butte County Fritillary *(Fritillaria eastwoodiae)*	--	--	3.2	Perennial bulbiferous herb found on serpentinite soils in openings in chaparral, cismontane woodland, and lower montane coniferous forests. Elevations range from 164 to 4,921 ft. Blooms March to June	**Unlikely.** Although the Action Area overlaps the range and habitat of species, it was not detected during special status vegetation surveys.
Chaparral Sedge *(Carex xerophila)*	--	--	1B.2	A monocot perennial herb found in gabbro and serpentine soils on the west slope of the northern Sierra Nevada in California with elevations from 430 to 760 m (1410 to 2495 ft) (Zika et al. 2014). Blooms March through June.	**Unlikely.** The Action Area is outside of the geographical range of this species.
Dubious Pea *(Lathyrus sulphureus var. argillaceus)*	--	--	3	Perennial herb found in cismontane woodlands and coniferous forests at elevations ranging from 492 to 3,051 ft. Blooms June through August.	**Unlikely.** Although the Action Area overlaps the range and habitat of species, it was not detected during special status vegetation surveys.
Dwarf Downingia *(Downingia pusilla)*	--	--	2B.2	Annual herb that grows in foothill woodlands, valley grasslands, freshwater wetlands in vernal pools (Cal Flora 2016). Blooms March through May.	**Unlikely**. Although the Action Area overlaps the range of species, it was not detected during special status vegetation surveys.

Common Name (*Scientific Name*)	Status[1]			Distribution and Habitat Association	Potential for Occurrence in the Action Area[2]
	ESA	CESA	CNPS		
Legenere (*Legenere limosa*)	--	--	1B.1	Found in a variety of habitats that include vernal pools, vernal marshes, ponds, sloughs, and floodplains of intermittent streams (USFWS 2005). Typically found within grassland, open woodland, or hardwood forest from 0 to 2000 ft elevation (USFWS 2005). Blooms April through June.	**Unlikely**. Although the Action Area overlaps the range of species, it was not detected during special status vegetation surveys.
Pine Hill Flannelbush *(Fremontodendron decumbens)*	FE	SR	1B.2	Occurs on scattered rocky outcrops either in fire-dependent chaparral or in the ecotone between woodland and chaparral. This taxon also appears in the ecotone between chaparral and Oak woodland. The subspecies depends on fire to promote seed germination. It is only known from one localized area near Pine Hill in western El Dorado County scattered within an area of approximately 5,000 acres. Blooms April through July.	**Unlikely**. This species has only been documented in one location and it was not detected during special status vegetation surveys.
Stebbins' Morning-glory *(Calystegia stebbinsii)*	FE	SE	1B.1	Endemic to the Sierra Nevada foothills, where it is known only from two spots in El Dorado and Nevada Counties. It grows in unique habitat in chaparral on gabbro soils. Blooms April through July.	**Unlikely.** Chaparral habitat is not present within the Action Area.

[1]Status = Status of state and federally protected species protected under the ESA.
SE: State Endangered
FE: Federally Endangered
NMFS: Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service
ST: State Threatened
FT: Federally Threatened
SSC: State Species of Concern
WL: State Watch List
FP: State Fully Protected
RP: Designated by CNPS as a Rare Plant
EFH: Essential Fish Habitat
SR: State Rare

California Native Plant Society (CNPS):
Rank 1A = Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B = Plants rare, threatened, or endangered in California and elsewhere
Rank 2A = Plants presumed extirpated in California but common elsewhere
Rank 2A = Plants rare, threatened, or endangered in California but more common elsewhere
Rank 3 = Plants about which more information is needed
Rank 4 = Plants of limited distribution
CNPS Code Extensions
.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 = Fairly threatened in California (20-80% occurrences threatened)
.3 = Not very threatened in California (less than 20% of occurrences threatened or no current threats known)

[2]Definition of Occurrence Indicators
Present: Species recorded in area and suitable habitat present.
Possible: Species recorded in area and habitat suboptimal.
Unlikely: Species recorded in area but habitat marginal or lacking entirely.
None: Species not recorded in study area and suitable habitat absent.

Table 5. Critical periods for special-status species that may be affected by Proposed Action activities.

Common Name	Critical Period
Fall-run Chinook Salmon	October through June
Spring-run Chinook Salmon	September through June
California Central Valley Steelhead	December through May
Bald Eagle	November through July
Swainson's Hawk	March through August
Northern Harrier	March through August
Yellow-breasted Chat	May through July
California Black Rail	March through July
Western Pond Turtle	March through July
Foothill Yellow-legged Frog	April through July
Western Red Bat	August through October

4.4.1 SPECIAL STATUS WILDLIFE AND FISH SPECIES

The Action Area includes a large gravel bar with infrequently inundated floodplain habitat, the main channel, and riparian and upland vegetation. There is residual riparian habitat in the Action Area that is used by various wildlife species. Special-status wildlife species are defined as taxa that are: 1) designated as threatened or endangered by the state or federal governments; 2) proposed or petitioned for federal threatened or endangered status; 3) state or federal candidate species; 4) listed as Species of Concern by the USFWS; or, 5) identified by the CDFW as Species of Special Concern. The special-status wildlife species that may potentially occur in the Action Area are described below and potential for impacts is assessed. Pre-construction surveys would be conducted for these species and if any are found, USFWS and CDFW biologists would be consulted about avoidance and conservation measures.

4.4.1.1 Fish

CCV Steelhead (*Oncorhynchus mykiss*)

Steelhead, the anadromous form of Rainbow Trout, have the greatest diversity of life history patterns of any Pacific salmonid, including varying degrees of anadromy, differences in reproductive biology, and plasticity of life history between generations (Kendall et al. 2015). Only winter-run CCV Steelhead currently occur in CV streams (McEwan and Jackson 1996). They prefer cold water, between 55°F – 70°F (13°C – 21°C), that is saturated with DO. In the Yuba River, two forms of *O. mykiss* exist: the resident form that remains in the river its entire life (Rainbow Trout), and the anadromous form (Steelhead) that migrates to the ocean and returns to the river to spawn, multiple times. The relationship between resident and anadromous forms is still being studied, but evidence suggests the two forms interbreed and produce juveniles of the alternate form and that individuals exhibit life history plasticity in variable environments (Shapovalov and Taft 1954; Burgner et al. 1992; Hallock 1989; Kendall et al. 2015). Additionally, it has been demonstrated that female resident *O. mykiss* can produce anadromous offspring and some years may produce a large proportion of the observed Steelhead (Courter et al. 2013). No genetic differentiation has been found between forms, supporting this hypothesis (Busby et al. 1993; Nielsen 1994). However, a large genomic region on *O. mykiss* chromosome Omy5 is strongly associated with life history of *O. mykiss* populations (Pearse et al. 2014). The frequency of alleles at the linked Omy5 loci indicate resident and anadromous associated haplotypes (Pearse et al. 2014). The CCV Steelhead DPS is listed as threatened by federal ESA (71 FR 834) and the LYR below Englebright Dam is included in the designated critical habitat (70 FR 52488). Critical habitat is defined by ESA as specific areas within a geographic region where the habitat values are essential for conserving the species. This designation includes river and adjacent riparian areas (NMFS 2000) and restoring rearing areas may be important for conservation (NMFS 2014). In the Sacramento River, adult winter CCV Steelhead migrate upstream during most years from July to March (Bailey 1954; Hallock et al. 1961). Spawning occurs from January to March. CCV Steelhead typically return from the ocean at ages two or three, weighing 2 – 12 lb (0.9 – 5.4 kg) (Reynolds et al. 1993). Adult CCV Steelhead immigration and holding in the LYR occurs from August through March with spawning occurring from January through April (Yuba Accord RMT 2013). Adipose fin-clipped hatchery Steelhead have been observed to stray into the Yuba River by the Vaki Riverwatcher system at Daguerre Point Dam (Yuba Accord RMT 2013). In 2010/2011 43% of upstream migrating Steelhead were adipose fin-clipped while in 2011/2012 it was 63% (Yuba Accord RMT 2013). CCV Steelhead in the LYR use riffle transitions, riffles, fast glides, slow glides, and point bars for spawning, depending on the discharge (Kammel and Pasternack 2016). Spawning CCV Steelhead in the LYR prefer areas with mean water column velocity of 1.18 to 2.25 cfs, water depths of 1.25 to 2.76 ft, and the medium gravel/small cobble (32-90 mm) substrate size class (Kammel and Pasternack 2016). CCV Steelhead embryo incubation occurs from January through May (Yuba Accord RMT 2013). Juvenile CCV Steelhead rearing and downstream migration occurs year-round while emigrating smolts have been observed from October through mid-April (Yuba Accord RMT 2013). CCV Steelhead is present within the Action Area.

Chinook Salmon (*O. tshawytscha*)

There are four races of Chinook Salmon in California: fall-, late-fall, winter-, and spring-run. Life history difference among species is mostly the timing of return to freshwater for spawning (Moyle 2002). Historically, both spring- and fall-run/late fall-run Chinook Salmon were known to exist in the Yuba River, with spring run Chinook Salmon found up to elevations of ~5,000 ft (Yoshiyama et al. 2000). The 15-ft high Daguerre Point Dam was constructed in 1910 with fishways, which were destroyed by floods in 1927-28, and created a partial barrier to salmon (Yoshiyama et al. 2000). Adequate fish ladders were added to

Daguerre Point Dam later. Construction of Bullards Bar Dam began in 1921 and blocked salmon from migrating further up the North Fork of the Yuba River (Yoshiyama et al. 1996). Englebright Dam was completed in 1941 and is a complete barrier to salmon and the current upstream limit for anadromous salmonids. However, in 2015 the Yuba Salmon Partnership Initiative agreed to a framework for an agreement to guide negotiations for reintroducing spring run Chinook Salmon into the North Fork of the Yuba River above New Bullards Bar Dam. Spring- and fall-run Chinook Salmon populations are still present in the LYR and have been studied intensively in recent years as a result of the Lower Yuba Accord (Yuba Accord RMT 2013). The CV spring-run Chinook Salmon ESU is listed as threatened under the ESA (64 FR 50394) and CESA and critical habitat was designated in 2005 (70 FR 52488) which includes the LYR below Englebright Dam. The fall/late fall-run Chinook Salmon are designated as a federal species of concern and by CDFW as a species of special concern. Fall-run Chinook Salmon escapement estimates were extremely low for all Sacramento River tributaries, including the Yuba River, in 2007 and 2008 (Bergman and Massa 2011), increasing the importance of understanding current population dynamics, targeting restoration efforts to improve conditions, and monitoring the effectiveness of all efforts. Fall-run Chinook Salmon escapement between 2009 and 2016 averaged 9,083 and has ranged between 4,057 in 2016 to 14,880 in 2013 (CDFW 2017).

The majority of spring-run Chinook Salmon spawning occurs upstream of the Highway 20 bridge. Fall-run Chinook Salmon spawn throughout the Yuba River upstream of the Simpson Lane Bridge, with the highest redd concentrations in the Timbuctoo and Parks Bar reaches (Yuba Accord RMT 2013). The Final Restoration Plan for the AFRP (USFWS 2001) calls for a fall-run Chinook Salmon production target of 66,000 fish for the Yuba River. Spring-run Chinook Salmon migrate into the LYR from April to June (Yuba Accord RMT 2013). A portion of the spring-run Chinook Salmon run hold during the summer below Daguerre Point Dam before migrating upstream of the Highway 20 bridge to spawn by the end of September (Yuba Accord RMT 2013). The other portion of the spring-run Chinook Salmon run hold over summer upstream of the Highway 20 Bridge (Yuba Accord RMT 2013). Spring-run Chinook Salmon spawning generally occurs from the beginning of September to the middle of October (Yuba Accord RMT 2013). Redds incubate and alevin hatch in the gravel between September and December, depending on time of spawning and water temperature (Yuba Accord RMT 2013). The annual fall-run Chinook Salmon migration in the Yuba River begins in early September, peaks in November, and tapers off in December (Yuba Accord RMT 2013). Spawning generally occurs shortly after migration, primarily from early October through mid-December. Redds incubate and alevin hatch in the gravel between October and March, depending on time of spawning and water temperature. Late fall-run Chinook Salmon generally spawn in late December and January (Moyle et al. 2015).

Chinook Salmon spawn in moderately sized cobble in riffles, riffle transitions, run, and fast glide (Merz and Setka 2004). Spawning distribution and incubation success are important factors controlled by substrate size and intergravel flow (Harrison 1923; Hobbs 1937; McNeil 1964; Cooper 1965; Platts 1979). Female Chinook Salmon excavate a redd that is typically 111 – 189 ft^2 (10.3 – 17.6 m^2) in size (Healey 1991). The female defends the redd until death, and fertilized eggs incubate for about 13 weeks, depending on water temperature (Bjornn and Reiser 1991). Larvae hatch with yolk sacs and remain in substrate until the sac is absorbed, about 2 – 3 weeks.

Spring-run Chinook Salmon fry begin to emerge from the gravel starting in November and continuing until February, while fall-run Chinook Salmon emerge from the gravel from December through April (Yuba Accord RMT 2013). Late fall-run Chinook Salmon emerge from the gravel from April through June (Moyle et al. 2015). After emerging, fry disperse downstream or to lateral margins of the river. Large numbers of fry have been captured at the mouth of the river in wet years (Yuba Accord RMT 2013). Spring-run Chinook Salmon fry rearing occurs in the LYR from mid-November to mid-February and young-of-year emigration occurs from mid-November through June (Yuba Accord RMT 2013). Some spring-run Chinook Salmon in the LYR rear for a year before emigrating as smolts between October and March (Yuba Accord RMT 2013). However, the majority of Chinook Salmon (both spring and fall run) emigration occurs as fry (30-49 mm) with peak emigration generally occurring in late January and 95% of emigration occurring prior to 30 April (Yuba Accord RMT 2013). Late fall-run Chinook Salmon juvenile emigration is not well understood in the LYR (Yuba RMT 2013). Late fall-run Chinook Salmon juvenile may hold for seven to 13 months before emigrating with peak emigration in October (Moyle et al. 2015). However, many late fall-run Chinook Salmon juveniles may emigrate earlier in the year at smaller sizes (Moyle et al. 2015). Both fall- and spring-run Chinook Salmon are present in the Action Area.

4.4.1.2 Birds

Bald Eagle (*Haliaeetus leucocephalus*)

The Bald Eagle is a large accipiter with a brown body and white head and tail. Adults can have wingspans up to 7.5 ft (2.3 m) and average ~6.8 lb (~3.1 kg) in weight. Historically, the Bald Eagle was found throughout North America, from Alaska and northern Canada to Baja California and the Gulf of Mexico. Currently, most populations are limited to the northern portion of their historic range. The Bald Eagle can live anywhere in North America with adequate nesting sites and open water (Snyder and Snyder 1991). The Bald Eagle requires large bodies of water or free-flowing rivers. There is suitable nesting and foraging habitat, and the species is likely to occur in the Action Area.

Swainson's Hawk (*Buteo swainsoni*)

The Swainson's Hawk is a medium-sized hawk that breeds in California and may migrate to Mexico and South America in the winter. The hawk often nests adjacent to riparian systems of the valley and in lone trees or groves of trees in agricultural fields. Valley Oak, Fremont Cottonwood, Black Walnut and large willows are the most commonly used nest trees in the Central Valley. This species also requires large open grasslands with suitable nest trees and abundant prey. Migrating individuals move south through the southern and central interior of California in September and October, and north March through May. Breeding occurs late March to late August. Nesting occurs primarily in the southern Sacramento Valley and northern San Joaquin Valley regions (Stillwater Sciences 2005). Although Swainson's Hawk would nest in trees located in upland areas, their strong association with riparian forests suggests that protection and restoration of these habitats may provide nesting habitat superior to other sources of trees such as those on roadsides or along field margins. Additionally, other bird species that occupy the mature tree and gallery forest component of riparian systems would also benefit from conservation or restoration of the river landscape (Woodbridge 1998). This species may occur in the Action Area.

Northern Harrier (*Circus cyaneus*)

The Northern Harrier is an accipiter hawk. Individuals have specialized feathers in the shape of a disk to focus sound into their ears, a white rump patch visible in flight, and wings that form a dihedral when gliding (Wheeler and Clark 1987). Adults range from 16.1 – 19.7 in (41 – 50 cm) in length and average ~1 lb (~450 g) in weight (Limas 2001). The Northern Harrier is found throughout the northern hemisphere and is known to breed from Alaska and Canada in northern North America to Baja California in southern North America. North American populations winter from southern Canada to Central America (Macwhirter and Bildstein 1996). The species prefers open habitats, such as fields, meadows, and marshes, but is also found in agricultural areas and riparian zones (Wheeler and Clark 1987; Macwhirter and Bildstein 1996). The Northern Harrier nests in loose colonies and breeding occurs from March through August. Nests are built on the ground on raised mounds (Limas 2001). Home range sizes vary and average 642 ac (~2.6 km^2) (Macwhirter and Bildstein 1996). Common diet items include small mammals, birds, reptiles, and amphibians (Wheeler and Clark 1987; Macwhirter and Bildstein 1996). This species may occur within the Action Area.

Yellow-breasted Chat (*Icteria virens*)

The Yellow-breasted Chat is a very large, aberrant warbler with distinctive plumage. It has olive green to grayish upper parts with lemon-yellow chin, throat, and breast; the large bill is strongly curved. The face of this species is grayish with black lores, white supercilium, and white eye-crescent on lower eyelid (Eckerle and Thompson 2001). It is an uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada. The Yellow-breasted Chat is present in portions of the northern Sacramento Valley (Schuford and Gardali 2008). The breeding and nesting period extends from late April through September. Nesting Yellow-breasted Chat select early successional riparian habitat with a mature shrub layer and open canopy with nesting habitat typically only found along streams and rivers (Schuford and Gardali 2008). Yellow-breasted Chat may occur in the Action Area.

California Black Rail (*Laterallus jamaicensis coturniculus*)

The California Black Rail is a small, blackish-gray marsh bird with light brown coloring on the breast and distinctive white spotting on the back, tail, and wings. Adults have bright red eyes. The species is elusive and prefers to maneuver through dense wetland vegetation on foot, rather than flying. Nests are built on the ground, concealed under dense vegetation and typically the species typically breeds from March through July. Although the current range of this species is confined to the coastal marsh vegetation of the San

Francisco Bay, breeding populations have been found in marshes within Dry Creek and at the California Sierra Foothill Research and Extension Center in Yuba County (Aigner et al. 1995). California Black Rail may occur in the Action Area.

4.4.1.3 Reptiles

Western Pond Turtle (*Emys marmorata*)

The Western Pond Turtle is a CDFW species of special concern. Its status is currently under review by the USFWS to determine if it warrants listing under the federal ESA (80 FR 19259). The Western Pond Turtle shell length is typically 3.5 to 8.5 in with a marbled carapacial pattern and drab coloration; dark brown, olive brown, or blackish. The Western Pond Turtle is found in California in the coast ranges north of Santa Cruz and in the CV west of the Sierra crest except for isolated populations near Susanville and in the Truckee, Carson, and East Walker rivers (Spinks et al. 2014). The Western Pond Turtle is typically found at elevations from sea level to 5,000 ft in a wide variety of aquatic habitats including rivers, streams, lakes, ponds, and marshes as well as human created habitat such as irrigation ditches and sewage treatment ponds. Structures such as logs, rocks, bedrock outcrops, and exposed banks are required for basking. Their preferred aquatic habitats have access to deep slow water containing underwater refugia (Ashton et al. 1997). In some environments the Western Pond Turtle may spend half the year or more on land (Ashton et al. 1997). In both aquatic and terrestrial environments, this species demonstrates a high degree of site fidelity, with males using a larger aquatic home range than females (Ashton et al. 1997). Mating takes place underwater in the spring and mature females typically oviposit every other year (Ashton et al. 1997). Oviposition occurs on land, from just above the floodplain to a few thousand ft from water, and the nest typically occurs in sparsely vegetated areas of annual grasses and herbs with dry soil, with the clutch size typically from four to seven eggs (Ashton et al. 1997). In northern California, hatching occurs in the fall, and the hatchlings usually remain in the nest chamber over the winter and emerge in spring (Holland 1994). In lakes and ponds, Western Pond Turtle would often over-winter underwater by burying itself in the mud, while turtles in streams and rivers would overwinter on land by burrowing in the duff or soil (Ashton et al. 1997). The Western Pond Turtle is a dietary generalist, feeding on both live prey and browsing on plants as well as scavenging carrion (Ashton et al. 1997). Commonly consumed food items include aquatic macroinvertebrates, crustaceans, annelids, and carcasses of mammals, birds, reptiles, amphibians, and fish (Ashton et al. 1997). The altered flow regime and cold water temperatures in rivers below dams have been found to have negative effects on basking behavior, growth, development, and body condition in pond turtles, which has implications for reproductive output and population fitness (Ashton et al. 2011). There is potential for competitive exclusion by introduced species such as Bullfrogs or Largemouth Bass. Habitat destruction is also noted as a reason for decline (Jennings et al. 1992). The largest threats to the species are the predation of hatchlings by introduced, non-native Bullfrogs and the loss of habitat due to urbanization. The Yuba River provides suitable habitat for this species and Western Pond Turtle is likely to be present within the Action Area.

4.4.1.4 Amphibians

Foothill Yellow-legged Frog (*Rana boylii*)

The Foothill Yellow-legged Frog is a CDFW species of special concern. The Foothill Yellow-legged Frog is currently undergoing a status review to determine if it warrants listing (80 FR 37568). It is a medium-sized frog with grainy skin, long legs, and webbed hind feet. Its coloration tends to match its habitat and is typically gray, brown, or olive with yellow on the underside of the rear legs and lower abdomen. The Foothill Yellow-legged Frog has experienced significant population declines across its range in California, including range contraction (Kupferberg et al. 2012). The current range of Foothill Yellow-legged Frog in California is in the coast ranges from Monterey County north and in the foothills of the Sierra Nevada from Kern County north. It is found from near sea level to around 6,000 ft, typically in or near rocky streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows (Zeiner et al.1990). Foothill Yellow-legged Frog eats a wide variety of invertebrates including aquatic and terrestrial insects. It is an obligate stream breeder, with females attaching egg masses to substrates in shallow water with low velocities, typically river bars, in the spring to early summer as high flows recede (Wheeler and Welsh 2008). Foothill Yellow-legged Frog life cycle is synchronized with the seasonal flow regimes of its habitat in California (Yarnell 2008). Altered flow regimes due to dam regulation has been implicated as one of the contributors to population declines as this species is not adapted to these regulated flow regimes (Yarnell et al. 2008, Kupferberg et al 2012). Altered thermal regime in rivers below dams with hypolimnetic releases can also impact the Foothill Yellow-legged Frog by shifting the timing of breeding activity, hatching success, and metamorphosis to later in the season and causing metamorphs to be smaller and leaner compared to metamorphs in unregulated streams (Wheeler et al. 2014). Foothill Yellow-legged Frogs are generally found at elevations greater than that of the Proposed Action (Yarnell et al. 2012); however, this species may be present in the Action Area.

4.4.1.5 Mammals

Western Red Bat (*Lasiurus blossevillii*)

The Western Red Bat has an upper body that is brick red to rusty red washed with white; males are usually more brightly colored than females. The Red Bat is locally common in some areas of California, occurring from Shasta County to the Mexican border, west of the Sierra Nevada/Cascades Crest, and deserts. Roosting habitat includes forests and woodlands between sea level and mixed coniferous forest. Preferred roost sites are in edge habitat adjacent to streams, fields, or urban areas. Roost sites are usually solitary, and can be between 2 ft and 40 ft (0.6 m and 12.2 m) from the ground. The Western Red Bat has been noted in the Proposed Action quadrants within the CNDDB. Cottonwood riparian habitat associated with the Yuba River provides significant roosting and foraging habitat for reproductive female Western Red Bats during the summer. Western Red Bat is likely to occur within the Action Area.

4.4.1.6 Plants

On 8 October 2020, vegetation surveys were performed to identify any special status plants that may be present within the Action Area (Vaghti 2020). No special status plant species were observed during the pre-Proposed Action vegetation surveys.

4.4.2 WETLANDS AND OTHER WATERS OF THE U.S.

The Corps has primary federal responsibility for administering regulations that concern jurisdictional Waters of the U.S., including wetlands, under Section 404 of the CWA. Section 404 regulates the discharge of dredged and fill material into Waters of the U.S. The Corps requires that a permit be obtained if a Proposed Action proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the OHWM. Waters of the U.S. are defined as "all waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters" (Section 404 of the CWA; 33 CFR Part 328). The limit of Corps jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the OHWM. The OHWM is defined as "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (Section 404 of the CWA; 33 CFR Part 328).

Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Section 404 of the CWA; 33 CFR Part 328).

A formal aquatic resources delineation of the Action Area was conducted by CFS and SYRCL on 8 October 2020. Scrub-Shrub Wetlands, Riverine Intermittent, and Riverine – Upper Perennial were identified as potentially jurisdictional under Section 404 of the CWA (Figure 4; Appendix D). An Ephemeral Drainage located along the west gully was identified as potentially non-jurisdictional. **Table 6** shows the potentially **j**urisdictional and non-jurisdictional waters of the U.S. delineated in the Action Area.

Table 6. Potential Jurisdictional and Non-jurisdictional Waters of the U.S.

Map ID	Waters Type	Total Acres	Linear Feet
Waters of the U.S.			
RUP-1	Riverine - Upper Perennial	17.80	2,882
RIS-1	Riverine - Intermittent Streambed	4.45	1,646
RIS-2	Riverine - Intermittent Streambed	0.82	910
Total:		**23.08**	**5,438**
Other Waters of the U.S.			
SSW-1	Scrub-Shrub Wetland	0.32	--
SSW-2	Scrub-Shrub Wetland	1.66	--
SSW-3	Scrub-Shrub Wetland	0.22	--
SSW-4	Scrub-Shrub Wetland	0.13	--
Total:		**2.32**	**--**
Non-jurisdictional Waters of the U.S.			
ED-1	Ephemeral Drainage	0.13	253
Total:		**0.13**	**0.13**

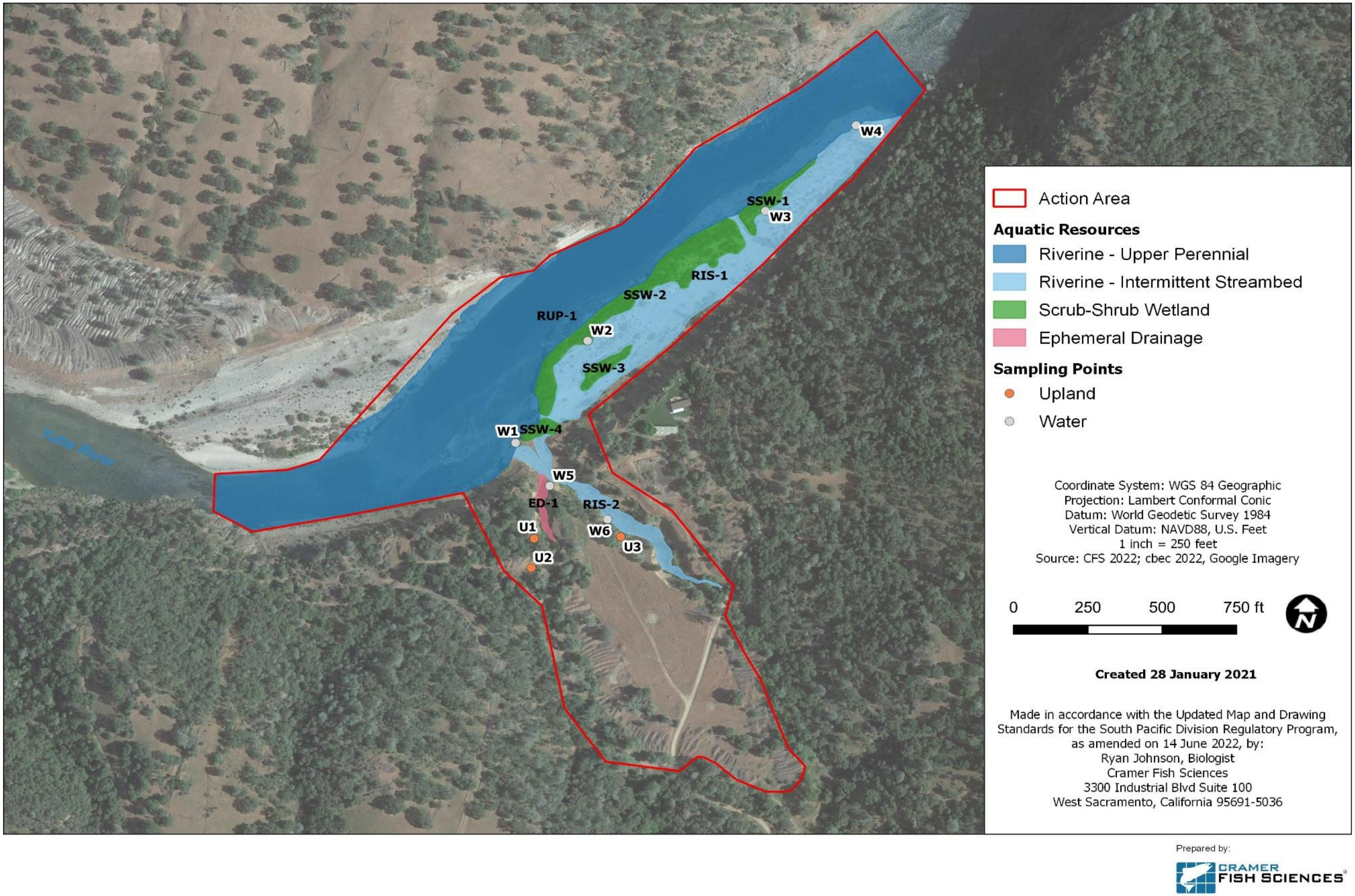

Figure 4. Delineation of wetlands and other waters of the U.S. for the Proposed Action.

4.4.3 SPECIAL STATUS NATURAL COMMUNITIES

Special status natural communities are those that have limited statewide or regional distribution, provide important wildlife habitat, or are of special concern to local, state, or federal agencies and can be vulnerable to environmental effects of Proposed Actions. Most types of wetlands and riparian communities are considered special status natural communities due to their limited distribution. Special status natural communities include areas of special concern to federal, state, or local resource agencies, areas regulated under Section 404 or 402 of the CWA, and areas protected by local and state regulations or policies. Natural communities within the Action Area considered special status by regulatory agencies include wetland and riparian communities and riverine habitat. There are extensive areas of riparian vegetation within the Action Area with wetlands found in select locations.

The CDFW's Natural Communities List (CDFG 2010) ranks vegetation alliances according to their degree of imperilment (as measured by rarity, trends, and threats) using a global (G) and state (S) rank. Alliances with CDFW ranks of S1-S3, including all associations within them, are considered highly imperiled and of special status for CEQA. The riparian vegetation alliances found in the Action Area are part of Great Valley riparian forest and Great Valley willow scrub.

4.4.4 DISCUSSION

4.4.4.1 No Action Alternative

Under the No-Action Alternative, there would be no impacts to biological resources as Proposed Action restoration activities would not occur. The beneficial impacts of restoration activities would not occur. In particular, the quality and quantity of spawning habitat for Chinook Salmon and CCV steelhead within the site would not be increased.

4.4.4.2 Proposed Action

a) Special-status species and their habitats that may be affected either directly or indirectly by Proposed Action implementation include Foothill Yellow-legged Frog, Western Pond Turtle, Bald Eagle, Yellow-breasted Chat, Western Red Bat, CCV Steelhead, fall run Chinook Salmon, and spring run Chinook Salmon. These potentially affected species and their habitats are described in further detail in the following section.

4.4.4.2.1 Special Status Fish

Construction activities would temporarily disturb soil and riverbed sediments, resulting in the potential for temporary increases in turbidity and suspended sediments in the LYR downstream from in-stream construction. Construction-related increases in sedimentation and siltation above the background level could potentially affect fish species and their habitat by reducing egg and juvenile survival, interfering with feeding activities, causing breakdown of social organization, and reducing primary and secondary productivity. The magnitude of potential effects on fish depends on the timing and extent of sediment loading and flow in the LYR before, during, and immediately following construction.

High concentrations of suspended sediment can have both direct and indirect effects on salmonids and other special status fishes. The severity of these effects depends on the sediment concentration, duration of exposure, and sensitivity of the affected life stage. Based on the types and duration of proposed in-water construction methods, short-term increases in turbidity and suspended sediment may disrupt feeding activities or result in avoidance or displacement of fish from preferred habitat. Juvenile salmonids have been observed to avoid streams that are chronically turbid (Lloyd 1987) or move laterally or downstream to avoid turbidity plumes (Sigler et al. 1984). Bisson and Bilby (1982) reported that juvenile Coho Salmon (*Oncorhynchus kisutch*) avoid turbidities exceeding 70 NTU's. Sigler et al. (1984) found that prolonged exposure to turbidities between 25 and 50 NTUs resulted in reduced growth and increased emigration rates of juvenile Coho Salmon and CCV steelhead compared to controls. These findings are generally attributed to reductions in the ability of salmon to see and capture prey in turbid water (Water 1995).

Chronic exposure to high turbidity and suspended sediment may also affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Water 1995). Berg and Northcote (1985) observed changes in social and foraging behavior and increased gill flaring (an indicator of stress) in juvenile Coho Salmon at moderate turbidity (30-60 NTUs). In this study, behavior returned to normal quickly after turbidity was reduced to lower levels (0-20 NTU). In addition to direct behavioral and physical effects on fish, increased sedimentation can alter downstream substrate conditions, as suspended sediment settles and increases the proportion of fine particles in the system. Deposition of fine substrate may lead to decreased production of the macroinvertebrate prey of juvenile salmonids (Chapman 1988, Phillips et al. 1975, Colas et al. 2013). Deposited fine sediment can impair growth and survival of juvenile salmonids (Suttle et al. 2004, Harvey et al. 2009). However, minor accumulations of deposited sediment downstream of construction zones are generally removed during normal annual high flow events (Anderson et al. 1996).

Any increase in turbidity associated with instream work is likely to be brief and occur only in the vicinity of the Action Area, attenuating as suspended sediment settles out of the water column. Instream Proposed Actions with a larger footprint than the Proposed Action have created turbidity plumes of 25-75 nephelometric turbidity unit(s) (NTU) extending up to 1,000 ft downstream from construction activities (NMFS 2006). These temporary spikes in suspended sediment may result in behavioral avoidance of the Action Area by fish; several studies have documented active avoidance of turbid areas by juvenile and adult salmonids (Bisson and Bilby 1982, Lloyd 1987, Servizi and Martens 1992, Sigler et al. 1984).

The number of juvenile salmonids and other special status fishes potentially residing in the Action Area during in-water construction is expected to be low because of the time of year, and turbidity generated by in-water work is expected to be rapidly attenuated by the large volume and flow of the river. Individual fish that encounter increased turbidity or sediment concentrations would be expected to move laterally, downstream, or upstream of the affected areas. For juveniles, this may increase their exposure to predators if they are forced to leave protective habitat.

The impacts of sedimentation and turbidity from site construction on fish species are potentially adverse. However, the Proposed Action would include preparation and implementation of a SWPPP in compliance with the State Water Resources Control Board's General Permit for Discharges of Storm Water Associated with Construction Activity. The amount of sediment generated by construction would be minimized by erosion and sediment control measures associated with the SWPPP that are designed to minimize erosion and sediment entering the channel. During the period following construction, before vegetation is fully established, there is some potential for indirect effects on water quality via erosion of Proposed Action features (e.g., inset floodplain benches and slopes) and associated increases in sediment loading and sedimentation. However, all Proposed Action features with exposed fine sediment would be treated as prescribed in the SWPPP and design plans to prevent erosion and sedimentation. The impacts of sedimentation and turbidity from construction on fish species are potentially significant. However, with implementation of **Mitigation Measure BIO-1** including conducting all in-water restoration activities during the dry season between 15 July and 30 September and **Mitigation Measure WQ-1** (see Section 4.10, *Hydrology and Water Quality*), the Proposed Action's sedimentation and turbidity impacts on special status fish species and their habitat would be **less than significant**.

BIO-1: Work Outside of Critical Periods for Sensitive Species

Table 5 lists the critical periods when disturbance could result in significant impacts to individuals or populations of special status species. To avoid these impacts, all Proposed Action in-water activities will be conducted during the period 15 July through 1 September, which is outside the listed critical periods for the majority of the species (Table 5). Surveys will be performed for species which have critical periods overlapping with the in-water work window or dry-ground work window (16 April to 31 October) which may be impacted by the Proposed Action activities. If special status or sensitive species are identified within the area which may be impacted by Proposed Action activities, then buffers will be established and/or CDFW and USFWS will be consulted. Nesting birds and raptors are protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code, and trees and shrubs within the Action Area likely provide nesting habitat for songbirds and raptors. If tree removal is unavoidable, it will occur during the non-breeding season (mid-September). If other construction activities must occur during the potential breeding season (1 February- 31 August) surveys for active nests and/or roosts will be conducted by a qualified biologist no more than 10 days prior to the start of construction. A minimum no disturbance buffer will be delineated around active nests (note, size of buffer depends on species encountered) until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival.

Mercury

The Proposed Actions restoration activities have the potential to expose clay and silt sized particles which have elevated mercury levels. These finer sized sediments with elevated mercury could then be transported into the wetted channel of the Yuba River during high flow events. A fraction of the mercury may then methylate and become toxic to fishes and other biota in the Yuba River. The inundation of floodplains plays an important role in the methylation, mobilization, and transport of mercury. Methylmercury has a range of toxic effects to fish including behavioral, neurochemical, hormonal, and reproductive changes. Methylmercury caused altered behavior and pathological damage in Atlantic salmon (*Salmo salar*; Berntssen et al. 2003). Fall-run Chinook Salmon that spent time rearing in the Yolo Bypass accumulated more methylmercury than salmon that remained in the Sacramento River (Henery et al. 2010). However, juvenile salmon rearing in the Yolo Bypass grew faster (0.7% more per day) than fish that remained in the Sacramento River (Henery et al. 2010).

Mercury impacts to special status fish species are potentially significant. Implementation of **Mitigation Measure WQ-1** and **Mitigation Measure BIO-2** would reduce the impact of mercury on special status fish species to **less than significant**.

BIO-2: Monitor Mercury Levels and Mitigate for Impacts

Sediment and aqueous total mercury levels will be measured before, during, and after restoration activities in the Action Area. Following methods in the Stillwater Sciences (2004) Mercury Assessment, total mercury from areas of Proposed Action exposed fine sediments (<63 µm) will be evaluated to determine if they are considered elevated by the Central Valley Regional Water Quality Control Board (0.10 mg/kg or greater). Aqueous raw total mercury will also be tested to ensure that it is below the California Toxics Rule for a drinking water source of 50 ng/L. It is unlikely that excavation and regrading activities may uncover mercury hot spots and or mobilize mercury in the aquatic food web; however, if samples are found with mercury levels above established standards, work will be halted in the vicinity of the elevated mercury area to assess contamination potential. If, sediment total mercury levels meet the elevated criteria then the mitigation action(s) defined in the Proposed Action 401 water quality certification will be implemented.

Contaminants

During construction activities, the potential exists for spills or leakage of toxic substances that could enter the LYR. Refueling, operation, and storage of construction equipment and materials could result in accidental spills of pollutants (e.g., fuels, lubricants, concrete, sealants, and oil). High concentrations of contaminants can cause adverse direct (sublethal to lethal) and indirect effects on fish. Direct effects include mortality from exposure or increased susceptibility to disease that reduces the overall health and survival of the exposed fish. The severity of these effects depends on the contaminant, the concentration, duration of exposure, and sensitivity of the affected life stage. A potential indirect effect of contamination is reduced prey availability; invertebrate prey survival could be reduced following exposure, therefore making food less available for fish. Fish consuming infected prey may also absorb toxins directly.

For special status fishes, potentially significant direct and indirect effects of reduced water quality during construction would be addressed by avoiding construction during times when fish are most likely to be present, utilization of vegetable-based lubricants and hydraulic fluids in equipment operated in the wet channel, and by implementing the construction housekeeping measures described in the SWPPP (Mitigation Measure WQ-1**)**. These measures include provisions to control erosion and sedimentation, as well as a Spill Prevention and Response Plan to avoid, and if necessary, clean up accidental releases of hazardous materials. The construction contractor would be responsible for complying with all conditions of these commitments. Implementation of the measures discussed above and **Mitigation Measure WQ-2** (see Section 4.10, *Hydrology and Water Quality*), the direct and indirect impacts of contaminants on special status fish species would be **less than significant**.

Non-native Species

Non-native invasive species can be considered a biological contaminant because many species have adverse impacts on the community that they invade. For example, the thick, filamentous algae Didymo (*Didymosphenia geminata*) is thought to have a significant effect on ecosystems due to its ability to alter abundance and distribution of organisms at the base of the aquatic food web (e.g., Gillis and Chalifour, 2010, Anderson et al. 2014). In waters where Didymo is abundant, macroinvertebrate taxonomic composition tends to shift from a highly diverse assemblage of large-bodied taxa to a less diverse assemblage of smaller-bodied taxa such as diptera, especially Chironomidae (Mundie and Crabtree, 1997; Blanco and Ector, 2009; Gillis and Chalifour, 2010; James et al., 2010). Likewise, mollusks such as the Overbite Clam (*Corbula amurensis*) and New Zealand Mud Snail (*Potamopyrgus antipodarum*) can out-compete native benthic invertebrates that dominate the diets of juvenile salmonids and other salmonids (Feyrer et al. 2003, Brenneis et al. 2011, Merz et al. 2016). These species are often spread by aquatic vehicles or other equipment, which carry propagules from one watershed to another. Because equipment would be working within the river channel during Proposed Action construction, particularly during installation of crossings, this is a potentially significant impact. However, implementation of **Mitigation Measure BIO-3** would reduce this impact to **less than significant.**

BIO-3: Prevent Spread of Aquatic Invasive Species

To minimize the chance that aquatic invasive plants and invertebrates will be transported and spread to other sections of the Yuba River or other water bodies on equipment, construction specifications will require that equipment be steam cleaned immediately after the work is completed and before being used in other water bodies. An Invasive Species Risk Assessment and Planning (ISRAP) protocol will be developed, and all appropriate staff will be trained as to its purpose and implementation before construction begins. The plan will be used to prevent the spread of invasive species during construction. Additional measures may be taken at the recommendation of CDFW.

Noise

Noise generated by heavy equipment and personnel during construction activities could adversely affect special status fish species. The potential direct effects of underwater noise on fish depend on a number of biological characteristics (e.g., fish size, hearing sensitivity, behavior) and the physical characteristics of the sound (e.g., frequency, intensity, duration) to which fish are exposed. Potential direct effects include behavioral effects, physiological stress, physical injury (including hearing loss), and mortality. The loudest noise generated is expected from the placement and removal of culvert and rock to create temporary crossings and sediment placed for topographic modification to improve rearing habitat. Using experienced heavy equipment operators would help minimize the noise impact during placement or removal. Diesel engines will also generate noise within the Action Area. No diesel engines or their exhaust systems would come into contact with water in the channel. Any fish present in the vicinity of the active construction area would be expected to detect and temporarily avoid the area as a result of the noise and disturbance. Implementation of **Mitigation Measure BIO-4** and **Mitigation Measure NOISE-1** (see Section 4.13, *Noise*) would reduce the impact of noise on special status fish to **less than significant**.

Mitigation Measure BIO-4: Construction Approach to Minimize Impacts to Fish

The construction approach will allow fish to move progressively downstream and away from the impact area as construction moves from upstream to downstream through the backwater channel. The majority of the in-water work will involve the filling in and creation of a side channel through the ponds and backwater.

Before in-water work starts in a section of the channel a qualified fisheries biologist will survey the area and determine whether there is a suitable egress route for fish to move downstream and away from the construction area. If a suitable downstream egress route is not present, most likely because an area is deemed too shallow, then the problem area will be altered such that it becomes suitable. An excavator would likely be used to deepen the problem area and would work from downstream to upstream to discourage fish from migrating downstream until the egress route is completed. Once suitable downstream egress has been established, in-stream construction will begin at the most upstream section of the channel and work progressively downstream and across the channel. The listed fish species most likely to be present are juvenile CCV steelhead from 7 to 30 cm (3 – 12 in) fork length and possibly juvenile CV spring-run Chinook Salmon that are demonstrating the yearling life history strategy from 7 to 12 cm (3 – 5 in) fork length. Juvenile CCV steelhead and Chinook Salmon are highly mobile and would be expected to easily move downstream and away from the impact area with a suitable egress route. Once work proceeds past an area, fish will be able to return to use the newly created habitat through upstream migration.

If a qualified fisheries biologist, with input from the contractor, determines that in-stream work in an area cannot be performed using the construction approach then fish relocation will be performed to avoid fish injury and mortality and minimize disturbance.

Instream Construction Activities

In-stream construction activities are expected to cause juvenile salmonids and other special status fish species to temporarily migrate away from the disturbance zone to avoid construction impacts in areas where fish relocation does not occur. In-stream construction activities are not expected to affect juvenile Chinook Salmon because construction activities would occur after nearly all juvenile fall-run Chinook Salmon have migrated out of the NCC. The only juvenile fall run Chinook Salmon that may be affected would be demonstrating the yearling life history strategy, and the yearling life history strategy for fall run Chinook Salmon in the Sacramento River is extremely rare (CFS unpublished data).

Fish that temporarily or permanently relocate in response to in-stream construction activities may endure short term stress from being forced to migrate away from their rearing area and needing to locate a new rearing area downstream. Fish may endure some short-term stress from crowding and competition with resident fish for food and habitat. Fish may also be subject to increased predation risk while they are locating a new rearing area. However, this effect would be temporary. If they are present, a small number of juvenile *O. mykiss*, Hardhead, Sacramento Splittail, or Riffle Sculpin may be displaced (CFS unpublished data). Given the limited size of the Action Area and small number of individual fish that may be affected, it is not expected that the temporary displacement of fish or the competition they endure would affect the survival of individual fish or the population as a whole.

Majority of juvenile salmonid migration occurs in low light to dark hours (dusk until dawn) during which construction activities would not be occurring, and adequate fish passage conditions would be maintained within the Action Area for the duration of construction. Channel crossings will be designed using NMFS passage criteria and installed to support fish passage and minimize in-channel work (NMFS 2007). Instream construction activities are therefore unlikely to impede migration of special status fish species within the Action Area.

Implementation of **Mitigation Measure BIO-4** would result in a **less than significant** impact of instream construction activities on special status fish species.

Physical Habitat Modification

Construction activities would modify bank habitat by lowering island elevations and thus bank heights. To the maximum extent practicable, existing riparian habitat would be retained and disturbance would be minimized. Removal of riparian trees would be mitigated for in-kind following **Mitigation Measure BIO 5**. Following construction, all disturbed or exposed soils would be stabilized and/or planted with native woody and herbaceous vegetation to control erosion and offset any loss of vegetation. Some short-term loss of mature riparian vegetation may occur during construction. There will be short-term reduction in riparian habitat resulting from tree removal in the long-term there will be an increase in riparian habitat from mitigation planting and bank erosion protection planting. Overall, the Proposed Action is expected to provide increased spawning habitat, complexity, and cover for Chinook Salmon and CCV steelhead in the Action Area.

Mitigation Measure BIO 5: Protect and Compensate for Native Trees

Native trees, such as Fremont cottonwood, willows, and alder, with a dbh of 6 in (15.2 cm) or greater shall be protected with 30-ft (9.1-m), 10-ft (3-m), and 10-ft (3-m) buffers, respectively, as possible. Native trees shall be marked with flagging if close to the work area to prevent disturbance. To compensate for the removal of riparian shrubs and trees during Proposed Action implementation, the plans shall identify tree and shrub species to be planted, how, where, and when they would be planted, and measures to be taken to ensure a minimum performance criteria of 70% survival of planted trees. The tree plantings shall be based on native tree species compensated for in the following manner:

To mitigate for any loss of native trees impacted by Proposed Proposed Action implementation, the contractor would follow the guidelines below:

- Oaks having a dbh of three to five inches would be replaced in-kind, at a ratio of 3:1, and planted during the winter dormancy period in the nearest suitable location to the area where they were removed. Oaks with a dbh greater than five inches would be replaced in kind at a ratio of 5:1.
- Riparian trees (i.e., willow, cottonwood, sycamore, alder, ash, etc.) would be replaced in-kind, at a ratio of 3:1, and planted during the winter dormancy period in the nearest suitable location to the area where they were removed.

Overall, completion of the Proposed Action is expected to provide higher quality and quantity of habitat for adult salmonids. Although some short-term disturbance may occur when riffles are built, these effects would be minimized through implementing **Mitigation Measure BIO-4** and therefore impacts on special status fish species would be **less than significant**. Indirect and long-term effects on salmonids and their habitat would be beneficial.

Critical Habitat and Essential Fish Habitat

The instream construction is expected to have short term effects on the Critical Habitat Physical and Biological Features (PBFs) of freshwater rearing habitat and freshwater migration corridors and the EFH Habitat Areas of Particular Concern (HAPC) of complex channels and floodplain habitats, and migration corridors through construction disturbance and modification as well as the removal of some riparian trees and shrubs. Freshwater rearing habitat and migration corridors would be temporarily disturbed during construction and removal of temporary culvert crossings and topographic modification of channel habitat features.

These habitats may be impacted by temporary increases to turbidity and suspended sediment as well as release of contaminants; however, these impacts are expected to be localized, minor, and short term. Implementation of a SWPPP with a spill prevention and response plan, construction BMPs, and performing work outside of critical periods for special status species would result in a **less than significant** impact to critical habitat and EFH.

Long-term direct effects on designated critical habitat and EFH are beneficial, including increased salmonid spawning habitat and increased native riparian vegetation. The main channel within the Action Area would continue to function as a freshwater migration corridor by providing adequate passage for adults and juvenile salmonids.

In summary, the Proposed Action may have short-term impacts on special-status fish species and their habitats. However, with implementation of the mitigation measures described above these impacts are expected to be **less than significant**.

4.4.4.2.2 Special Status Birds

During biological surveys, no raptor or migratory bird nests were observed within or adjacent to the Action Area. However, upslope trees and riparian habitat within and adjacent to the Action Area provide suitable nesting habitat and may be used by Bald Eagle, Swainson's Hawk, Northern Harrier, Yellow-breasted Chat, California Black Rail, and other raptors and migratory birds. Additionally, the Yuba River provides suitable foraging habitat for these bird species.

Proposed Action restoration activities (16 April – 31 October) would overlap with the breeding season for raptors and migratory birds (1 February – 31 August), resulting in the potential for adverse impacts. The potential impacts include removal of habitat serving as nesting, roosting, or foraging locations and disturbance from construction equipment, including noise, and human presence during restoration activities. These adverse impacts are potentially significant. However, implementation of **Mitigation Measure BIO-5**, **Mitigation Measure BIO-6**, and **would** reduce impacts to special status birds to **less than significant**. Implementation of **Mitigation Measure BIO-7** would ensure that Proposed Action activities comply with the MBTA and California Fish and Game Code.

BIO 6: Pre-construction Survey(s) and Monitoring for Special Status Wildlife Species

Pre-construction surveys by qualified biologists will be conducted no more than 10 days prior to the start of construction of work within the Action Area to verify the presence or absence of special-status wildlife and birds.

Surveys for active bird nests will be performed using qualified biologists no more than 10 days prior to the start of disturbance activities. A minimum no-disturbance buffer of 250 ft around active nests of non-listed bird species; a 500-ft no-disturbance buffer around migratory bird species; and a half mile buffer for nest of listed species and fully protected species will be established until breeding season is over or young have fledged. If such a buffer cannot be accomplished, CDFW will be consulted.

If sensitive wildlife species or active nest or den sites are found within the construction area, the biologist shall have the authority to stop construction activities and establish a non-disturbance buffer until it is determined that the animal would not be harmed. If the potential to harm sensitive wildlife or an active nest/den site remains, the non-disturbance buffer is to remain, and the biologist shall contact CDFW for authorization before work resumes.

BIO 7: Nesting Raptor and Bird Avoidance and Minimization

To the extent feasible, Proposed Action activities should be scheduled to avoid the nesting bird season (see Mitigation Measure BIO-1). For Proposed Action activities expected to occur during the nesting season of raptors (1 February to 31 August) and migratory birds, a qualified biologist shall conduct a pre-construction survey no more than 10 days prior to the start of construction to determine if active nests are present on or within 500 feet of the Action Area. If no active nests are identified during the pre-construction survey, no further mitigation is necessary. If active nests are found on or within 500 feet of the Action Area, the following buffers shall be established until breeding season is over or young have fledged to ensure that Proposed Action activities comply with the MBTA and California Fish and Game Code:

- a minimum no-disturbance buffer of 250 feet around active nests of birds protected under the MBTA (including Yellow-breasted Chat and California Black Rail);
- a 500-foot no-disturbance buffer around active nests of raptors protected under the MBTA (including Swainson’s Hawk and Northern Harrier); and
- a ½-mile buffer for nesting Bald Eagles.

Implementation of **Mitigation Measure BIO 1** will avoid impacts during nesting period. In addition, wildlife surveys would be performed before construction activities to determine if there are nesting sites on or nearby the site (Mitigation Measure BIO 6). If nesting activity is confirmed, a no-disturbance buffer would be created around the nest, as appropriate for the species. CDFW would also be contacted to discuss implementation changes and/or additional avoidance measures. With these measures in place, the impact is expected to be **less than significant.**

After completion of the Proposed Action, vegetation impacted by Proposed Action construction would regenerate. Areas along the floodplain within the Action Area are anticipated to support dense emergent vegetation thus providing suitable habitat for migratory bird species. Since Proposed Action construction would be temporary, habitat in the Action area would return to pre-Proposed Action conditions and considered a beneficial impact for bird species and their habitat.

4.4.4.2.3 Western Pond Turtle

The Action Area contains suitable aquatic habitat for the Western Pond Turtle. Western Pond Turtle may use the aquatic habitat in present within the Action Area in the LYR. However, Western Pond Turtle individuals have not been observed in the site during pre-Proposed Action snorkel surveys (CFS unpublished data). The Proposed Action restoration activities have the potential to cause harassment, injury, or mortality to the Western Pond Turtle if present. This would be a potentially significant impact. Implementation of **Mitigation Measure BIO-8** would reduce impacts to Western Pond Turtle to **less than significant**.

Mitigation Measure BIO-8: Surveys and Avoidance for Western Pond Turtle

Within 10 days prior to ground disturbing activities, a qualified biologist shall conduct a pre-activity survey to identify Western Pond Turtle individuals or nests within proposed work areas during the egg-laying season (March-August). If any western pond turtle is found within the Proposed Action area, the activities in the vicinity shall cease until they have moved outside of the Proposed Action area of their own volition. If a western pond turtle nest is found, the biologist shall flag the site, maintain an appropriate no-disturbance buffer, and determine if Proposed Action activities can avoid affecting the nest.

4.4.4.2.4 Foothill Yellow-legged Frog

The Action Area contains potentially suitable habitat for the Foothill Yellow-legged Frog. The Foothill Yellow-legged Frog may use the aquatic habitat present within the Action Area in the LYR and the basking habitat in adjacent terrestrial areas. The Proposed Action restoration activities, particularly grading and topographic modification, have the potential to cause harassment, injury, or mortality to Foothill Yellow-legged Frog if present. This would be a potentially significant impact; however, amphibian surveys will occur prior to start of construction as part of **Mitigation Measure BIO-9**, and actions described in this mitigation measure would be implemented if Foothill Yellow-legged Frog is observed. Implementation of this mitigation measure would reduce this to a **less than significant impact.**

Mitigation Measure BIO-9: Surveys and Avoidance for Foothill Yellow-legged Frog

Pre-construction surveys shall be conducted for FYLF prior to the commencement of construction activities. These surveys shall conform to the survey protocol established in *Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog* (USFWS 2005). If construction activities occur between November 1 and March 31, a qualified biologist shall monitor the construction activities daily.

4.4.4.2.5 Western Red Bat

Riparian vegetation in the Action Area may provide roosting and foraging habitat for the Western Red Bat. Proposed Action restoration activities (16 April – 31 October) would overlap with the bat breeding season (1 April – 15 August) resulting in the potential for adverse impacts. The potential adverse impacts include removal of roosting habitat and disturbance from construction equipment, including noise and light, and human presence during restoration activities. It is not anticipated that any trees that could potentially be used by bats for roosting would be removed as the Proposed Action would make all effort to avoid removing large riparian trees. However, disturbance of roosting special status bats could be a potentially significant impact.

Since the Proposed Action would result in an increase in riparian habitat, it would result in long-term benefits to this species. To prevent impacts to Western Red Bat, bat surveys would be conducted prior to Proposed Action initiation and, if roosting bats are observed, a minimum 300 ft (91.4 m) buffer of roosting bats, maternity roosts or winter hibernacula until all young bats have fledged (Mitigation Measure BIO-10). With these measures in place, the expected impact would be **less than significant.**

> **Mitigation Measure BIO-10: Monitor for Bats to Prevent Impacts**
>
> Before any ground disturbing activities, a qualified biologist shall survey for the presence of associated habitat types for the bat species of concern. If bats are present, the biologist shall apply a minimum 300 ft (91.4 m) no-disturbance buffer around roosting bats, maternity roosts or winter hibernacula until all young bats have fledged. If suitable habitat is present, evening emergence surveys shall be conducted during the appropriate seasonal period of bat activity to determine the presence of bats.

4.4.4.2.6 Special Status Plants

Ten special status plant species were identified as having the potential to occur within the Action Area (Table 4). None of these plant species were observed within the action area during pre-Proposed Action vegetation surveys (Vaghti 2020). If any of these species are found, resource agency biologists (CDFW, USFWS) would be contacted to develop appropriate avoidance and conservation measures to avoid adverse effects on special status species and associated habitats. **No impacts** to special status plant species are expected to result from grading and excavation activities or to provide access routes for heavy equipment to the site.

b) The Proposed Action is located along the Yuba River, which supports riparian habitat and is considered sensitive natural communities by CDFW. The Proposed Action restoration activities would have temporary impacts which are potentially significant on these sensitive natural communities. Implementation of **Mitigation Measure BIO-5** would reduce impacts to sensitive natural communities to **less than significant**. Overall, implementation of the Proposed Action is expected to improve quality and quantity of riparian vegetation. Therefore, adverse impacts to sensitive natural communities would be **less than significant**.

c) The Corps has primary federal responsibility for administering regulations that concern jurisdictional Waters of the U.S., including wetlands, under Section 404 of the CWA. Section 404 regulates the discharge of dredged and fill material into Waters of the U.S. The Corps requires that a permit be obtained if a Proposed Action proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the OHWM. Waters of the U.S. are defined as “all waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters” (Section 404 of the CWA; 33 CFR Part 328). The limit of Corps jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the OHWM. The OHWM is defined as “the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (Section 404 of the CWA; 33 CFR Part 328).

Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Section 404 of the CWA; 33 CFR Part 328).

A formal aquatic resources delineation of the Action Area was conducted by CFS and SYRCL on 8 October 2020. Scrub-Shrub Wetlands, Riverine Intermittent, and Riverine – Upper Perennial were identified as potentially jurisdictional under Section 404 of the CWA (Figure 4; Appendix D). An Ephemeral Drainage located along the west gully was identified as potentially non-jurisdictional.

Implementation of the Proposed Action would result in in-channel, floodplain, and riparian restoration within the Yuba River, to improve habitat for CV spring- and fall-run Chinook Salmon, CCV steelhead, and other native fish. Implementation of the Proposed Action would require access, use of heavy machinery, and the excavation and placement of fill material (e.g., spawning gravels and cobbles) within an adjacent to jurisdictional waters. Implementation of the Proposed Action would have temporary impacts to 8.67 acres of Riverine – Upper Perennial, 0.001 acre of Riverine – Intermittent, and 0.02 acre of Scrub-Shrub Wetland below the OHWM to create the in-channel features (Table 7). Construction of the new access road would result in permanent conversion of 0.13 acre of Riverine – Upper Perennial, 0.13 acre of Riverine – Intermittent, 0.03 acre of Scrub-Shrub Wetland below OHWM (Table 7).

The Proposed Action would have some small permanent change to Waters of the U.S. as well as some temporary impacts but overall, implementation of the Proposed Action would result in the restoration of aquatic critical habitat and EFH within the OHWM of the LYR (Table 5). Therefore, the impact on jurisdictional Waters of the U.S. would be **less than significant**.

Table 7. The temporary impacts, permanent conversion, and new acres with implementation of the Proposed Action for the aquatic resource types found within the survey area.

Aquatic Resource Type	Area (Acre)	Temporary Impact (Acre)	Permanent Impact (Acre)
Riverine – Upper Perennial	17.80	8.67	0.13
Riverine – Intermittent	5.27	0.001	0.13
Scrub-Shrub Wetland	2.32	0.02	0.03
Total:	**25.40**	**8.69**	**0.30**

d) The LYR and the adjacent gravel bar and riparian areas within the Proposed Action Area serve as a migration corridor for wildlife. Likewise, the river serves as a migratory corridor for resident and anadromous fish. Wildlife may experience some temporary disturbance to movement corridors from the restoration activities, but would be able to move through the Action Area outside of working hours. In-stream construction activities may cause temporary disturbance to migrating special status fish species. Adult and juvenile anadromous salmonids generally migrate during low and no light hours (dusk until dawn) which generally do not overlap with Proposed Action work hours. Implementation of the Proposed Action would have long term beneficial impacts on riparian habitat and in-stream habitat for special status fish species. Therefore, adverse impacts to wildlife or fish movement or wildlife migration corridors would be **less than significant**.

e) Yuba County does not have a tree protection ordinance. Therefore, there would be **no impact**. Implementation of the Proposed Action would have long term benefits for quality and quantity of riparian vegetation within the Action Area.

f) The Proposed Action does not include any area that is covered by an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, there would be **no impact**.

4.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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 formal cemeteries?	☐	☒	☐	☐

Compliance with Section 106 of the NHPA of 1966 (16 United State Code [USC] § 470f [2008]) is required, whereby any federal undertaking must "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register." The implementing regulations for Section 106 are found under 36 CFR § 800, as amended (2001). Cultural resources may also be considered separately under the National Environmental Protection Act (42 USC) Section 4321-4327, whereby federal agencies are required to consider potential environmental impacts and appropriate mitigation measures for Proposed Actions with federal involvement. Also, impacts to cultural resources are considered if the resource is "significant" or "important" or "unique archaeological resource" under the provisions of CEQA Sections 15064.5 and 15126.4.

A record search was conducted within the Area of Potential Impact (APE) with the North Central Information Center (NCIC) of the California Historical Resources Information System, Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search, field survey, resources identification and evaluation, and management recommendations. Background research conducted at the NCIC located at California State University (CSU), Sacramento in Sacramento, California included a search of previously conducted cultural resources studies and findings on file. The record search included the APE and a 0.50-mile radius surrounding. The results found one cultural resource intersecting the APE and 32 cultural resources within the 0.50-mile radius. One previous cultural resource study has been conducted within a portion of the APE and six previous cultural resource studies have been conducted within the 0.50-mile radius.

A Sacred Lands File search of the APE was initiated on August 20, 2020, with the NAHC. The NAHC responded on August 26, 2020 via email, indicating the area was negative for sacred lands and provided a list of Native American contacts to reach out to for more information regarding the APE. This list included: Tsi Akim Maidu, United Auburn Indian Community of the Auburn Rancheria, and Colfax-Todds Valley Consolidated Tribe. On December 6, 2022 the Corps initiated consultation with these three tribes in compliance with Section 106 and Public Resources Code Section 21080.3.1 subd. (b), otherwise known as Assembly Bill 52 (AB 52) (Appendix F).

Cultural resource field evaluations were conducted by GANDA on 29 September and 8 October 2020 (Appendix E). Follow up surveys of additional areas were conducted on 12 July 2021 and 17 March 2022. The field survey resulted in updating and evaluating one historic-period cultural resource (P-58-000692; the Rose Bar mining community), within a portion of the APE. The updated portion is a mining resource that consists of a historic-period ditch; a depression with a small oven, non-native plants, and refuse; a raised flat area with a refuse concentrations; a trail; berms; remnants of a concrete water conveyance system; and tailings piles with another refuse concentration. The portion that falls within the APE is recommended not eligible for listing on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). Even though this portion of the archaeological site is recommended not eligible for listing on the CRHR and NRHP, there is the potential for subsurface components to have been buried under sediments in the Yuba River riverbed from historical flooding and hydraulic mining.

4.5.1 DISCUSSION

No Action Alternative

Under the No-Action Alternative, there would be **no impact** to cultural resources.

Proposed Action

Impacts to cultural resources during ground disturbing activities associated with site construction are potentially significant.

a-c) A qualified archaeological monitor will be present during all ground-disturbing activity that will result in removal of material (**Mitigation Measure CR-1**). If buried cultural resources or human remains are discovered then all ground disturbing activities within 100 feet would be halted, **Mitigation Measure CR-2** would be implemented and the USFWS Regional archeologist notified immediately. If any changes are made that result in an expansion of the Action Area, additional surveys will be performed, and impacts will be re-assessed**.** With implementation of this mitigation measure, potential impacts to cultural resources would be **less than significant**

Mitigation Measure CR-1: Archaeological Construction Monitor

A qualified archaeological monitor shall be present during all ground-disturbing activity that will result in removal of material within/near the Yuba River riverbed; including, but not limited to, moving of cobble rocks and leveling of incised gorges and the riverbed.

Mitigation Measure CR-2: Inadvertent Discoveries of Objects of Cultural Significance

If archaeological components are encountered during ground-disturbing activities, all ground disturbing work at the find location and 100-foot buffer placed around the area until a qualified archaeologist can assess the significance of the finding and provide (if needed) avoidance and/or data recovery plan.

Pursuant to California Health and Safety Code §7050.5, if human remains are encountered, all ground-disturbing work must cease in the vicinity of the discovery, and the County Coroner shall be contacted. The respectful treatment and disposition of remains and associated grave offerings shall be in accordance with Public Resource Code (PRC) §5097.98. The Proposed Action owner is responsible for implementation PRC §5097.98 and coordination with the likely descendant (MLD) identified by the Native American Heritage Commission. PRC §5097.98 also outlines next steps should the landowner and MLD not reach an agreement to the final disposition of the remains.

4.6 ENERGY

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

4.6.1 DISCUSSION

No Action Alternative

No energy would be consumed under the No-Action Alternative. Therefore, there would be **no impact.**

Proposed Action

a) Energy consumption during Proposed Action construction would be minimal and restricted to that required for operating heavy machinery, including fossil fuels necessary for completion of the Proposed Action. Heavy machinery and additional equipment used during the Proposed Action would be subject to state and federal regulations that require heavy machinery to operate under certain performance standards. **Tables 2** and **3** in the Air Quality Resources section of this document provide additional detail regarding equipment utilization and expected emissions. The impact of the project on energy resources is expected to be **less than significant.**

b) The Proposed Action would not interfere with a state or local plan for renewable energy or energy efficiency. There would be **no impact**.

4.7 GEOLOGY AND SOILS

Would the project:	**Potentially Significant Impact**	**Less than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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 geological feature?	☐	☐	☒	☐

REGIONAL AND SITE GEOLOGY

The Action Area is located in the foothills of the Sierra Nevada geomorphic province of California. The Sierra Nevada Range is a northwest trending tilted fault block with a gently sloping western face and a steep eastern escarpment. Much of the range is a massive granitic batholith. Volcanic deposits cover areas in the northern half of the Sierra Nevada. Outcrops of metamorphic and sedimentary rock are scattered throughout the range. Deep river canyons are cut into the western slope. The Sierra Nevada foothills are at the western edge of the range, up to 2,000 feet in elevation in the northern portion. The Sierra Nevada foothills transitions to the west into the Great Valley geomorphic province. The Great Valley consists of deep marine basins filled with large volumes of sediment eroded during the Jurassic to Quaternary periods from the eastern Sierra Nevada Range and western Coast Range.

The northern portion of the Action Area consists of alluvial cobbles, gravels, and sand deposited by the LYR (NRCS 2022). The LYR within the Action Area is confined on the north and south by rocky outcrop covered in 10 to 28 inches of Auburn and Sobrante gravelly loams. The southern portion of the Action Area is comprised almost exclusively of mine tailings and overburden. The origin of this material is from historic hydraulic mining activity located to the south, and outside of, the Action Area at the Blue Point Mine. Elevations within the site range from approximately 240 to 400 feet above mean sea level. Gully erosion is the main geomorphic process in the higher elevation (southern) portion of the Action Area. Fluvial erosion is the main geomorphic process in the lower (northern) portion of the Action Area.

SOILS

Soils within the Action Area identified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) indluce Auburn-Sobrante complex, gravelly, 30 to 50 percent slopes, Auburn-Sobrante-Rock outcrop complex, 50 to 75 percent slopes, dumps mine tailings, riverwash, and water (NRCS 2022).

FAULTS AND SEISMICITY

The Action Area is located in east-central California, which is an area of relatively low seismic activity. No active faults or Earthquake Fault Zones are located within or adjacent to the Action Area (CDC 2021). The Action Area is located in between two inactive, quaternary age faults. It is east of the Swan Ravine Fault and west of a small, unnamed pre-quaternary fault. Prairie Creek Fault to the west and Swain Ravine Fault to the east (CDC 2021). The nearest active fault is the Cleveland Hill Fault which is located approximately 19 miles northwest of the Action Area (CDC 2021). The Foothills Fault System is a continuation of the Cleveland Hill Fault. Seismic activity in the area is estimated to have a very long recurrence interval.

LIQUEFACTION

Liquefaction susceptibility occurs where saturated sandy or silty soils become unstable during strong seismic shaking. During an earthquake, these sediments can take on characteristics similar to liquid, potentially causing damage to overlying structures. Based on the lack of published data regarding liquefaction in Yuba County and the soil types within the Action Area, liquefaction susceptibility is considered low.

PALEONTOGOLICAL RESOURCES

Paleontological resources are defined as fossilized remains, imprints, or traces of prehistoric organisms (e.g., invertebrates, vertebrates, and plants) found within sedimentary rock formations. According to the University of California (Berkeley) Museum of Paleontology (UCMP) online database, there are no paleontological collections recorded in the Yuba River (UCMP 2022).

4.7.1 DISCUSSION

No Action Alternative

Under the No Action Alternative, there would be no adverse impacts to geology or soils as no restoration activities would occur within the Action Area. Therefore, there would be **no impact**.

Proposed Action

a i) The Proposed Action is not located within an Alquist-Priolo Fault Zone and the nearest active fault is the Cleveland Hill Fault which is located about 19 miles northwest of the Action Area. The Proposed Action is located in an area of relatively low seismic risk and would not be affected by risk associated with seismic rupture expose people or structures to seismic risks of an earthquake. Therefore, there would be **no impact.**

a ii) As described above, the Proposed Action is located in an area of relatively low seismic risk and would not affect strong seismic groundshaking relative to baseline conditions. Therefore, there would be **no impact.**

a iii) Proposed Action activities would occur in the Yuba River channel and floodplain, underlain by alluvial cobbles, gravels, and sand which are potentially vulnerable to liquefaction. However, liquefaction susceptibility is considered low in the Action Area and the Proposed Action is located in an area of relatively low seismic risk. Therefore, potential seismic-related hazards including liquefaction and ground failure would be **less than significant.**

a iv) Topography in the Action Area is relatively flat and the Proposed Action is located in an area of relatively low seismic risk; however, landslide susceptibility is rated low to moderate within the east and west gullies (CDOC 2022). Exposed and eroded slopes may have greater potential for seismic induced landslides under saturated soil conditions. Proposed Action construction of the new road within the west gully might further expose slopes or loosen soils. However, as described in Section 3.3.2, *Road Design*, slopes will be treated with temporary erosion control practices, such as coir wattles and erosion control blanket, and will be planted with suitable native vegetation to help stabilize the soil, thus reducing landslide potential. Therefore, this impact would be **less than significant**.

b) Proposed Action activities, (e.g., site preparation and construction of the new road) would expose surface soil materials to rainfall, potentially resulting in the removal and transport of these materials to the Yuba River. Eroded material or contaminants entering the waterway could be potentially significant. A SWPPP will be prepared for the Proposed Action as required to obtain a Storm Water Construction General Permit from the CVRWQCB, as the Proposed Action is subject to the water quality standards under the CVRWQCB (see Mitigation Measure WQ-1). The SWPPP contains BMPs to minimize impacts to surface water quality from erosion or contaminants. The construction contractor would be required to implement the erosion and sediment control BMPs in the SWPPP to minimize erosion related impacts. Mitigation Measures required in Section 4.10, *Hydrology and Water Quality*, address erosion and sediment control. With these measures in place, the erosion related impacts of the Proposed Action would be **less than significant**.

Proposed Action activities would be temporary, and construction of the new road would not be significant with implementation of **Mitigation Measure WQ-1** (see Section 4.10, *Hydrology and Water Quality*)**.** Overall, side slopes will be planted with suitable native vegetation, stabilizing the eroding banks along the west gully would reduce sediment load to the Yuba River. The long-term effects of the Proposed Action on drainage patterns would be beneficial.

c) As describe above, the Action Area is relatively flat with the exception of both the east and west gullies, and the Proposed Action would not increase the potential for off-site landslides. Additionally, the probability of soil liquefaction in the Action Area is low, thus having a low potential for lateral spreading. Overall, side slopes will be planted with suitable native vegetation, stabilizing the eroding banks along the west gully would reduce sediment load to the Yuba River. The long-term effects of the Proposed Action on drainage patterns would be beneficial. Therefore, the Proposed Action would result in a **less than significant** impact.

d) Expansive soils are predominantly clay material that are susceptible to shrinkage and expansion during variable water conditions (e.g., saturation and evaporation). The Action Area is comprised of Riverwash, cobble and gravelly soils, which have a low shrink-swell potential. Therefore, there would be **no impact.**

e) The Proposed Action would not involve the use of septic tanks or alternative wastewater systems. Therefore, there would be **no impact.**

f) No paleontological resources have been discovered in the Action Area. Proposed Action activities would include excavation of unconsolidated mine tailings and overburden and alluvial deposits. It is unlikely that these activities would encounter paleontological resources. Therefore, potential impacts would be **less than significant.**

4.8 GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

Greenhouse gases (GHGs) are gases which trap heat in the atmosphere by allowing sunlight to enter the atmosphere while trapping a portion of the exiting infrared radiation, which increases air temperature. Global climate change, particularly increases in global temperature, has been linked to the increasing concentration of GHGs in the atmosphere primarily as a result of anthropogenic combustion of fossil fuels. The primary GHGs are carbon dioxide (CO_2), methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, perfluorocarbons, and water vapor. Carbon dioxide is the reference gas for climate change with GHG emissions typically quantified and reported as CO_2 equivalents (CO_{2e}) for standardization.

Climate change impacts in California are predicted to include increasing average air temperature, greater temperature extremes, more precipitation falling as rain rather than snow, more extreme variability in precipitation, and sea level rise.

4.8.1 DISCUSSION

No Action Alternative

Greenhouse gases would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a, b) The Proposed Action would emit greenhouse gases from the heavy equipment used for the restoration activities. **Table 3** contains the estimated amount of CO_{2e} emissions by the Proposed Action. The total amount of CO_{2e} estimated to be produced by the Proposed Action's restoration activities is 653.38 metric tons (720.23 tons). However, the implementation of the Proposed Action also has the potential to store a significant amount of carbon through an increase in the quality and quantity of riparian vegetation (Matzek et al. 2015, Gorte 2009), salmon (Merz and Moyle 2006), and macroinvertebrate production (Duffy and Kahara 2011). Over the life of the Proposed Action, we predict a substantial amount of carbon would be sequestered in tree production alone through increased natural recruitment of riparian vegetation (Sellheim et al. 2016b).

The FRAQMD has not established a significance threshold for GHG emissions but when estimated Proposed Action GHG emissions (653.38 metric tons of CO_{2e}) are compared to the SMAQMD significance threshold of 1,100 metric tons per year (1,213 tons) of CO_{2e} the threshold is not exceeded. The Proposed Action's GHG emissions would not exceed the significance criteria (for the SMAQMD surrogate) and a substantial amount of carbon sequestration is predicted as a result of Proposed Action implementation; therefore, the Proposed Action's emissions of GHG would be **less than significant**.

4.9 HAZARDS AND HAZARDOUS MATERIALS

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

Materials and waste are considered hazardous if they are poisonous, ignitable, corrosive, or reactive. California law (Health and Safety Code 6.95, Section 25501(o)) defines "hazardous material" as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. Soils having concentrations of contaminants that are higher than acceptable levels as a result of past spills or leaks must be handled and disposed as hazardous waste during excavation, transportation, and disposal. The characteristics that would cause soil to be classified as hazardous waste are found in the California Code of Regulations, Title 22, Section 66261.20-24.

The California Environmental Protection Agency's (CalEPA) Cortese List is used to comply with CEQA requirements in providing information about the location of hazardous materials release sites (CalEPA 2022). The Cortese List data resources were searched to determine if any hazardous waste facilities or sites are located within or near the Action Area. The Cortese List data resources are the following: list of hazardous waste and substance sites from the Department of Toxic Substances Control (DTSC) EnviroStor database, list of leaking underground storage tank sites from the Water Board geo tracker database, list of solid waste disposal sites identified by Water Board with waste constituents above hazardous waste levels outside the waste management unit, list of active Cease and Desist Orders and Cleanup and Abatement Orders from the Water Board, and list of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code as identified by DTSC. The Cortese List data resources were searched in April 2022 with no listed sites being located within 0.5 miles of the Action Area (CalEPA 2022).

4.9.1 DISCUSSION

No Action Alternative

Hazards and hazardous materials would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a) The heavy equipment and vehicles used for Proposed Action construction would use potentially hazardous substances including diesel, gasoline, oil, grease, hydraulic fluid, and solvents. These hazardous substances are similar or identical to those used in heavy equipment and vehicles for other construction Proposed Actions in Yuba County. All equipment that is used within the Yuba River's stream corridor would be properly cleaned before being transported to the Action Area to prevent release of any hazardous materials into the river, riparian areas, wetlands, or other sensitive areas. Oil and grease used in equipment would be vegetable based, or another material that does not affect beneficial uses. All equipment working within the stream corridor would be inspected daily for fuel, lubrication, and coolant leaks and for leak potentials. All equipment would be free of fuel, lubrication, and coolant leaks before working. All equipment would be stored in staging areas which are within the dredge tailings and away from the river, riparian areas, wetlands, or other riparian areas. A Spill Prevention and Response Plan would be prepared for the Proposed Action and spill prevention kits would be kept close to construction areas and workers would be trained in their use. A search (April 2022) of the Cortese List data resources determined that the

Action Area is not on a list of hazardous sites compiled pursuant to Government Code Section 65962.5 (EPA 2018). Therefore, the Proposed Action would have a **less than significant** impact.

b) The Proposed Action does not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment. Therefore, the Proposed Action would have **no impact**.

c) The Action Area is not within one-quarter mile of an existing or proposed school. The nearest school is the Browns Valley elementary School, which is located approximately 5.7 miles northwest of the Action Area. In addition, emissions resulting from the Proposed Action would be limited to diesel and gasoline engine exhaust and fugitive dust. The Proposed Action construction would occur outside in a rural area such that all diesel and gasoline engine exhaust is expected to dissipate rapidly and not reach concentrations that are hazardous to public health. Fugitive dust would be controlled through periodic wetting of access roads and work areas as necessary. Therefore, the Proposed Action would have **no impact**.

d) The Action Area is not 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 not create a significant hazard to the public or the environment. Therefore, the Proposed Action would have **no impact**.

e) There are no public airports or private airstrips near the Action Area. The Action Area is not located within an airport land use plan or within two miles of a public airport or private airstrip. The nearest public airport Yuba County Airport, which is approximately 16 miles southwest of the Action Area. Therefore, the Proposed Action would have **no impact**.

f) Traffic created implementing the Proposed Action would include the mobilization and demobilization of heavy equipment (loaders, excavator, articulated haulers, and mobile screen plant) for each of the construction season (16 April to 31 October) it would take to complete the Proposed Action. Once the heavy equipment is onsite, it would travel within the Action Area using access roads and be stored at the staging area. Additional traffic on public roads during Proposed Action implementation would be limited to daily trips for personnel, service, and supply vehicles. No sediment would be imported or exported from the Action Area, resulting in limited driving of heavy trucks on public roads as a result of the Proposed Action. Construction activities would be conducted and managed to not interfere with emergency response or evacuation plans. The impact on emergency response or evacuation plans would be **less than significant.**

g) The Action Area is designated as a moderate and very high fire hazard severity zone (CalFire 2007). Proposed Action construction activities are a potential source of wildfire ignition. However, the majority of the Action Area is comprised of remnant tail minings which contain minimal vegetation fuel resulting in a low wildfire risk. In addition, the majority of vegetation within the Action Area is riparian vegetation which are relatively moist areas with green vegetation resulting in a low ignition risk. If riparian areas due ignite then the wildlife usually spreads slowly as an underburn due to the relatively moist, green vegetation.

Additionally, Proposed Action activities would occur within the Yuba River corridor and west gully drainage. The Yuba River serves as a natural fuel break. Short-term impacts associated with wildland fire during Proposed Action activities would result in a potentially significant impact. However, implementation of **Mitigation Measure HAZ-1** would reduce the impact of the Proposed Action on wildfire risk is **less than significant**.

Mitigation Measure HAZ-1: Reduce Potential Impacts from Wildfire Risk

During Proposed Action construction, any dry vegetation present on the staging areas or temporary access roads would be cleared prior to being used by vehicles or heavy equipment. Fire extinguishers would be present onsite in vehicles to quickly put out any vegetation that ignites as a result of a spark from heavy equipment.

4.10 HYDROLOGY AND WATER QUALITY

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

The Regional Water Quality Control Board and the California Department of Health Services regulate water quality levels and maximum contaminant levels for primary drinking water supplies. State water quality standards are more stringent than the federal standards. The following potential water quality impacts have been identified as part of the Proposed Action:

- exceedance of state water quality objectives for any given parameters;
- discharge of oils, grease, or any other material that would result in a film on the water or objects in the water;
- alteration of the suspended sediment load and suspended sediment discharge rate that causes a nuisance or adversely affects beneficial uses;
- alteration of surface water temperatures unless demonstrated to the Regional Water Quality Control Board that no impacts to beneficial uses would occur; and,
- changes in turbidity that cause a nuisance or adversely affect beneficial uses.

WATER QUALITY

The LYR provides water for agricultural uses, municipal and domestic supply, recreation, and fish and wildlife habitat. The LYR has overall good water quality which has improved in recent decades following controls on hydraulic and dredge mining and the establishment of minimum in-stream flows (Beak Consultants, Inc. 1989). Dissolved oxygen concentrations, total dissolved solids, pH, hardness, alkalinity, and turbidity are within acceptable or preferred ranges for salmonids and other aquatic organisms (Corps 2012). The minimum, maximum, and mean levels of pH, turbidity, DO, total organic carbon, nitrogen, phosphorus, and electrical conductivity are presented below (Table 8) (Corps 2012).

Table 8. Water quality parameters measured in the LYR near Marysville, CA (Corps 2012).

Parameter	Minimum	Maximum	Mean
Acidity pH	7	7.8	7.5
Turbidity (mg/L)	1	153	30
Dissolved Oxygen (mg/L)	8	12.4	11.4
Total Organic Carbon (mg/L)	0.7	2.4	1.1
Nitrogen (mg/L)	0.05	0.14	0.07
Phosphorus (mg/L)	0.01	0.02	0.01
Electrical Conductivity (µS/cm)	44	105	73

The Proposed Action may temporarily increase suspended sediment in the LYR for short periods of time. Construction activities would be closely monitored to ensure that water quality in the LYR is not affected during implementation. Temperature loggers would be installed to constantly monitor river water temperature. Data would be downloaded and reviewed frequently during the construction process, and monthly following restoration. Turbidity would also be monitored on site. Turbidity samples would be monitored at regular intervals during in-stream construction upstream and downstream, in accordance with measures included in the Proposed Action's Section 401 Water Quality Certification.

SURFACE WATER HYDROLOGY

The Yuba River has an approximately 1,300 square mile watershed with elevations ranging from 9,100 at the crest of the Sierra Nevada to 30 ft at the Feather River confluence. The LYR flows for approximately 24 miles from below Englebright Dam to its confluence with the Feather River. Historic gold mining and water regulation from upstream reservoirs have altered the hydrology and fluvial geomorphology of the LYR (cbec 2014). The hydrologic regime in the LYR is characterized as a mixed rain and snowmelt system (cbec 2013a). Peak flows occur during the winter and spring in response to precipitation events, particularly rain on snow. Snowmelt runoff in the LYR occurs from March through the end of May and recedes in June and July to summer baseflows in August and September (cbec 2013a). The upstream reservoir water regulation has reduced monthly flow variation and has shifted the pattern of peak and minimum flows (Corps 2012). Water regulation has reduced the magnitude of floods that occur with 1.5- and 5-year recurrence intervals and has increased summer baseflows (cbec 2013a; cbec 2021).

The flow in the LYR is partially controlled by New Bullards Bar Reservoir, the largest reservoir in the watershed, with the capacity to store 966,000 acre-ft of the total watershed storage of 1,377,000 acre-ft (Corps 2012; cbec 2013a). During the summer and fall, after snowmelt has ceased, the majority of the flow in the LYR is regulated by releases from New Bullards Bar through the New Colgate powerhouse. Releases into the LYR below Englebright Dam are made by the Narrows I and II powerhouses. Water that is released from New Bullards Bar generally passes through Englebright Reservoir without altering the water surface elevation (Corps 2012).

GROUNDWATER HYDROLOGY

The LYR serves as the boundary between the North Yuba Groundwater Basin and the South Yuba Groundwater Basin (YCWA 2005). The YWA manages groundwater in these basins through the YWA groundwater management plan (YCWA 2005). Groundwater and surface water are managed conjunctively. The groundwater levels in the South Yuba Groundwater Basin declined substantially between 1948 and 1981, prompting YCWA in 1984 to begin delivering surface water from New Bullards Bar Reservoir to the basin to offset groundwater use (YCWA 2005). The surface water deliveries have resulted in the return of groundwater levels in the South Yuba Groundwater Basin to near historic levels (YCWA 2005). YWA participates in temporary water transfers to other parts of California when there is a need for additional supply and when available Yuba River water is greater than the need of its member units (YCWA 2005). These temporary transfers can be in the form of groundwater substitution in which participating member units use groundwater in lieu of surface water, thereby allowing surface water to be transferred (YCWA 2005).

4.10.1 DISCUSSION

No Action Alternative

There would be no changes to existing water quality under the No Action Alternative. Hydrologic processes would continue as they are now and available habitat for salmonids would continue to degrade as the channel continues to be disconnected from the natural floodplain. Native riparian vegetation recruitment and floodplain function in relation to juvenile salmonid habitat would continue to be degraded. LYR water resources and hydrology within the site would not change. There would be **no impact**.

Proposed Action

a) The Proposed Action has the potential to affect water quality in the Action Area. Chemical constituents would be limited to those present at the Action Area. The pH would not be changed, and no pesticides would be used or mobilized during Proposed Action activities. Salinity and radioactivity would not be changed due to the Proposed Action. Water temperature conditions would not be elevated during construction activities; however, water temperature may be improved (reduced) as a result of the Proposed Action. The DO levels would not be reduced below levels specified in the water quality objectives (CRWQCB 1998). The Proposed Action must comply with the water quality and waste discharge requirements of the CVRWQCB.

The Proposed Action’s restoration activities may temporarily increase or contribute to the amount of suspended sediment in the Yuba River. Actions likely to temporarily impact turbidity include adding sorted and washed gravels to the LYR creating salmon spawning habitat, excavating and grading adjacent mine tailings and overburden. In-stream construction would be performed in a manner that minimizes sediment discharge. Turbidity associated with Proposed Action construction activities would not exceed turbidity objectives in the Sacramento River Basin (CRWQCB 1998). Where feasible, a silt curtain or other turbidity control would be installed in the channel to capture floating material or sediment mobilized during construction activity to minimize water quality impacts.

However, a channel-spanning curtain or dewatering would not be logistically or ecologically feasible for in-channel work. To minimize construction related water quality impacts, the Proposed Action's proponents would obtain and implement a SWPPP prepared in accordance with NPDES. All access and staging areas would be treated with erosion control measures at the end of each construction season. Erosion control measures may include erosion control fabric, coir logs, hydroseeding, and hay or straw spreading. At the end of the Proposed Action, native riparian vegetation would be planted in select locations including locations disturbed by the restoration activities. The contractor would be required to follow all construction BMPs in the SWPPP to minimize water quality impacts. The Proposed Action must comply with the water quality and waste discharge requirements of the CVRWQCB, which would be outlined in the Section 401 Water Quality Certification for the Proposed Action. Complying with water quality standards and implementing **Mitigation Measure WQ-1** would reduce water quality impacts to **less than significant**.

Mitigation Measure WQ-1 – Monitor Water Quality and Prevent Impacts

During in river work, turbidity and total suspended solids shall be monitored with intermittent grab samples from the river, and construction curtailed if turbidity exceeds criteria established by the Regional Water Quality Control Board in its Clean Water Act §401 Water Quality Certification for the Proposed Action. Specifically, sampling shall be performed immediately upstream from the Action Area and approximately 300 feet downstream of the active work area during construction.

Activities shall not cause in surface waters:

- turbidity to exceed 2 NTU's where natural turbidity is less than 2 NTU;
- where natural turbidity is between 1 and 5 NTUs, increases exceeding 1 NTU;
- where natural turbidity is between 5 and 50 NTUs, increase exceeding 20 percent;
- where natural turbidity is between 50 and 100 NTUs, increases exceeding 10 NTUs;
- where natural turbidity is greater than 100 NTUs, increase exceeding 10 percent.

Activities shall not cause settleable material to exceed 0.1 ml/L in surface waters as measured in surface waters downstream from the Action Area. Activities shall not cause pH to be depressed below 6.5 nor raised above 8.5 as measured in surface waters downstream from the Action Area.

The Proposed Action shall not discharge petroleum products into surface water. The Central Valley Water Board shall be notified immediately of any spill of petroleum products.

Sediment fencing shall be used along the river corridor to capture floating materials or sediments mobilized during construction activities and prevent water quality impacts. Stream bank impacts shall be isolated and minimized to reduce bank sloughing. Banks shall be stabilized with revegetation following Proposed Action activities, as appropriate.

A SWPPP shall be developed as part of the BMPs. All pertinent staff shall be trained on and familiarized with these plans. Copies of the plans and appropriate spill prevention equipment referenced in them shall be made available onsite and staff shall be trained in its use. Spill prevention kits shall be in close proximity to construction areas, and workers tined in their proper use.

b) The Proposed Action would not utilize groundwater supplies. The Proposed Action includes construction of a new road to access the Yuba River within the Action Area, thus altering groundwater recharge by increasing impervious surfaces. However, the new road would be at grade to preserve existing drainage patterns in the east gully and drainage ditches would be constructed on each shoulder of the road provide stability to reduce erosion potential. Additionally, a series of 2-ft check dams would be added to slow runoff and prevent gully erosion and side slopes will be treated with temporary erosion control practices, such as coir wattles and erosion control blanket, and will be planted with suitable native vegetation to help stabilize the soil. Land within and adjacent to the Action Area would continue to provide sufficient groundwater infiltration and recharge. Therefore, impacts would be temporary in duration and would be **less than significant.**

c i) As described above, Proposed Action activities would restore habitat within the Yuba River and address bank erosion along the west gully within the Action Area. Stabilizing the eroding banks along the west gully would reduce sediment load to the Yuba River, thus decreasing downstream sediment deposition. During Proposed Action activities, drainage channels in the west gully would be temporarily altered from excavation and use of heavy machinery. These activities could cause or lead to erosion or siltation due to the transportation of loose soil. However, compliance with water quality standards and implementing **Mitigation Measure WQ-1** would reduce water quality impacts to **less than significant**

Overall, Proposed Action activities would be temporary and would not be significant with implementation of **Mitigation Measure WQ-1** and the long-term effects of the Proposed Action on drainage patterns would be beneficial.

c ii) As described above, construction of the new road would increase impervious surfaces within the Action Area. However, the new road would be at grade to preserve existing drainage patterns in the east gully and drainage ditches would be constructed on each shoulder of the road provide stability to reduce erosion potential. Additionally, the Proposed Action would not add impervious surfaces to a degree that would result in a decrease in infiltration rates and an increase in stormwater runoff rates, as the area of land surface being converted to impervious is minor in relation to the Action Area.

Overall, Proposed Action activities would be temporary the long-term effects of the Proposed Action on drainage patterns would be beneficial. Therefore, impacts would be temporary in duration and would be **less than significant.**

c iii) The design of the new road would be at grade to preserve existing drainage patterns in the west gully and drainage ditches would be constructed on each shoulder of the road. As such, the Proposed Action would improve streamflow and function of the drainage patters within the Action Area.

The heavy equipment and vehicles used for Proposed Action construction would use potentially hazardous substances, which could potentially lead to accidental release of such substances into the Yuba River. Oil and grease used in equipment would be vegetable based, or another material that does not affect beneficial uses. All equipment working within the stream corridor would be inspected daily for fuel, lubrication, and coolant leaks and for leak potentials. All equipment would be free of fuel, lubrication, and coolant leaks before working. Implementation of **Mitigation Measure WQ-2** would require the use of biodegradable lubricants and hydraulic fluids.

> **Mitigation Measure WQ-2: Use Clean Equipment and Biodegradable Lubricants**
>
> All equipment shall be clean and use biodegradable lubricants and hydraulic fluids. All equipment working within the stream channel shall be inspected daily for fuel, lubrication, and coolant leaks; and, for leak potentials (e.g. cracked hoses, loose filling caps, stripped drain plugs). Vehicles shall be fueled and lubricated in a designated staging area located outside the stream channel and banks. Construction specifications shall require that any equipment used in or near the river is properly cleaned to prevent any hazardous materials from entering the river, and containment material shall be available onsite in case of an accident. Spill prevention kits shall be located close to construction areas, with workers trained in its use. Contracted construction managers shall regularly monitor construction personnel to ensure environmental compliance.

Additionally, a Spill Prevention and Response Plan would be prepared for the Proposed Action and spill prevention kits would be kept close to construction areas and workers would be trained in their use. With implementation of **Mitigation Measure WQ-2** and **Mitigation Measure WQ-1,** the potential for accidental release of hazardous materials and would not result in substantial discharges of polluted runoff. There, this impact would be **less than significant.**

c iv) The Proposed Action would not substantially alter the existing drainage pattern, thus impeding or redirecting flood flows. The drainage pattern would be altered slightly through removal of material between the two gullies within the Action Area and along the gully slopes. However, long-term effects of the Proposed Action on drainage patterns would be beneficial. Therefore, impacts would be temporary in duration and would be **less than significant.**

d) The Action Area is located approximately 130 miles east of the California coastline and would not be affected by flood hazard, seiche, or tsunami that would result in release of pollutants. Therefore, there would be **no impact.**

e) The Proposed Action would not add impervious surfaces to a degree that would result in a decrease in infiltration rates and an increase in stormwater runoff rates, as the area of land surface being converted to impervious is minor in relation to the Action Area. Therefore, the impacts of the Proposed Action on the implementation of a water quality control plan or sustainable groundwater management plan would be **less than significant.**

4.11 LAND USE AND PLANNING

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

4.11.1 DISCUSSION

No Action Alternative

Land use and planning would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a) The Action Area is located in unincorporated Yuba County and is not within an established community. The Proposed Action would take place within and along the immediate Yuba River channel corridor, access road, and private land and would not physically divide an established community. Therefore, there would be **no impact.**

b) Land use in the Action Area is designated as Resource Production (Yuba County 2011). The Proposed Action does not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Proposed Action (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. The Proposed Action would not have an adverse impact on land use and planning. Therefore, there would be **no impact.**

4.12 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Yuba County contain a wide variety of mineral resources, including clay, sand and gravel, stone, silica, silver, and gold (Yuba County 2011). The California Department of Conservation, California Geological Survey, have mapped mineral deposits as Mineral Resources Zones (MRZs) that include the following (CGS 2018):

- MRZ-1: Areas where available geologic information indicates that little likelihood exists for the presence of significant concrete aggregate resource;
- MRZ-2: Areas where geologic information indicates the presence of significant concrete aggregate resources, except where noted as Construction Aggregate;
- MRZ-3: Areas containing known or inferred concrete aggregate resources of undetermined mineral resource significance; and
- MRZ-4: Areas where available geologic information is inadequate to assign to any other mineral resource zone category.

The Action Area is mapped as MRZ-2; however, no known mineral resource recovery sites have been identified in the Action Area.

4.12.1 DISCUSSION

No Action Alternative

Mineral resources would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a-b) No known mineral resource recovery sites have been identified within the Action Area and the Proposed Action does not result in the loss of availability of a known mineral resource classified MRZ-2 that would be of value to the region and the residents of the state.

The Proposed Action would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. The Proposed Action would not have an adverse impact on mineral resources for the reasons stated above. Therefore, there would be **no impact.**

4.13 NOISE

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

The Proposed Action would create a temporary increase in noise levels, as material is removed then processed, transported, and placed within the Action Area. Material would also be transported within the site to fill in specific areas within the site. These noise levels would be higher than the current ambient noise levels in the area but would be temporary in nature and not excessive. The maximum noise levels allowed by industrial activity in the Yuba County General Plan are 75 decibels (dB) (Yuba County 2011). This Proposed Action may create noise at or near this level for brief periods during site construction. A limited number of individuals would be impacted by the change in noise, as the area is mostly rural and there are few individuals and businesses in the immediate Action Area. There is not a public airport within two miles of the Action Area. The Proposed Action would have no impact on air traffic or airport activity. The Proposed Action would have a limited and temporary impact on noise levels in the immediate area, with the closest home over 500 ft away from the nearest location where Proposed Action activity would occur so there would not be a significant impact to surrounding people and businesses for the reasons stated above.

4.13.1 DISCUSSION

No Action Alternative

Existing noise levels would not be affected under the No-Action Alternative. Therefore, there would **be no impact.**

Proposed Action

a) The Proposed Action would operate construction equipment (e.g., excavators, bulldozers, back-hoes, rubber-tired front-end loaders, end-dump haulers, etc.) in the Action Area and generate noise during restoration activities. The types of construction equipment used for the Proposed Action would typically generate noise levels approximately 75 dB above the reference noise at a distance of 50 ft (15.2 m). Construction equipment would be properly equipped and maintained to reduce noise levels. The Proposed Action would not expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance (75 dB maximum for Heavy Manufacturing; Yuba County General Plan, Yuba County 2011), or applicable standards of other agencies. Vibration would increase during operation of construction equipment for restoration activities, but no construction equipment would be used that is known to cause excessive vibration levels (e.g., impact and vibratory pile drivers, vibratory rollers, large bulldozers, hydraulic breakers, and jackhammers). All changes in noise and vibration levels would occur in a mostly rural and relatively unpopulated area. The majority of heavy equipment activities will occur in mine tailings and overburden adjacent to the water’s edge resulting in less noise (due to distance buffering) reaching the public fishing alongside or in the LYR. The impact is still considered potentially significant because there would be increases in noise levels within the Action Area. However, there is limited housing within 1 mi (1.6 km) of the Action Area and there is minimal recreational (fishing) use during much of the construction season. The impact would be mitigated to a **less than significant** level with implementation of **Mitigation Measure NOISE-1.**

NOISE-1 - Reduce Impacts from Noise.

To mitigate noise related impacts, the Project shall require all contractors to comply with the following operational parameters:

- Restrict construction activities to time periods between 7:00 am and 5:00 pm when there is the least potential for disturbance;
- Install and maintain sound-reducing equipment and muffled exhaust on all construction equipment.

b) The Proposed Action would not support a substantial permanent increase in ambient noise levels in the Proposed Action vicinity above levels existing without the Proposed Action, because construction activities associated with the Proposed Action would only occur during a limited period of time in one to two years during the construction season (16 April to 31 October). During construction there would be temporary increases in ambient noise levels but this increase in ambient noise level would not exceed Yuba County noise standards and would be consistent with construction projects. . There is limited housing within 1 mi (1.6 km) of the Action Area, and minimal recreational use for much of the construction window. Any increases above the ambient noise level would be addressed by **Mitigation Measure NOISE-1.** Therefore, this impact would be **less than significant**.

c) The Action Area is not located within an airport land use plan, within two miles of a public airport, or within the vicinity of a private airstrip. The nearest public airport is in Olivehurst which is approximately 16 miles southwest of the Action Area. Beale air force base is approximately 9 miles southwest of the Action Area. The nearest private airstrip is the Hammonton Air Strip, approximately 6 miles west of the Action Area. The Proposed Action consists of restoration activities for native fishes and riparian vegetation and would not change the land use thereby exposing people residing or working in the Action Area to excessive noise levels. Therefore, there is **no impact**.

4.14 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

4.14.1 DISCUSSION

No Action Alternative

Populations and housing would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a, b) The Proposed Action would not involve any activities that would directly increase population growth, resulting in housing or attract a new development. Therefore, the Proposed Action does not have a direct or indirect effect on substantial population growth. Implementation of the Proposed Action does not displace housing or residents or cause the construction of replacement housing in another location. Therefore, the Proposed Action would have **no impact.**

4.15 PUBLIC SERVICES

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

The Smartsville Fire District Station, at 8459 Blue Gravel Road, provides fire protection to the Action Area, which is approximately 0.6 miles south of the Action Area. The station would be the first response team in the event of a fire emergency in the Action Area.

The Yuba County Sheriff's Department provides law enforcement services for the unincorporated areas of Yuba County, including the Action Area. The closest Sheriff's Department is located at 720 Yuba Street in Marysville, approximately 16 miles west of the Action Area.

There are no schools that are located within 0.25 mile of the Action Area. The closest school is Browns Valley elementary School, which is located approximately 5.7 miles northwest of the Action Area.

4.15.1 DISCUSSION

No Action Alternative

Public services would not be affected under the No-Action Alternative. Therefore, there would be **no impact.**

Proposed Action

a) As discussed in Section 4.9, *Hazards and Hazardous Materials*, Proposed Action activities are a potential source of wildfire ignition. However, increase in local traffic would be minor and temporary due to the Proposed Action and is not anticipated to have a significant impact on emergency access in vicinity of the Action Area. Additionally, the Proposed Action would not alter the existing emergency access. Implementation of **Mitigation Measure HAZ-1** would reduce the potential for wildfire risk associated with Proposed Action activities. Therefore, this impact would be **less than significant.**

As discussed in Section 4.14, *Population and Housing*, the Proposed Action would not increase population resulting in an increase demand for schools, parks, or other public facilities and services in vicinity of the Action Area. Therefore, there would be **no impact.**

4.16 RECREATION

	Potentially Significant Impact	Less than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

The Action Area is on private land owned by YWA. Currently, public access to the Action Area is only available through boats floating downstream; however no public river access exists between the Action Area and Englebright Dam, located approximately 2.3 miles upstream. There are no developed regional or city parks or other recreational facilities within or directly adjacent to the Action Area.

4.16.1 DISCUSSION

No Action Alternative

The recreational opportunities and public safety concerns would not be affected under the No-Action Alternative.

Proposed Action

a, b) The Proposed Action is a salmon habitat restoration project. Therefore, it would not involve any activities that would directly increase population growth and would not increase the use of existing parks. Additionally, the Proposed Action does not include or require the expansion of recreational facilities. Therefore, the would be **no impact.**

4.17 TRANSPORTATION

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

State Route (SR) 20 provides regional access to the Action Area. From SR-20, the Action Area would be accessed at the intersection of Smartville Road and Krista Trail. Krista Trail turns into Capra Way, a single-lane gravel road that leads to the Action Area. Proposed Action personnel and heavy machinery would access the Action Area via existing roads and would occur between 16 April and 31 October. Equipment used for transporting water for dust control and Proposed Action personnel would access the Action Area daily.

As part of the Proposed Action, a new road from Capra Way would be constructed for the purpose of

4.17.1 DISCUSSION

No Action Alternative

Transportation would not be affected under the No-Action Alternative. Therefore, there would be **no impact.**

Proposed Action

a) The Proposed Action would cause a minor, short-term, temporary increase in traffic volume as a result of daily commutes by workers to the Action Area during the construction season and occasional supply deliveries. A few days of additional traffic would occur at the beginning and end of each construction season during transport of heavy equipment to the Action Area during annual mobilization and demobilization. Individual drivers may experience minor delays if they are travelling behind a truck transporting heavy equipment on a two-lane road. The Proposed Action's temporary traffic would primarily center on SR 20 and Smartville Road. All worker vehicles would be parked, and heavy equipment would be stored in staging areas where there would be sufficient room for all of the vehicles and equipment; the Proposed Action would not displace any existing parking. Therefore, the Proposed Action would have a **less than significant** impact.

b) The Action Area is in an isolated area with only limited local traffic and no public transportation. As described above, the Proposed Action would result in a few days of additional traffic at the beginning and end of each traffic season. Therefore, the Proposed Action would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) and **no impact** would occur.

c) The Proposed Action includes the construction of the new private road to access the Yuba River to facilitate future restoration efforts. The location for this new road was chosen to provide stability to reduce erosion potential in the west gully of two existing drainage channels identified for improvements. The road would also adhere to specific engineering requirements that would not increase hazards due to unsafe design features or incompatible uses into the area. Therefore, this impact would be **less than significant.**

d) Increase in local traffic would be minor and temporary due to the Proposed Action and is not anticipated to have a significant impact on emergency access in vicinity of the Action Area. Additionally, the Proposed Action would not alter the existing emergency access. Therefore, this impact would be **less than significant.**

4.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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 the local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☒	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

A Sacred Lands File search of the APE was initiated on August 20, 2020, with the NAHC. The NAHC responded on August 26, 2020 via email, indicating the area was negative for sacred lands and provided a list of Native American contacts to reach out to for more information regarding the APE. This list included: Tsi Akim Maidu, United Auburn Indian Community of the Auburn Rancheria, and Colfax-Todds Valley Consolidated Tribe. On December 6, 2022 the Corps initiated consultation with these three tribes in compliance with Section 106 and Public Resources Code Section 21080.3.1 subd. (b), otherwise known as Assembly Bill 52 (AB 52) (Appendix F).

4.18.1 DISCUSSION

No Action Alternative

Tribal cultural resources would not be affected under the No-Action Alternative. Therefore, there would be **no impact**.

Proposed Action

a i-ii) No listed or eligible tribal cultural resources defined in Public Resources Code Section 5020.1(k) and 5024.1 (c) were recorded in the Action Area as a result of the records search and field survey. However, the Proposed Action construction activities would include grading and excavation of areas, primarily dredge tailings, covered by cobble and gravel. Subsurface tribal cultural objects could be unearthed during the grading and excavation activities, which is a potentially significant impact. If any objects with potential tribal cultural significance are unearthed during the construction process, work would be halted within the vicinity of the inadvertent discovery until a qualified archeologist (and Native American representative if the find is potentially pre-historic) can assess the significance of the new find (**Mitigation Measure CR-2,** see Section 4.5, *Cultural Resources*) and prescribe measures to reduce potential impacts to be **less than significant**. The final disposition of tribal cultural resources recovered on State lands under the jurisdiction of the State Lands Commission must be approved by the Commission.

4.19 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

4.19.1 DISCUSSION

No Action Alternative

Utilities and service systems would not be affected under the No-Action Alternative. Therefore, there would be no impact.

Proposed Action

a-c) Proposed Action activities include construction of riffle and backwater features and a new access road to the Yuba River. The Proposed Action does not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Water for dust control would be used during Proposed Action construction activities and would be supplied by water trucks provided by the contractor. Therefore, the Proposed Action will have **no impact.**

d, e) As discussed in Sections above, the Proposed Action would not increase population or alter land use that would generate solid waste. Proposed Action activities include excavation of material and vegetation from the Yuba River and gullies within the Action Area. Sorting and washing of excavated material would occur and remain within the Action Area and any tree or vegetation removed due to Proposed Action actions would remain on site.

Overall, solid waste generated by the Proposed Action will be very limited in volume and would comply with federal, state, and local regulations related to solid waste. Therefore, this impact would be **less than significant.**

4.20 WILDFIRE

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

The Action Area is designated as Moderate and Very High Fire Hazard Severity Zone (FHSZ) within the State Responsibility Area (SRA) (CAL FIRE 2007). The Moderate FHSZ is located along the Yuba River corridor and the Very High FHSZ is located within the rest of the Action Area. Therefore, CAL FIRE is responsible for wildfire emergencies in the Action Area.

4.20.1 DISCUSSION

No Action Alternative

Wildfire risk would not be affected under the No-Action Alternative. Therefore, there would be **no impact.**

Proposed Action

a) Construction traffic would include the mobilization and demobilization of heavy machinery. Once the heavy equipment is onsite, it would travel within the Action Area using access roads and be stored at the staging area. The Proposed Action use of SR 20 would be limited to daily trips for personnel, service, and supply vehicles. Construction activities would be conducted and managed to not interfere with emergency response or evacuation plans. Therefore, this impact would be **less than significant.**

b) The Action Area is designated as a moderate and very high fire hazard severity zone (CalFire 2007). Proposed Action construction activities are a potential source of wildfire ignition. However, the majority of the Action Area is comprised of remnant tail minings which contain minimal vegetation fuel resulting in a low wildfire risk. In addition, the majority of vegetation within the Action Area is riparian vegetation which are relatively moist areas with green vegetation resulting in a low ignition risk. If riparian areas due ignite then the wildlife usually spreads slowly as an underburn due to the relatively moist, green vegetation.

Additionally, Proposed Action activities would occur within the Yuba River corridor and west gully drainage. The Yuba River serves as a natural fuel break. Short-term impacts associated with wildland fire during Proposed Action activities would result in a **potentially significant impact**. However, implementation of **Mitigation Measure HAZ-1** would reduce the impact of the Proposed Action on wildfire risk is **less than significant**.

c) The Proposed Action would not 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. There would be **no impact.**

d) The Proposed Action would not expose people or structures to significant risks to wildfire. The Proposed Action would occur in the Yuba River corridor an area comprised primarily of remnant mine tailings and would be of limited duration. Therefore, **no impact** is expected.

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" 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?	☐	☐	☐	☒

4.21.1 DISCUSSION

The Proposed Action does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. In contrast, the Proposed Action is designed to enhance fish and wildlife species by recovering a functional river landscape. Mitigation measures have been included to reduce all potential Proposed Action impacts to less than significant. The Proposed Action would result in short-term impacts from construction related activities. The cumulative impacts from the Proposed Action are less than significant. The impacts of the Proposed Action would improve the environmental conditions in the area by recovering functioning spawning habitat.

4.22 CONCLUSION

There is a potentially significant impact from Proposed Action implementation on air quality, biological resources, cultural resources, noise, and water quality. Therefore, the Proposed Action includes measures to mitigate these potential impacts. These mitigation measures are outlined in the following section (Section 5.0). These measures would be followed throughout Proposed Action implementation and would reduce any potential impacts to **less than significant**.

5 CUMULATIVE IMPACTS

There would be temporary and minor adverse effects that would occur within the construction area; however, the overall improvement to the environment would outweigh these effects. The Proposed Action would not contribute to the accumulation of impacts in the watershed. However, cumulative actions to improve stream habitats in the watershed are expected to provide long-term benefits to associated vegetation, wildlife, and fish. Because vegetation communities and wildlife habitats within the Yuba River watershed have been substantially modified to suit human land uses and would likely continue to be modified as human populations increase, cumulative benefits from proposed actions over time may be partially offset with new adverse impacts in the watershed.

Other related activities aimed at salmonid production, enhancement, restoration, and mitigation are being planned and implemented for the Yuba River system and CV under directives of the CVPIA, USFWS AFRP, LYR Accord, FERC relicensing of the Yuba River Development Project, Corps' Yuba River Ecosystem Restoration and Voluntary Conservation Measures. These activities include gravel and large woody material additions, water acquisition, water year type-based flow schedules, improving fish passage, riparian habitat restoration, and other enhancement actions. The magnitude of cumulative effects under all current and proposed salmonid habitat improvement actions is undetermined at this time.

Together, this Proposed Action and the reasonably foreseeable projects and actions would improve environmental quality in the long term. Therefore, **no cumulatively considerable contributions to significant cumulative impacts to the environment are expected** if the Proposed Action is implemented.

5.1 RELATED ACTIVITIES

RESTORATION ACTIVITIES IN THE YUBA RIVER

The Proposed Action is one of several projects in the Yuba River aimed at restoring ecosystem processes within the watershed. Taken together, these projects are expected to enhance salmonid spawning and rearing areas within the Yuba River and contribute to the increase in natural production and population size for imperiled salmonids.

U.S. ARMY CORPS OF ENGINEERS ACTIVITIES

The Corps has performed gravel augmentation and monitoring in the LYR immediately downstream of Englebright Dam since 2007 and plans to continue to do so until 2024 (Corps 2014). The Corps placed 15,500 tons of gravel and cobble into the Englebright Dam Reach between 2007 and 2013 (Corps 2014). The Corps plans to implement a Large Woody Material Management Plan that would place large woody material back into the LYR at selected sites until 2024 (Corps 2014). A pilot large woody material placement was completed at Lower Gilt Edge Bar in 2013 (Corps 2014). The Corps is currently performing a feasibility study for performing Yuba River Ecosystem Restoration (Corps 2014).

6 CONSULTATION AND COORDINATION

Yuba County is the lead state agency under CEQA and the Corps is the lead federal agency under NEPA. YWA is the landowner and Project applicant. SYRCL, cbec, and CFS are responsible for the development of the proposal, design, permitting, outreach, and implementation of the Proposed Action. The SYRCL, CFS, and cbec team prepared the IS on behalf of the Yuba County, which assessed the impacts of the Proposed Action as required by CEQA. This environmental document was reviewed by Yuba County prior to public release, by other appropriate regulatory agencies, and will be available for public review and comment.

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Appendix A

Basis of Design Report

Upper Rose Bar Habitat Enhancement Project
Basis of Design Report

Prepared for
South Yuba River Citizens League
on behalf of
Cramer Fish Sciences

Prepared by
cbec, inc.

June 16, 2022

cbec Project #: 20-1029

This report is intended solely for the use and benefit of the South Yuba River Citizens League, and Cramer Fish Sciences, and Yuba Water Agency. No other person or entity shall be entitled to rely on the details contained herein without the express written consent of cbec, inc., eco engineering, 2544 Industrial Boulevard, West Sacramento, CA 95691.

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GLOSSARY OF ACRONYMS

Acronym	Meaning
cfs	cubic feet per second
CY	cubic yards
D_{50}	Particle size for which 50% of the gradation is finer, the median particle diameter
D_{90}	Particle size for which 90% of the gradation is finer
DEM	Digital Elevation Model
DHSI	Depth Habitat Suitability Index
ESA	Environmental Science Associates
GHSI	Combined Habitat Suitability Index
HSC	Habitat Suitability Curve
HSI	Habitat Suitability Index
LYR	Lower Yuba River
LiDAR	Light Detection and Ranging
NAVD88	North American Vertical Datum of 1988
NLCD	National Land Cover Dataset
RTK-GPS	Real-Time Kinematic Global Positioning System
TIN	Triangulated Irregular Network
SYRCL	South Yuba River Citizens League
USACE	United States Army Corps of Engineers
VHSI	Velocity Habitat Suitability Index
WSE	water surface elevation
WUA	weighted usable area
YWA	Yuba Water Agency

1 INTRODUCTION

The purpose of this report is to provide background information, design rationale and anticipated benefits of the proposed Upper Rose Bar Habitat Enhancement Project (Project) located in the lower Yuba River (LYR). The purpose of the Project is to enhance hydraulic and substrate conditions within the Project site to support improved spawning and rearing habitat conditions for Chinook Salmon (*Oncorhynchus tshawytscha)* and steelhead (*O. mykiss*) (a.k.a., salmonids), which have been degraded through a number of anthropogenic impacts. Englebright Dam marks the upstream extent of the LYR and was constructed as a debris control dam in 1941 to retain hydraulic mining derived sediment to reduce deposition in the lower gradient portions of the river. The dam continues to serve this purpose, preventing transport of coarse sediment to the LYR. The dam also acts as a fish passage barrier, limiting spawning in the Yuba River to the reaches downstream of the dam. As salmonids travel upstream to spawn, the portions of the LYR just downstream of Englebright Dam provide preferential spawning habitat (SYRCL 2016). Because Englebright Dam restricts downstream sediment transport, finer bed particles at the Upper Rose Bar site are not replenished. The mean particle size at Upper Rose Bar is in the 5- to-10-inch range (Jackson, et al. 2013) and the site has a relatively low bed sediment diversity (SYRCL 2016). These sediment characteristics are unsuitable for spawning for approximately half the Chinook Salmon population and all steelhead (SYRCL 2016).

South Yuba River Citizens League (SYRCL) has evaluated the potential for enhancing Chinook Salmon and steelhead spawning habitat at the Upper Rose Bar site (Figure 1) and has documented this work in two reports: a feasibility report (SYRCL 2016) and a concept report (ESA 2016). These reports provide the ecological and geomorphic rationale for enhancing Chinook Salmon and steelhead spawning habitat at Upper Rose Bar, assess the potential for harvesting and processing locally derived sediment to construct the habitat improvements, and provide conceptual designs for spawning habitat enhancements. The previous studies documented in these reports provide the foundation for the design for the Project.

1.1 PROJECT GOALS

The goals of the Project are to:

- Increase the amount of high-quality spawning habitat by modifying hydraulic (i.e., depth and velocity) and substrate conditions to within the ranges preferred by Chinook Salmon and steelhead during typical spawning periods;
- Create habitat that incorporates varying depths and low velocities to create juvenile salmonid rearing habitat over a range of flows;
- Create a design that mimics natural morphological features (e.g., riffle, pool) that would not erode significantly through typical non-flood control related operations; and

- Reduce bank erosion in the west gully that may be contributing mercury contaminated sediment to the LYR.

1.2 PROJECT AREA

The Project is located approximately 2 miles downstream of Englebright Dam at the end of the Narrows Reach, in the upstream portion of the Timbuctoo Bend Reach and at the base of the former Blue Point Mine, near Smartsville, California (Figure 1). Two existing ephemeral drainages — the east and west gullies — drain from the Blue Point Mine property directly into the LYR at the downstream end of the Project site. These gullies have eroded through mine tailings and potentially contribute mercury-contaminated sediment to the river.

1.3 DESIGN SUMMARY

The design was initiated by considering a modified version of concept scenario #1 (ESA 2016), shown in Figure 2, which included sediment placement to provide two riffles in the main channel and excavation in the tributary gullies to provide material for the riffles. The concept evolved rapidly based on several factors that came to light in the design process. The initial concept was modified to take advantage of accumulation of sediment located at the downstream end of the Narrows Pool that was suspected to have been transported from the U.S. Army Corps of Engineers (USACE) gravel injection actions, upstream. This decision relocated the upstream riffle farther upstream, into the Narrows Pool. Constructability and feasibility of this option were called into question by the Project team (SYRCL, CFS and cbec) because such a riffle would require channel fill up to 21 ft deep to provide access to construct a riffle in that location. More importantly, the design required much more material than excavation associated with gully erosion work had potential to provide. The difference between material estimates provided in ESA (2016) and Project estimates are assumed to be due to sediment transport and changes in the channel bed since 2014, especially following winter 2017 floods.

Identifying the changed bed conditions spurred a review of the geomorphic setting and rationale for coarse sediment additions. The upstream riffle, although sited on an existing deposit of alluvial material, was not located consistently with long-term geomorphic trends. It was too far upstream of Upper Rose Bar in a narrow portion of the river, subject to high velocities from "flow steering" off the left bank (left bank from a downstream looking perspective) in high flow events (ESA 2016) where a riffle would be unlikely to persist. Upper Rose Bar, immediately downstream of that location, is a depositional feature, located where the river valley widens, and flow velocity is reduced. Two riffles that endured the 2017 floods were identified adjacent to Upper Rose Bar and the design team revised the focus on augmenting these riffles. The riffles approximately exhibited reach-appropriate 1,100 ft spacing identified by Wyrick and Pasternack (2012). Enhancing these riffles would require much less fill — the existing riffles would only need to be filled by up to 13 ft — to achieve desired hydraulic conditions. The design team consensus was to enhance these two existing riffles instead of creating one where there is not a riffle currently, to the benefit of constructability and potential for significantly reduced construction costs. It was also decided that additional spawning habitat should be created by excavating a bench into the bar on river right, adjacent to the downstream riffle, and that rearing and spawning habitat should be added by modifying the elevation and lateral slope of Upper Rose Bar between the two augmented riffles. Because of the reduced quantity of material required for the revised riffle locations, the design for gully stabilization was reduced to limit the amount of excavated material. In addition, it was agreed that grading within the east and west gullies (Figure 4) would be limited to that required to construct an access road down to Upper Rose Bar. Even with that reduction in grading scope, there will be significantly more material generated by grading than is needed to augment existing riffles in one season, opening the possibility of stockpiling appropriately sized sediment for future riffle replenishment actions and adding further justification to access road development.

A change in land ownership of the Project site further influenced consideration of phased construction and contributed to shaping the Project. Yuba Water Agency (YWA) purchased the Blue Point Mine through which access to Upper Rose Bar is gained and also purchased the Rogers-Tyner property which is located immediately across the river and downstream from Upper Rose Bar. YWA is a Project proponent interested in improving salmonid habitats in the LYR and initial conversations with YWA identified an interest to participate in future projects at the site. Understanding that access to both sides of the river will be possible in the future allowed the design team to consider scheduled coarse sediment augmentations at the site. Scheduled coarse sediment augmentations will provide the opportunity to improve and refine spawning and rearing habitat improvements on the site as well as downstream for years to come. This idea is complemented by the surplus material that will be generated by the Project and proposed future east gully stabilization grading actions. Stockpiles of appropriately sized sediment derived from the Project and future east gully excavation/stabilization can be transported via the Project's access road to the riffles adjacent to Upper Rose Bar relatively easily in the future. Additionally, the access road will likely provide the most logical access to potential habitat enhancement projects on the Rogers-Tyner property downstream of the Project.

An iterative ecohydraulic design process was undertaken, where different potential topographic configurations were tested using a two-dimensional (2D) hydraulic model to optimize hydraulic conditions to support spawning at design flows ranging from 500 to 5,000 cfs, juvenile rearing in flows ranging from 2,000 to 5,000 cfs, and to minimize the potential for erosion during flows from 5,000 to 10,000 cfs (i.e., approximately bankfull and slightly above). 21 design iterations were evaluated in developing the 100% design. The 100% design consists of two augmented riffles that will be constructed through the placement of appropriately sized coarse sediment spanning the river low-flow channel (i.e., between Upper Rose Bar and the Yuba River right bank) at the location of an existing riffle and a relative high point upstream of the existing riffle, replacing coarse sediment with appropriately sized sediment at the downstream end of the second riffle at river left, a longitudinal bar between the two riffles that will function as a rearing and spawning bench and a spawning bench constructed by excavating into the lateral bar adjacent to the downstream riffle, on river right (Figure 4) (Appendix A).

The site is currently inaccessible by conventional construction equipment and an access road must be developed to gain access to Upper Rose Bar. The Project also includes a constructed access road that serves three purposes: provide access to the site, flatten the side slopes of the east gully to reduce erosion, and generate material for riffle construction and future replenishment. Side slopes of the road cut will be laid back to 3H:1V slopes to reduce runoff erosion potential. The excavation will generate a large volume of material that will be sorted and washed locally to produce appropriately sized spawning material for riffle construction. Excess sorted material will be stockpiled for future riffle enhancements. The access road will facilitate access to the site for the Project and for future coarse sediment augmentation efforts. The 100% design has an estimated excavation (cut) volume of approximately 115,600 cubic yards (CY) in the access road and 11,900 CY in the spawning bench area. SYRCL (2016) estimated that 54% of the excavated access road material would be suitable for spawning sediment, once sorted and washed. It is estimated that approximately 62,400 CY of spawning sediment will be produced from road excavation. The sediment size of the material excavated for the spawning bench (11,900 CY) has not been evaluated and is not included in the estimate of spawning sediment production. The spawning riffles, backwater infill grading area, spawning bench and rearing bench will require approximately 23,800 CY of spawning sediment to construct a top 2 ft-thick top course on all features. If all riffles, backwater infill grading area, and benches are constructed using spawning sediment instead of using larger foundation material, approximately 43,100 CY of spawning sediment will be required. Depending on availability of large foundation material, approximately 19,300 CY to 38,600 CY of appropriately sized spawning sediment is likely to be stockpiled for future riffle enhancements.

2 METHODOLOGY

Topographic and bathymetric data were collected to provide a baseline of the existing conditions at the Project site as well as to create a triangulated irregular network (TIN) surface of the existing conditions. A proposed TIN surface was then developed to represent the design features. A 2D hydraulic model was developed to analyze both the existing conditions and the proposed design surfaces in order to evaluate the Project's potential to provide optimal spawning and rearing conditions. The model results were evaluated with respect to salmonid habitat suitability indices as well as sediment particle mobility, and the design was refined iteratively to balance habitat enhancement with longevity.

2.1 FIELD DATA COLLECTION

To inform design efforts, topographic and bathymetric data of the site were collected prior to the start of the design phase of the Project.

2.1.1 TOPOGRAPHIC SURVEYS

Existing conditions topographic and bathymetric data were collected in November 2020 (NV5 Geospatial 2021) to provide the basis for grading design and habitat improvements. Data included channel bathymetry and topography of the adjacent banks and the east and west gullies. Data were collected via airplane equipped with a green LiDAR sensor capable of penetrating water to depths of approximately 20 ft. At the upstream end of the surveyed area, the Narrows Pool was too deep for green LiDAR penetration. This data gap was filled by extrapolating data from the edge of the LiDAR data to the upstream end of the Project reach. Data were ground truthed by a terrestrial survey using RTK-GPS survey equipment. A topobathymetric surface was developed in Autodesk Civil3D.

2.2 HYDROLOGY

LYR flows are regulated by YWA's operation of the Yuba River Development Project. YWA maintains a hydrologic model of their operations and provided cbec results of their long-term simulation. cbec analyzed this flow record to select a range of flows associated with the typical timing of Chinook Salmon and steelhead spawning (Figures 5-7). The analysis involved calculating the exceedance probability of a range of flows over the time period from October 1969 to September 2010. The exceedance probability is a measure of how frequently flow exceeds a certain value on the river. For example, the 100% exceedance probability flow value represents the rate of flow that is exceeded 100% of the time (i.e., the lowest flow simulated during the analysis period). Higher flows which occur less frequently have lower exceedance probabilities (e.g., the 10% exceedance probability represents the flow rate that is equaled or exceeded in 10% of the analysis period).

Spring-run Chinook Salmon spawning occurs from September through January, fall-run Chinook Salmon spawning occurs from October through December, and steelhead spawning occurs from January through April (ESA 2015, RMT 2013). Separate exceedance probability curves were calculated for each of the spawning periods and flows were selected to demonstrate results with the hydraulic model (See section 2.4) for a wide range of typical flows. For fall-run Chinook Salmon, modeled flows range from the 100% (approximately 500 cfs) to the 10% (2,000 cfs) exceedance probabilities (Figure 5). For spring-run Chinook Salmon, modeled flows range from the 99% (approximately 500 cfs) to the 15% (2,000 cfs) exceedance probabilities (Figure 6). For steelhead, modeled flows range from the 99% (approximately 500 cfs) to the 18% (5,000 cfs) exceedance probabilities (Figure 7). Although steelhead spawn later in the wet season when flows are typically higher, this analysis also includes simulations of a lower discharge range (500 to 2,000 cfs) to provide results across the full range of typical flows that occur during the steelhead spawning period.

2.3 SUBSTRATE

Spawning habitat suitability depends on appropriately sized bed substrate in addition to hydraulics (i.e., depth and velocity). The spawning sediment gradation that will be used for constructing the riffles will be a mixture identified by ESA (2018) as being both appropriately sized for salmonid spawning and more resistant to transport. The spawning sediment gradation is similar to the gradation being used in the USACE gravel injection project just downstream of Englebright Dam, but the upper limit will be increased to 10 inches to help reduce sediment transport and increase the longevity of constructed features. The gradation limits for sorting on site will be as follows: 100% finer than 10 inch, 50% finer than 2.6 inch and 0% finer than 0.4 inch. The gradation is expected to have a D_{90} of 7.1 inch. Spawning sediment will be placed at least 2 feet thick on top of all constructed features.

2.4 HYDRAULIC MODELING

A 2D hydraulic model of the existing conditions was developed using HEC-RAS 6.1.0, a modeling platform developed by the USACE Hydrologic Engineering Center (Brunner 2016). Model terrain elevations were adopted from the existing conditions topographic surface for calibration and then from Project design surfaces to evaluate design iterations. The model was run for a range of flows from 500 cfs to 10,000 cfs. Model results were post-processed in RAS Mapper, R Studio, and ArcGIS to produce depth, velocity, habitat suitability, and sediment mobility maps of the existing conditions.

2.4.1 EXISTING CONDITIONS TOPOGRAPHY

To accurately represent the existing conditions topography in the model, the existing conditions TIN was exported to a digital elevation model (DEM) with 3 ft grid cells and was used for subsequent hydraulic modeling and GIS analyses (Figure 8).

2.4.2 HYDRAULIC MODEL DEVELOPMENT AND CALIBRATION

The 2D hydraulic model was developed with a mesh resolution of uniform 5 ft grid of cells throughout the model domain. Roughness values were assigned using base values from the 30 m USGS National Land Cover Dataset (NLCD). Overriding these base values, the simulated extents of a 1,000 cfs flow rate was used to assign different roughness values within the channel. Channel roughness values were varied between pools and riffles and calibrated to LiDAR water surface elevations (WSEs) that were recorded during a 997 cfs flow and WSEs that were surveyed using Real-Time Kinematic Global Positioning System (RTK-GPS) survey grade equipment during a 620 cfs flow. The downstream boundary condition for all flow rates simulated was a normal depth boundary with a calibrated energy grade slope to match the observed water surface slopes. The calibrated model was then used to simulate flow rates ranging from 500 to 10,000 cfs to target specific flows for habitat suitability and sediment mobility for the existing and design topographic conditions.

2.4.3 HABITAT SUITABILITY

Spawning habitat and juvenile rearing habitat for both steelhead and Chinook Salmon were evaluated to measure the quality of habitat developed and to refine the design. For evaluating Chinook Salmon spawning habitat, habitat suitability curves (HSCs) developed by Beak Consultants (1989) and bioverified by YWA in Pasternack et al. (2014) were used (Figure 9). For steelhead spawning calculations, HSCs developed by Beak Consultants (1989) and bioverified by Kammel et al. (2016) were used (Figure 10). For steelhead and Chinook Salmon juvenile rearing habitat suitability calculations, bioverified HSCs developed in Moniz and Pasternack (2019) were used (Figures 11 and 12).

Combined (or Global) hydraulic habitat suitability index (GHSI) and total weighted useable area (WUA) for both Chinook Salmon and steelhead within the Project reach were calculated by the geometric mean method using the following equations:

$$GHSI_{cell} = \sqrt{VHSI \times DHSI} \tag{1}$$

$$WUA = \sum_{i=1}^{n}(GHSI_{cell} \times Area_{cell}) \tag{2}$$

Where VHSI and DHSI are velocity and depth HSIs, respectively, taken from the species- and lifestage-specific curves. Weighted usable area is calculated by summing the product of GHSI and cell area over the entire number of wetted cells (n). This approach to estimating spawning habitat suitability does not include substrate size in the calculation. For the Project design, it is assumed that the placed material is the appropriate size for the two species. Because substrate size is not included, the existing conditions spawning WUA calculations are likely overestimated because the existing conditions substrate sizes are too coarse in most areas (SYRCL 2016).

Model results for depth and velocity habitat suitability were converted to raster grids and were used to calculate GHSI within each cell using equation (1). The value of each cell in the GHSI raster was then multiplied by the cell area and this product was summed across all cells in the model domain to calculate total WUA using equation (2) for the Project reach. Combined habitat suitability was then binned into habitat suitability ranges of: non-habitat (GHSI = 0), very poor quality (0 < GHSI ≤ 0.2), low quality (0.2 < GHSI ≤ 0.4), medium quality (0.4 < GHSI ≤ 0.6), and high quality (0.6 < GHSI). Habitat suitability was further grouped as unsuitable (GHSI < 0.6) and suitable (GHSI ≥ 0.6) (Kammel et al. 2016) and these areas were summed to summarize the magnitude of habitat enhancement.

2.4.4 POTENTIAL FOR SEDIMENT MOBILITY

Sediment mobility was calculated based on model predicted depth and velocity to assess whether placed spawning-sized sediment would be transported downstream during typical annual operations. Shields stress was calculated at each computational node using the following equation:

$$\tau^* = \frac{\tau_b}{(\gamma_s - \gamma_f)D_{50}} \tag{3}$$

Where τ^* is Shields stress, τ_b is the bed shear stress (Pa), γ_s is the specific weight of the sediment (N/m^3), γ_w is the specific weight of water (N/m^3) and D_{50} is the median grain size in (m).

Bed shear stress (τ_b) was calculated by processing hydraulic model results (depth and velocity) in GIS according to equation 4:

$$\tau_b = \rho_w \left(\overline{u} / \left(5.75 \, log \left(\frac{12.2H}{2D_{90}} \right) \right) \right)^2 \tag{4}$$

Where ρ_w is the density of water (kg/m^3), $\bar{u}$ is the nodal depth-averaged velocity (m/s), H is the nodal water depth (m), and D_{90} is the grain size (m) for which 90% of the grains are smaller (Brown and Pasternack, 2009).

The Shields stress value indicates the sediment transport regime: a value of 0 – 0.01 signifies no transport, 0.01 – 0.03 signifies intermittent transport, 0.03 – 0.06 signifies partial sediment transport, and 0.06 – 0.1 signifies full bed mobilization. The intent of this design is to follow the guidance provided by ESA (2016) that Shields stress in riffles should be "<0.03 at spawning flows and <0.06 at higher flows" and to maintain riffle stability at bankfull flows (approximately 5,000 cfs) and slightly above (up to 10,000 cfs).

To assess the potential for sediment mobility in the design condition, proposed topography was simulated with the hydraulic model and those hydraulic results were combined with the proposed sediment distribution to evaluate the potential for mobility of the placed sediment. For the design condition the newly placed spawning-sized sediment is expected to have a D_{50} of 2.6 inches and a D_{90} of 7.1 inches consistent with coarse sediment used in other recent spawning habitat development projects on the LYR (ESA 2018). Shear stress maps are presented for flows ranging from 5,000-10,000 cfs in Figures 13 through 15. Shields stress results for the design condition are provided in Section 3.2.3.

2.5 ITERATIVE DESIGN PROCESS

An iterative design process was used in which design surfaces were developed using AutoCAD Civil 3D 2020, then simulated using the HEC-RAS 2D hydraulic model and evaluated to determine the relative increase in habitat within the Project area. Following post-processing of the model results, each design scenario was evaluated based on the following parameters:

- Relative increase in Chinook Salmon and steelhead spawning and rearing habitat area and quality based on depth, velocity, and combined habitat suitability indices relative to existing conditions and the previous iteration for flows ranging from 500 cfs to 5,000 cfs;
- Potential sediment mobility (Shields stress) for flows ranging from 5,000 cfs to 10,000 cfs; and
- Volume balance between the excavated material (i.e., access road and spawning bench) and the placed spawning habitat features.

After the evaluation of each iteration, a new surface was created to improve upon the last, simulated with the hydraulic model and the results were again evaluated. Modifications to each design were made to maximize spawning and rearing habitat across a range of flows while staying within the target spawning sediment harvest volume and minimizing shear stress at higher flows. The progression of the design was evaluated during design meetings and recommendations or constraints voiced by the Project team were incorporated into the design.

2.6 ROAD DESIGN

Access to the sediment placement areas is provided by a new road (Appendix A, Sheet C4). The location for this road was chosen to provide stability to reduce erosion potential in the west gully. From Carmelita Way, the 24 ft wide road slopes down to the LYR at an 11.4% slope for 1,100 ft. Road drainage is provided by a 2% cross-slope, and a 3 ft deep drainage ditch on the left shoulder. A series of 2 ft check dams are spaced at intervals of approximately 23 ft in the drainage ditch to slow runoff, control grade and prevent gully erosion. Side slopes are graded up at 3H:1V slopes on both sides of the road, laying back the sides of the west gully and reducing potential for erosion. The side slopes will be treated with temporary erosion control practices, such as coir wattles and erosion control blanket, and will be planted with suitable native vegetation to help stabilize the sediment. The road alignment crosses the natural drainage point of the east gully at-grade to preserve existing drainage patterns in the east gully. For the remainder of the alignment, the road is at-grade on the existing bar. The final road design has an expected excavation (cut) volume of approximately 115,600 CY.

3 RESULTS

3.1 FINAL DESIGN

The 100% design consists of two spawning riffles, a rearing bench, a spawning bench and an access road to the bar (Figure 16). Both riffles are augmentations of existing riffles, but the upstream riffle requires significantly more sediment fill to develop suitable hydraulic conditions that are appropriate for spawning. The upstream spawning rifle is approximately 525 ft long, spans the width of the channel, and requires approximately 29,600 CY of fill, with fill up to 13 ft in depth. The downstream spawning riffle is located approximately 750 ft downstream of the tail of the upstream riffle and requires approximately 9,300 CY of fill. The downstream riffle is approximately 575 ft long and adds approximately 300 ft on the upstream end of an existing riffle and spans the width of the main channel.

The upstream faces of both riffles were designed with concave-upstream entrance edges and 3:1 slopes. The relatively steep faces and concave-upstream shape of the entrances is intended to promote hyporheic flow through the riffles to improve intergravel water quality conditions. While a more gradual slope would be desired, the upstream slope reflects the expected resultant slope based on construction using conventional equipment such as front-end loaders and bulldozers. Both riffles are designed with large foundation material and 2 ft of spawning-sized sediment as a top layer.

The downstream crest of the upstream riffle was designed with a two-stage exit grade to reduce sediment mobility. The downstream riffle was designed with a mildly sloping downstream transition to reduce shear as flow departs the riffle. Additionally, larger material (9-inch D_{50}, minimum) was specified for approximately 100 ft at the downstream ends of the riffles to help resist erosion during flows up to 10,000 cfs. A mild exit slope was incorporated in the riffle design to the expected water depth that construction equipment is expected to be operable. On the upstream riffle, a similar resultant slope to the upstream face was added downstream of this where it is expected that sediment will be placed by simply pushing it over the edge of the riffle. Water depths during construction are anticipated to be shallower over the downstream riffle, allowing equipment operation to the end of the riffle, and a longer, milder exit slope was included.

Fill will be placed in a side channel and deep backwater area contiguous with the downstream riffle to further increase spawning habitat area. In the existing condition, the area provides suitable hydraulics for spawning, but the existing substrate is too coarse, limiting its utilization for spawning. For a portion of the side channel, the top 2 ft of existing material will be removed and replaced with spawning-sized sediment. The deeper backwater at the downstream end of the side channel was designed with large foundation material and 2 ft of spawning-sized sediment as a top layer. Approximately 1,600 CY of existing material will be removed, and 3,300 CY of material will be placed on this portion of the downstream riffle, with fill depths of up to 6 ft.

A 1.2 ac rearing bench was included along the margin of the pool separating the two riffles to provide rearing habitat for juvenile salmonids. The rearing bench was designed with a gentle slope towards the main channel to provide optimal Chinook salmon and steelhead juvenile rearing depths over the flow range of 900 to 5,000 cfs, and to reduce stranding potential as flows recede. The rearing bench is designed to inundate from approximately 1.5 ft depth at the lower side of the bench at 900 cfs to approximately 2.4 ft depth on the high side at 5,000 cfs. The bench is designed with large foundation material and approximately 2,600 CY of spawning-sized sediment as a 2 ft top layer. The rearing bench also provides suitable steelhead spawning habitat at flows ranging from 2,000 to 5,000 cfs.

The spawning bench adjacent to the downstream riffle provides approximately 1.3 ac of steelhead and Chinook salmon spawning habitat that is intended to function between 2,000 and 5,000 cfs to function at the upper end of the anticipated spawning flow range. The bench is designed to inundate to 1.25 ft depth at 2,000 cfs and to 2.75 ft depth at 5,000 cfs.

The design is estimated to require approximately 42,200 CY of sediment in the main channel. This volume consists of both spawning-sized sediment used to construct the top 2 ft of the riffles, larger foundation material, and material with a 9-inch D_{50} at the downstream portions of the riffles to reduce sediment mobility.

Spawning and rearing habitat suitability for existing and design conditions for both Chinook Salmon and steelhead are provided in Figures 17 through 36. WUA, inundated area, and added suitable habitat area for the 100% design under all modeled flows are provided in Tables 1 through 9.

3.1.1 SPAWNING HABITAT SUITABILITY

The proposed design produced favorable depths and velocities within the vicinity of the sediment placement for salmonid spawning habitat as well as an increase in inundated area. Table 1 shows the amount and percent change in inundated area and Table 2 shows the amount and percent change in Chinook Salmon spawning WUA for flows ranging from 500 to 5,000 cfs. It is important to note that WUA is an index rather than an actual area that is useful as an indicator of developed habitat relative to existing habitat. Also note that the WUA values presented in Table 2 account for hydraulic suitability only; they do not include substrate size. Because the existing sediment in the project reach is coarser than the preferred range for Chinook Salmon and steelhead spawning habitat (SYRCL 2016), it is likely that the existing conditions suitable area is greatly overestimated.

Table 1: Predicted inundation area for existing and design conditions.

Inundated Area			
Flow (cfs)	**Existing (acres)**	**Design (acres)**	**% Change**
5,000	42.38	46.17	9%
3,500	39.58	42.29	7%
2,000	35.87	39.23	9%
1,300	33.75	37.24	10%
900	32.05	35.87	12%
700	30.81	35.06	14%
500	29.46	33.80	15%

Table 2: Predicted Chinook Salmon spawning WUA for existing and design conditions.

Chinook Salmon Spawning Weighted Usable Area			
Flow (cfs)	**Existing (acres)**	**Design (acres)**	**% Change**
2,000	5.11	8.02	57%
1,300	5.24	9.91	89%
900	5.66	10.50	86%
700	5.87	10.56	80%
500	6.03	10.32	71%

**Substrate quality is not included in the WUA calculations. Because the existing sediment is too coarse, the existing WUA values are likely an overestimate.*

The area of suitable and unsuitable Chinook Salmon spawning habitat is provided in Table 3. Note that values in Table 3 are actual areas, not WUA, and are binned as either suitable (GHSI ≥ 0.6) or unsuitable (GHSI < 0.6) (Kammel et al. 2016). Visual representations for each flow are provided in Figures 17 through 36 where 0.6< High Quality ≤ 1, 0.4 < Medium Quality ≤ 0.6, 0.2 < Low Quality ≤ 0.4, Poor Quality ≤ 0.2, and Non-habitat = 0. In figures 17 through 36, the warm colors (red, orange, yellow) represent unsuitable habitat and the cool colors (cyan and blue) represent suitable habitat. The design predicted a substantial increase in the amount of suitable Chinook Salmon spawning habitat within the Project reach as compared to the existing conditions topography.

Table 3: Predicted area of suitable and unsuitable spawning habitat for Chinook Salmon.

GHSI Predicted Spawning Area for Chinook Salmon (acres)*				
Flow (cfs)	**Unsuitable**		**Suitable**	
	Existing	**Design**	**Existing**	**Design**
2,000	32.05	32.98	3.82	6.24
1,300	30.17	28.55	3.58	8.69
900	28.21	26.93	3.85	8.95
700	26.65	25.88	4.17	9.18
500	25.12	24.71	4.34	9.09

**Spawning areas are unweighted and are binned as either suitable (GHSI ≥ 0.6) or unsuitable (GHSI <0.6) (Kammel et al. 2016).*

Table 4 shows the change in WUA for a range of flows (2,000 to 5,000 cfs) typical during steelhead spawning. The proposed design produced an increase in inundated area within the same area (Table 1). The proposed design saw a reduction in WUA within the vicinity of the sediment placement for steelhead spawning habitat. Habitat assessments are based only on the hydraulics of the flow (depth and velocity) and do not account for the suitability of the underlying bed substrate. Previous evaluation of bed particles (SYRCL 2016) indicated that they are too large for steelhead redd development, making the existing conditions mostly unsuitable for steelhead spawning. Consequently, while good hydraulic conditions may currently exist for spawning, the habitat area estimates for existing conditions are likely greatly overestimated due to the lack of suitable bed substrate. The design will place appropriately sized sediment so the acreage shown in table 4 for design conditions should be considered as gained spawning habitat.

Table 4: Predicted spawning WUA for steelhead for existing and design conditions.

Steelhead Spawning Weighted Usable Area			
Flow (cfs)	**Existing (acres)**	**Design (acres)**	**% Change**
5,000	5.22	5.00	-4%
3,500	5.83	5.87	1%
2,000	5.77	8.17	42%
1,300	6.24	10.30	65%
900	6.41	11.10	73%
700	6.41	10.97	71%
500	6.28	10.41	66%

**Substrate quality is not included in the WUA calculations. Because the existing sediment is too coarse, the existing WUA values are likely an overestimate.*

The suitable and unsuitable area of steelhead spawning habitat is provided in Table 5. Note that values in Table 5 are actual areas, not WUA, and are binned as either suitable (GHSI > 0.6) or unsuitable (GHSI ≤ 0.6) (Kammel et al. 2016). The design evaluation predicted a decrease in the area of suitable steelhead spawning habitat within the Project reach as compared to the existing conditions topography. The apparent loss of habitat is due to an increase in the flow velocity over the downstream riffle that does not occur under existing conditions. However, although the hydraulics of existing conditions are more suitable for habitat at this discharge, the estimated habitat area does not account for the suitability of the bed substrate. Because existing sediment in the project reach is coarser than the preferred range for Chinook Salmon and steelhead spawning habitat (SYRCL 2016), it is likely that area of existing conditions habitat is overestimated. Given that the design will place sediment tailored to the sizes preferred by each species, design conditions are likely to meet or exceed existing habitat estimates despite the apparent loss in spawning area due to hydraulics alone.

Table 5: Predicted area of suitable and unsuitable spawning habitat area for steelhead.

GHSI Predicted Spawning Area for Steelhead (acres)*				
Flow (cfs)	**Unsuitable**		**Suitable**	
	Existing	**Design**	**Existing**	**Design**
5,000	37.81	41.82	4.58	4.35
3,500	34.23	37.31	5.35	4.98
2,000	30.94	32.19	4.93	7.03
1,300	28.67	27.48	5.08	9.76
900	26.48	25.46	5.58	10.41
700	25.09	24.62	5.72	10.44
500	23.80	23.85	5.66	9.95

**Spawning areas are unweighted and are binned as either suitable (GHSI > 0.6) or unsuitable (GHSI ≤ 0.6) (Kammel et al. 2016). Substrate quality is not included in the WUA calculations. Because the existing sediment is too coarse, the existing WUA values are likely an overestimate.*

3.1.2 JUVENILE REARING HABITAT SUITABILITY

The proposed design produced mixed results for creating additional juvenile Chinook Salmon rearing habitat (Table 6).

Table 6: Predicted rearing WUA for Chinook Salmon juveniles for existing and design conditions.

Chinook Salmon Rearing Weighted Usable Area			
Flow (cfs)	**Existing (acres)**	**Design (acres)**	**% Change**
5,000	6.19	7.93	12%
3,500	6.98	6.78	-3%
2,000	8.11	7.95	-2%

The amount of suitable and unsuitable Chinook Salmon juvenile rearing habitat is provided in Table 7. Note that values in Table 7 are actual areas, not WUA, and are binned as either suitable (GHSI > 0.6) or unsuitable (GHSI ≤ 0.6) (Kammel et al. 2016).

Table 7: Predicted area suitable and unsuitable rearing habitat quality for Chinook Salmon juveniles.

*GHSI Predicted Rearing Area for Juvenile Chinook Salmon (acres)**				
Flow (cfs)	Unsuitable		Suitable	
	Existing	Design	Existing	Design
5,000	37.87	40.52	4.51	5.65
3,500	34.63	37.19	4.95	5.10
2,000	30.10	33.59	5.77	5.63

**Rearing areas are unweighted and are binned as either suitable (GHSI > 0.6) or unsuitable (GHSI ≤ 0.6).*

The proposed design produced mixed results for creating additional steelhead juvenile rearing habitat. Table 8 shows the change in WUA for a range of flows (2,000 to 5,000 cfs). At 5,000 cfs, the evaluation predicted an increase in WUA for juvenile Chinook Salmon rearing habitat in the design condition as compared to the existing conditions topography. At lower flows, the design results in a decrease in rearing habitat WUA of -5% and -3% at 3,500 cfs and 2,000 cfs, respectively.

Table 8: Predicted juvenile steelhead rearing WUA for existing and design conditions.

Steelhead Rearing Weighted Usable Area			
Flow (cfs)	Existing (acres)	Design (acres)	% Change
5,000	5.84	6.53	12%
3,500	6.78	6.45	-5%
2,000	8.02	7.81	-3%

The amount of suitable and unsuitable juvenile steelhead rearing habitat is provided in Table 9. Note that values in Table 9 are actual areas, not WUA, and are binned as either suitable (GHSI > 0.6) or unsuitable (GHSI ≤ 0.6) (Kammel et al. 2016). At 5,000 cfs the design evaluation predicted a 19% increase in the amount of juvenile steelhead rearing habitat. At lower flows, the design results in a decrease in rearing habitat of 1% and 7% at 3,500 cfs and 2,000 cfs respectively.

Table 9: Predicted area of suitable and unsuitable rearing habitat for steelhead juveniles.

*GHSI Predicted Rearing Area for Juvenile Steelhead (acres)**				
Flow (cfs)	Unsuitable		Suitable	
	Existing	Design	Existing	Design
5,000	37.36	40.18	5.02	5.99
3,500	33.85	36.64	5.73	5.65
2,000	29.15	32.96	6.72	6.27

**Spawning areas are unweighted and are binned as either suitable (GHSI > 0.6) or unsuitable (GHSI <0.6) (Kammel et al. 2016).*

3.1.3 POTENTIAL SEDIMENT MOBILITY

Shields stress for the range of design flows, for sediment with a D_{50} of 2.6 inches and a D_{90} of 7.1 inches, is shown in Figures 37 through 39. The upper map of each figure uses the D_{90} value with depth and velocity results to calculate the median size of sediment (D_{50}) that exceeds the partial transport threshold ($\tau^* = 0.03$). The lower map of each figure uses the D_{90}, D_{50}, depth, and velocity results to calculate the Shields stress at each location. At all flows, the model predicted that spawning-sized sediment at the downstream crest of the riffle would be partially mobile (τ^* = 0.03 to 0.06) due to increased head and a steep slope back to the existing bed. To improve stability during typical summer flows, design specifications required sediment gradation with a D_{50} of 9 inches or greater to be used at the downstream ends of the riffles, where the mobility analysis indicated that fill with the 2.6 inch D_{50} sediment used elsewhere would be mobilized. These results may indicate a limitation of the analysis, as the calculated D_{50} approaches the D_{90} of the gradation and may fall outside of the effective range of the equations used. Further, in a conventional spawning sediment sorting operation, the ratio of D_{90} to D_{50} is typically expressed as a ratio of 1.5 to 2.5.

4 CONCLUSIONS

The addition of spawning sized sediment to created topographic features that yield preferential depths and velocities was shown to significantly increase the amount of high-quality spawning habitat and to increase the total inundated area within the Project reach. At a typical fall-run Chinook Salmon spawning flow rate of 700 cfs, habitat suitability modeling results predicted an increase of 5.01 Ac of suitable habitat area relative to existing conditions. At a typical steelhead spawning flow of 2,000 cfs, modeling results predicted an increase of 2.10 Ac in suitable spawning area relative to existing conditions. The riffles will be fortified at the downstream ends with larger sediment (D_{50} = 9 inches, min), harvested on-site, to reduce the likelihood that the spawning-sized sediment will be transported downstream in typical higher flow conditions. The riffles will be constructed using larger material for the foundations and a 2 ft top layer of spawning-sized sediment to sustain the riffle form and to extend the supply of spawning-sized sediment for future replenishment.

The rearing bench provides rearing habitat at the upper end of the rearing flow ranges for juvenile Chinook salmon and steelhead. For Chinook Salmon juvenile rearing habitat, suitable rearing area is decreased at 2,000 cfs and increased at 3,500 and 5,000 cfs. For steelhead juvenile rearing habitat, suitable rearing area is decreased at 2,000 and 3,500 cfs and increased at 5,000 cfs. Gains in suitable juvenile rearing habitat area at 5,000 cfs are 1.14 acres for Chinook Salmon and 0.97 acres for steelhead relative to existing conditions.

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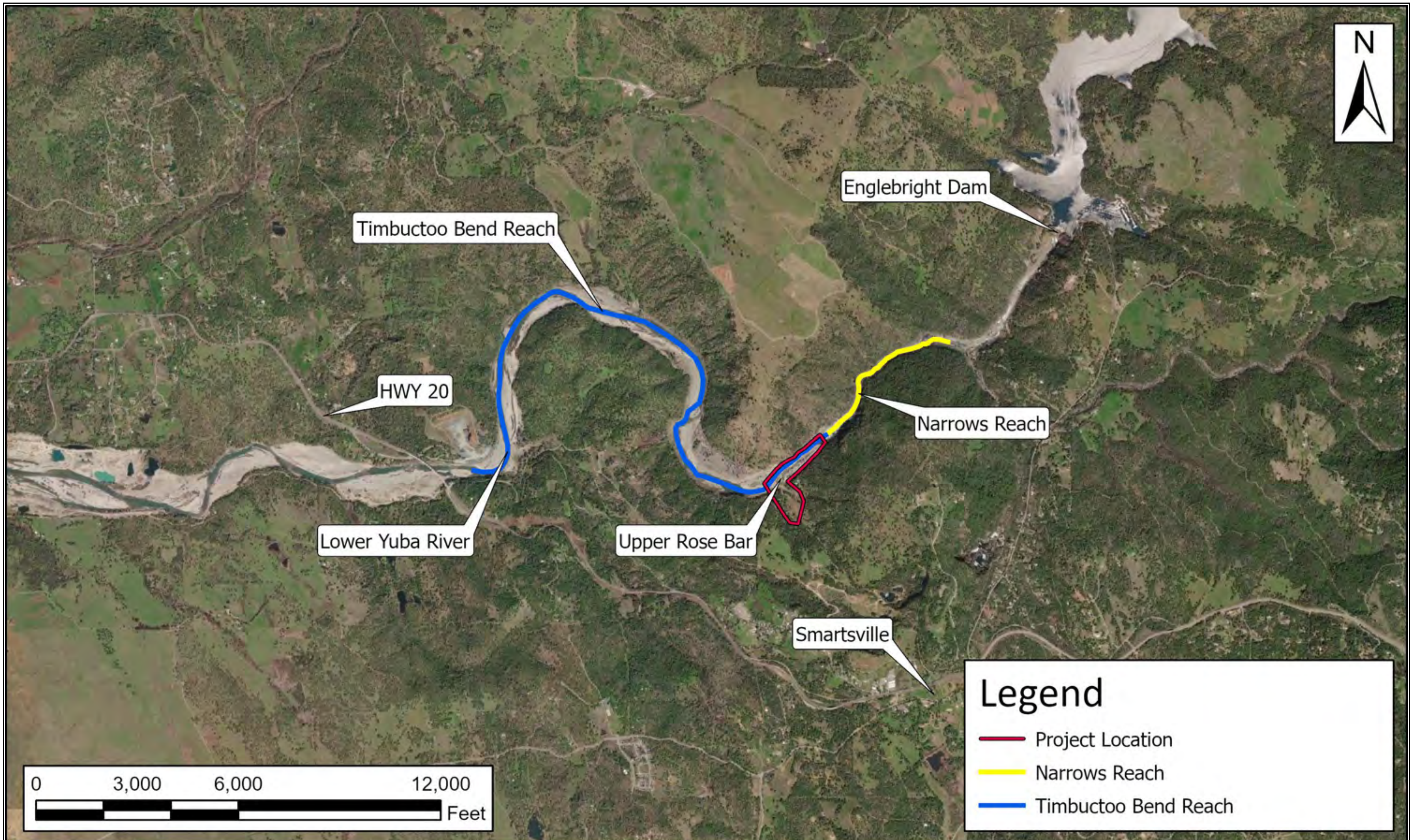
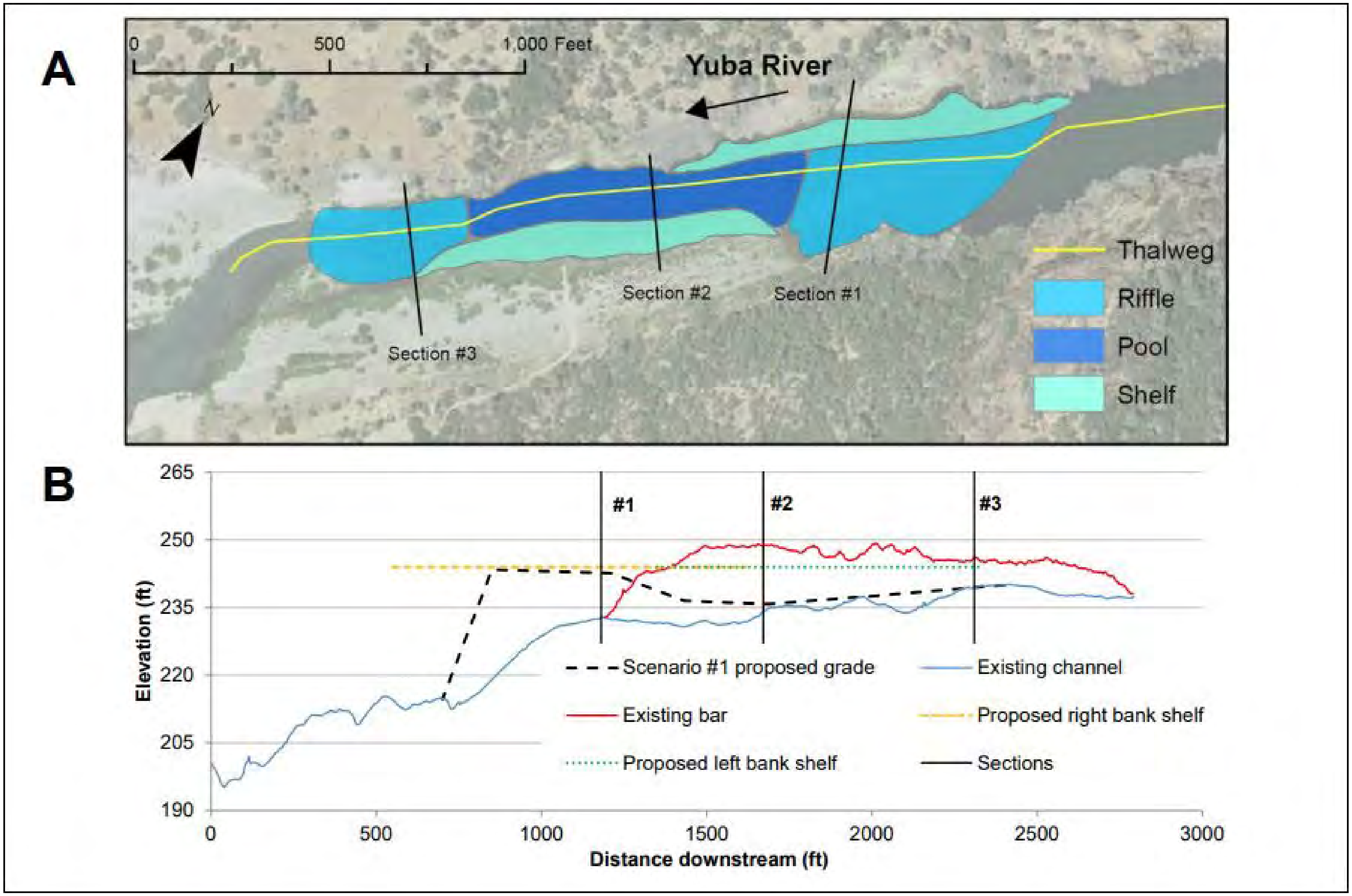
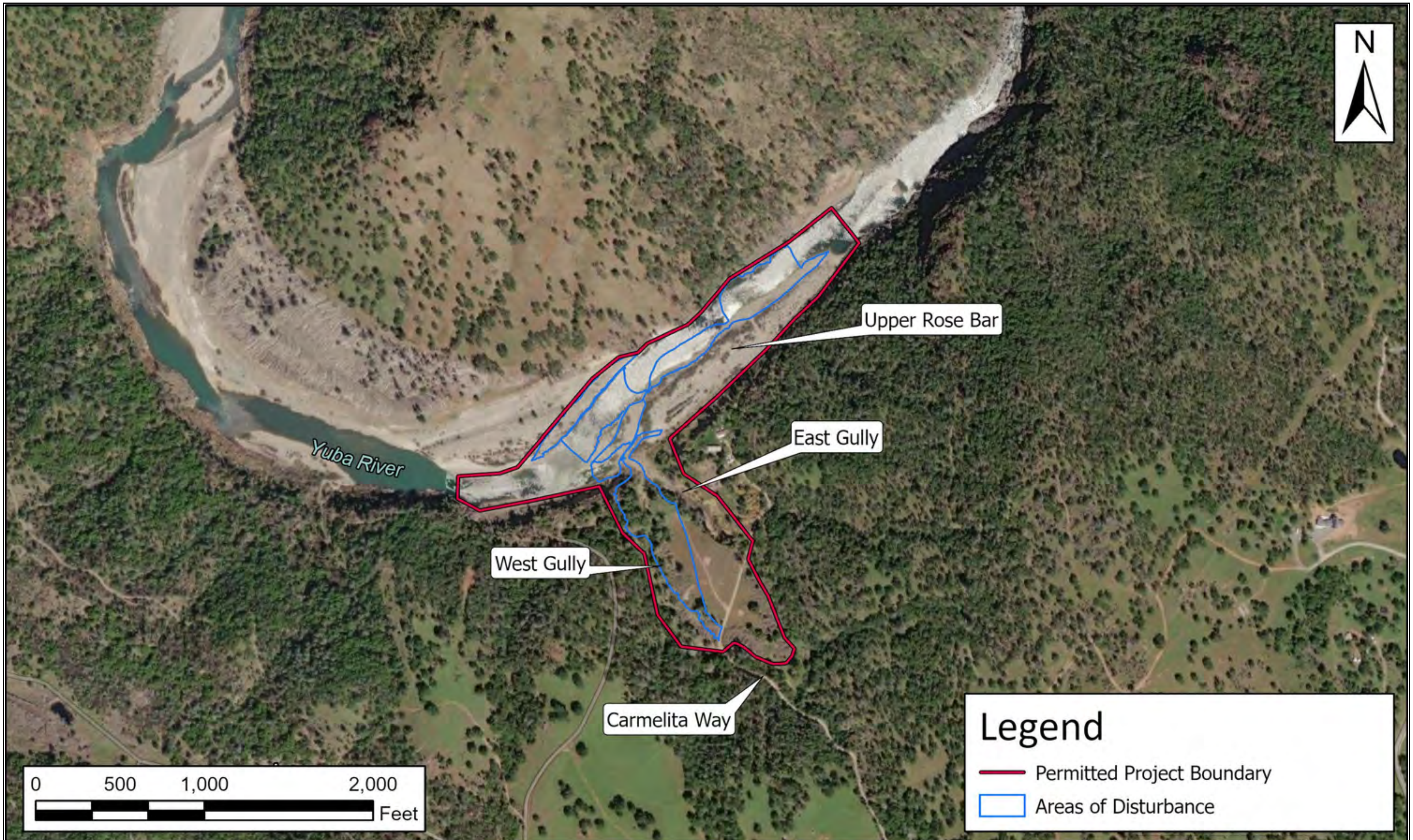
7 FIGURES



Notes: Image Source: Esri	cbec	*Upper Rose Bar Habitat Enhancement Project* **Project Location**		
		Project No. 20-1029	Created By: JCI	**Figure 1**



Notes: Credit: Originally developed by ESA (2016)	cbec	*Upper Rose Bar Habitat Enhancement Project* **ESA Concept Scenario #1**	
		Project No. 20-1029	Created By: JCI	**Figure 2**



Notes: Image Source: Esri	cbec	*Upper Rose Bar Habitat Enhancement Project* **Project Area**		
		Project No. 20-1029	Created By: JCI	**Figure 3**

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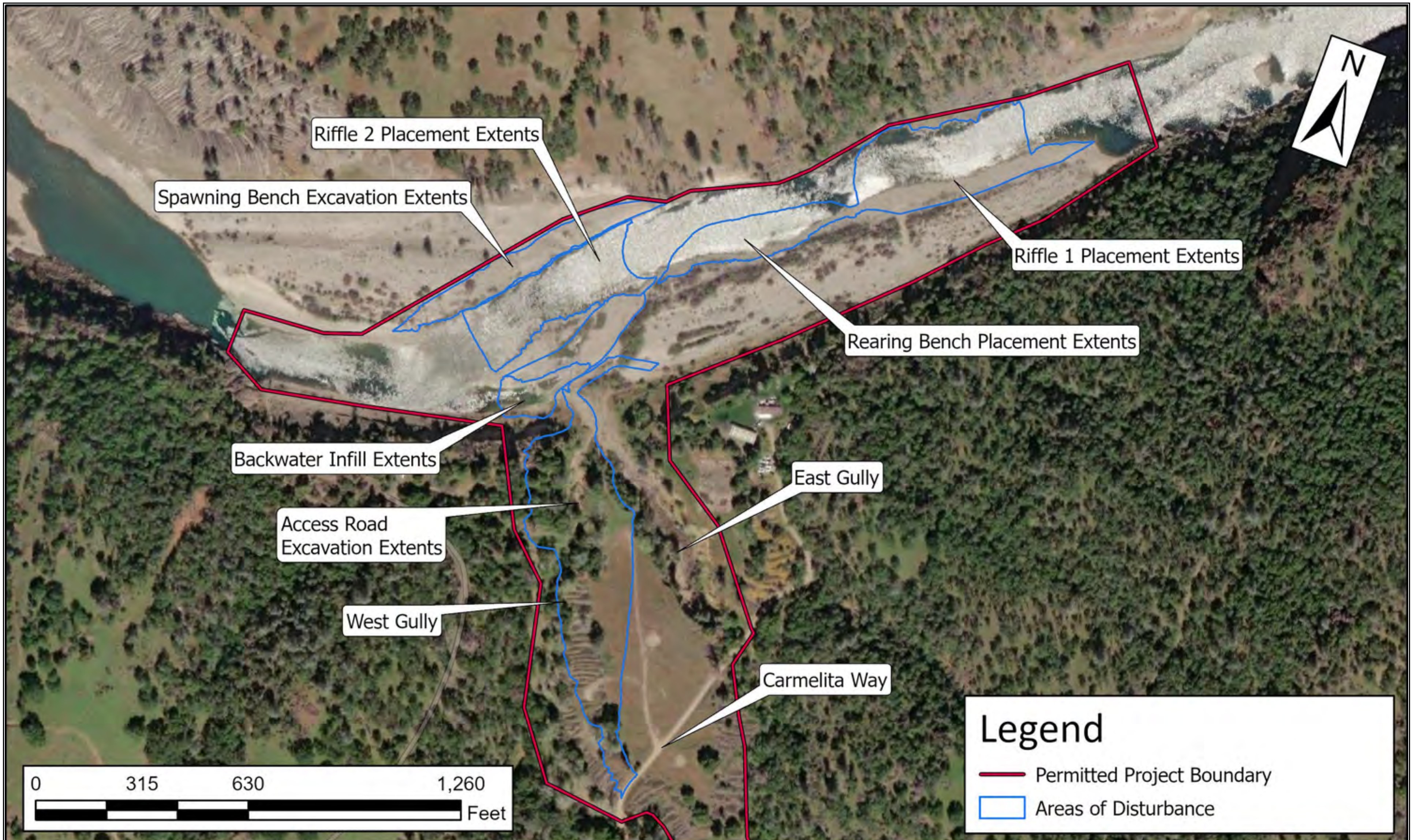

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		Project No. 20-1029	Created By: JCI	**Figure 4**

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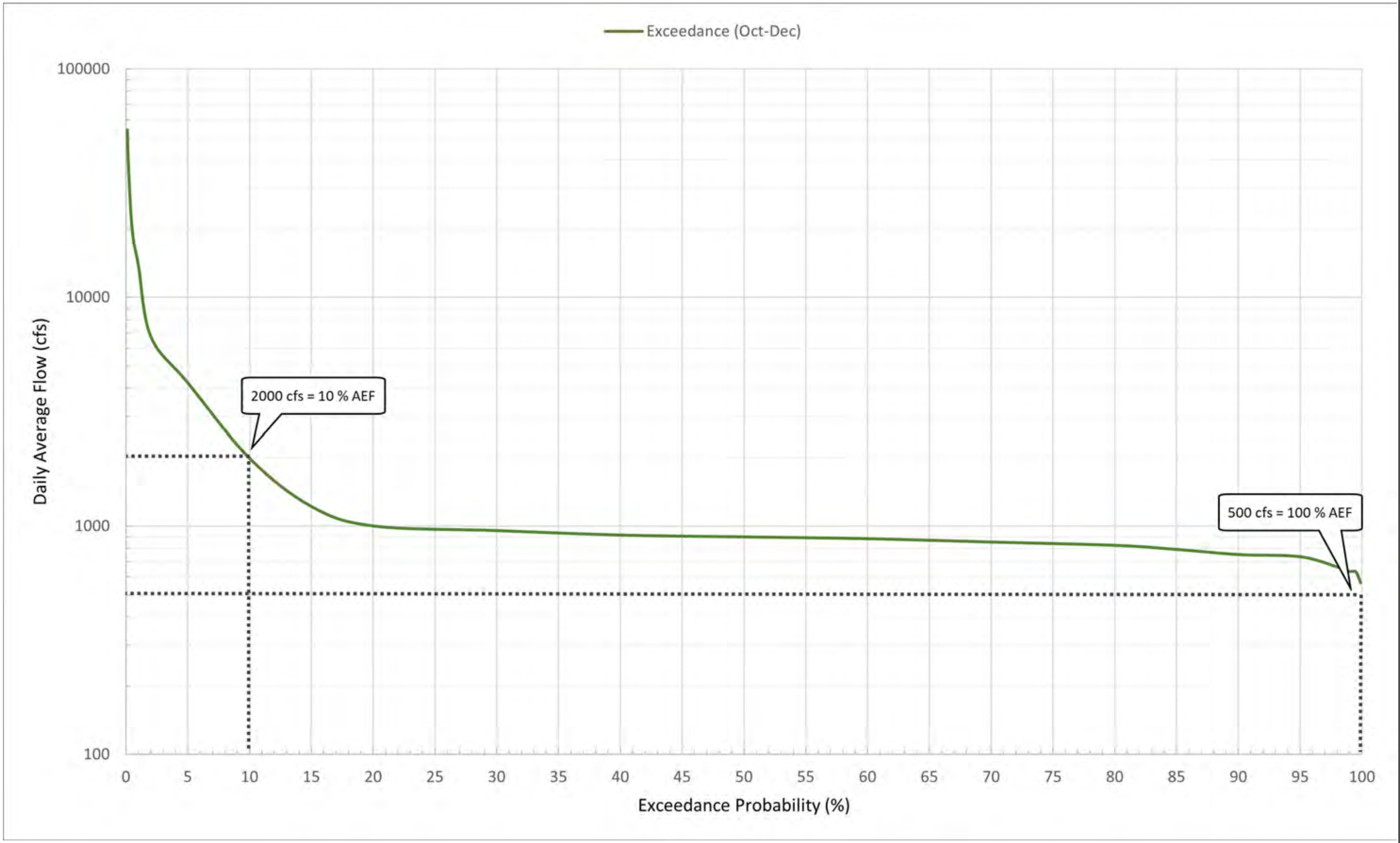
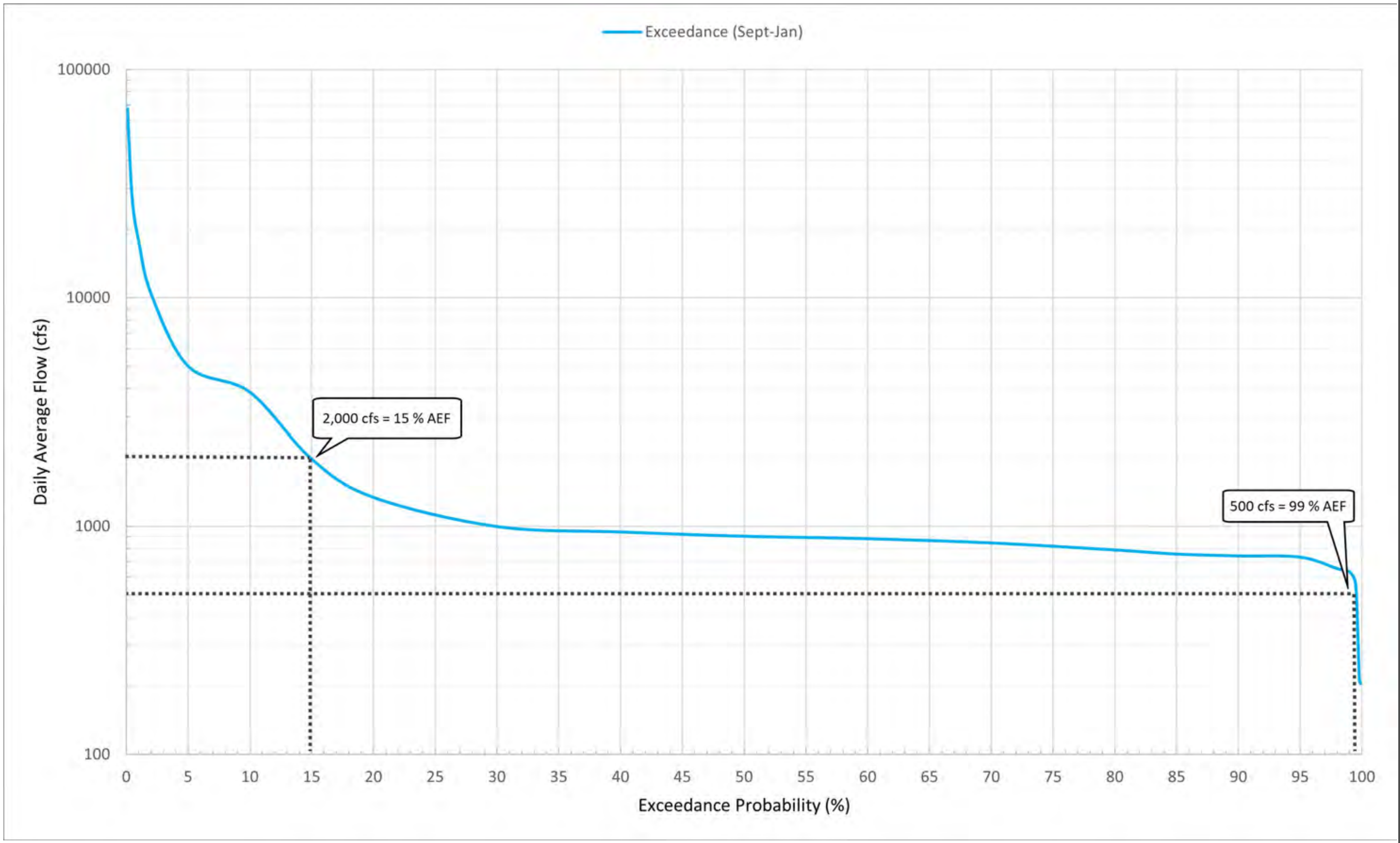
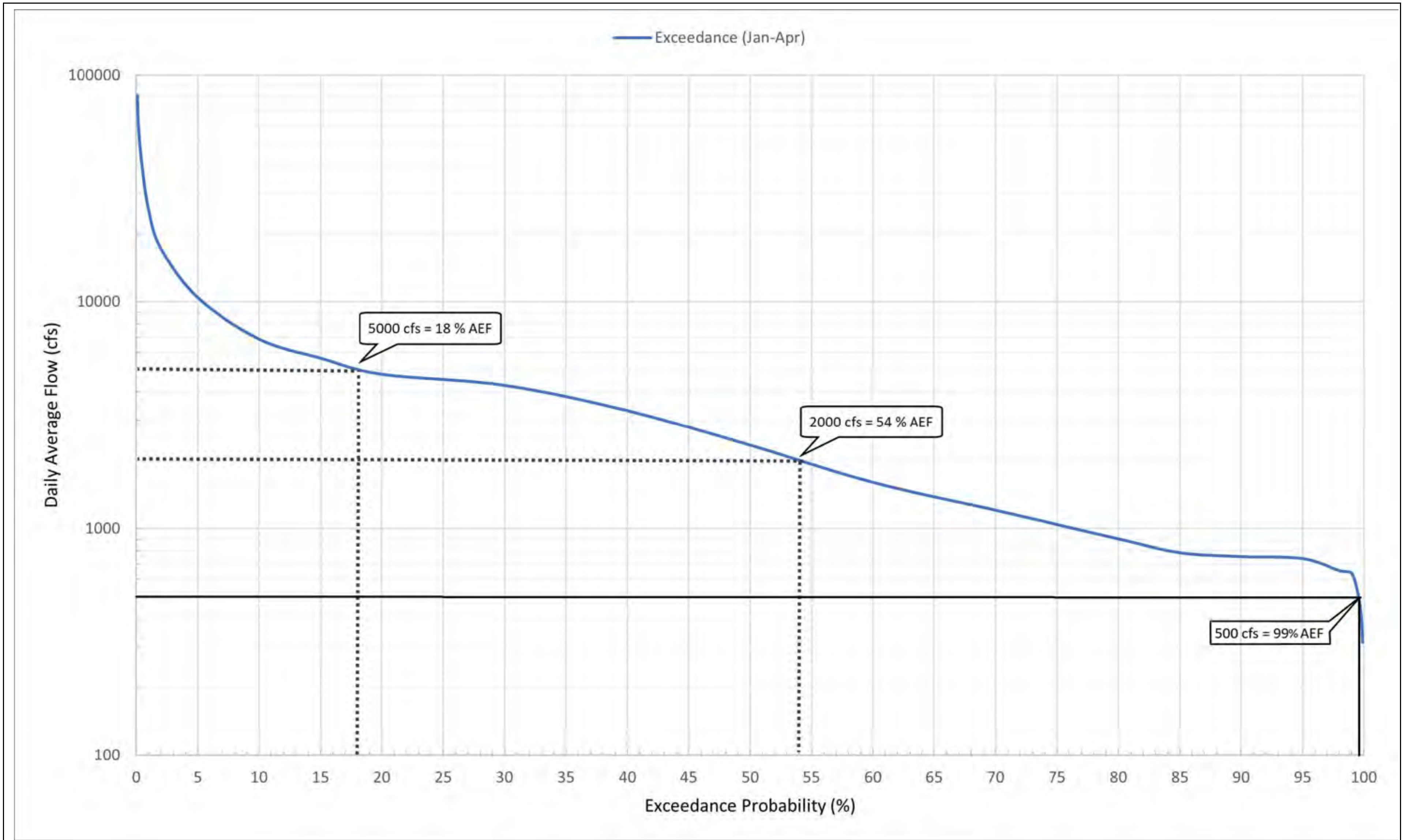


Notes: Exceedance curves calculated over the interval from October through December, typical of Fall-Run Chinook Salmon spawning.	cbec	*Upper Rose Bar Habitat Enhancement Project* **Flow Exceedance Probability for Fall-Run Chinook Salmon Spawning Period**		
		Project No. 20-1029	Created By: GS/JCI	**Figure 5**



Notes: Exceedance curves calculated over the interval from September through January, typical of Spring-Run Chinook Salmon spawning.	cbec	*Upper Rose Bar Habitat Enhancement Project* **Flow Exceedance Probability for Spring-Run Chinook Salmon Spawning Period**		
		Project No. 20-1029	Created By: GS/JCI	**Figure 6**



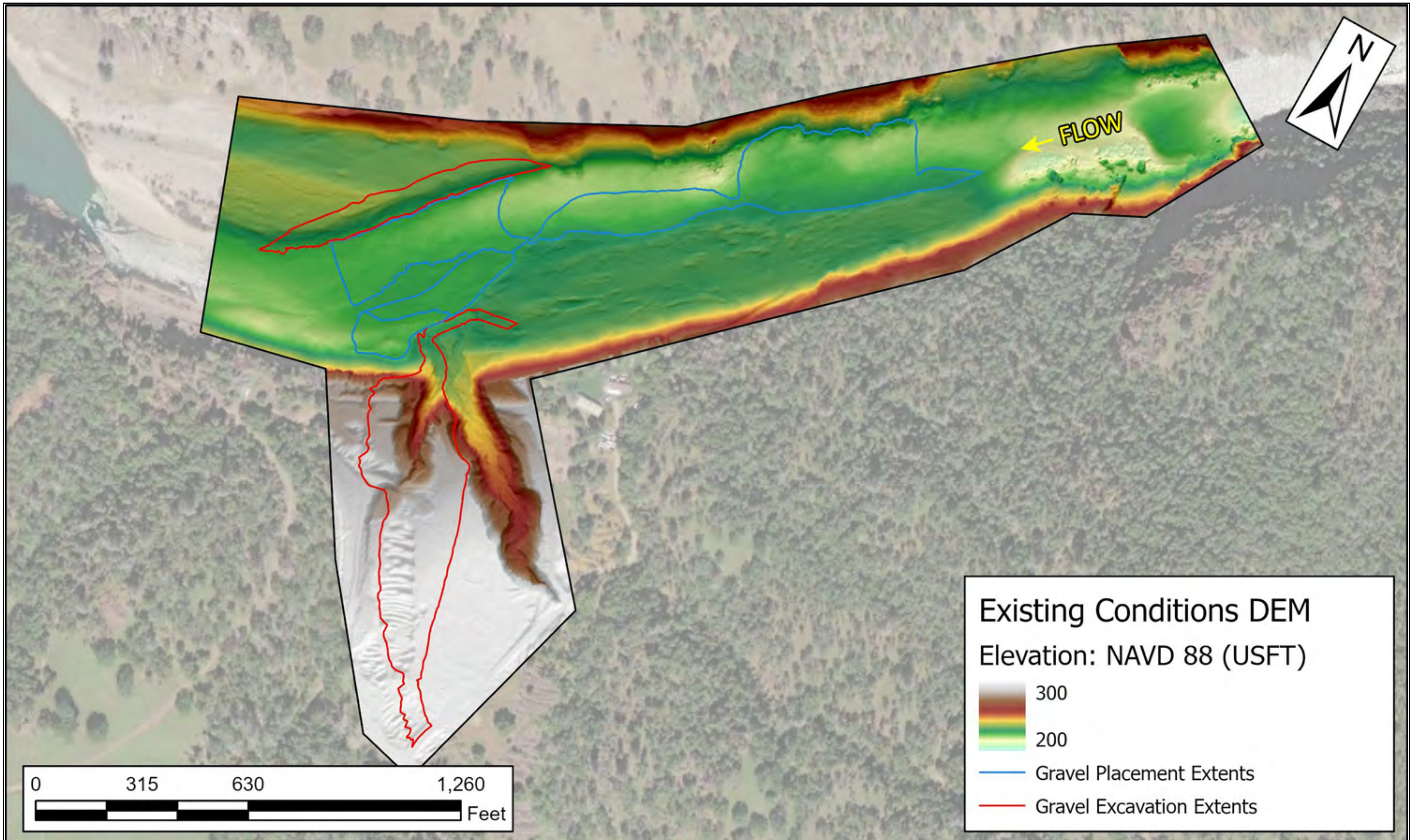
Notes:
Exceedance curves calculated over the interval from January through April, typical of Steelhead spawning.

cbec

Upper Rose Bar Habitat Enhancement Project

Flow Exceedance Probability for Steelhead Spawning Period

Project No. 20-1029	Created By: GS/JCI	**Figure 7**



Notes:
Image Source: Esri

cbec

Upper Rose Bar Habitat Enhancement Project

Existing Conditions DEM

Project No. 20-1029 | Created By: JCI | **Figure 8**

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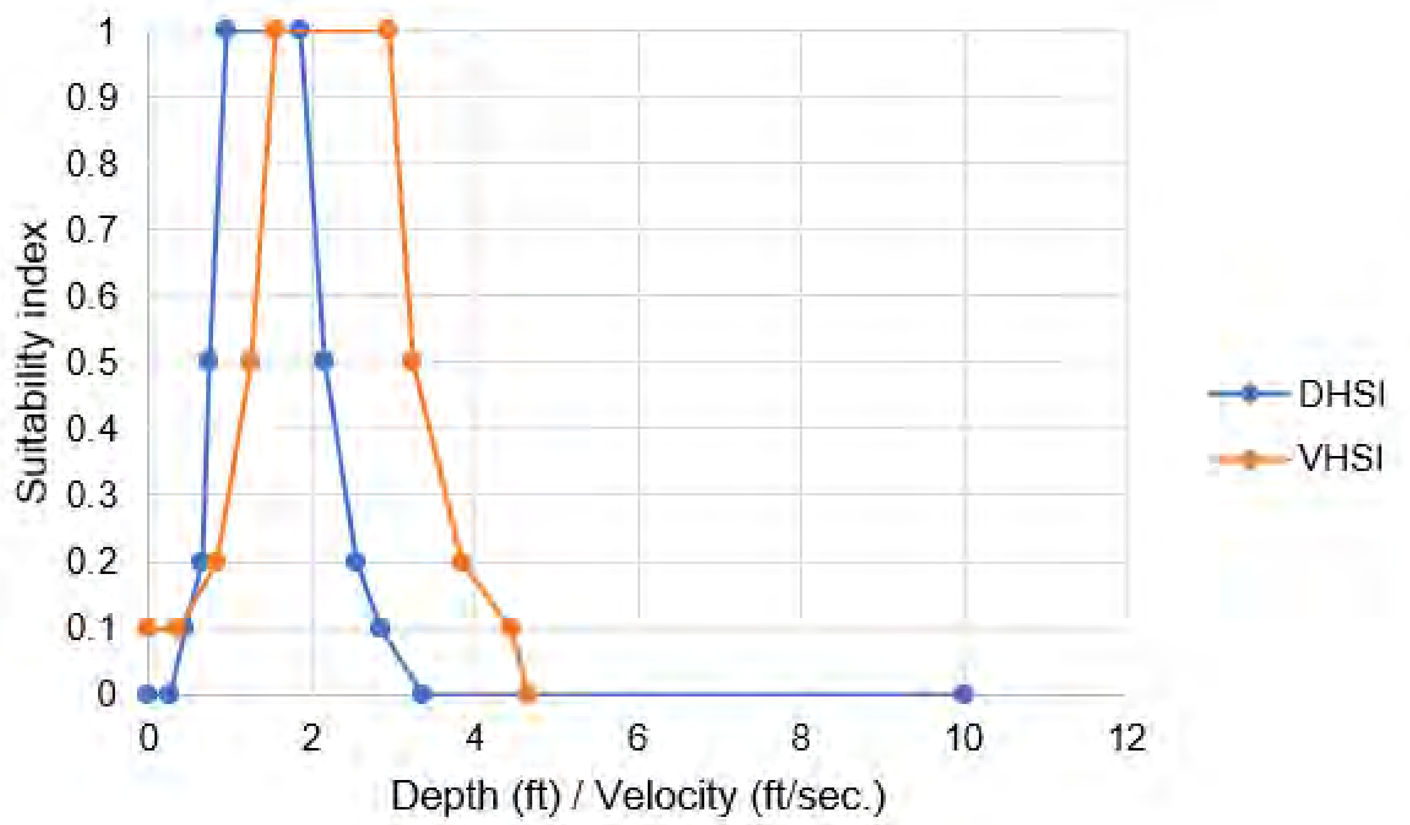
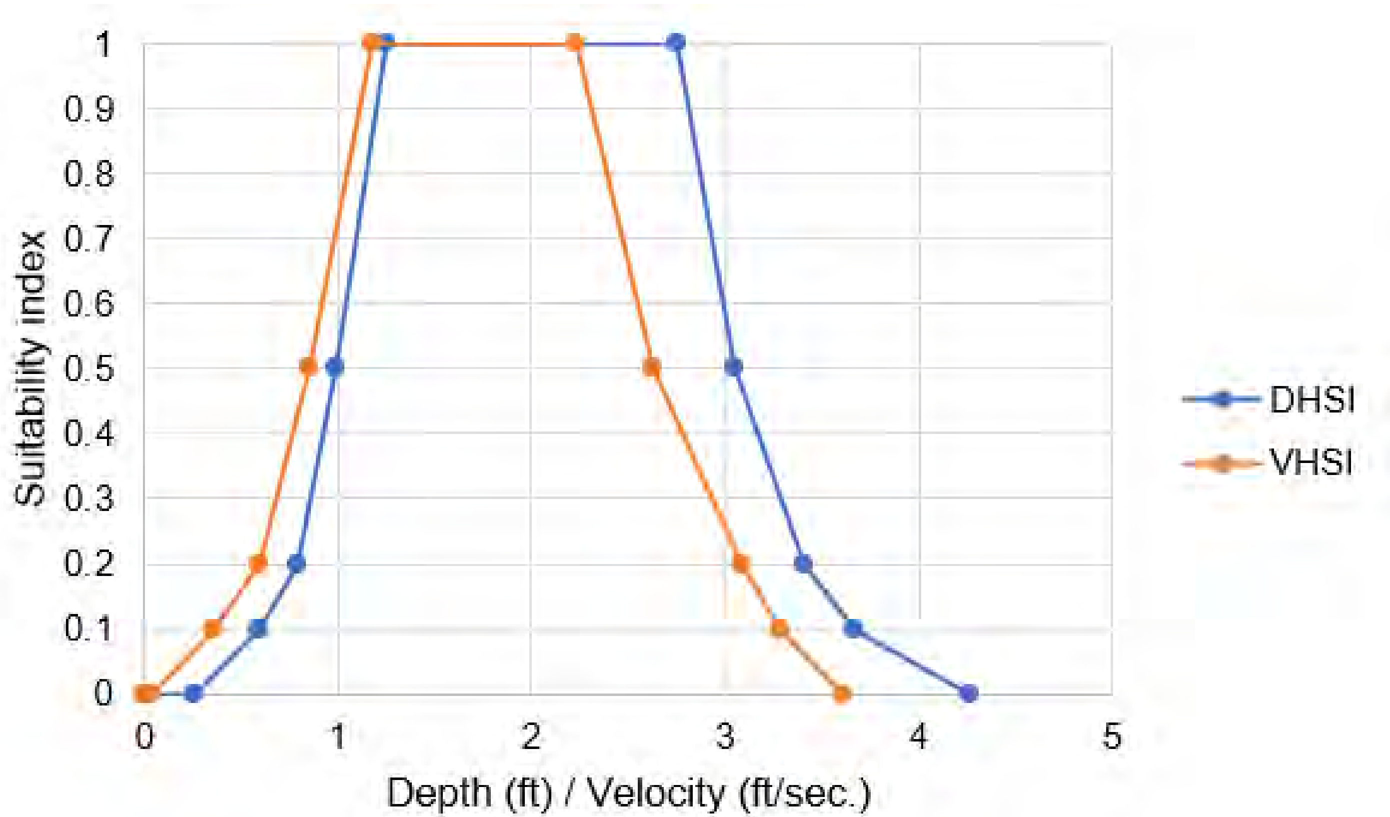
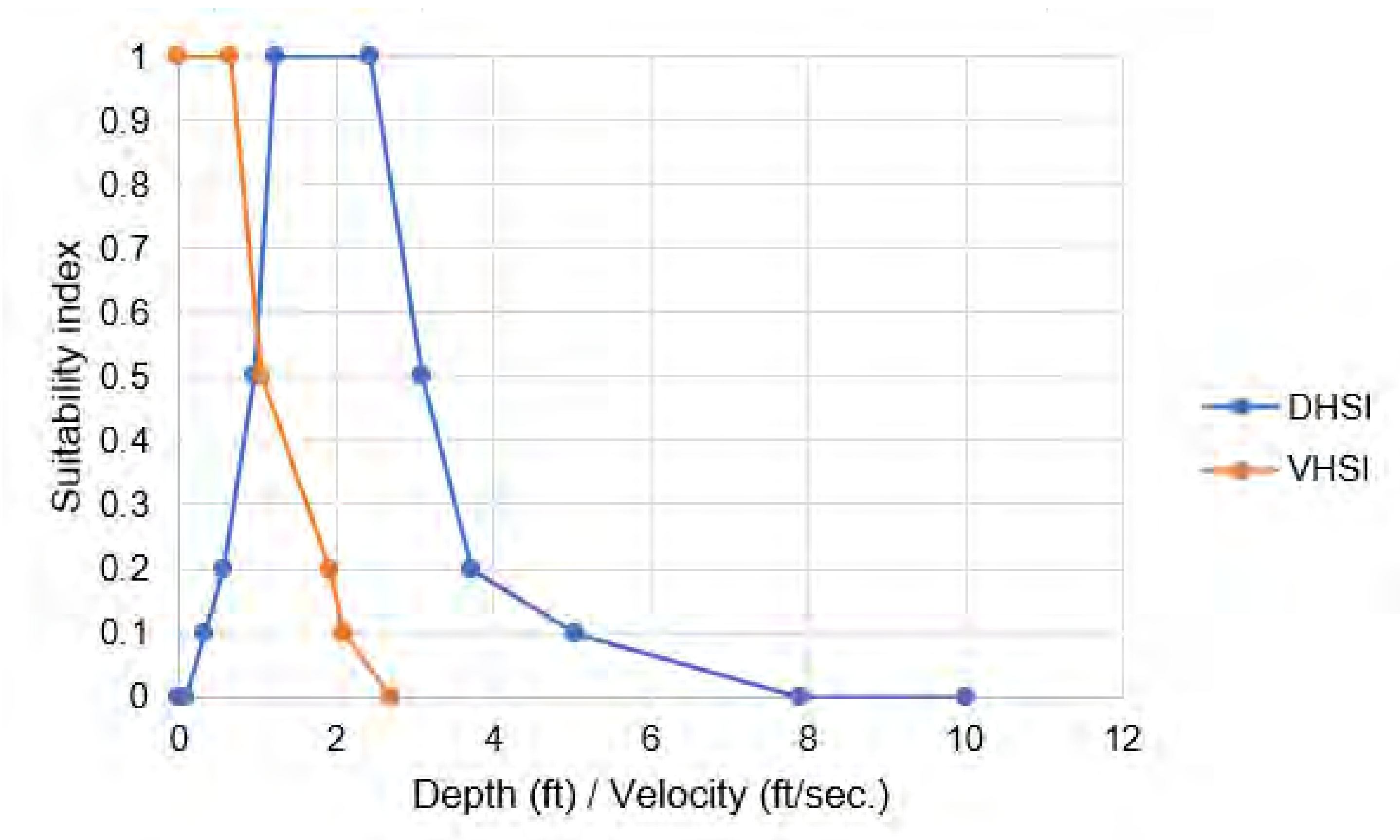


Notes: Beak Consultants, 1989. Bioverified by Pasternack et al. 2014.	cbec	*Upper Rose Bar Habitat Enhancement Project* **Depth and Velocity Chinook Salmon Spawning Habitat Suitability Indices**		
		Project No. 20-1029	Created By: GS/JCI	**Figure 9**



Notes: Beak Consultants, 1989. Bioverified by Kammel et al. 2016.	cbec	*Upper Rose Bar Habitat Enhancement Project* **Depth and Velocity Steelhead Spawning Habitat Suitability Indices**		
		Project No. 20-1029	Created By: GS/JCI	**Figure 10**

D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_HSICurves.docx
6/16/2022

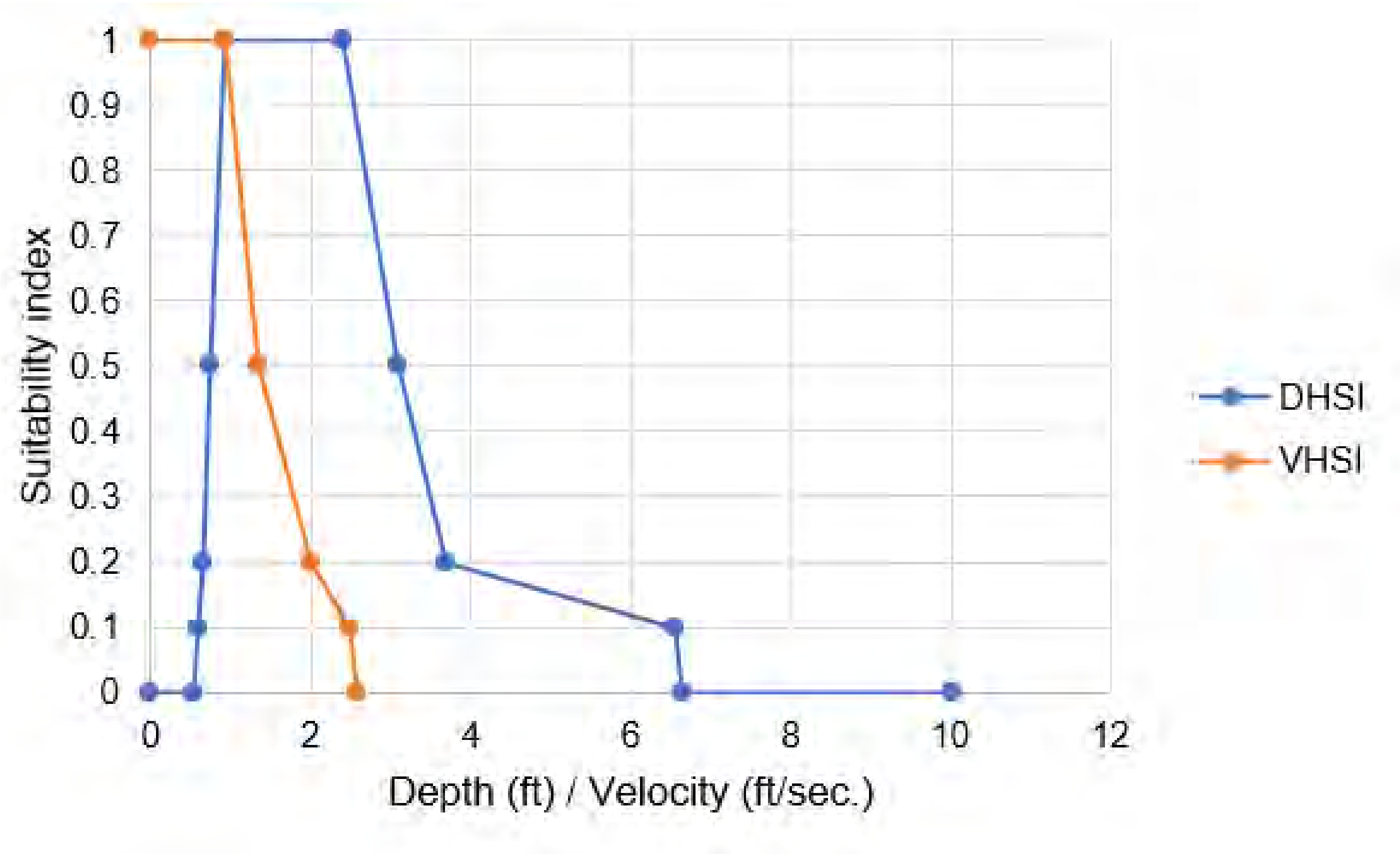


Notes:
Source: Moniz and Pasternack, 2019.

Upper Rose Bar Habitat Enhancement Project

Depth and Velocity Chinook Salmon Rearing Habitat Suitability Indices

Project No. 20-1029	Created By: GS/JCI	**Figure 11**



Notes:
Source: Moniz and Pasternack, 2019.

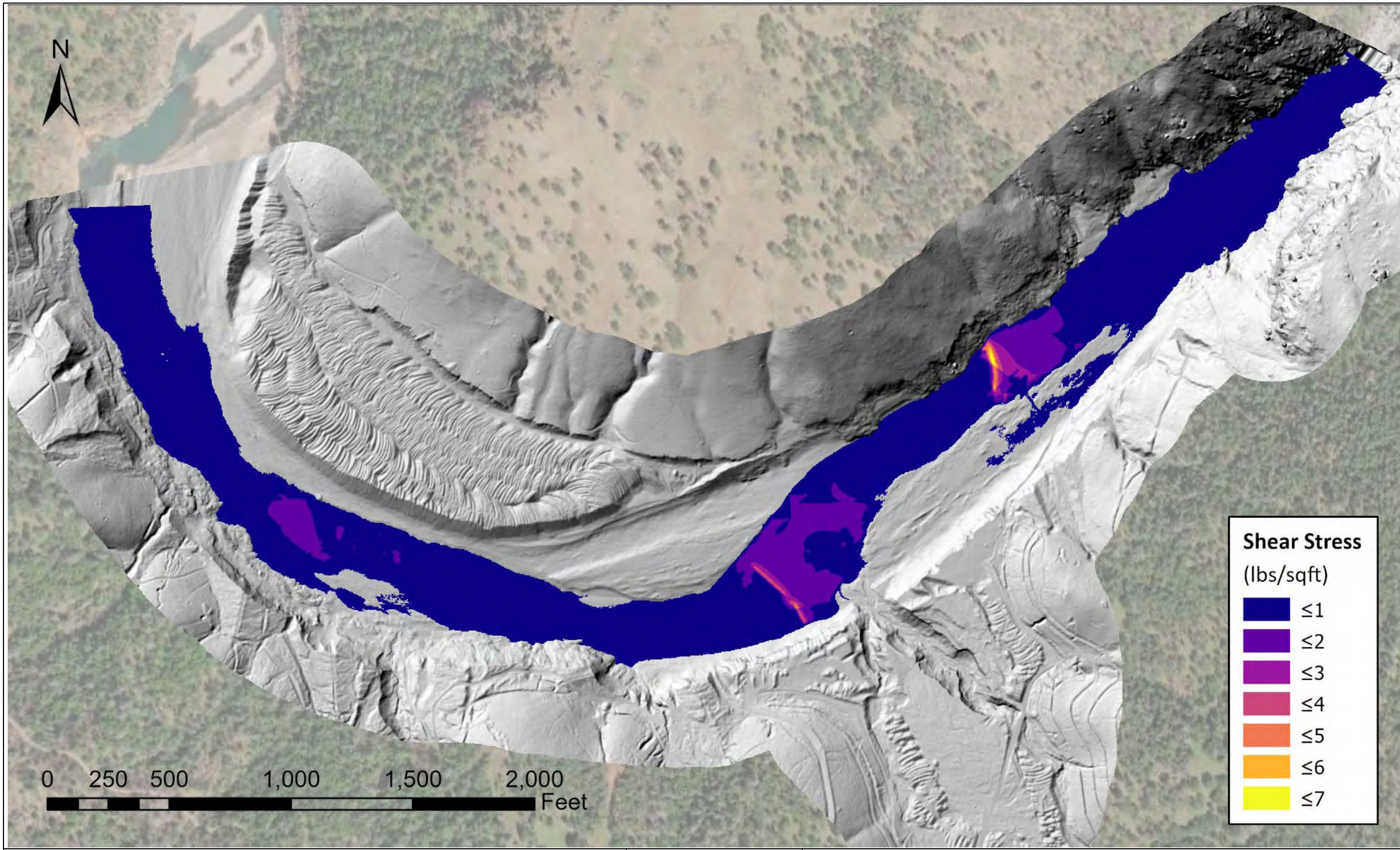
cbec

Upper Rose Bar Habitat Enhancement Project

Depth and Velocity Steelhead Rearing Habitat Suitability Indices

Project No. 20-1029	Created By: GS/JCI	**Figure 12**

D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_HSICurves.docx
6/16/2022



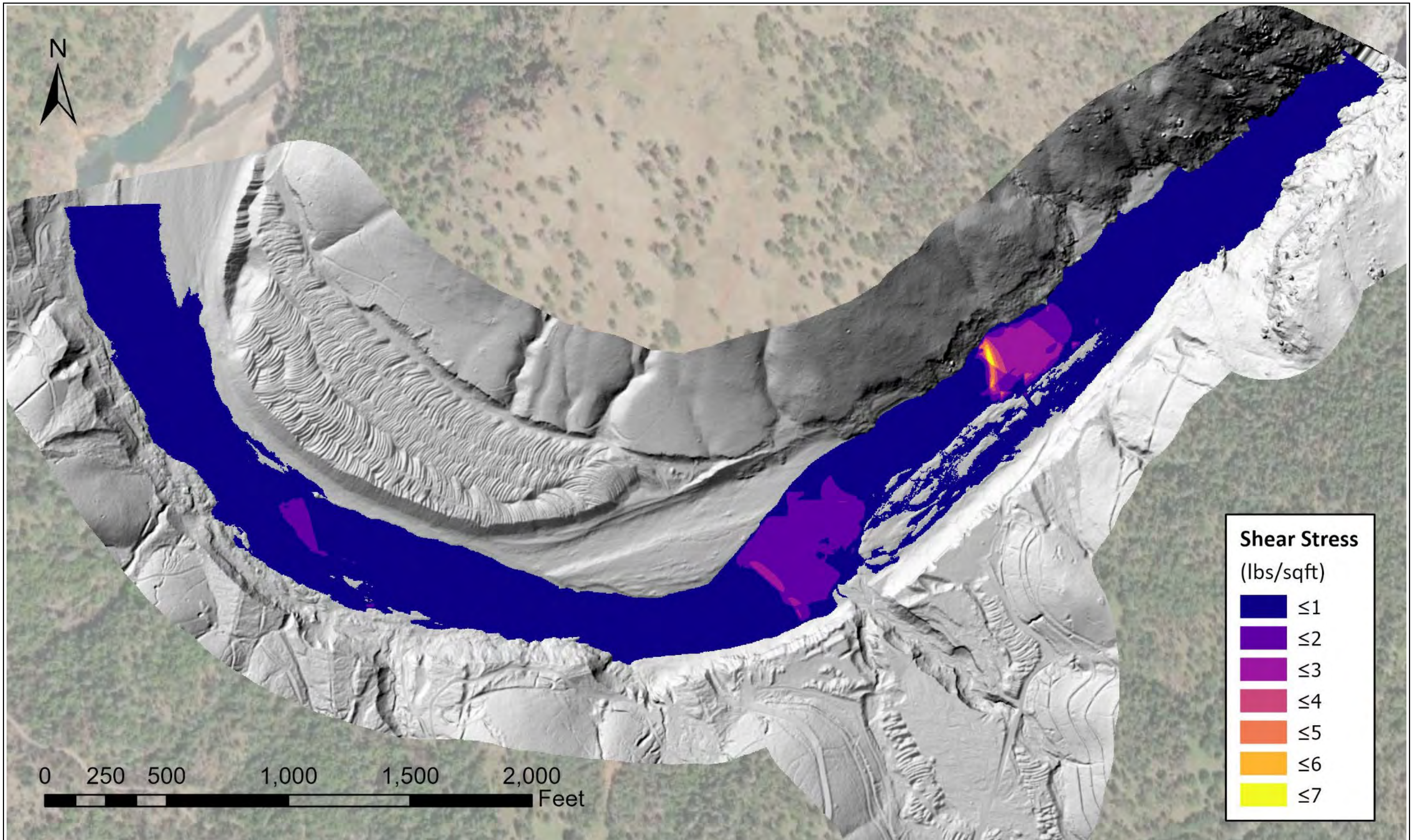
Notes:
Image Source: Esri

cbec

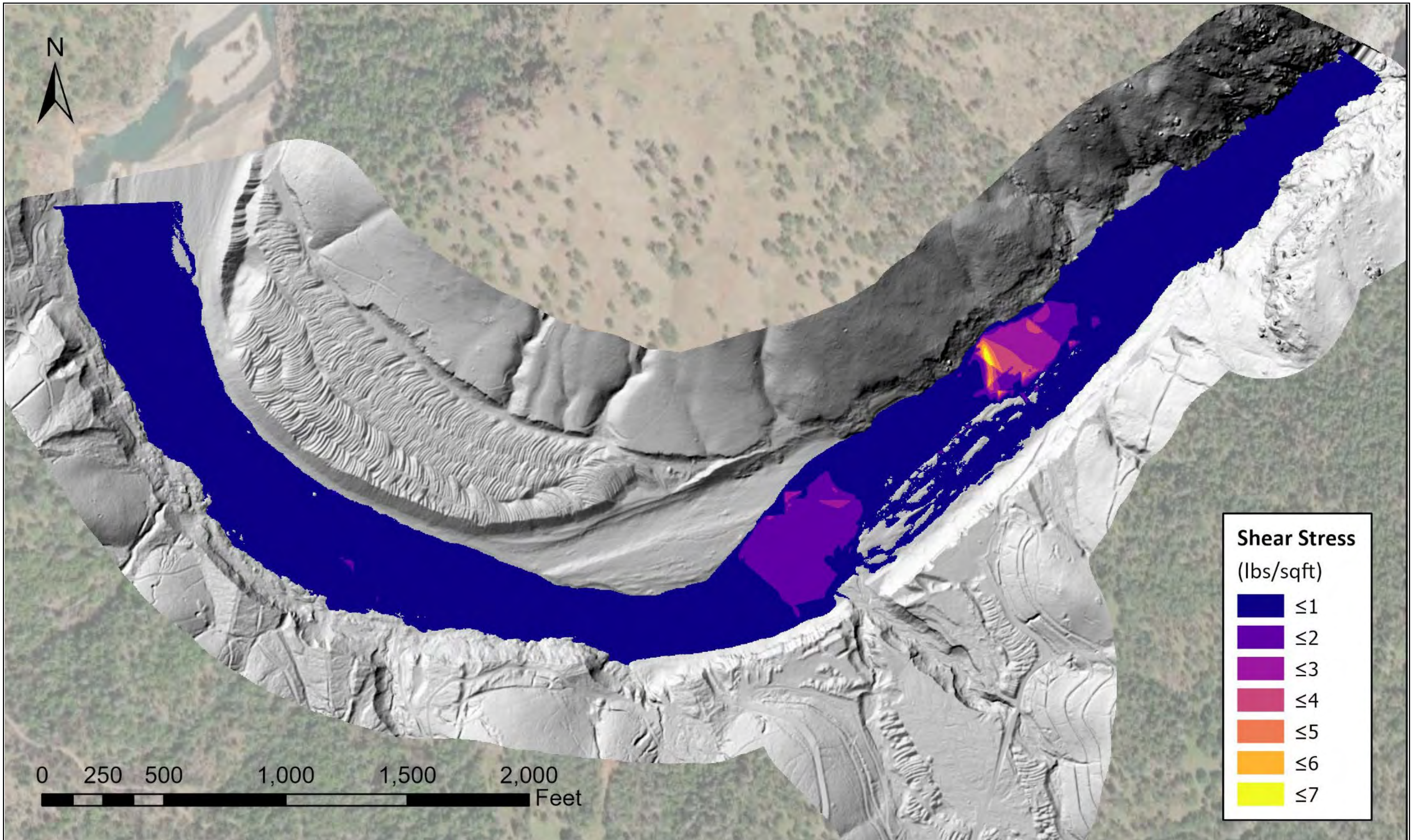
Upper Rose Bar Habitat Enhancement Project

Shear Stress at 5,000 cfs

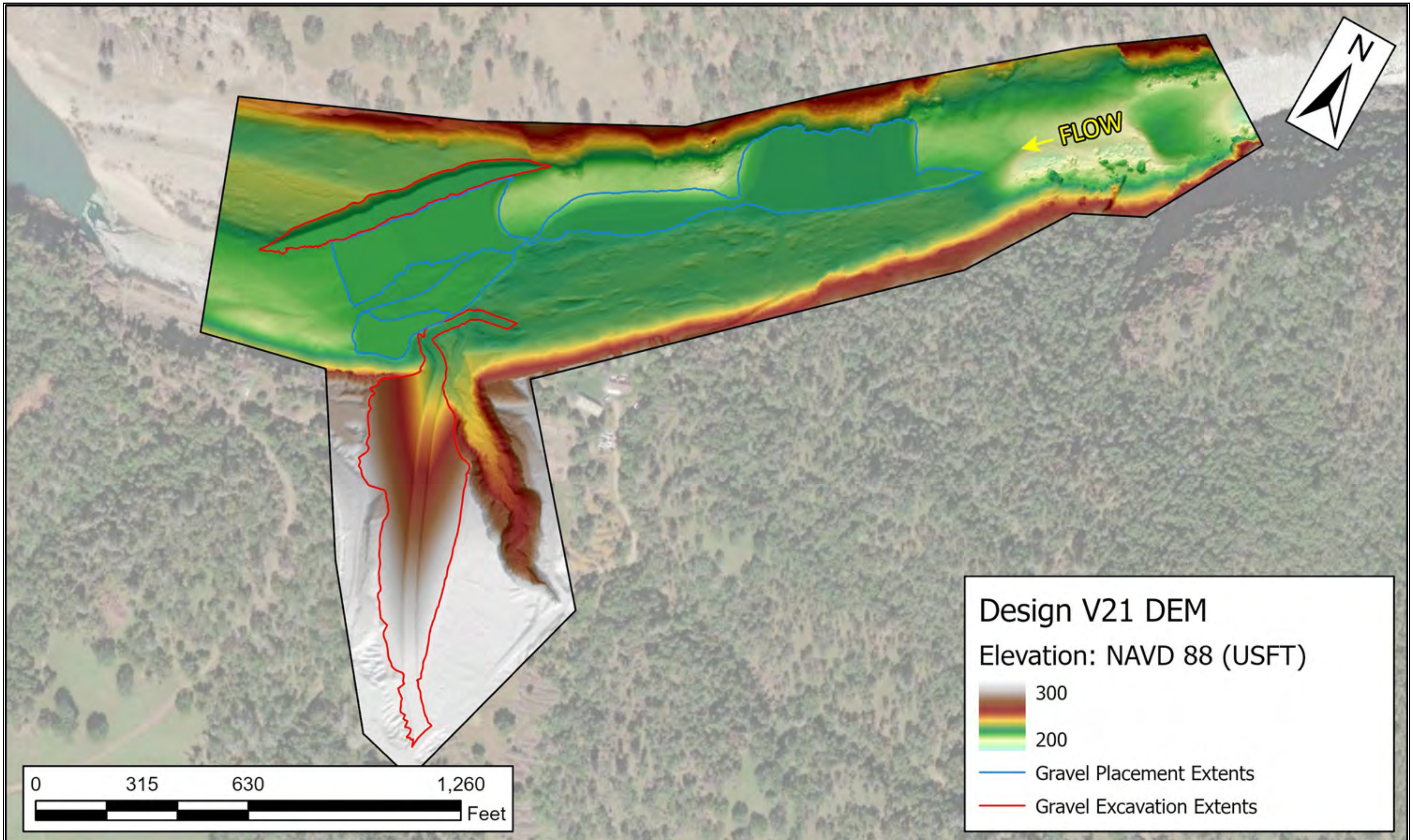
Project No. 20-1029	Created By: GS	**Figure 13**



Notes: Image Source: Esri	cbec	*Upper Rose Bar Habitat Enhancement Project* **Sheer Stress at 7,000 cfs**		
		Project No. 20-1029	Created By: GS	**Figure 14**



Notes: Image Source: Esri	cbec	*Upper Rose Bar Habitat Enhancement Project* **Shear Stress at 10,000 cfs**		
		Project No. 20-1029	Created By: GS	**Figure 15**



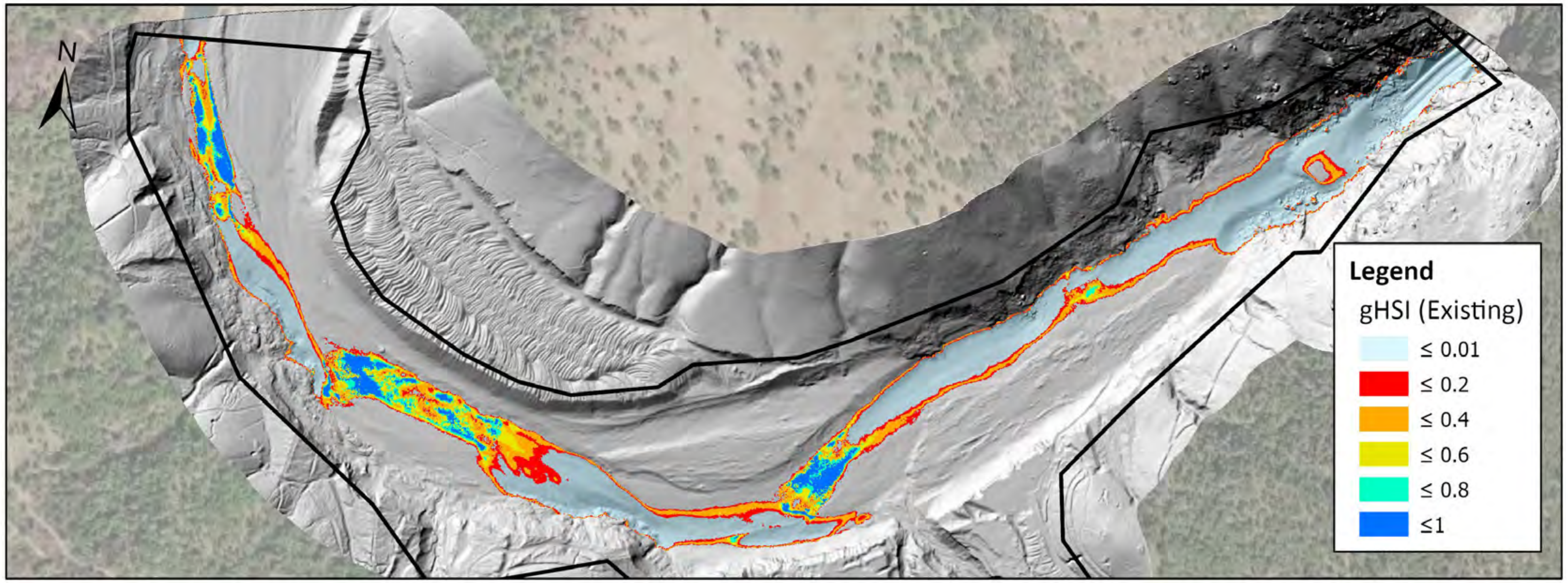
Notes:
Image Source: Esri

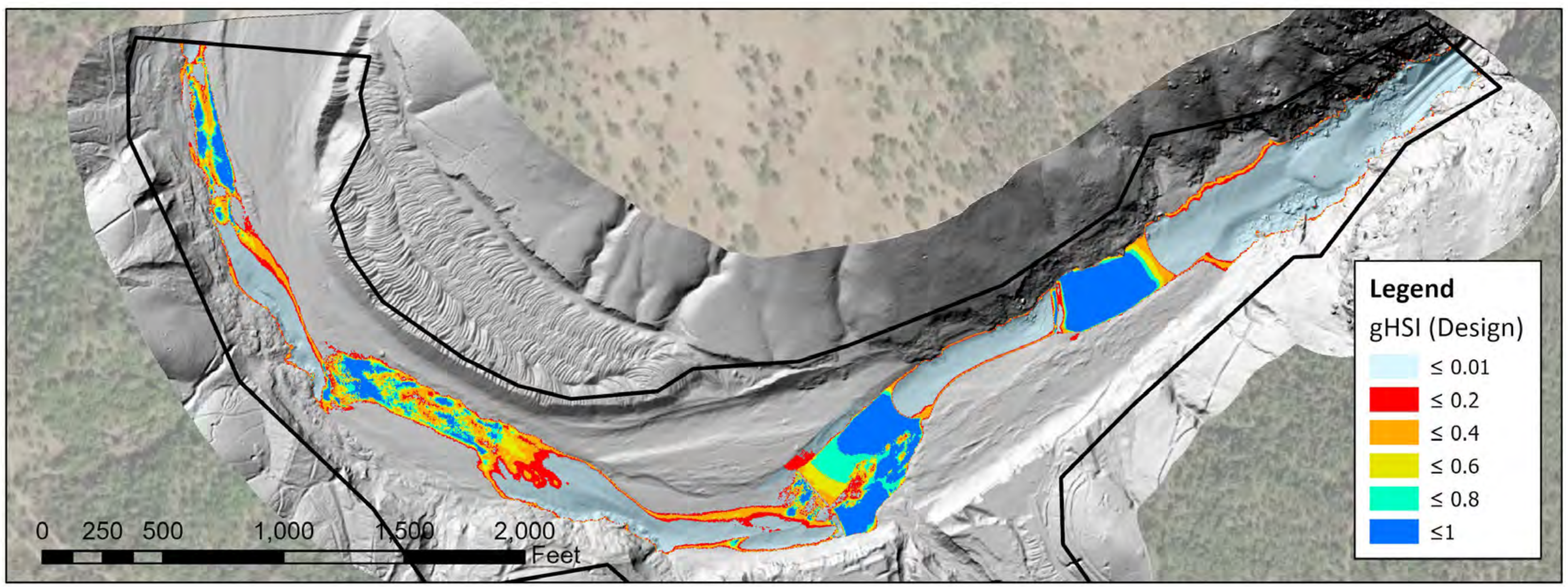
Upper Rose Bar Habitat Enhancement Project

Design Conditions DEM

Project No. 20-1029 | Created By: JCI | **Figure 16**

D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_BOD_AllFigures.docx
6/16/2022



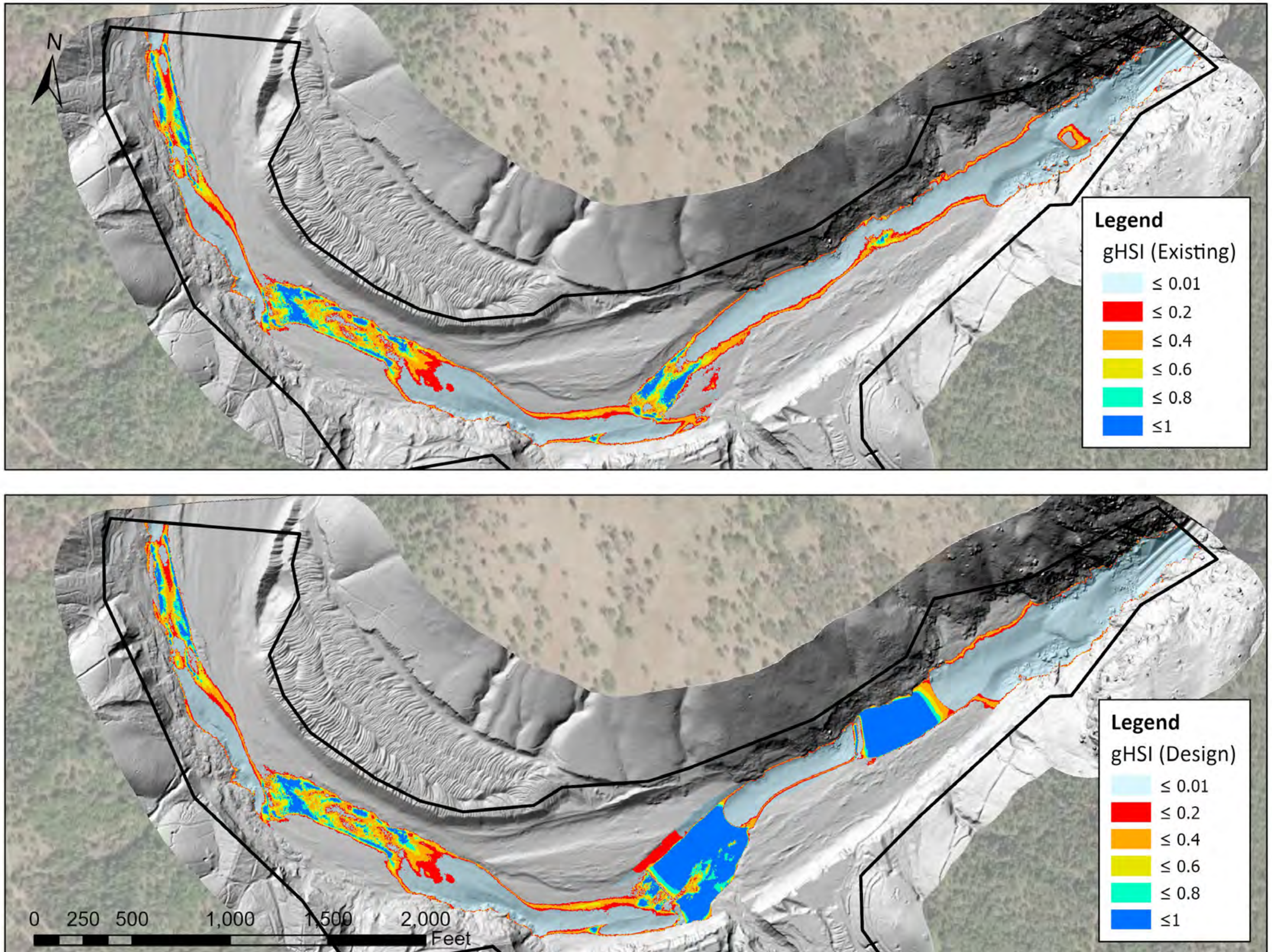


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 500 cfs

Project No. 20-1029 | Created By: GS/JCI | **Figure 17**

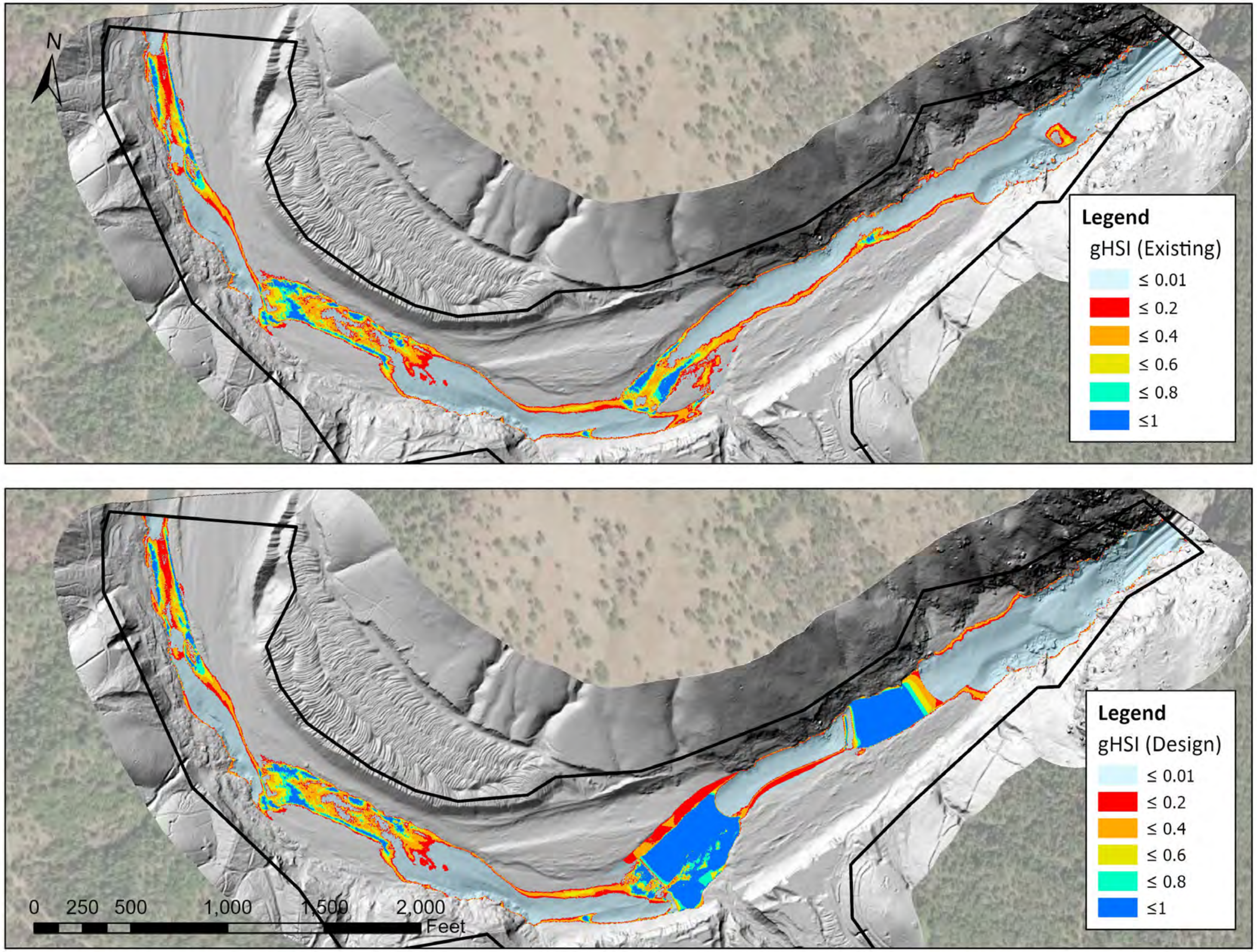


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 700 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 18**

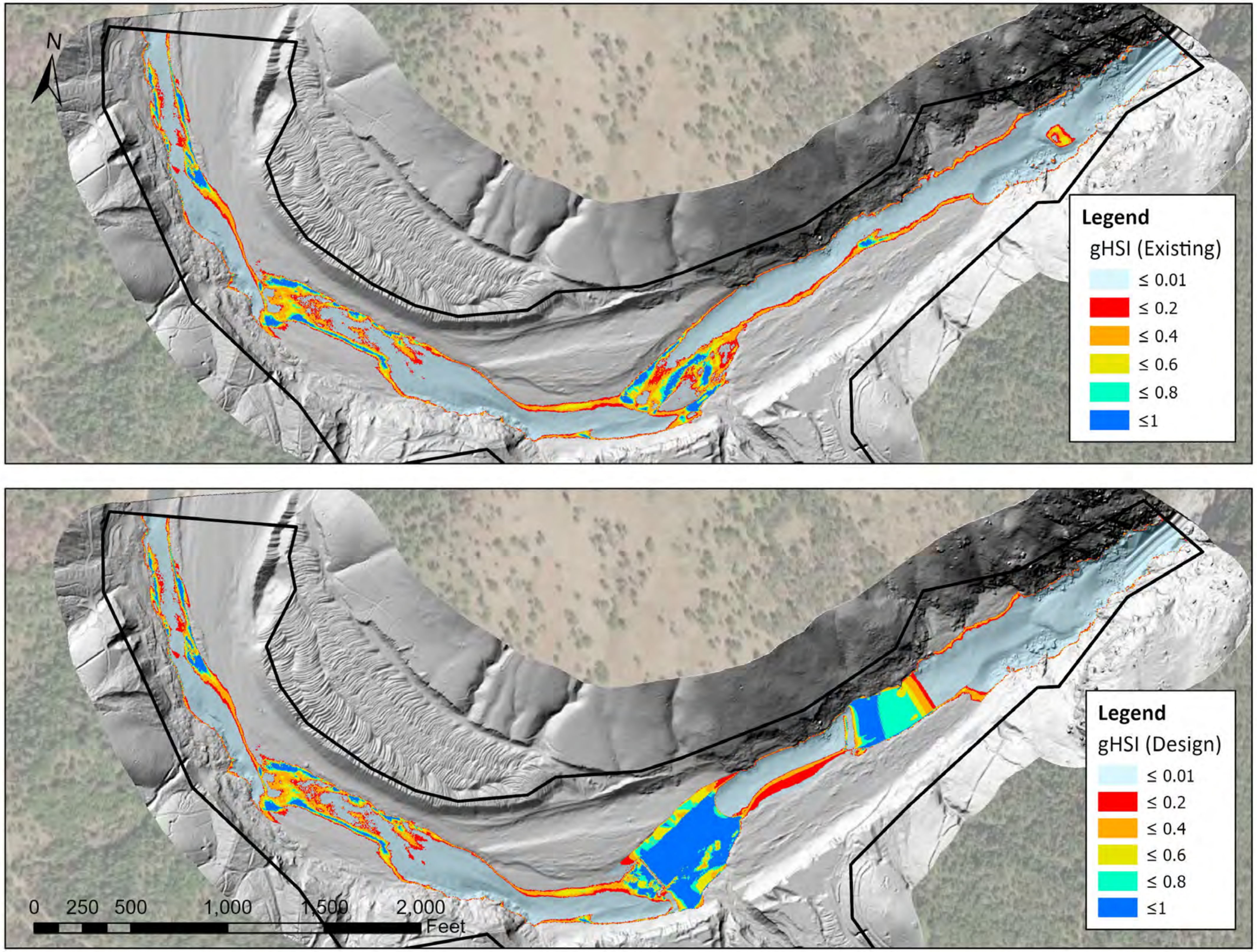


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 900 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 19**



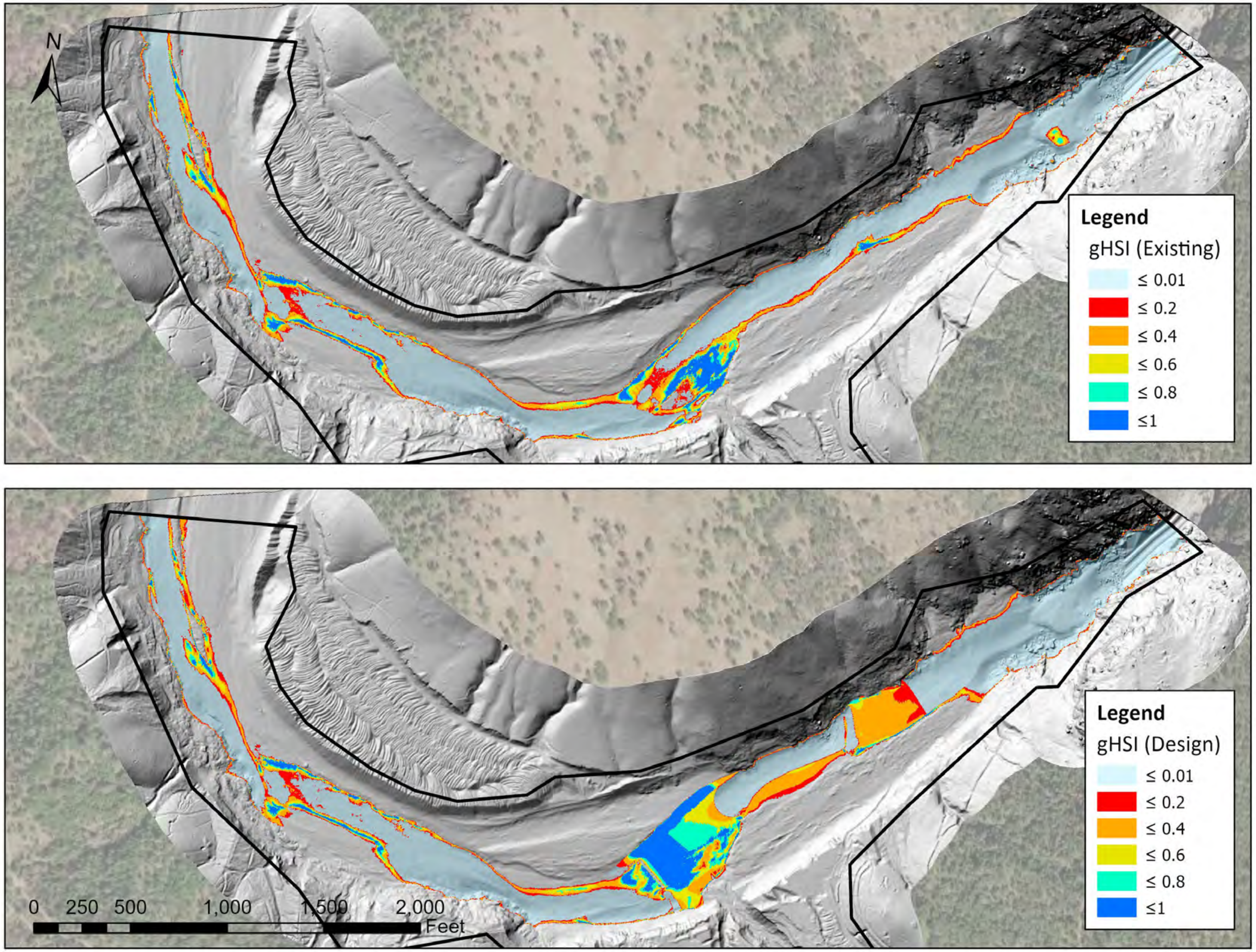
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 1,300 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 20**

D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_BOD_HSIFigures.docx
6/16/2022



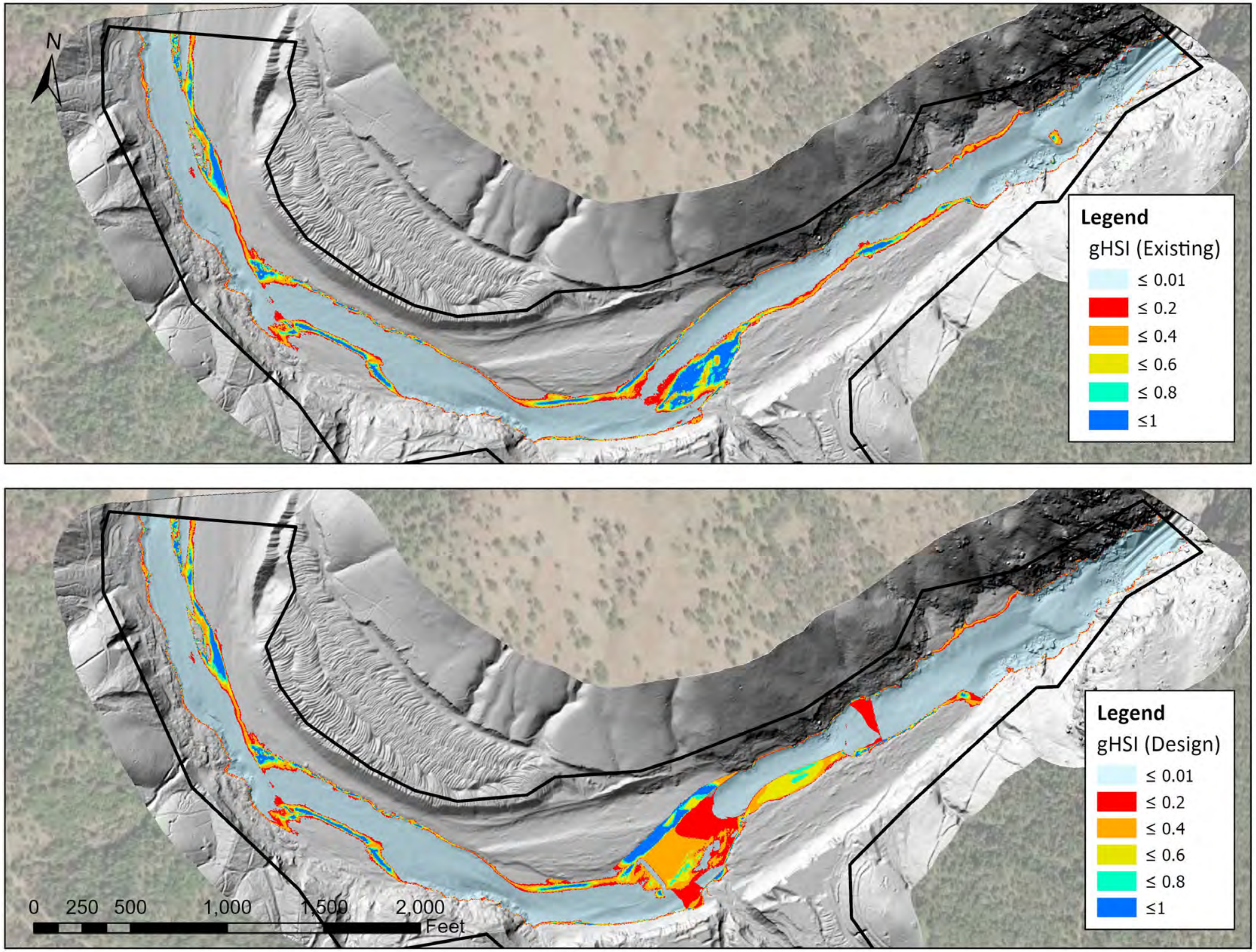
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 2,000 cfs

Project No. 20-1029 | Created By: GS/JCI | **Figure 21**

D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_BOD_HSIFigures.docx
6/16/2022

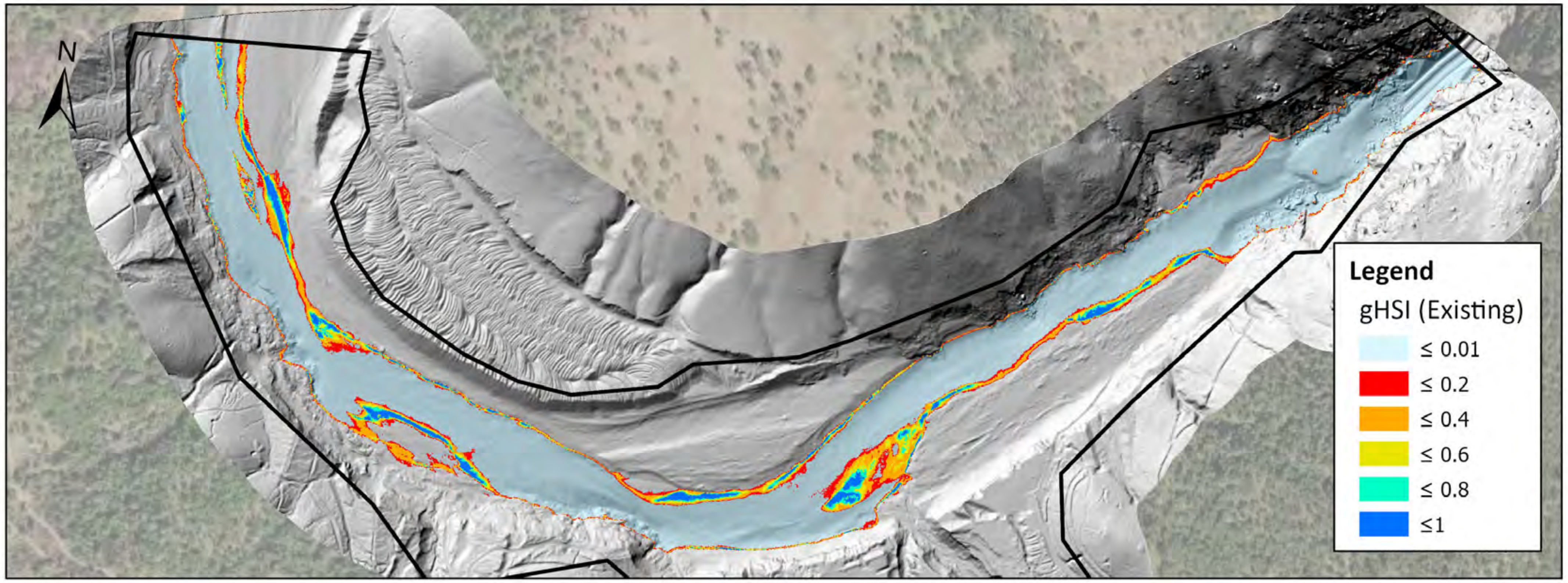


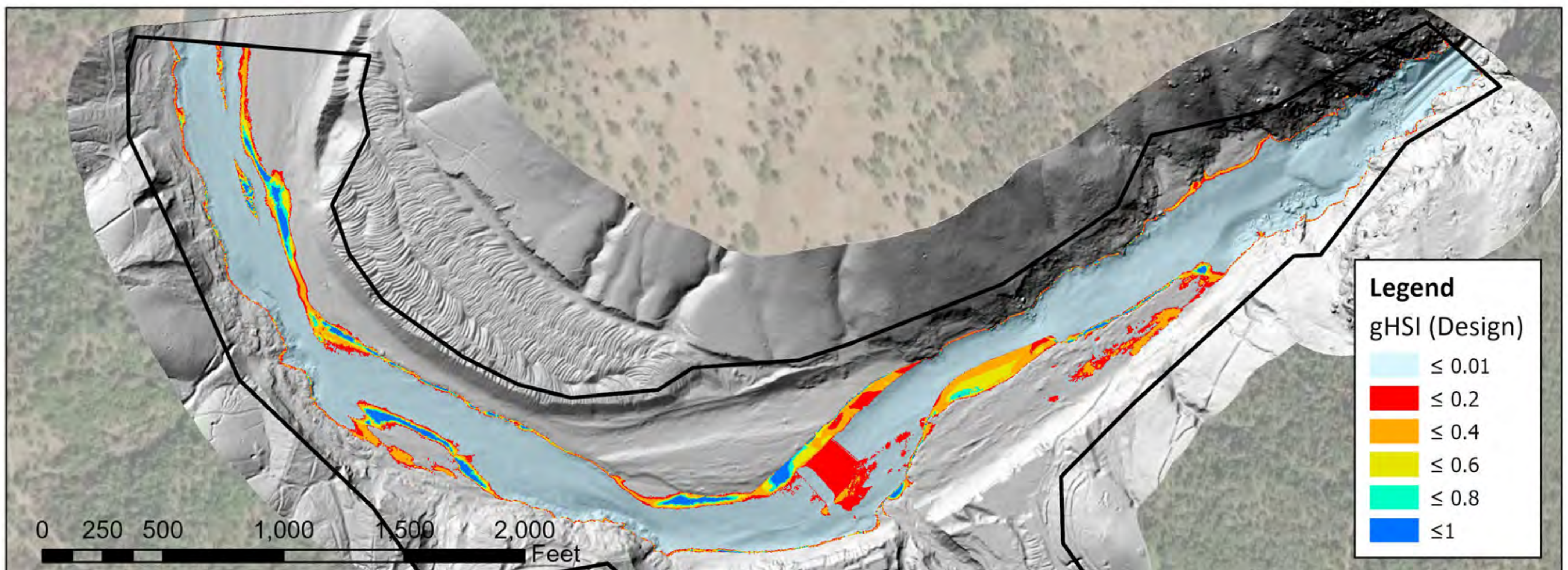
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 3,500 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 22**



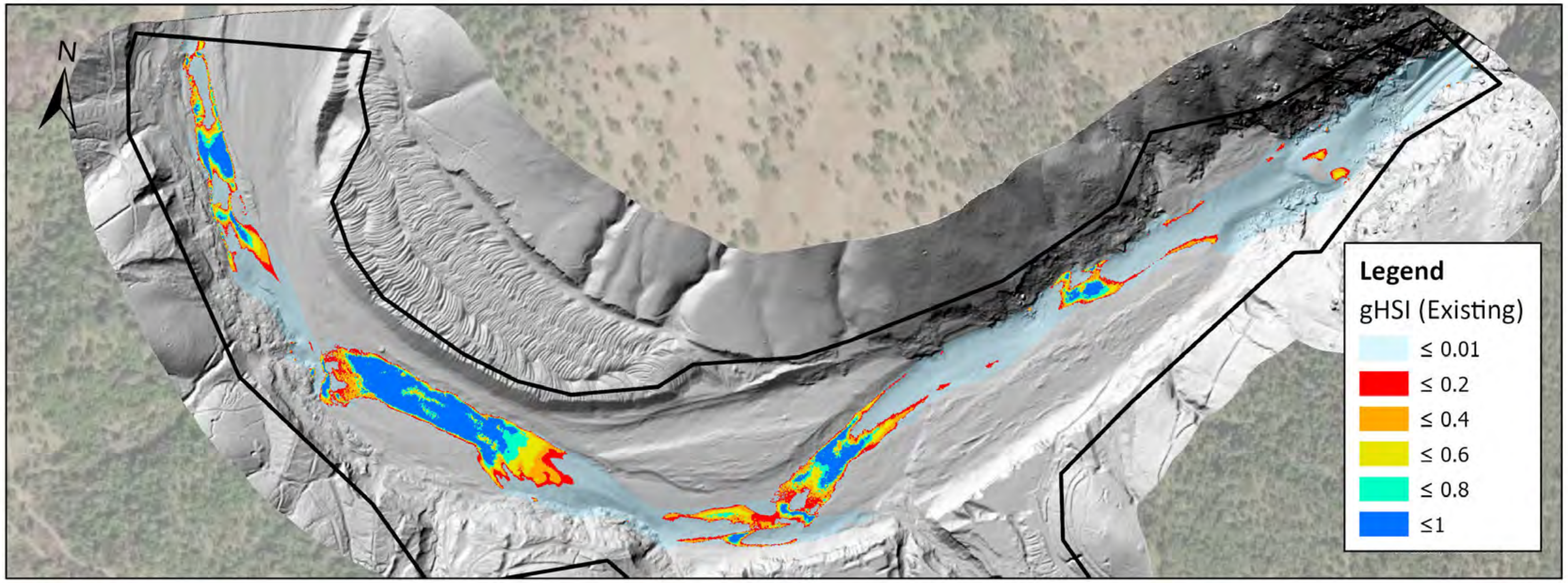


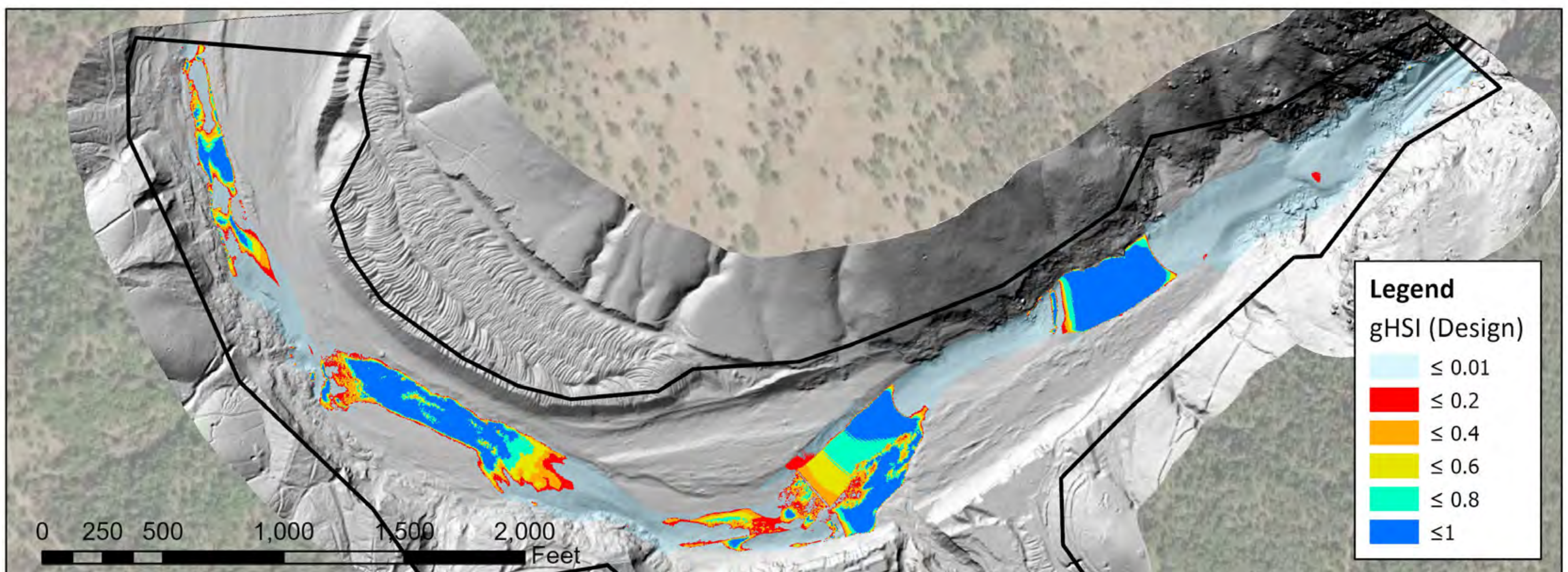
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Spawning HSI at 5,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 23**



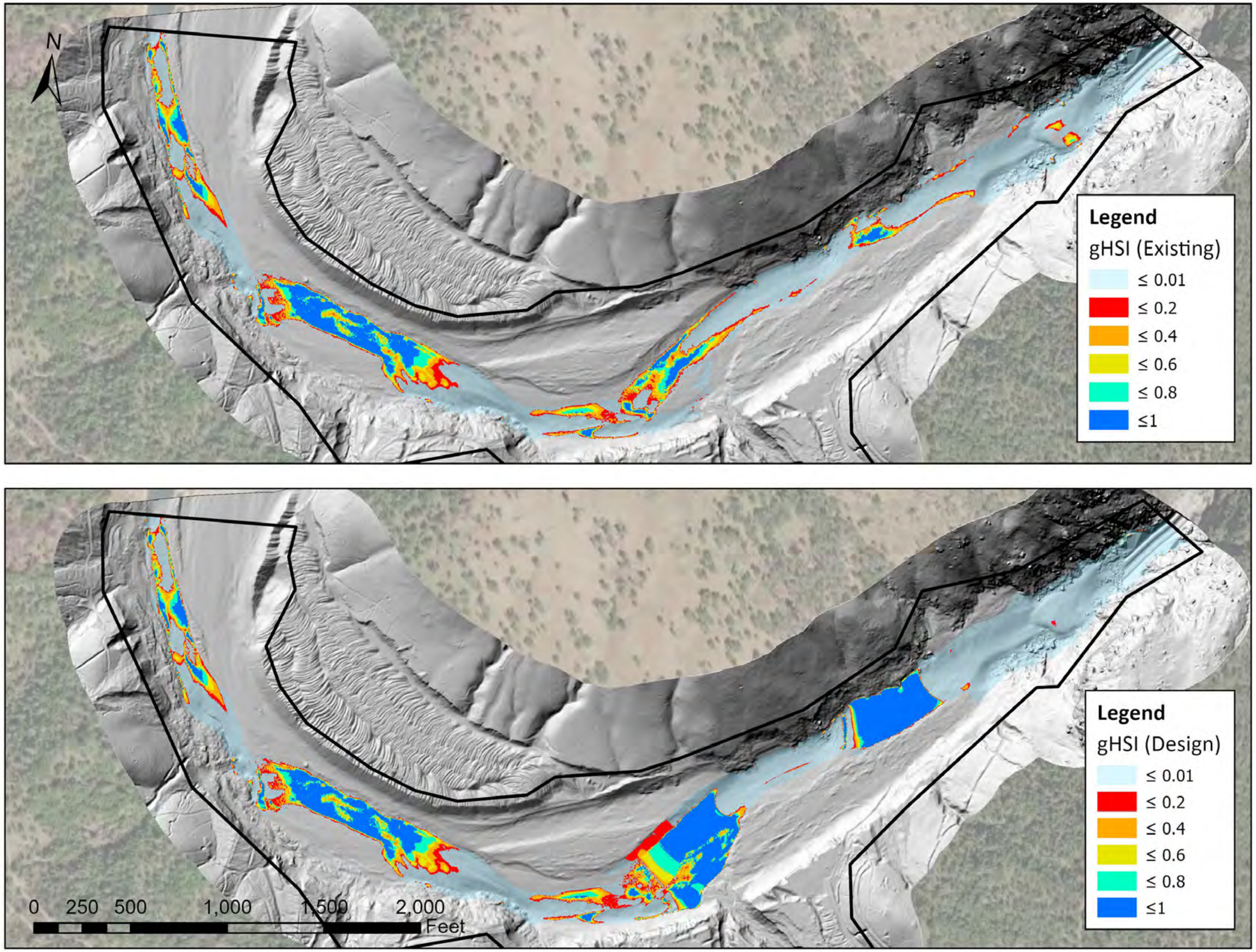


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Spawning HSI at 500 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 24**



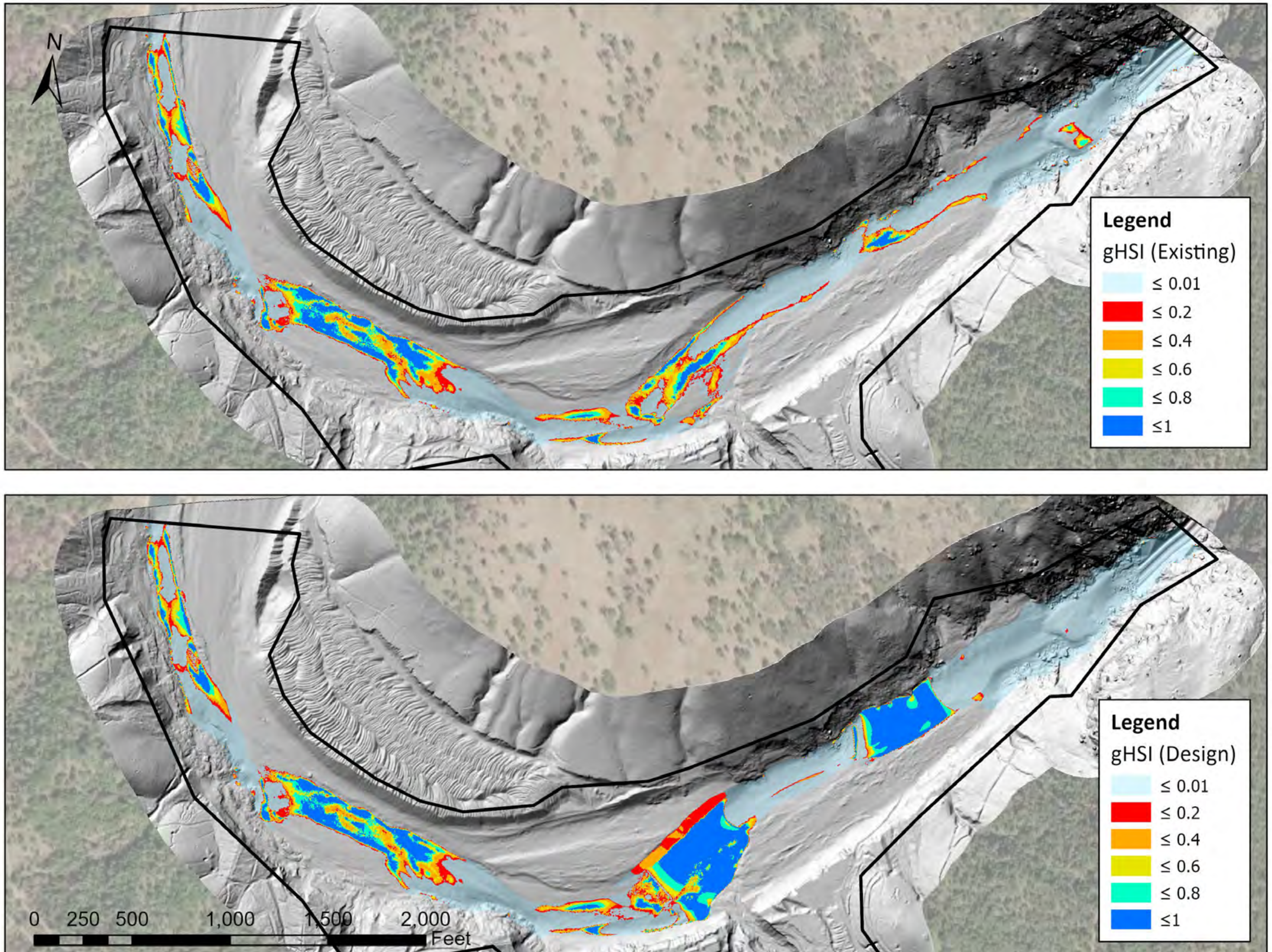
Notes:
Image Source: Esri

cbec

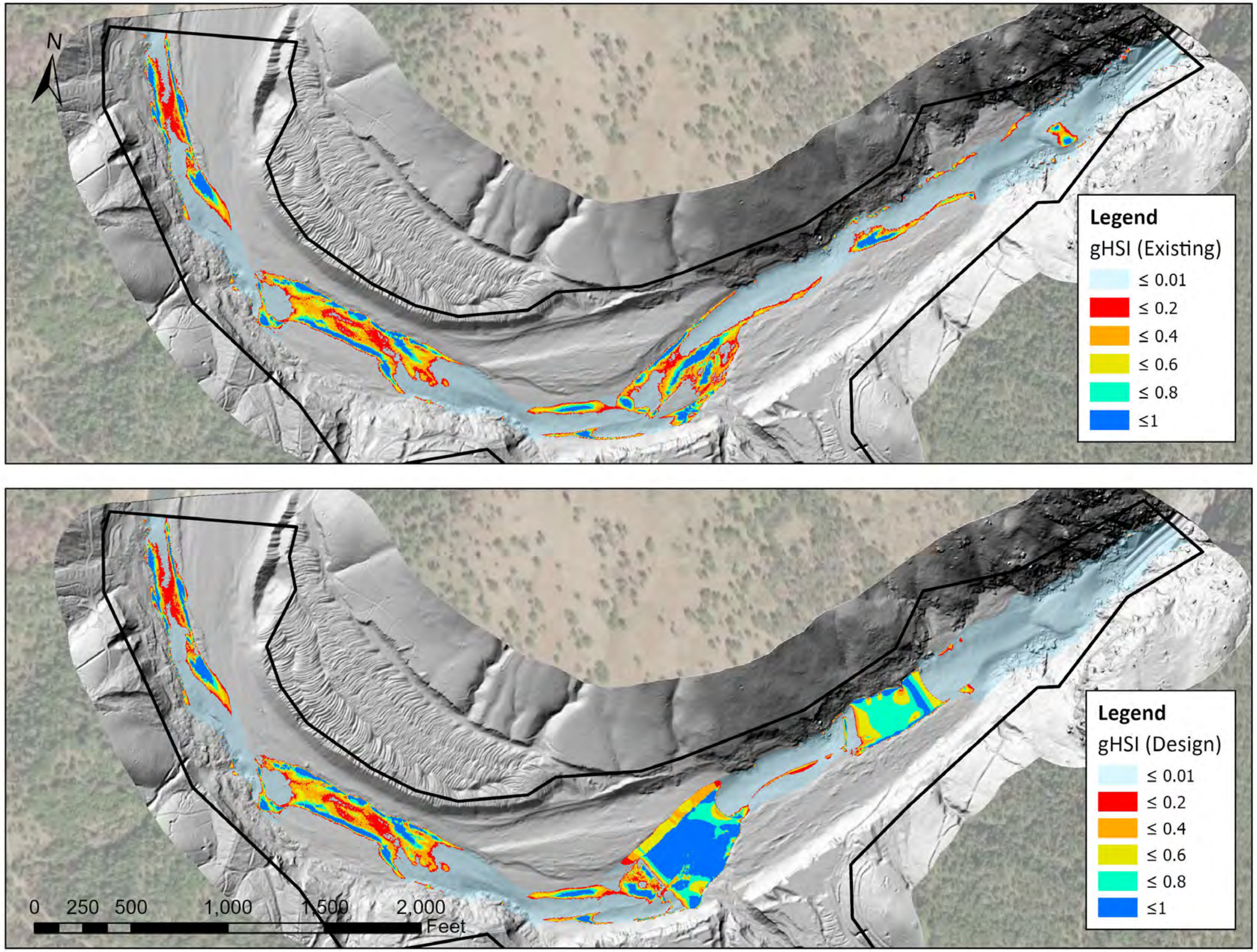
Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Spawning HSI at 700 cfs

Project No. 20-1029 | Created By: GS/JCI | **Figure 25**



Notes: Image Source: Esri	cbec	*Upper Rose Bar Habitat Enhancement Project* **Existing vs. Design Condition Steelhead Spawning HSI at 900 cfs**
		Project No. 20-1029 · Created By: GS/JCI · **Figure 26**

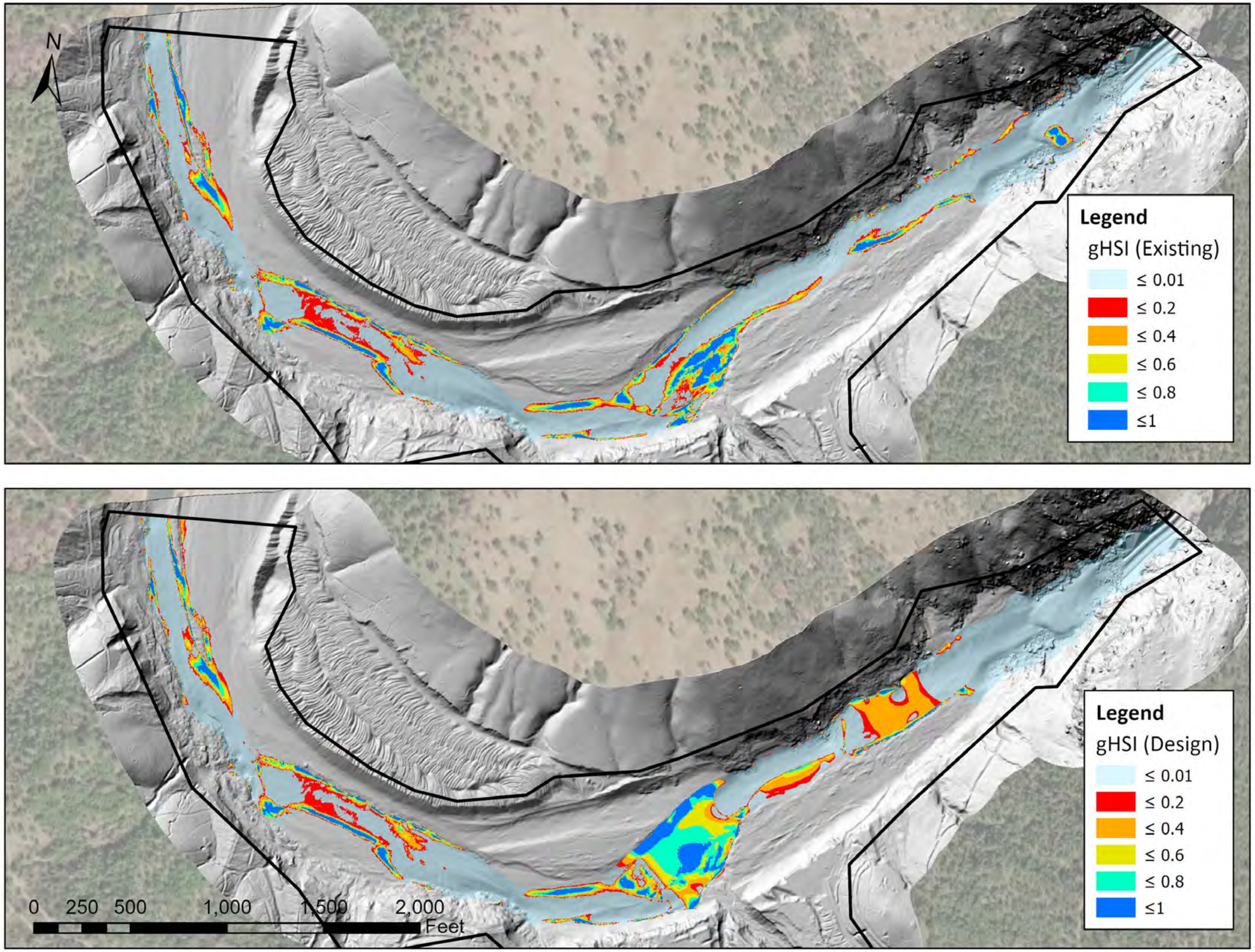


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Spawning HSI at 1,300 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 27**

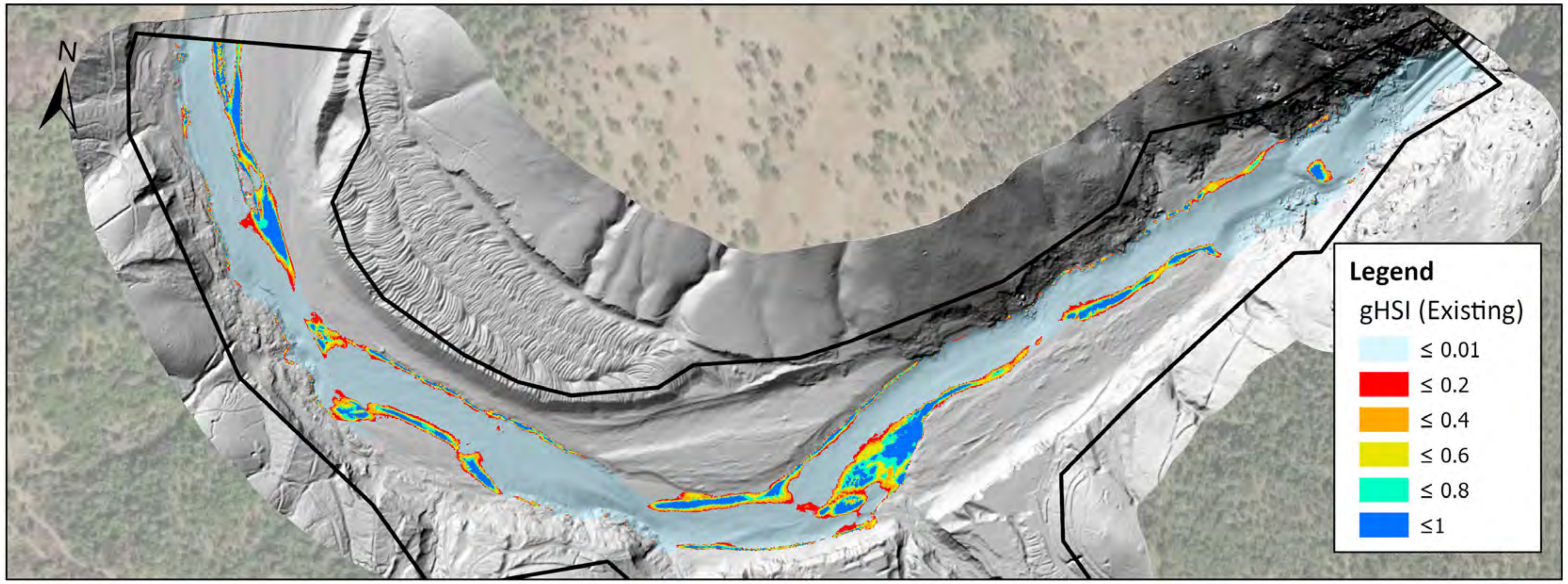


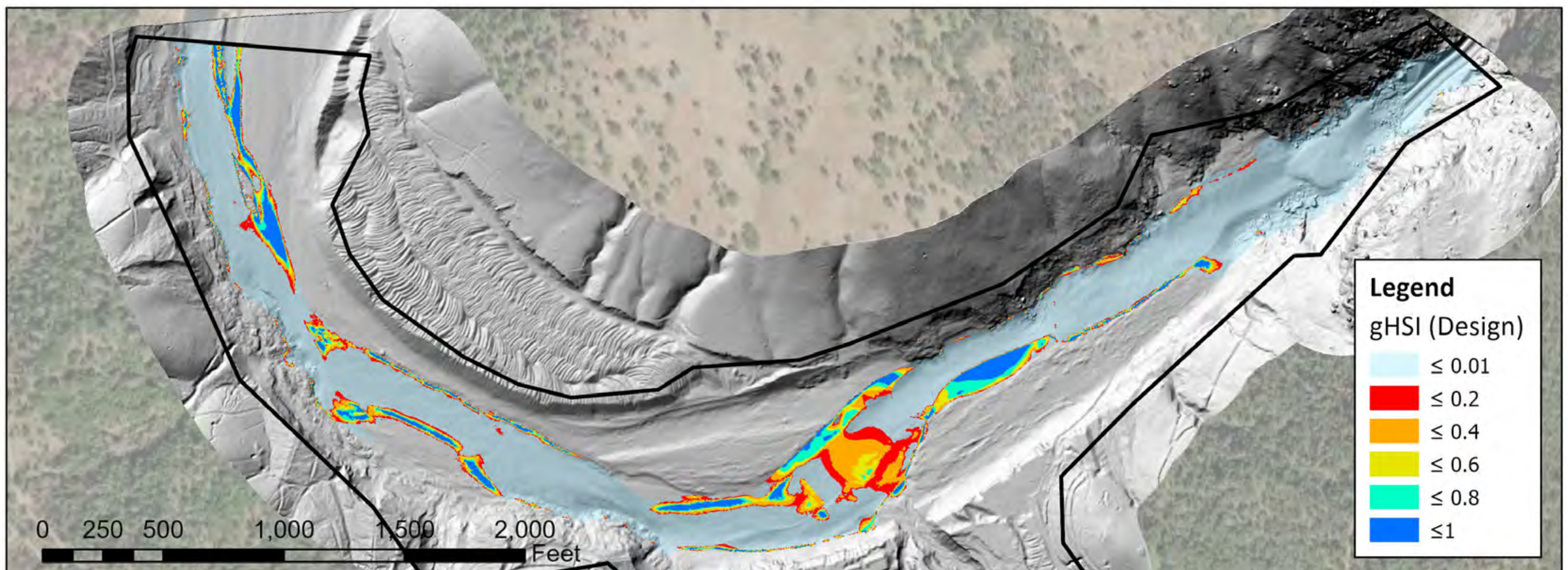
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Spawning HSI at 2,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 28**





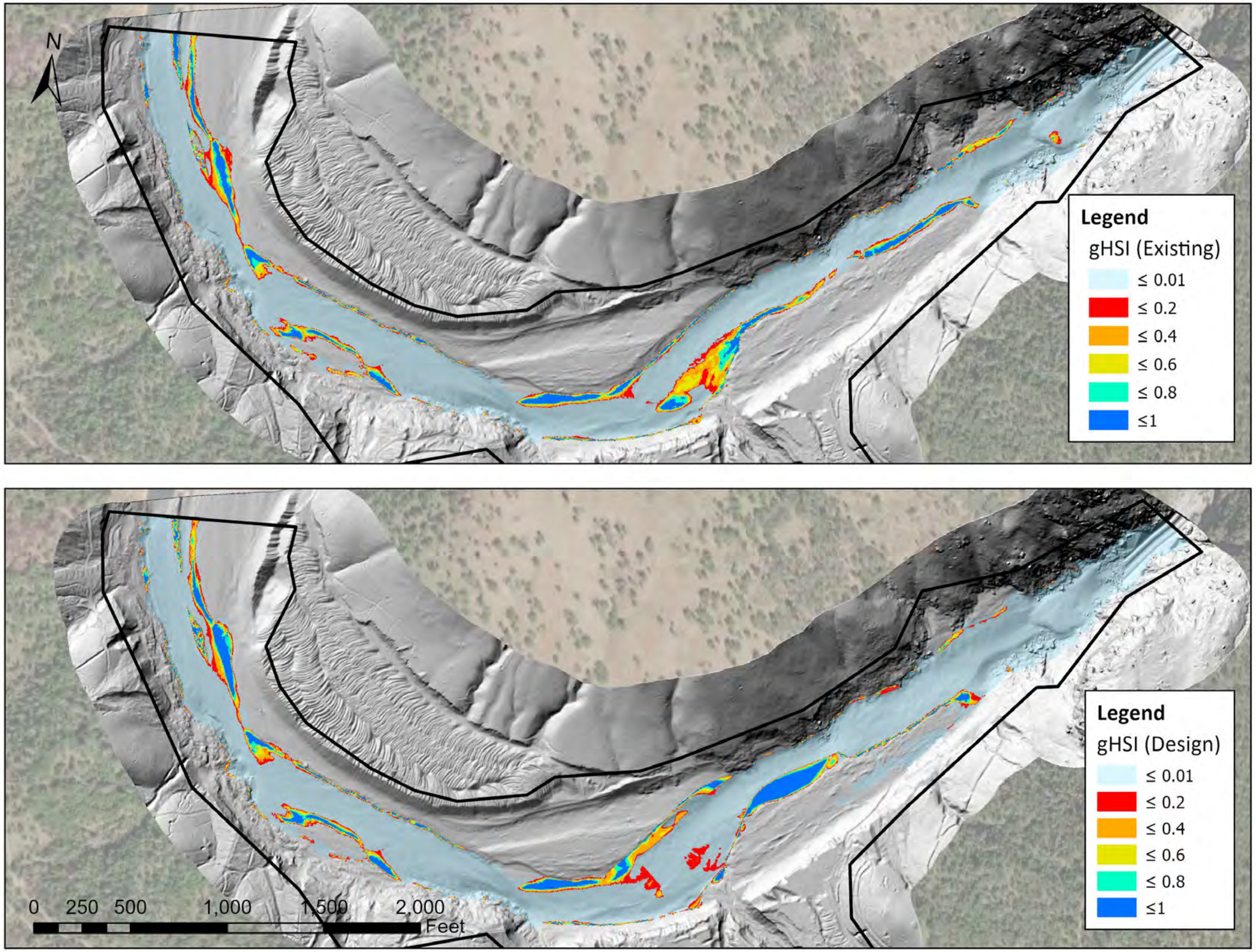
Notes:
Image Source: Esri

cbec

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Spawning HSI at 3,500 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 29**



Notes:
Image Source: Esri

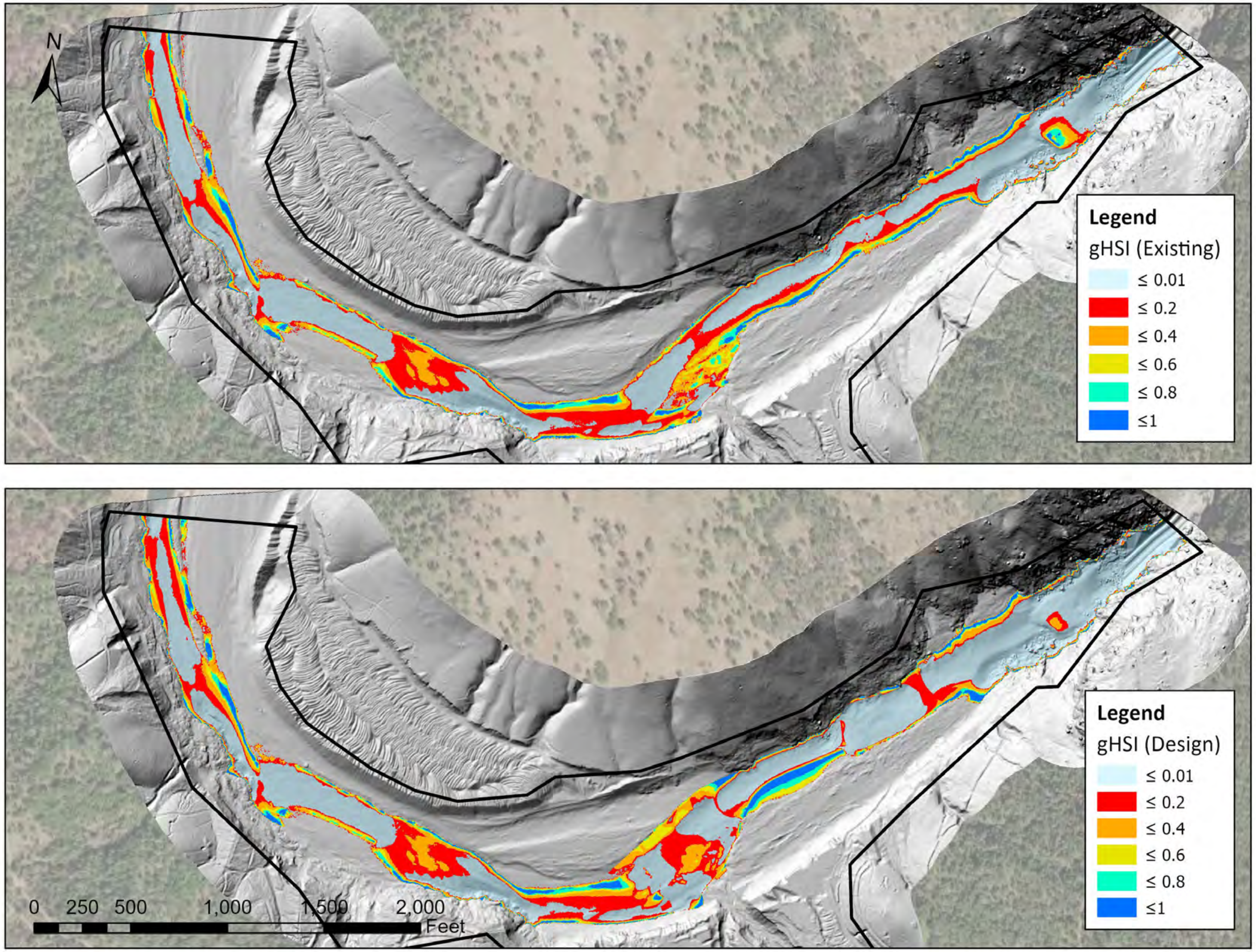
cbec

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Spawning HSI at 5,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 30**

D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_BOD_HSIFigures.docx
6/16/2022



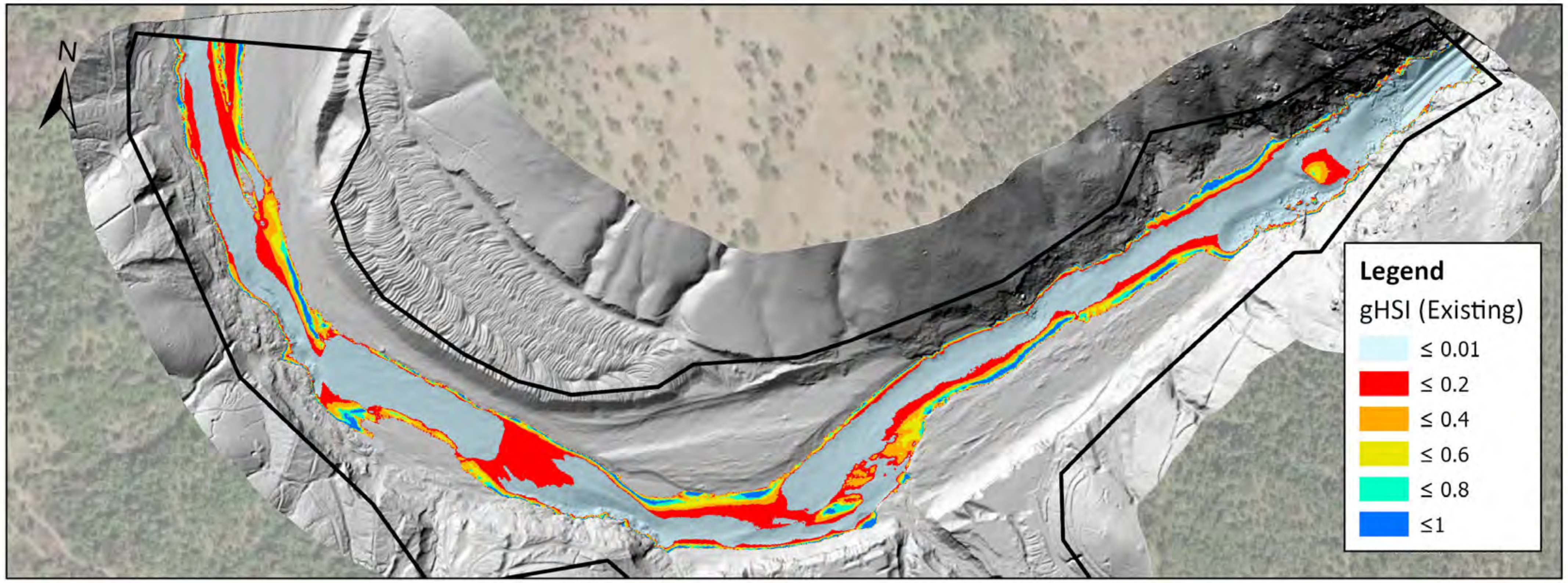
Notes:
Image Source: Esri

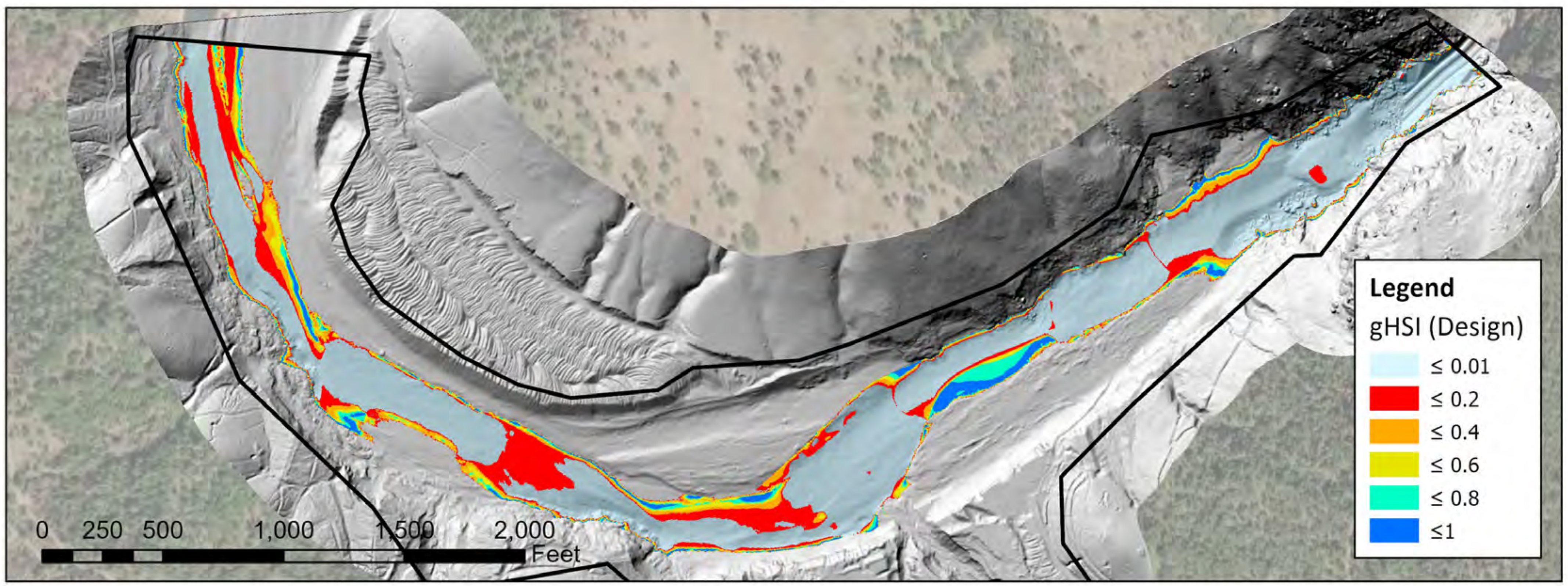
cbec

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Rearing HSI at 2,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 31**





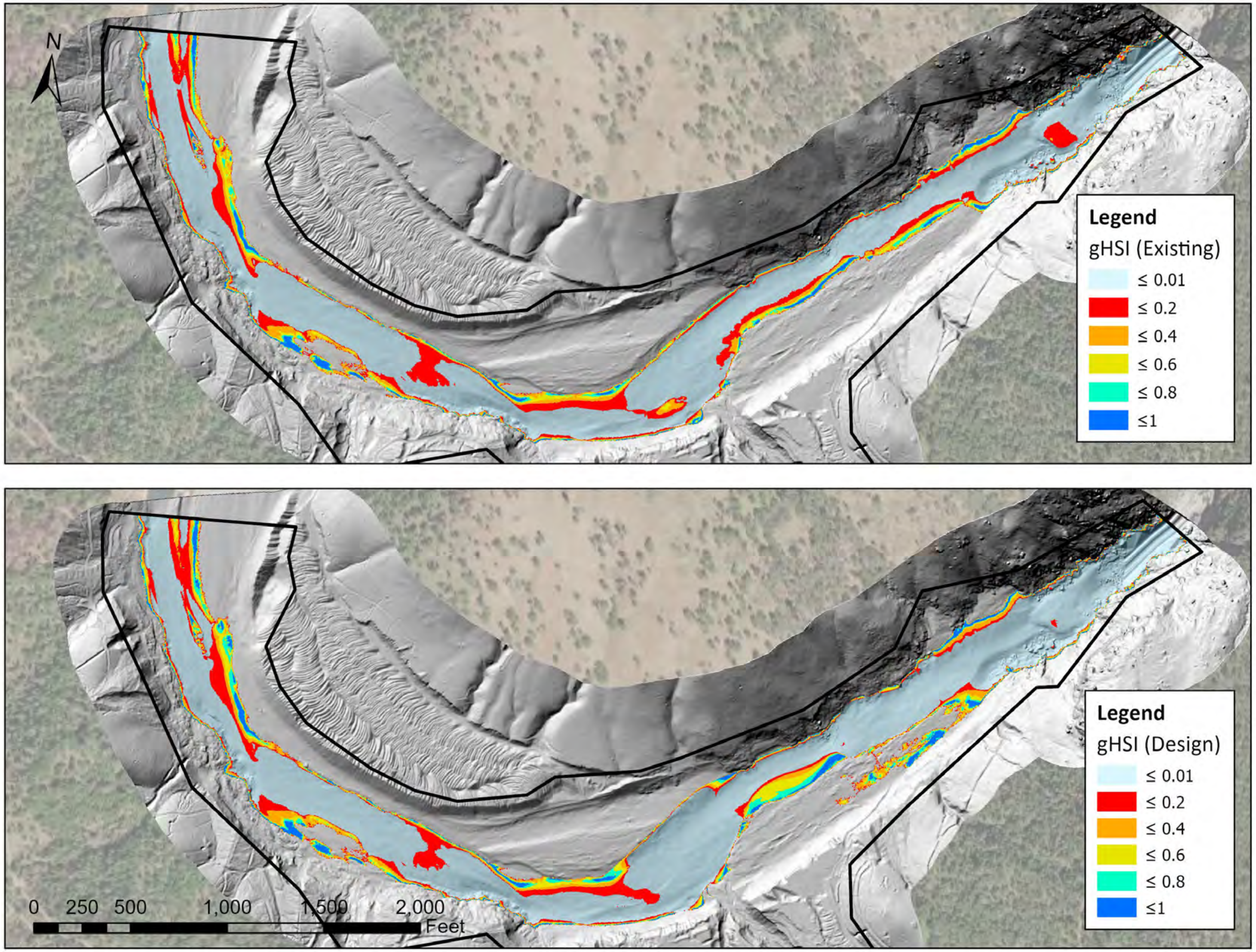
Notes:
Image Source: Esri

cbec

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Rearing HSI at 3,500 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 32**

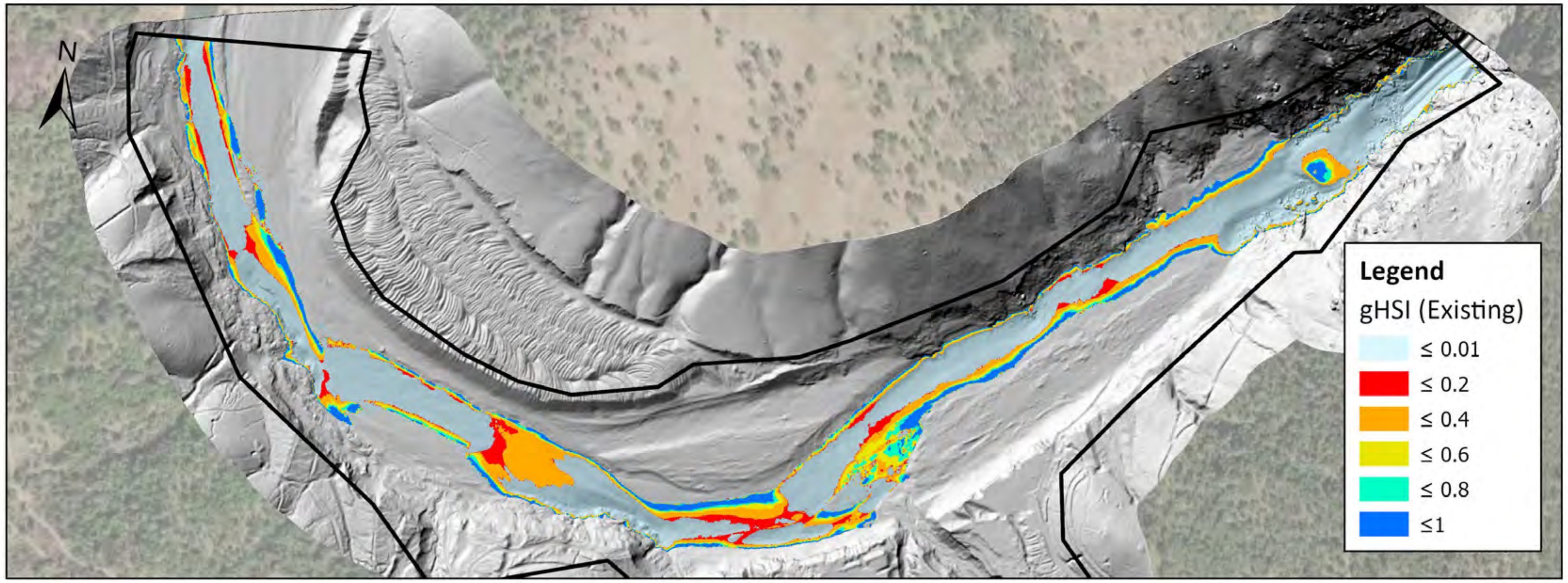


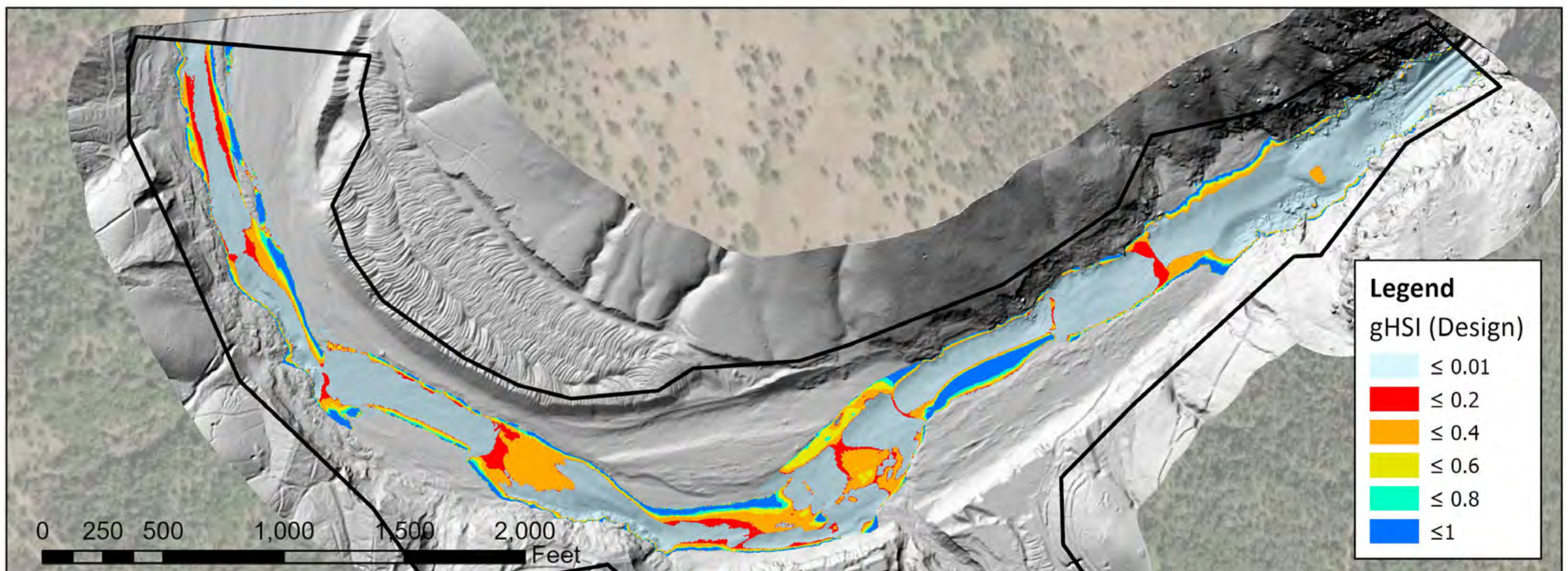
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Chinook Salmon Rearing HSI at 5,000 cfs

Project No. 20-1029 | Created By: GS/JCI | **Figure 33**



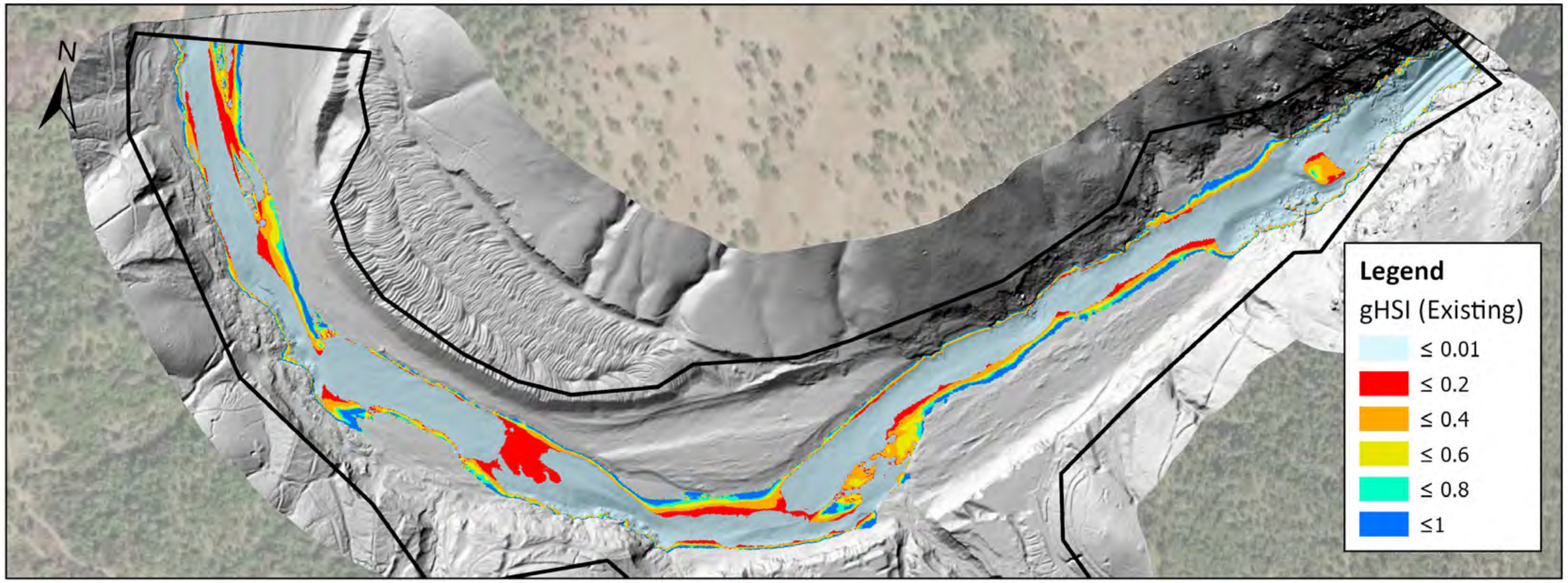


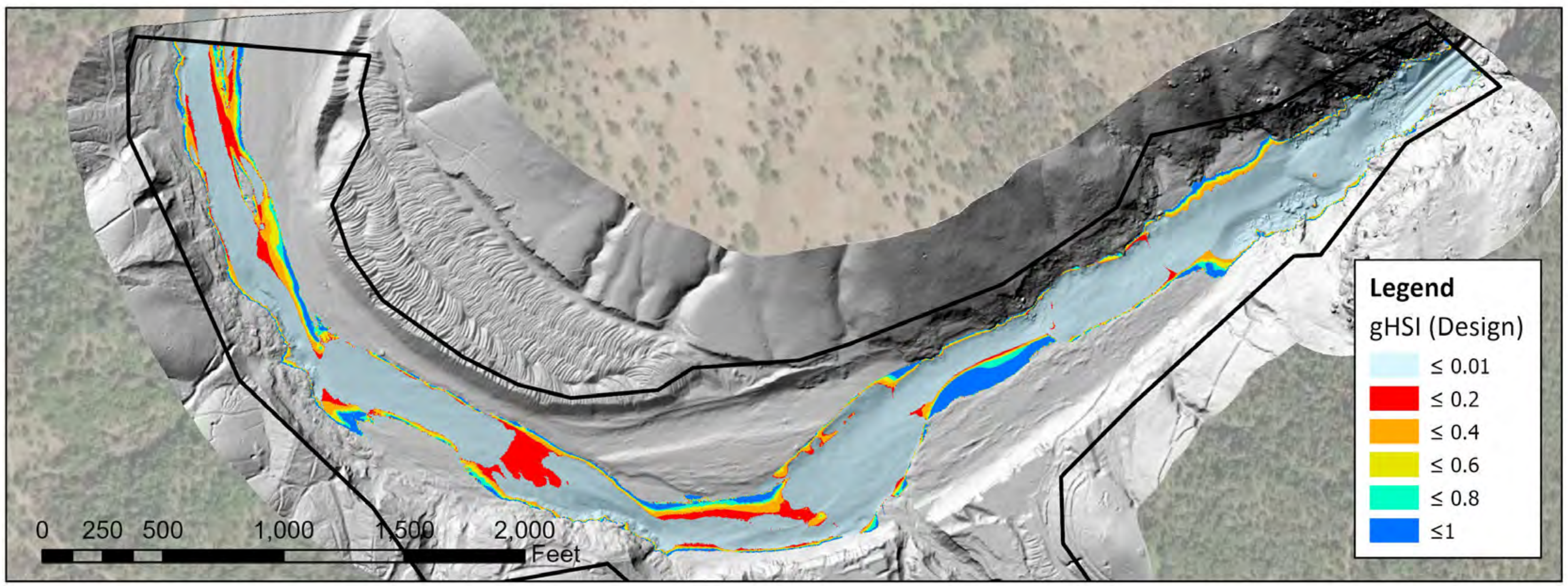
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Rearing HSI at 2,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 34**



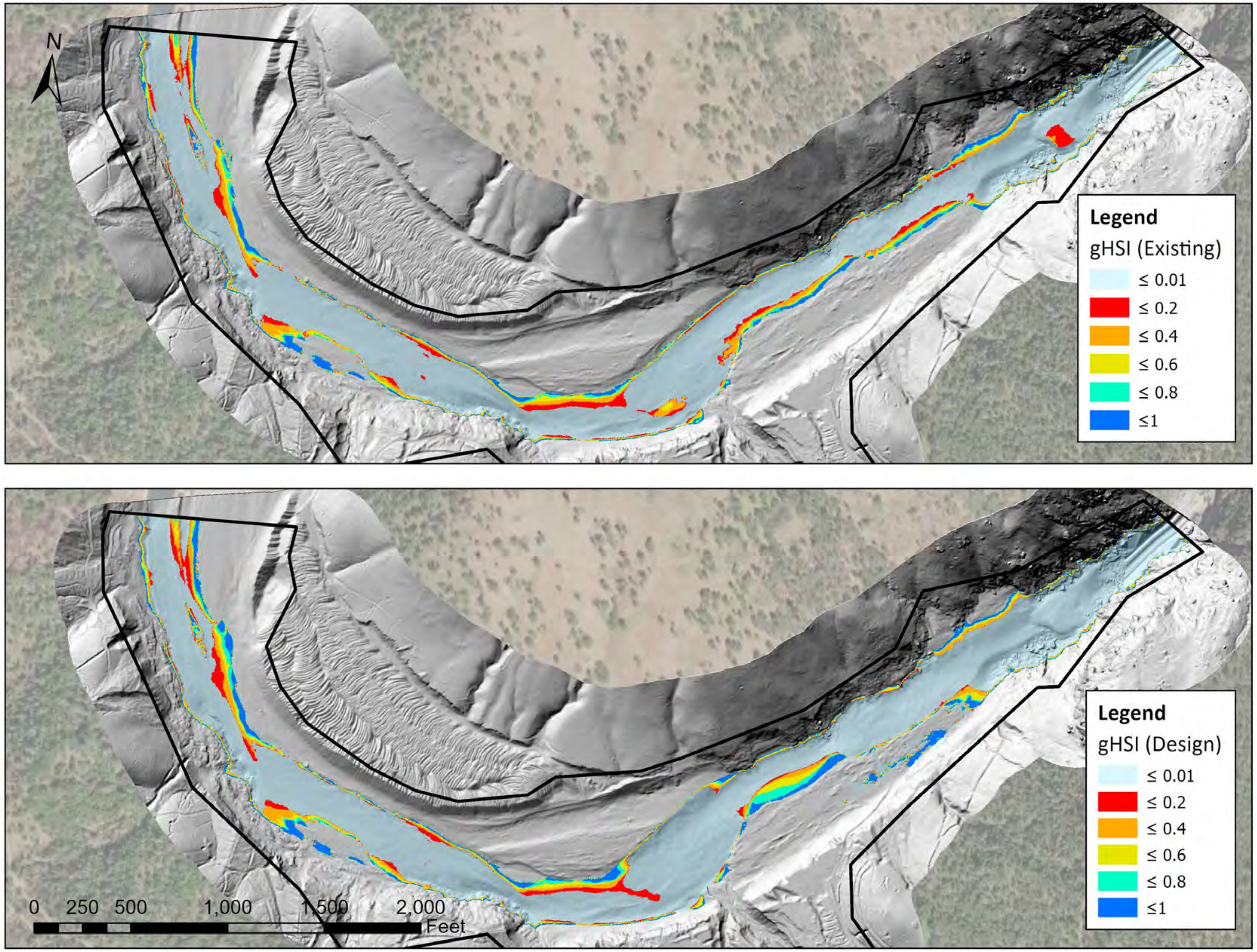


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Rearing HSI at 3,500 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 35**

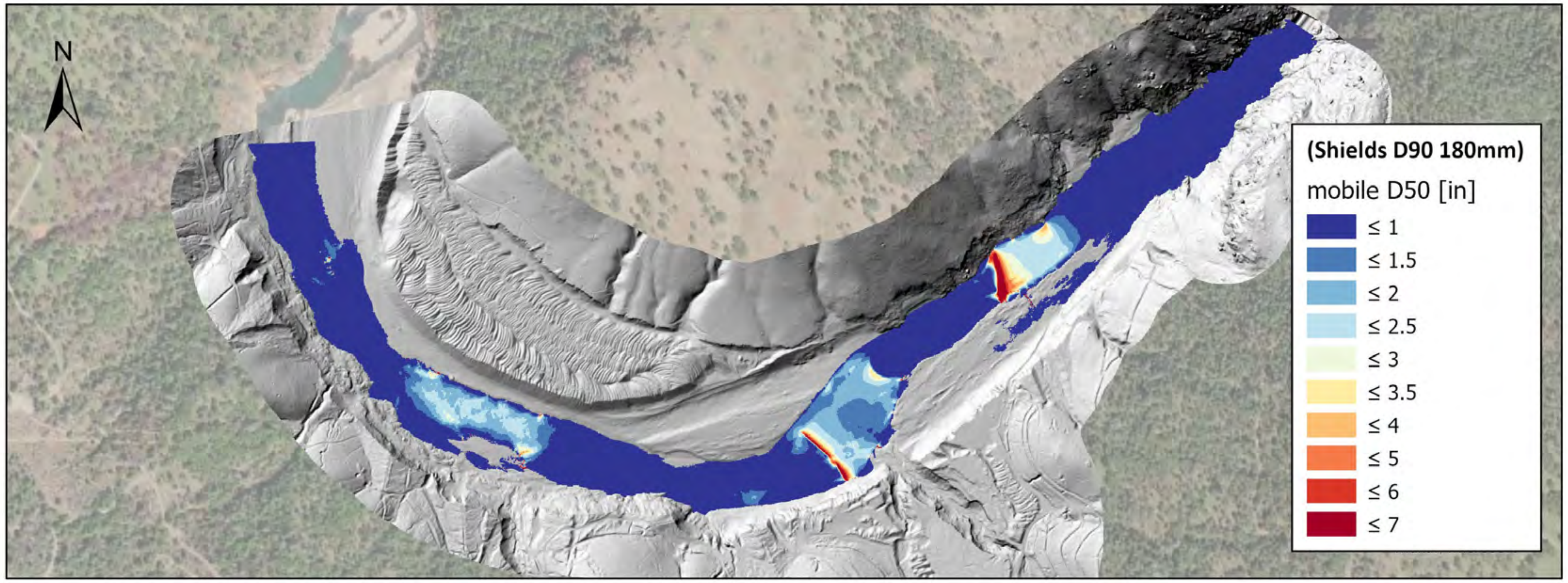


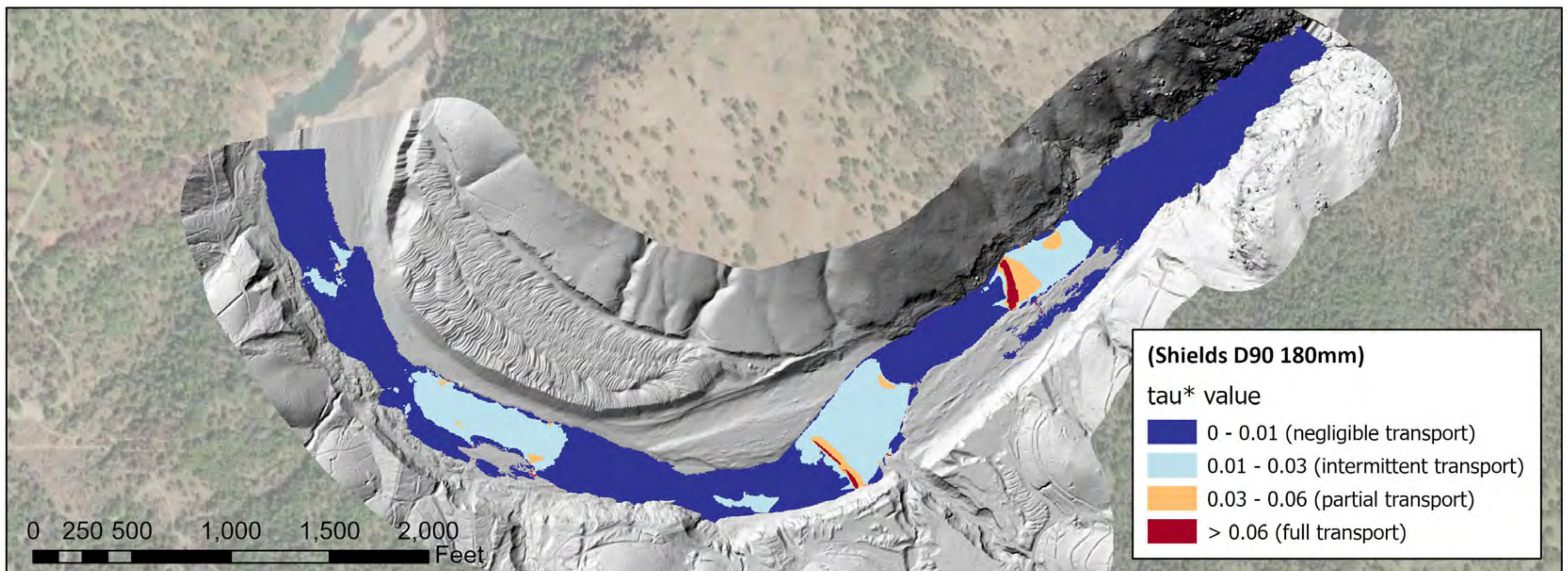
Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Existing vs. Design Condition Steelhead Rearing HSI at 5,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 36**





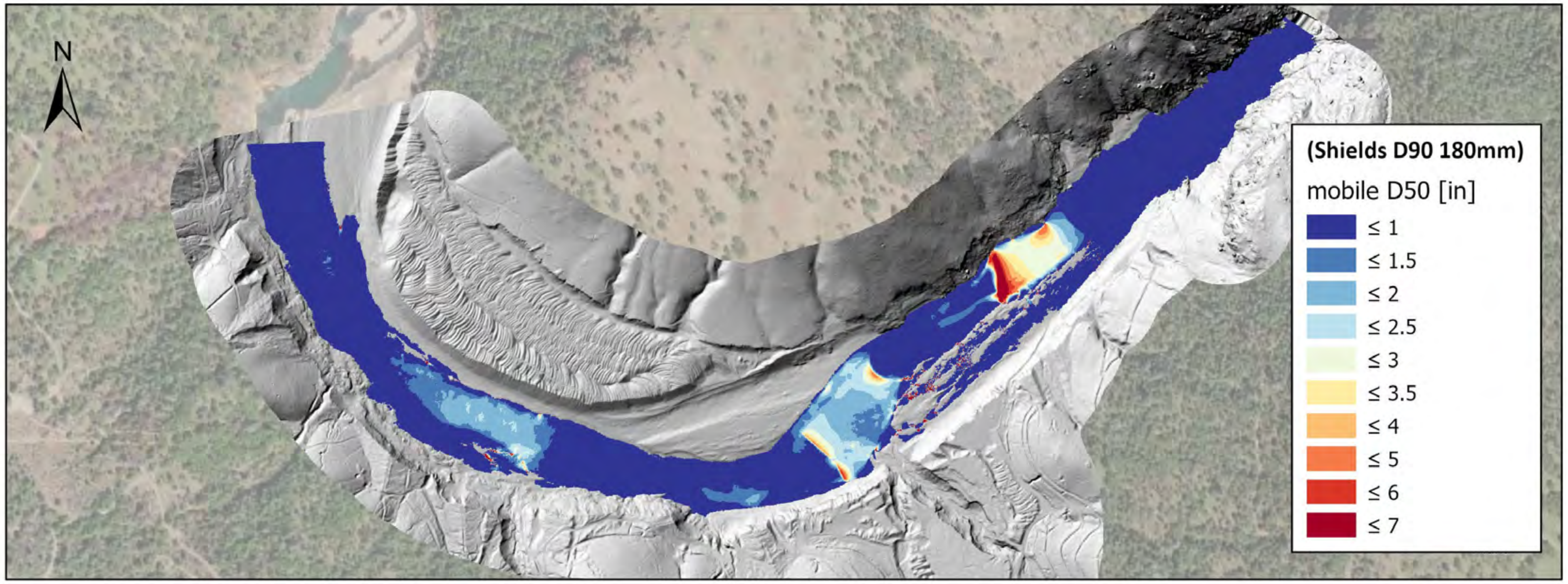
Notes:
Upper map shows the calculated size of particles (D_{50}) that exceed the threshold for intermittent transport (Shields stress > 0.03). This map is intended to show the minimum D_{50} size that is appropriate for stability in a given location assuming a D_{90} of 7.1 inches. Lower map shows the calculated shields stress and is intended to show the expected transport regime at each location assuming a D_{50} of 2.6 inches and a D_{90} of 7.1 inches. Image Source: Esri

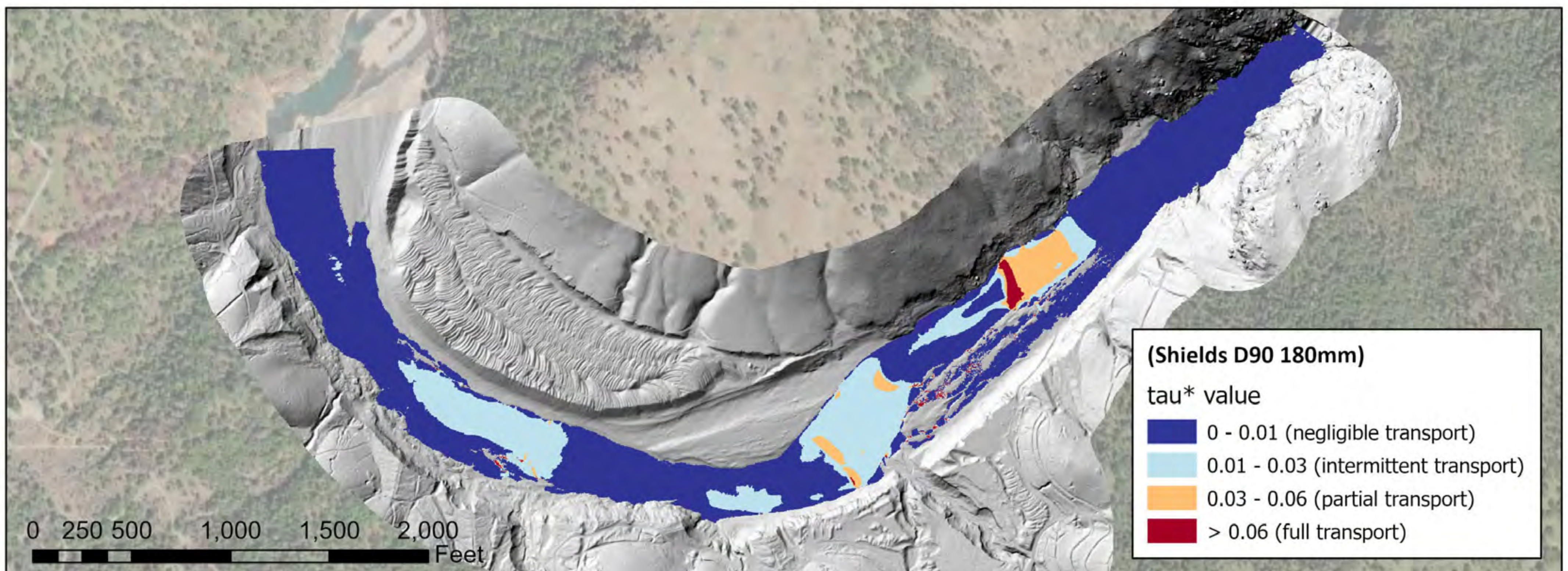
cbec

Upper Rose Bar Habitat Enhancement Project

Shields Stress and Particle Mobility at 5,000 cfs

Project No. 20-1029 | Created By: GS/JCI | **Figure 37**





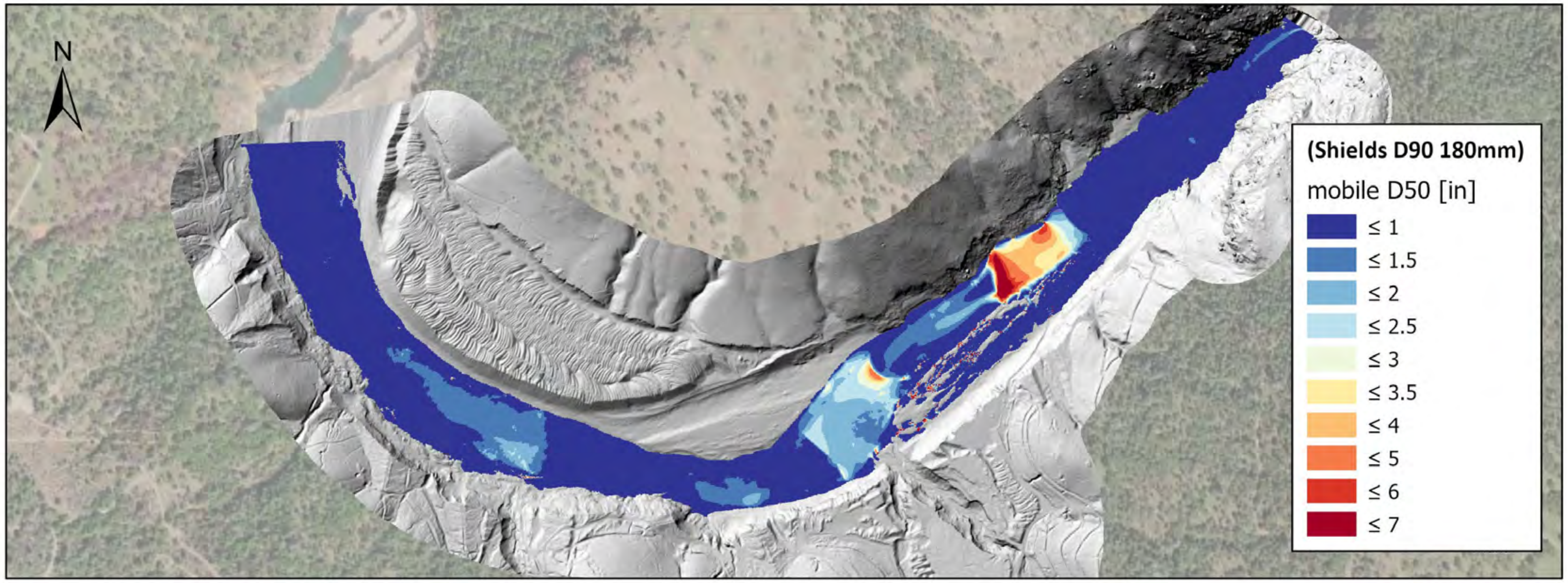
Notes:
Upper map shows the calculated size of particles (D_{50}) that exceed the threshold for intermittent transport (Shields stress > 0.03). This map is intended to show the minimum D_{50} size that is appropriate for stability in a given location assuming a D_{90} of 7.1 inches. Lower map shows the calculated shields stress and is intended to show the expected transport regime at each location assuming a D_{50} of 2.6 inches and a D_{90} of 7.1 inches. Image Source: Esri

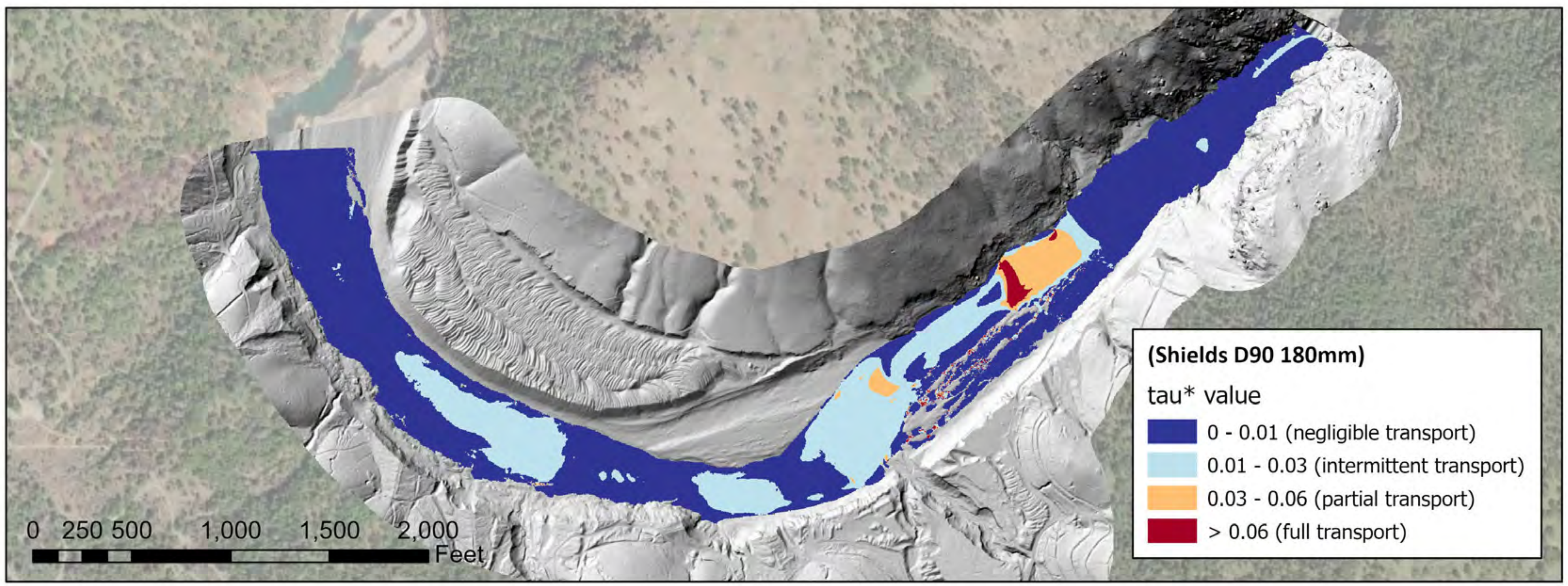
cbec

Upper Rose Bar Habitat Enhancement Project

Shields Stress and Particle Mobility at 7,000 cfs

Project No. 20-1029	Created By: GS/JCI	**Figure 38**



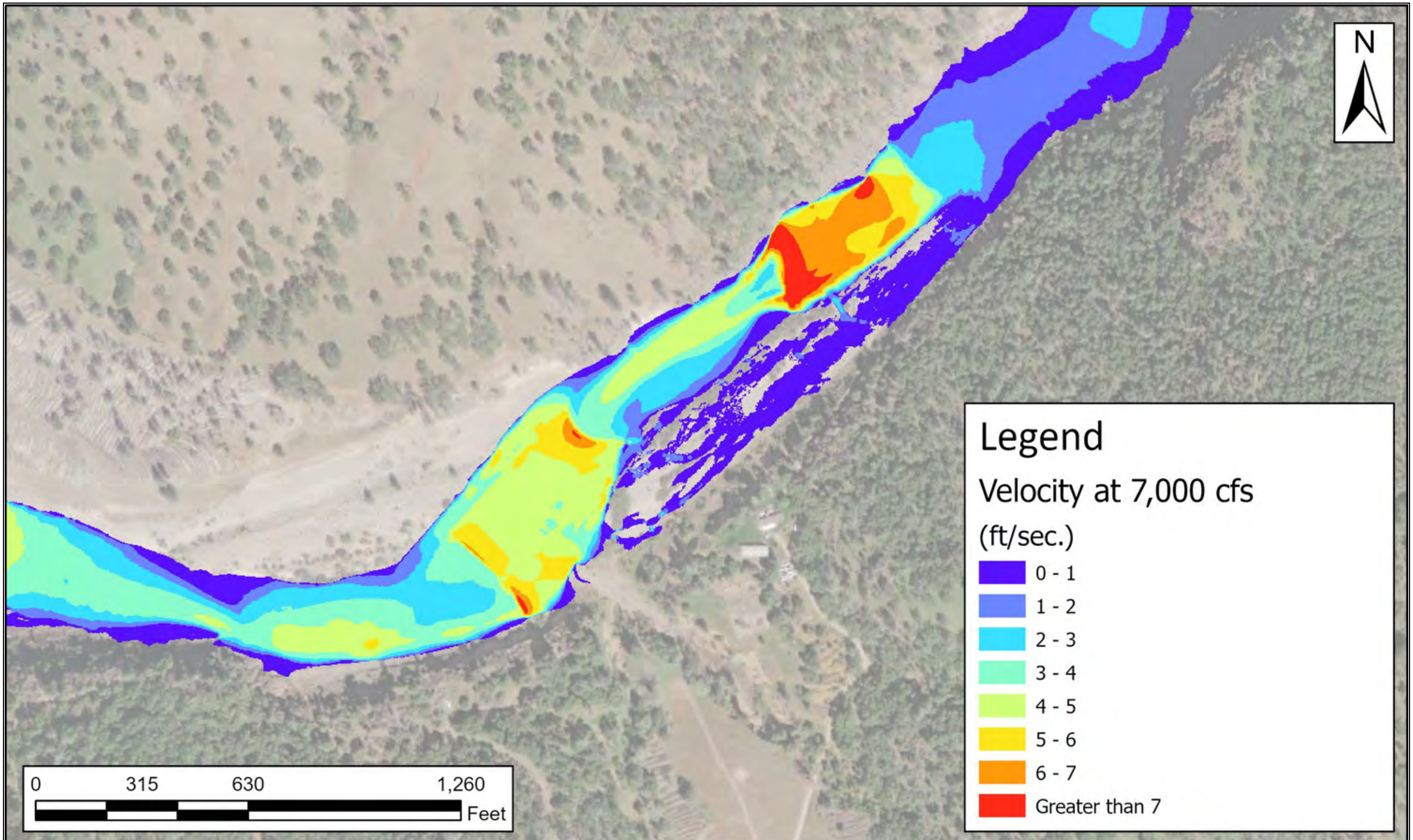


Notes:
Upper map shows the calculated size of particles (D_{50}) that exceed the threshold for intermittent transport (Shields stress > 0.03). This map is intended to show the minimum D_{50} size that is appropriate for stability in a given location assuming a D_{90} of 7.1 inches. Lower map shows the calculated shields stress and is intended to show the expected transport regime at each location assuming a D_{50} of 2.6 inches and a D_{90} of 7.1 inches. Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Shields Stress and Particle Mobility at 10,000 cfs

Project No. 20-1029 | Created By: GS/JCI | **Figure 39**

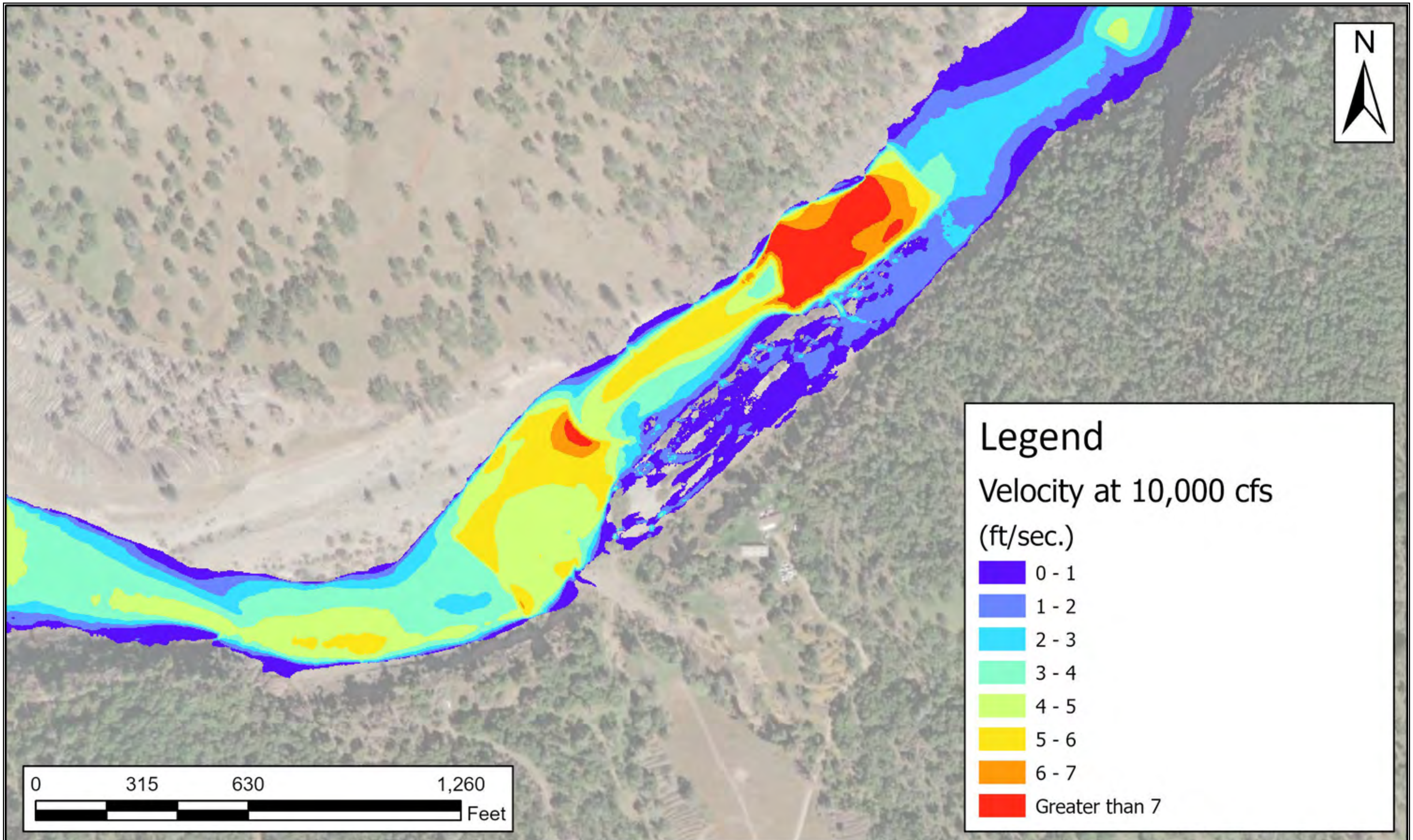


Notes:
Image Source: Esri

Upper Rose Bar Habitat Enhancement Project

Velocity at 7,000 cfs

Project No. 20-1029 | Created By: JCI | **Figure 40**



Notes: Image Source: Esri	cbec	*Upper Rose Bar Habitat Enhancement Project* **Velocity at 10,000 cfs**		
		Project No. 20-1029	Created By: JCI	**Figure 41**

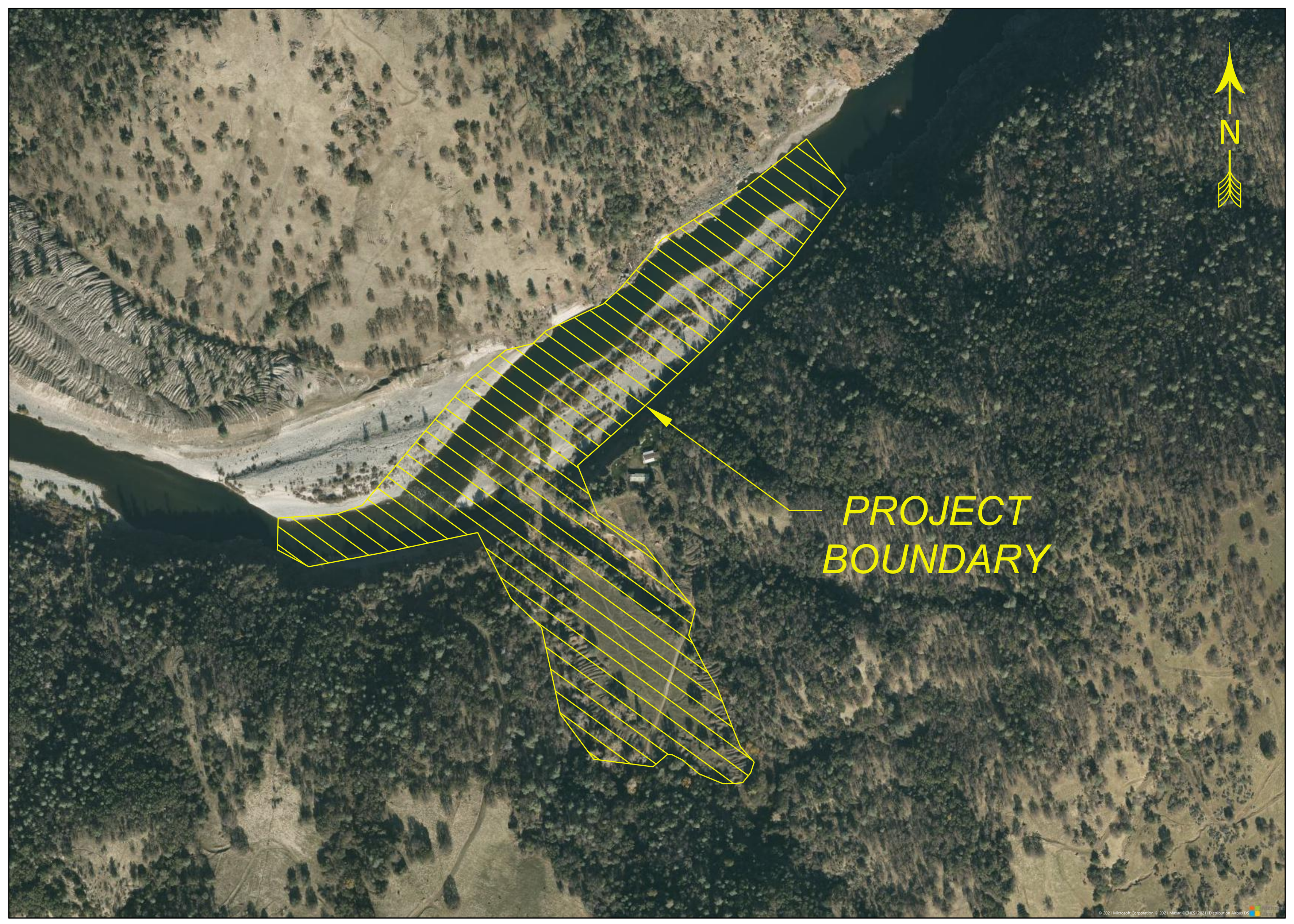
D:\Work\Projects\20-1029_Rose_Bar_Habitat_Enhancement_Project\400_Data\402_GIS\BOD Figures\RB_BOD_Velocities.docx
6/16/2022

Appendix B

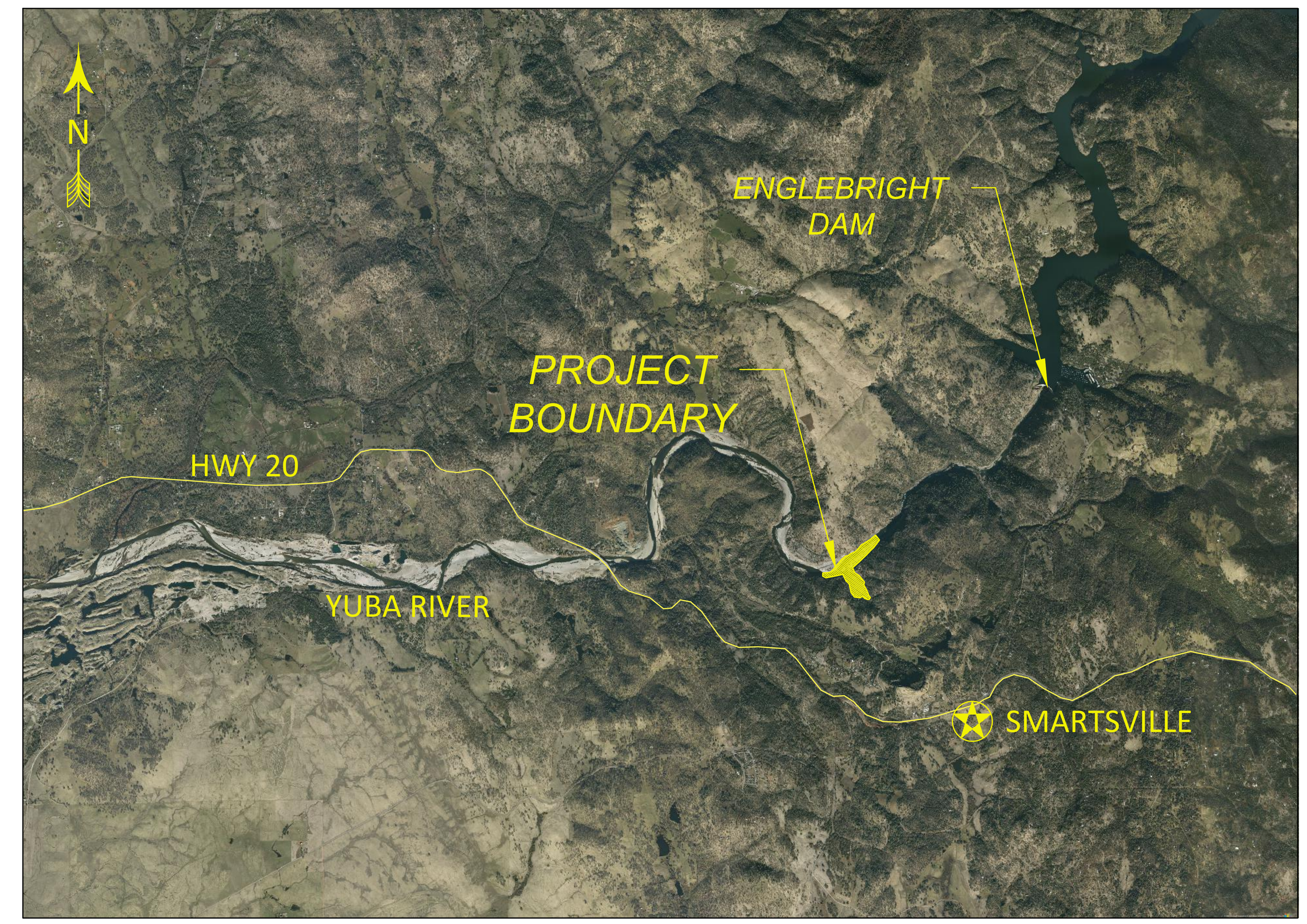
100% Design Plans

UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

YUBA RIVER
SMARTSVILLE, CA



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

LEGEND

- 100 — *EXISTING GROUND CONTOURS*
- 80 — *FINISHED GRADE CONTOURS*
- × 89.4 — *EXISTING GROUND SPOT ELEVATION*
- + 84.5 — *FINISHED GRADE SPOT ELEVATION*
- *GRADING EXTENTS*
- *GRADING BREAKLINE*
- *PROPERTY LINE*
- *PROJECT BOUNDARY*
- *ORDINARY HIGH WATER MARK*

CONTACTS

SYRCL	AARON ZETTLER-MANN, PROJECT DIRECTOR	(707) 499-1588
CRAMER FISH SCIENCES	AVERY SCHERER, PROJECT MANAGER	(916) 250-2135
cbec, INC.	SAM DIAZ, PROJECT ENGINEER	(530) 601-1917

NOTE: TOPOGRAPHIC AND BATHYMETRIC DATA PROVIDED BY NV5 GEOSPATIAL AND DOCUMENTED IN "YUBA RIVER, CALIFORNIA - TOPOBATHYMETRIC LIDAR TECHNICAL DATA REPORT" (NV5 GEOSPATIAL 2021). TOPOGRAPHIC DATA SHOWN ARE IN REFERENCE TO CALIFORNIA STATE PLANE ZONE 2: NAD83 (2011) AND NAVD88 (GEOID 12B).

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C1	COVER SHEET
C2	SHEET LAYOUT PLAN
C3	ACCESS & STAGING
C4	PLAN VIEW 1
C5	PLAN VIEW 2
C6	PLAN VIEW 3
C7	PROFILES & SECTIONS 1
C8	PROFILES & SECTIONS 2

REVISION NOTES

DESIGNED SD/JCI
DRAWN JCI
REVIEWED CH
APPROVED SD

PREPARED BY: cbec eco engineering

SOUTH YUBA RIVER CITIZENS LEAGUE
313 RAILROAD AVE STE 101
NEVADA CITY, CA 95959
(530) 265-5961

CLIENT: SYRCL

YUBA COUNTY CALIFORNIA
UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

COVER SHEET

JOB NUMBER 20-1029
DOCUMENT RELEASE 100% DRAFT
DATE 06/2022
SHEET C1
1 OF 8

A B C D E

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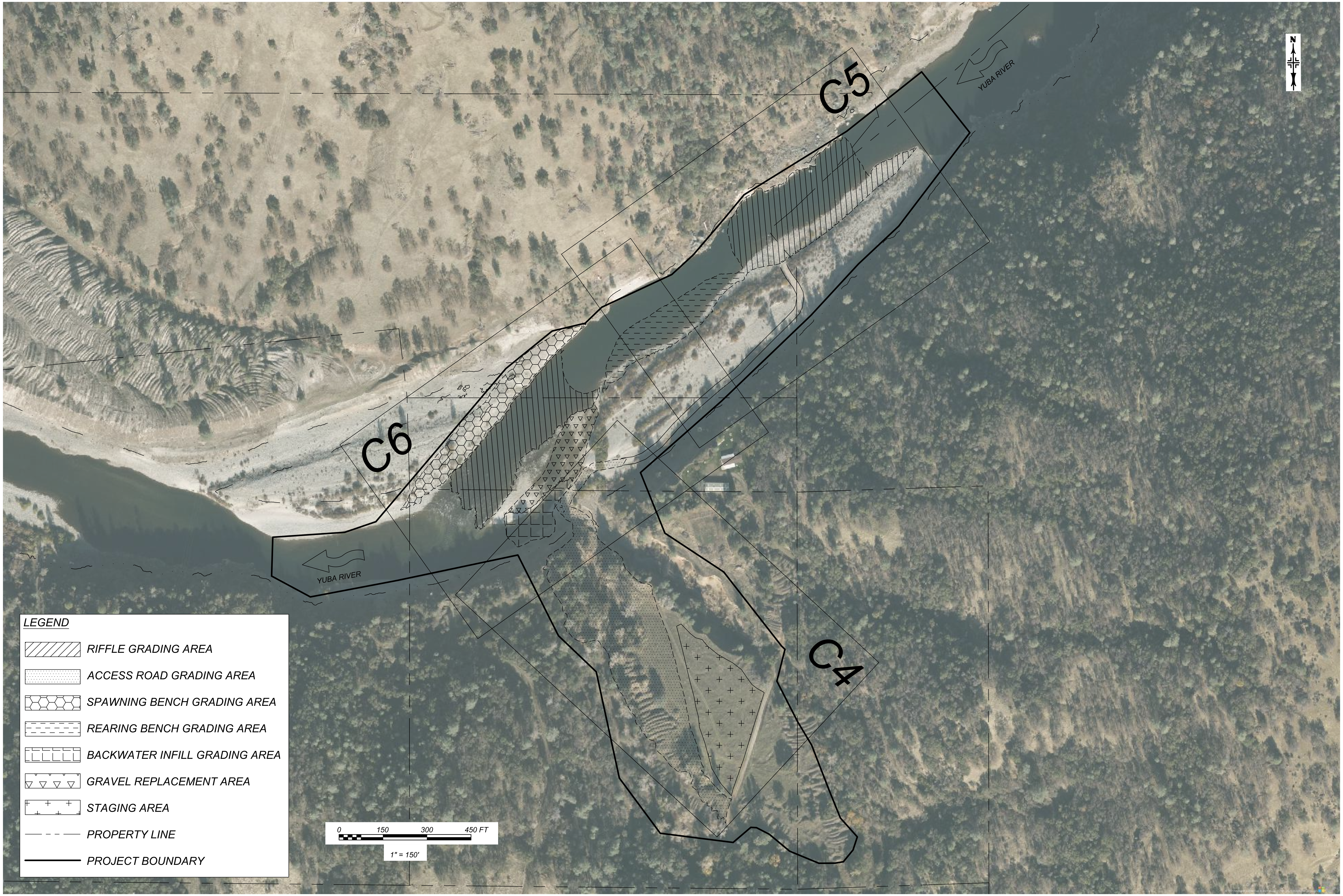

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REVISION NOTES

DESIGNED SD/JCI
DRAWN JCI
REVIEWED CH
APPROVED SD

PREPARED BY:

cbec eco engineering

CLIENT:

SOUTH YUBA RIVER CITIZENS LEAGUE
313 RAILROAD AVE STE 101
NEVADA CITY, CA 95959
(530) 265-5961

YUBA COUNTY CALIFORNIA

UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

SHEET LAYOUT PLAN

JOB NUMBER 20-1029

DOCUMENT RELEASE 100% DRAFT

DATE 06/2022

SHEET C2

2 OF 8

LOCATION: d:\Work\Projects\20-1029_rose_bar_habitat_enhancement_project\400_Data\403_CAD_DWGS\production\SHEET_LAYOUT_PLAN.dwg

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YUBA COUNTY CALIFORNIA
UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

ACCESS & STAGING

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C3
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APPROVED	SD

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UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

PLAN VIEW 1

JOB NUMBER
20-1029

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C4
4 OF 8

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PLOT:6/16/2022

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YUBA COUNTY
CALIFORNIA
UPPER ROSE BAR HABITAT
ENHANCEMENT PROJECT

PLAN VIEW 2

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APPROVED	SD

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PLAN VIEW 3

JOB NUMBER
20-1029

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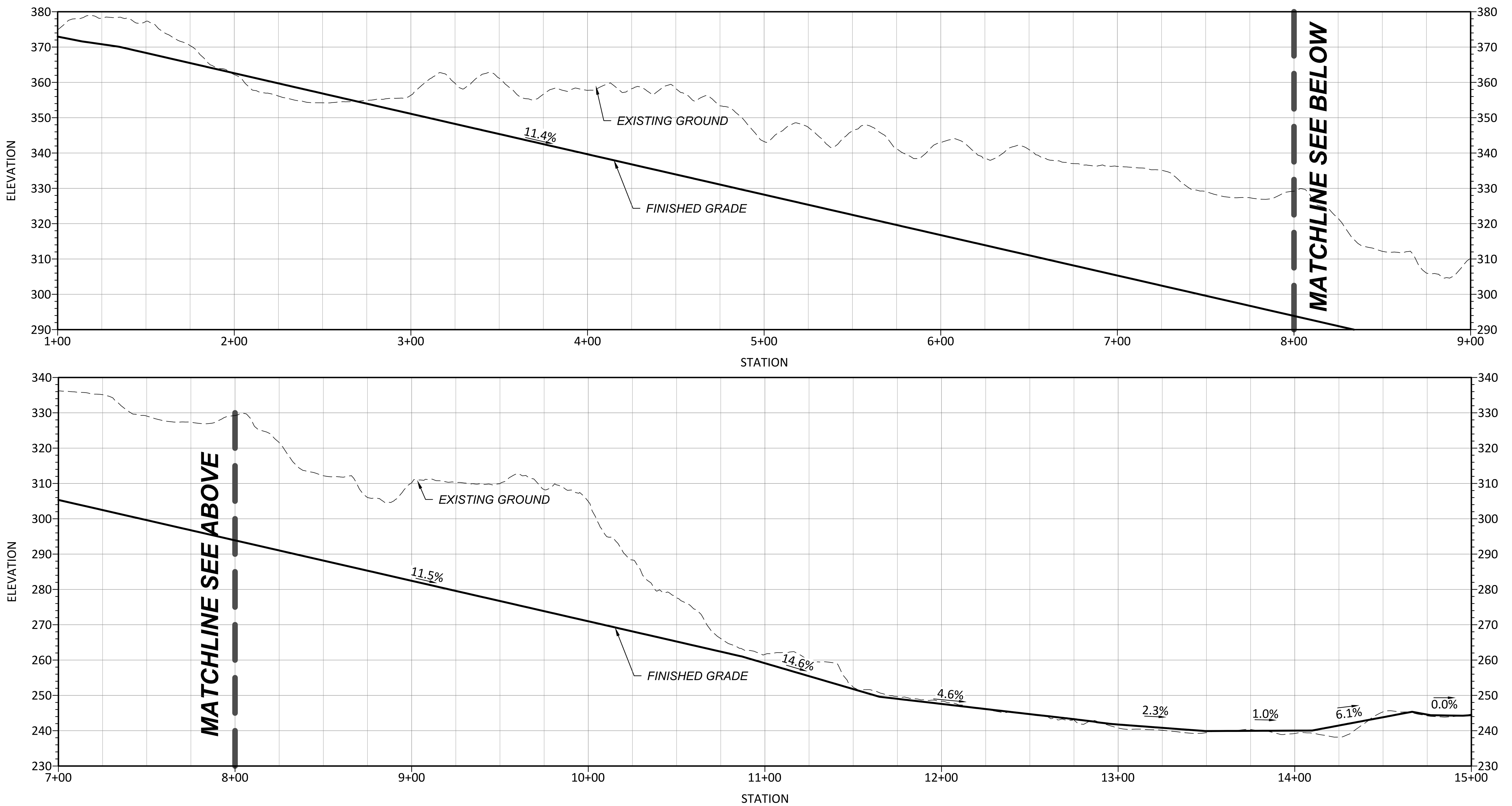
06/2022

SHEET
C6
6 OF 8



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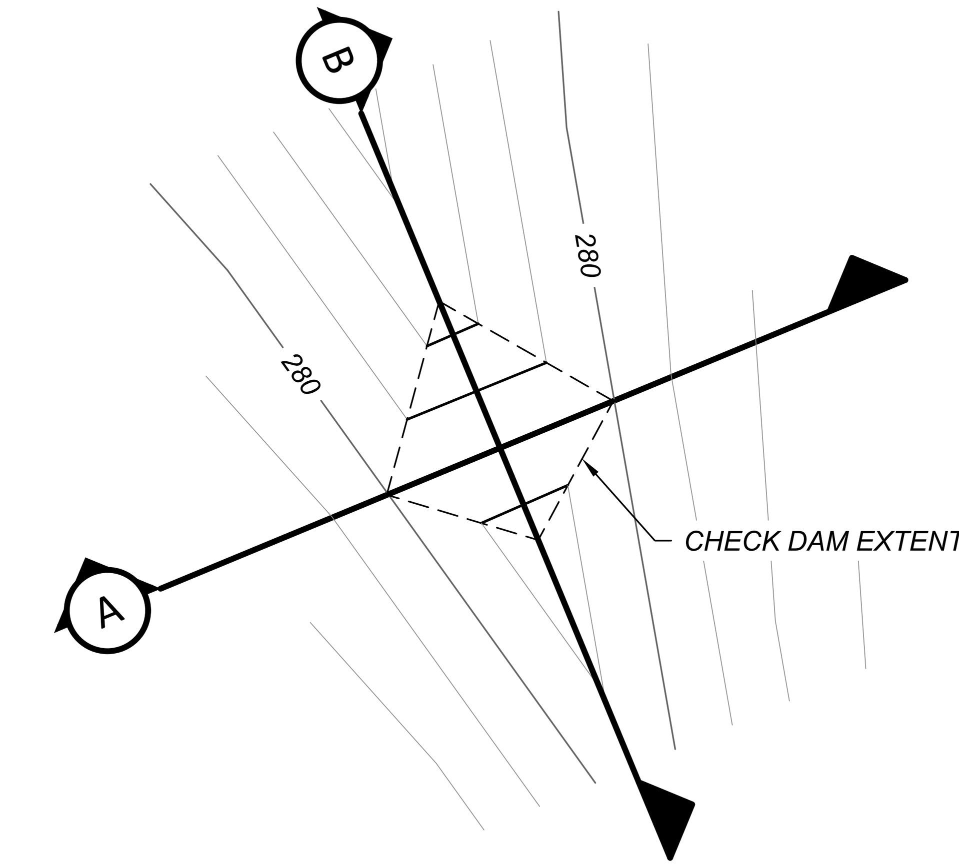

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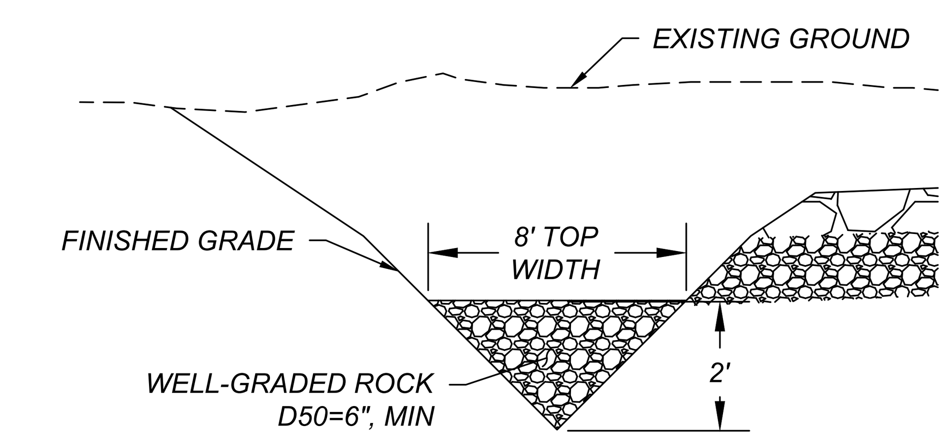

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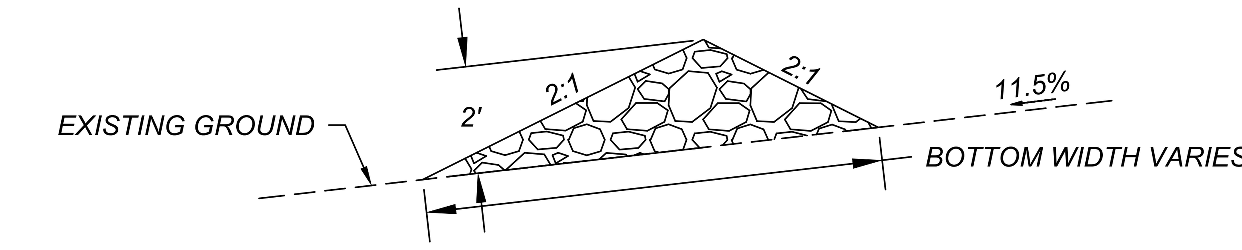

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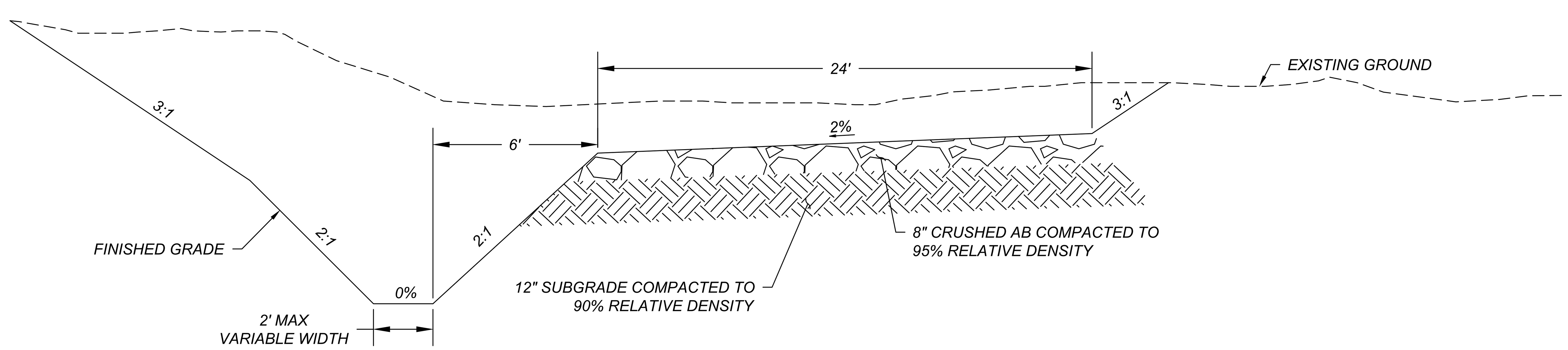

TYPICAL ROAD SECTION
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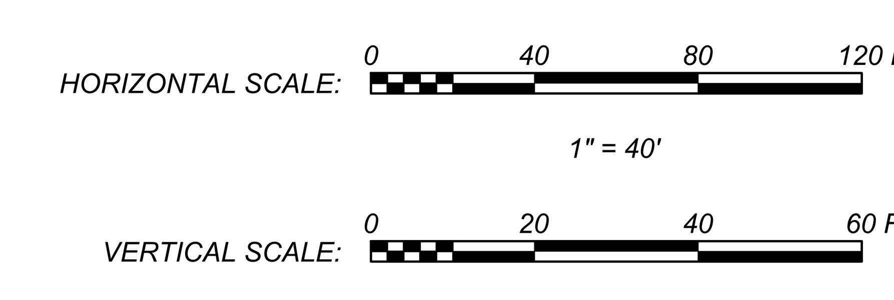

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YUBA COUNTY CALIFORNIA

UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

PROFILES & SECTIONS 1

JOB NUMBER 20-1029
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SHEET C7
7 OF 8

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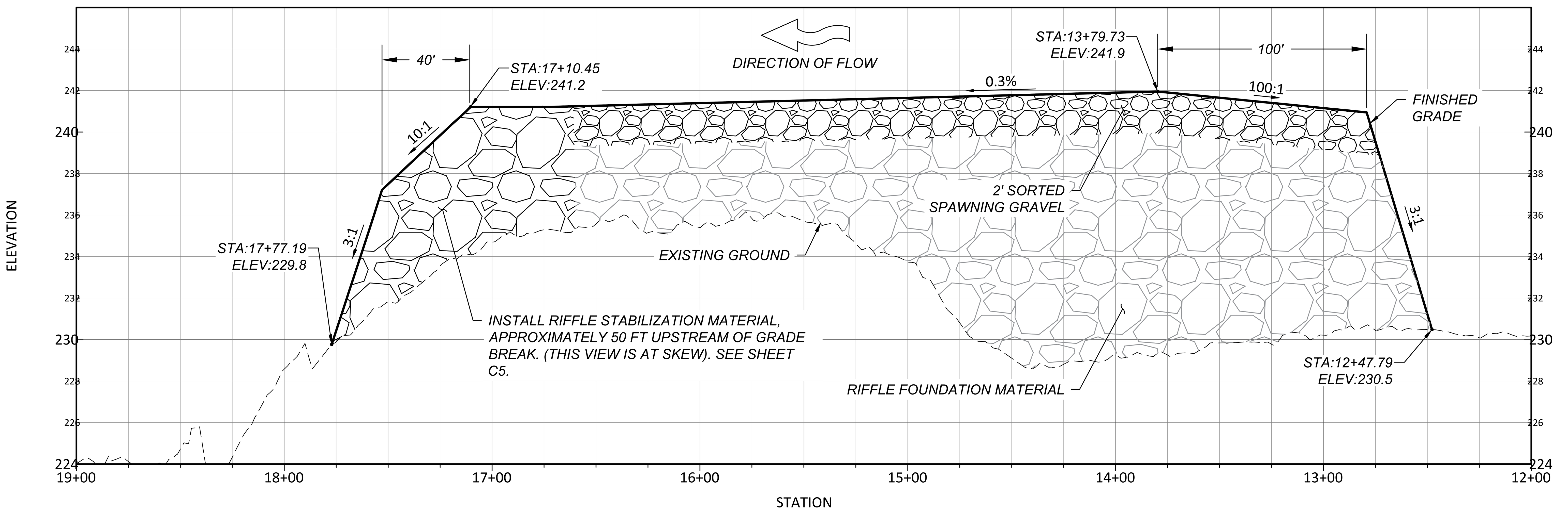
PLOT:6/16/2022



-- C5 RIFFLE 1 PROFILE
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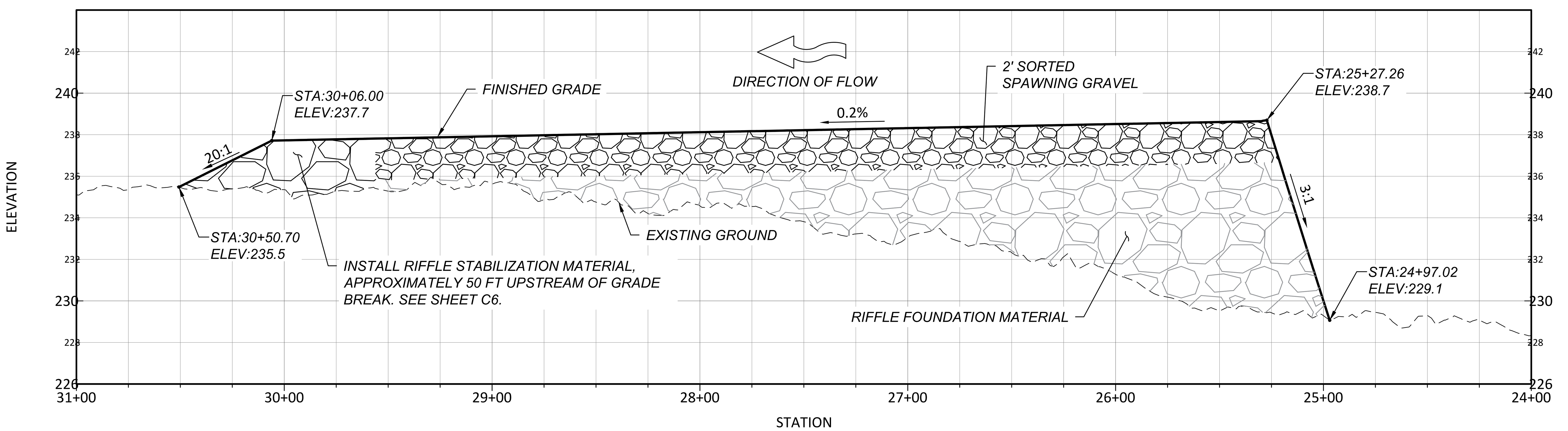

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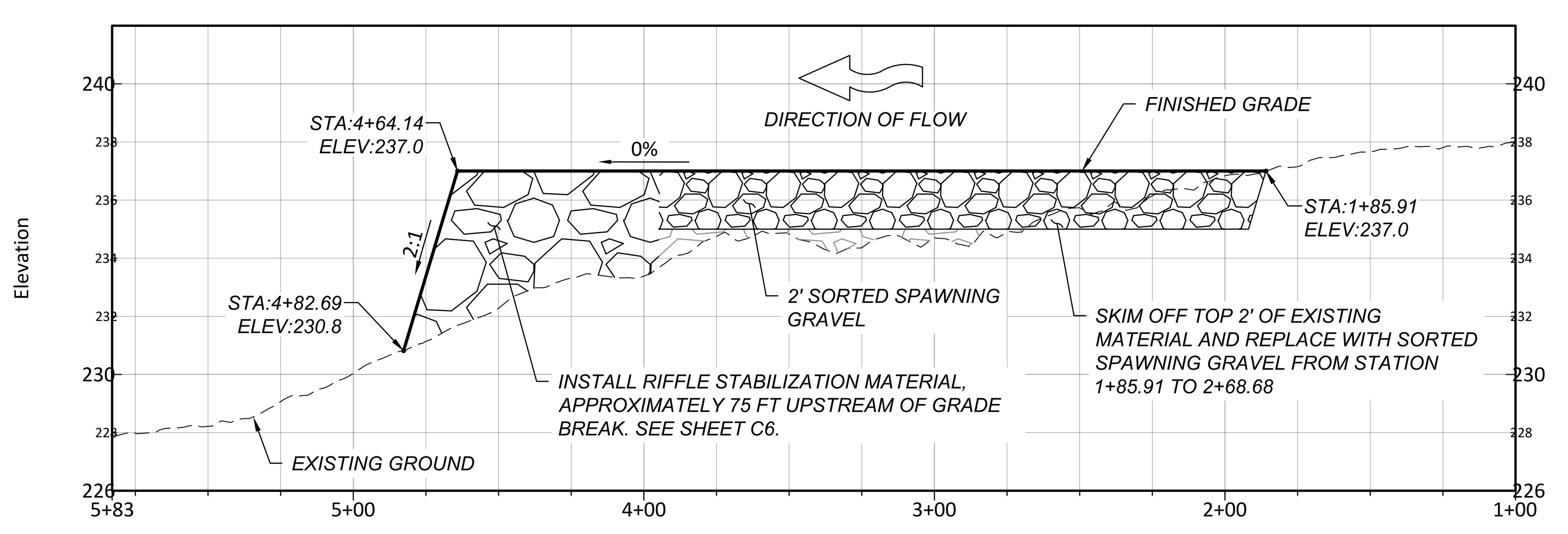

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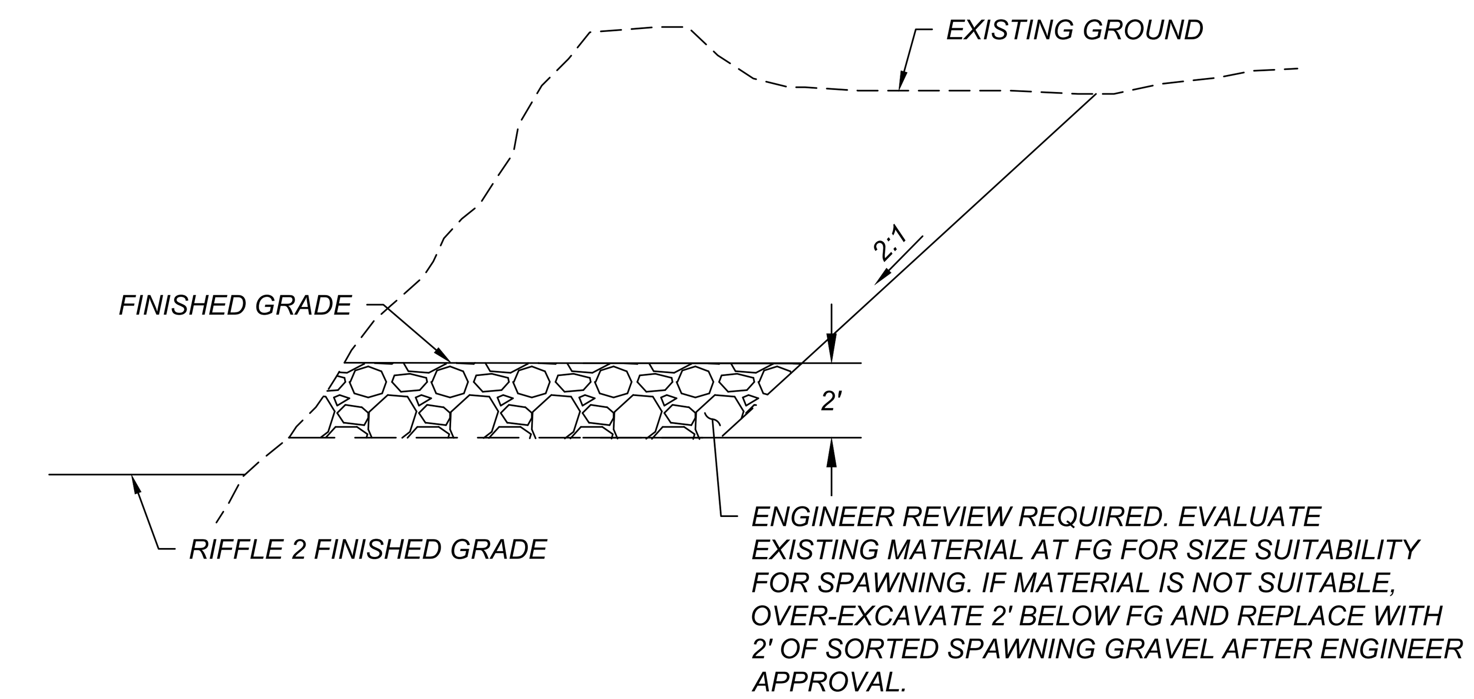

-- C6 SPAWNING BENCH TYPICAL SECTION
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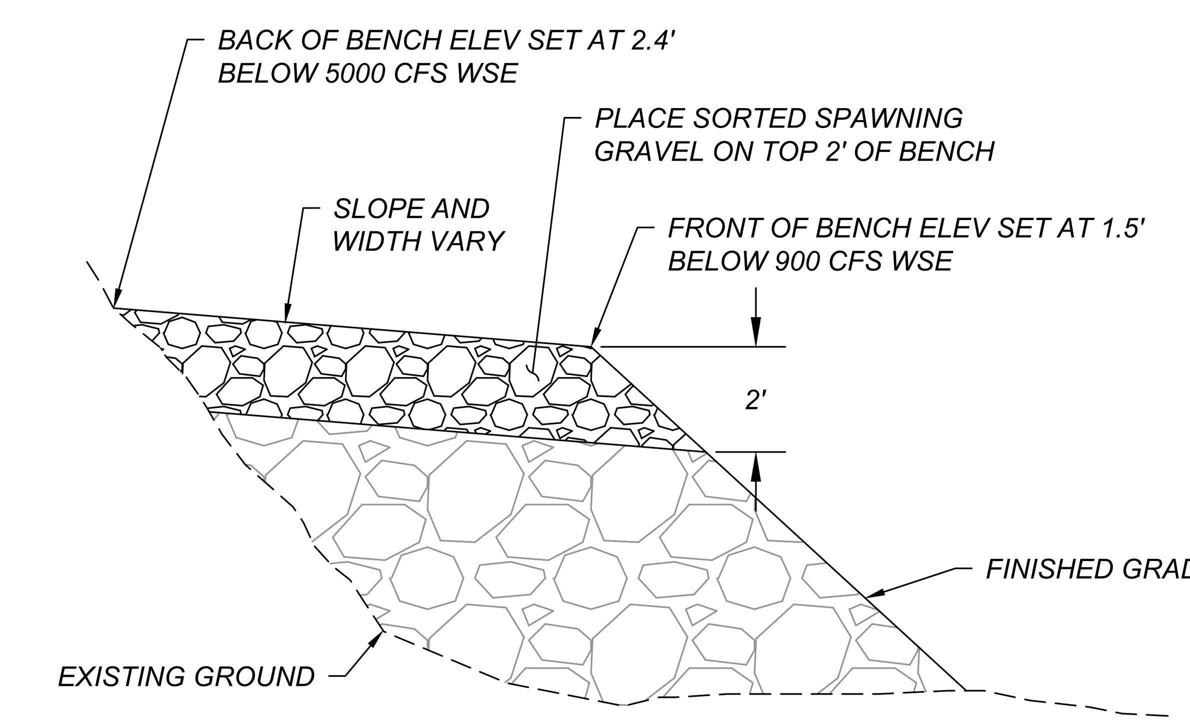
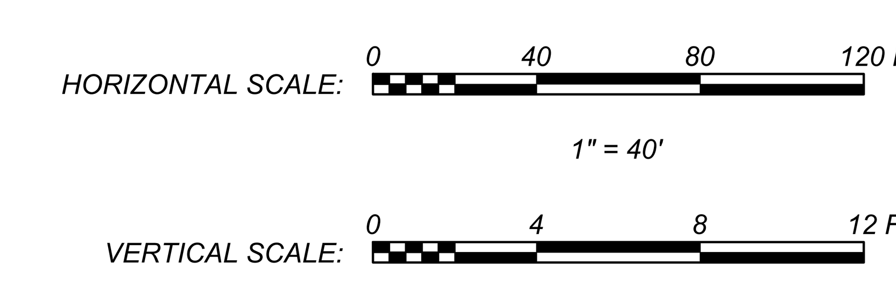


-- C5 REARING BENCH TYPICAL SECTION
SCALE: NTS

SPAWNING GRAVEL GRADATION		
SIZE CLASS (MM)	% RETAINED	FRACTIONAL %
170 TO 254	12	12
128 TO 170	20	8
90 TO 128	35	15
32 TO 90	80	45
19 TO 32	88	8
13 TO 19	96	8
6 TO 13	100	4

NOTE:
SPAWNING GRAVEL GRADATION (CLASSIFIED ABOVE)
RIFFLE FOUNDATION MATERIAL - SPAWNING GRAVEL OR LARGER
RIFFLE STABILIZATION MATERIAL - D50 = 9" MIN



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YUBA COUNTY CALIFORNIA
UPPER ROSE BAR HABITAT ENHANCEMENT PROJECT

PROFILES & SECTIONS 2

JOB NUMBER 20-1029
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SHEET C8
8 OF 8

LOCATION: d:\Work\Projects\20-1029_rose_bar_habitat_enhancement_project\400_Data\403_CAD_DWGS\production\PROFILES_2.dwg
PLOT:6/16/2022

Appendix C

Mitigation Monitoring and Reporting Program (MMRP)

MITIGATION MONITORING AND REPORT PROGRAM:

UPPER ROSE BAR SALMONID SPAWNING HABITAT RESTORATION PROJECT MITIGATED NEGATIVE DECLARATION

This Mitigation Monitoring and Reporting Program (MMRP) was prepared in accordance with Section 15097 of the California Environmental Quality Act (CEQA) Guidelines. Section 15097 requires that a lead agency establish a program to report on or monitor measures adopted as part of the environmental review process to mitigate or avoid significant effects on the environment. The MMRP for the Upper Rose Bar Salmonid Spawning Habitat Restoration Project is presented here as Table 1.

This MMRP is designed to ensure that the mitigation measures necessary to reduce significant impacts identified in the Project Initial Study and Proposed Mitigated Negative Declaration (IS/MND) are implemented. The components of the MMRP Table 1 are listed below:

Mitigation Measures: The mitigation measures are taken verbatim from the Project IS/MND.

Timing/Milestone: Identifies a schedule for conducting each mitigation action.

Responsible Entity: Identifies the entity responsible for implementing specific mitigation measures.

Mitigation Action: Identifies the specific action or actions that must be completed to implement the mitigation measure.

Monitoring and Enforcement Responsibility: Identifies the department/agency, consultant, or other entity responsible for overseeing that mitigation occurs.

Check off Date/Initials: To be filled out when individual mitigation is complete.

<table>
<tr><th colspan="6">MITIGATION MONITORING AND REPORTING PROGRAM:
UPPER ROSE BAR SALMONID SPAWNING HABITAT RESTORATION PROJECT</th></tr>
<tr><th>Mitigation Measure(s)</th><th>Timing/ Milestone</th><th>Responsible Entity</th><th>Mitigation Action</th><th>Monitoring and Enforcement Responsibility</th><th>Check off Date/Initials</th></tr>
<tr><td colspan="6">Air Quality</td></tr>
<tr><td>AQ-1. Reduce Dust Impacts

The following dust reduction measures will be implemented during movement of materials from the construction area to the processing plant to reduce construction-related emissions:
• wet materials to limit visible dust emissions using water;
• provide at least 6 in (15.2 cm) of freeboard space from the top of the container; or,
• cover the container.

Implement the following dust reduction measure during cobble placement to reduce construction-related emissions:
• limit or promptly remove any of mud or dirt on construction equipment and vehicles at the end of each workday, or once every 24 hours.
• water trucks would be used to wet down construction access roads, staging areas, and restoration activity zones to minimize dust production.</td><td>During restoration activities (Ongoing)</td><td>Project Applicant/ Contractor</td><td>Implement specified mitigation measures</td><td>Project Applicant/ Contractor</td><td></td></tr>
<tr><td colspan="6">Biological Resources</td></tr>
</table>

BIO-1: Work Outside of Critical Periods for Sensitive Species Table 5 lists the critical periods when disturbance could result in significant impacts to individuals or populations of special status species. To avoid these impacts, all Proposed Action in-water activities will be conducted during the period 15 July through 1 September, which is outside the listed critical periods for the majority of the species (Table 5). Surveys will be performed for species which have critical periods overlapping with the in-water work window or dry-ground work window (16 April to 31 October) which may be impacted by the Proposed Action activities. If special status or sensitive species are identified within the area which may be impacted by Proposed Action activities, then buffers will be established and/or CDFW and USFWS will be consulted. Nesting birds and raptors are protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code, and trees and shrubs within the Action Area likely provide nesting habitat for songbirds and raptors. If tree removal is unavoidable, it will occur during the non-breeding season (mid-September). If other construction activities must occur during the potential breeding season (1 February- 31 August) surveys for active nests and/or roosts will be conducted by a qualified biologist no more than 10 days prior to the start of construction. A minimum no disturbance buffer will be delineated around active nests (note, size of buffer depends on species encountered) until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival.	Prior to restoration activities	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	

BIO-2: Monitor Mercury Levels and Mitigate for Impacts Sediment and aqueous total mercury levels will be measured before, during, and after restoration activities in the Action Area. Following methods in the Stillwater Sciences (2004) Mercury Assessment, total mercury from areas of Proposed Action exposed fine sediments (<63 µm) will be evaluated to determine if they are considered elevated by the Central Valley Regional Water Quality Control Board (0.10 mg/kg or greater). Aqueous raw total mercury will also be tested to ensure that it is below the California Toxics Rule for a drinking water source of 50 ng/L. It is unlikely that excavation and regrading activities may uncover mercury hot spots and or mobilize mercury in the aquatic food web; however, if samples are found with mercury levels above established standards, work will be halted in the vicinity of the elevated mercury area to assess contamination potential. If, sediment total mercury levels meet the elevated criteria then the mitigation action(s) defined in the Proposed Action 401 water quality certification will be implemented.	Prior to, during and after restoration activities (Ongoing)	Project Applicant/ Contractor	Use qualified QSP and implement measures	Project Applicant/ Contractor	
BIO-3: Prevent Spread of Aquatic Invasive Species To minimize the chance that aquatic invasive plants and invertebrates will be transported and spread to other sections of the Yuba River or other water bodies on equipment, construction specifications will require that equipment be steam cleaned immediately after the work is completed and before being used in other water bodies. An Invasive Species Risk Assessment and Planning (ISRAP) protocol will be developed, and all appropriate staff will be trained as to its purpose and implementation before construction begins. The plan will be used to prevent the spread of invasive species during construction. Additional measures may be taken at the recommendation of CDFW.	Prior to restoration activities	Project Applicant/ Contractor	Implement mitigation measures specified in ISRAP	Project Applicant/ Contractor	

BIO-4: Construction Approach to Minimize Impacts to Fish The construction approach will allow fish to move progressively downstream and away from the impact area as construction moves from upstream to downstream through the backwater channel. The majority of the in-water work will involve the filling in and creation of a side channel through the ponds and backwater. Before in-water work starts in a section of the channel a qualified fisheries biologist will survey the area and determine whether there is a suitable egress route for fish to move downstream and away from the construction area. If a suitable downstream egress route is not present, most likely because an area is deemed too shallow, then the problem area will be altered such that it becomes suitable. An excavator would likely be used to deepen the problem area and would work from downstream to upstream to discourage fish from migrating downstream until the egress route is completed. Once suitable downstream egress has been established, in-stream construction will begin at the most upstream section of the channel and work progressively downstream and across the channel. The listed fish species most likely to be present are juvenile CCV steelhead from 7 to 30 cm (3 – 12 in) fork length and possibly juvenile CV spring-run Chinook Salmon that are demonstrating the yearling life history strategy from 7 to 12 cm (3 – 5 in) fork length. Juvenile CCV steelhead and Chinook Salmon are highly mobile and would be expected to easily move downstream and away from the impact area with a suitable egress route. Once work proceeds past an area, fish will be able to return to use the newly created habitat through upstream migration.	During restoration activities (Ongoing)	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	

If a qualified fisheries biologist, with input from the contractor, determines that in-stream work in an area cannot be performed using the construction approach then fish relocation will be performed to avoid fish injury and mortality and minimize disturbance.					
BIO-5: Protect and Compensate for Native Trees Native trees, such as Fremont cottonwood, willows, and alder, with a dbh of 6 in (15.2 cm) or greater shall be protected with 30-ft (9.1-m), 10-ft (3-m), and 10-ft (3-m) buffers, respectively, as possible. Native trees shall be marked with flagging if close to the work area to prevent disturbance. To compensate for the removal of riparian shrubs and trees during Project implementation, the plans shall identify tree and shrub species to be planted, how, where, and when they would be planted, and measures to be taken to ensure a minimum performance criteria of 70% survival of planted trees. The tree plantings shall be based on native tree species compensated for in the following manner: To mitigate for any loss of native trees impacted by Proposed Project implementation, the contractor would follow the guidelines below: • oaks having a dbh of three to five inches would be replaced in-kind, at a ratio of 3:1, and planted during the winter dormancy period in the nearest suitable location to the area where they were removed. Oaks with a dbh greater than five inches would be replaced in kind at a ratio of 5:1. • riparian trees (i.e., willow, cottonwood, sycamore, alder, ash, etc.) would be replaced in-kind, at a ratio of 3:1, and planted during the winter dormancy period in	Prior to initiation of restoration activities	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	

the nearest suitable location to the area where they were removed.					
BIO-6: Pre-construction Survey(s) and Monitoring for Special Status Wildlife Species Pre-construction surveys by qualified biologists will be conducted no more than 10 days prior to the start of construction of work within the Action Area to verify the presence or absence of special-status wildlife and birds. Surveys for active bird nests will be performed using qualified biologists no more than 10 days prior to the start of disturbance activities. A minimum no-disturbance buffer of 250 ft around active nests of non-listed bird species; a 500-ft no-disturbance buffer around migratory bird species; and a ½-mile buffer for nest of listed species and fully protected species will be established until breeding season is over or young have fledged. If such a buffer cannot be accomplished, CDFW will be consulted. If sensitive wildlife species or active nest are found within the construction area, the biologist shall have the authority to stop construction activities and establish a non-disturbance buffer until it is determined that the animal would not be harmed. If the potential to harm sensitive wildlife or an active nest/den site remains, the non-disturbance buffer is to remain and the biologist shall contact CDFW for authorization before work resumes.	Prior to and during restoration activities	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	
BIO-7: Nesting Raptor and Bird Avoidance and Minimization To the extent feasible, Proposed Action activities should be scheduled to avoid the nesting bird season (see Mitigation	Prior to and during restoration activities	Project Applicant/ Contractor	If necessary, implement specified mitigation measures	Project Applicant/ Contractor	

Measure BIO-1). For Proposed Action activities expected to occur during the nesting season of raptors (1 February to 31 August) and migratory birds, a qualified biologist shall conduct a pre-construction survey no more than 10 days prior to the start of construction to determine if active nests are present on or within 500 feet of the Action Area. If no active nests are identified during the pre-construction survey, no further mitigation is necessary. If active nests are found on or within 500 feet of the Action Area, the following buffers shall be established until breeding season is over or young have fledged to ensure that Proposed Action activities comply with the MBTA and California Fish and Game Code: • a minimum no-disturbance buffer of 250 feet around active nests of birds protected under the MBTA (including Yellow-breasted Chat and California Black Rail); • a 500-foot no-disturbance buffer around active nests of raptors protected under the MBTA (including Swainson's Hawk and Northern Harrier); and • a ½-mile buffer for nesting Bald Eagles.					
BIO-8: Surveys and Avoidance for Western Pond Turtle Within 10 days prior to ground disturbing activities, a qualified biologist shall conduct a pre-activity survey to identify Western Pond Turtle individuals or nests within proposed work areas during the egg-laying season (March-August). If any western pond turtle is found within the Proposed Action area, the activities in the vicinity shall cease until they have moved outside of the Proposed Action area of their own volition. If a western pond turtle nest is found, the biologist shall flag the site, maintain an appropriate no-	Prior to and during restoration activities	Project Applicant/ Contractor	If necessary, implement specified mitigation measures	Project Applicant/ Contractor	

disturbance buffer, and determine if Proposed Action activities can avoid affecting the nest.					
BIO-9: Surveys and Avoidance for Foothill Yellow-legged Frog Pre-construction surveys shall be conducted for FYLF prior to the commencement of construction activities. These surveys shall conform to the survey protocol established in Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog (USFWS 2005). If construction activities occur between November 1 and March 31, a qualified biologist shall monitor the construction activities daily.	Prior to and during restoration activities	Project Applicant/ Contractor	If necessary, implement specified mitigation measures	Project Applicant/ Contractor	
BIO-10: Monitor for Bats to Prevent Impacts Before any ground disturbing activities, a qualified biologist shall survey for the presence of associated habitat types for the bat species of concern. If bats are present, the biologist shall apply a minimum 300 ft (91.4 m) no-disturbance buffer around roosting bats, maternity roosts or winter hibernacula until all young bats have fledged. If suitable habitat is present, evening emergence surveys shall be conducted during the appropriate seasonal period of bat activity to determine the presence of bats.	Prior to restoration activities	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	
Cultural Resources					
CR-1: Archaeological Construction Monitor A qualified archaeological monitor shall be present during all ground-disturbing activity that will result in removal of material within/near the Yuba River riverbed; including, but	During restoration activities (Ongoing)	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	

not limited to, moving of cobble rocks and leveling of incised gorges and the riverbed.					
CR-2: Inadvertent Discoveries of Objects of Cultural Significance If archaeological components are encountered during ground-disturbing activities, all ground disturbing work at the find location and 100-foot buffer placed around the area until a qualified archaeologist can assess the significance of the finding and provide (if needed) avoidance and/or data recovery plan. Pursuant to California Health and Safety Code §7050.5, if human remains are encountered, all ground-disturbing work must cease in the vicinity of the discovery, and the County Coroner shall be contacted. The respectful treatment and disposition of remains and associated grave offerings shall be in accordance with Public Resource Code (PRC) §5097.98. The project owner is responsible for implementation PRC §5097.98 and coordination with the likely descendant (MLD) identified by the Native American Heritage Commission. PRC §5097.98 also outlines next steps should the landowner and MLD not reach an agreement to the final disposition of the remains**.**	During restoration activities (Ongoing)	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	
Hazards and Hazardous Materials					
HAZ-1: Reduce Potential Impacts from Wildfire Risk During Proposed Action construction, any dry vegetation present on the staging areas or temporary access roads would be cleared prior to being used by vehicles or heavy equipment. Fire extinguishers would be present onsite in vehicles to	Prior to and during restoration activities	Project Applicant/ Contractor	If necessary, implement specified mitigation measures	Project Applicant/ Contractor	

quickly put out any vegetation that ignites as a result of a spark from heavy equipment.					
Noise					
NOISE-1. Reduce Impacts from Noise To mitigate noise related impacts, the Proposed Action shall require all contractors to comply with the following operational parameters: • Restrict construction activities to time periods between 7:00 am and 5:00 pm when there is the least potential for disturbance; • Install and maintain sound-reducing equipment and muffled exhaust on all construction equipment.	During restoration activities (Ongoing)	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	
Water quality					
WQ-1: Monitor Water Quality and Prevent Impacts During in river work, turbidity and total suspended solids shall be monitored with intermittent grab samples from the river, and construction curtailed if turbidity exceeds criteria established by the Regional Water Quality Control Board in its Clean Water Act §401 Water Quality Certification for the Project. Specifically, sampling shall be performed immediately upstream from the Project Area and approximately 300 feet downstream of the active work area during construction. Activities shall not cause in surface waters:	Prior to, during and after restoration activities (Ongoing)	Project Applicant/ Contractor	Use qualified QSP and implement measures	Project Applicant/ Contractor	

a) turbidity to exceed 2 NTU's where natural turbidity is less than 2 NTU; b) where natural turbidity is between 1 and 5 NTUs, increases exceeding 1 NTU; c) where natural turbidity is between 5 and 50 NTUs, increase exceeding 20 percent; d) where natural turbidity is between 50 and 100 NTUs, increases exceeding 10 NTUs; e) where natural turbidity is greater than 100 NTUs, increase exceeding 10 percent. Activities shall not cause settleable material to exceed 0.1 ml/L in surface waters as measured in surface waters downstream from the Project Area. Activities shall not cause pH to be depressed below 6.5 nor raised above 8.5 as measured in surface waters downstream from the Project Area. The Project shall not discharge petroleum products into surface water. The Central Valley Water Board shall be notified immediately of any spill of petroleum products. Sediment fencing shall be used along the river corridor to capture floating materials or sediments mobilized during construction activities and prevent water quality impacts. Stream bank impacts shall be isolated and minimized to reduce bank sloughing. Banks shall be stabilized with revegetation following Project activities, as appropriate. A SWPPP shall be developed as part of the BMPs. All pertinent staff shall be trained on and familiarized with these					

plans. Copies of the plans and appropriate spill prevention equipment referenced in them shall be made available onsite and staff shall be trained in its use. Spill prevention kits shall be in close proximity to construction areas, and workers tined in their proper use.					
WQ-2: Use Clean Equipment and Biodegradable Lubricants All equipment shall be clean and use biodegradable lubricants and hydraulic fluids. All equipment working within the stream channel shall be inspected daily for fuel, lubrication, and coolant leaks; and, for leak potentials (e.g. cracked hoses, loose filling caps, stripped drain plugs). Vehicles shall be fueled and lubricated in a designated staging area located outside the stream channel and banks. Construction specifications shall require that any equipment used in or near the river is properly cleaned to prevent any hazardous materials from entering the river, and containment material shall be available onsite in case of an accident. Spill prevention kits shall be located close to construction areas, with workers trained in its use. Contracted construction managers shall regularly monitor construction personnel to ensure environmental compliance.	During restoration activities (Ongoing)	Project Applicant/ Contractor	Implement specified mitigation measures	Project Applicant/ Contractor	

Appendix D

Wetland Delineation Report

Upper Rose Bar Salmonid Spawning Habitat Restoration Project on the Lower Yuba River

Aquatic Resources Delineation Report

Prepared by:
Cramer Fish Sciences
and
South Yuba River Citizen's League

Prepared for:
California Department of Fish and Wildlife and
U.S. Army Corps of Engineers

October 2021

Suggested citation: Cramer Fish Sciences and South Yuba River Citizen's League. 2021. Upper Rose Bar Salmonid Spawning Habitat Restoration Project Wetland Delineation Report. Prepared for the California Department of Fish and Wildlife and the U.S. Army Corps of Engineers. 17 pp. + appendices.

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1.0 INTRODUCTION

Cramer Fish Sciences (CFS) and South Yuba River Citizen's League (SYRCL) conducted a wetland delineation of the approximately 26.3-acre survey area for the Upper Rose Bar Salmonid Spawning Habitat Restoration Project (Proposed Project) in Yuba County, California. This wetland delineation report describes the potentially jurisdictional Waters of the United States (U.S.) (including wetlands) identified within the survey area that may be subject to regulation by the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act (CWA). Prior to submittal to the Corps and following 100% design completion, impacts to Waters of the U.S. will be calculated in acres to estimate the potentially jurisdictional features within the survey area. These estimates are subject to modification following the Corps verification process, and results are considered preliminary until the Corps verifies the findings.

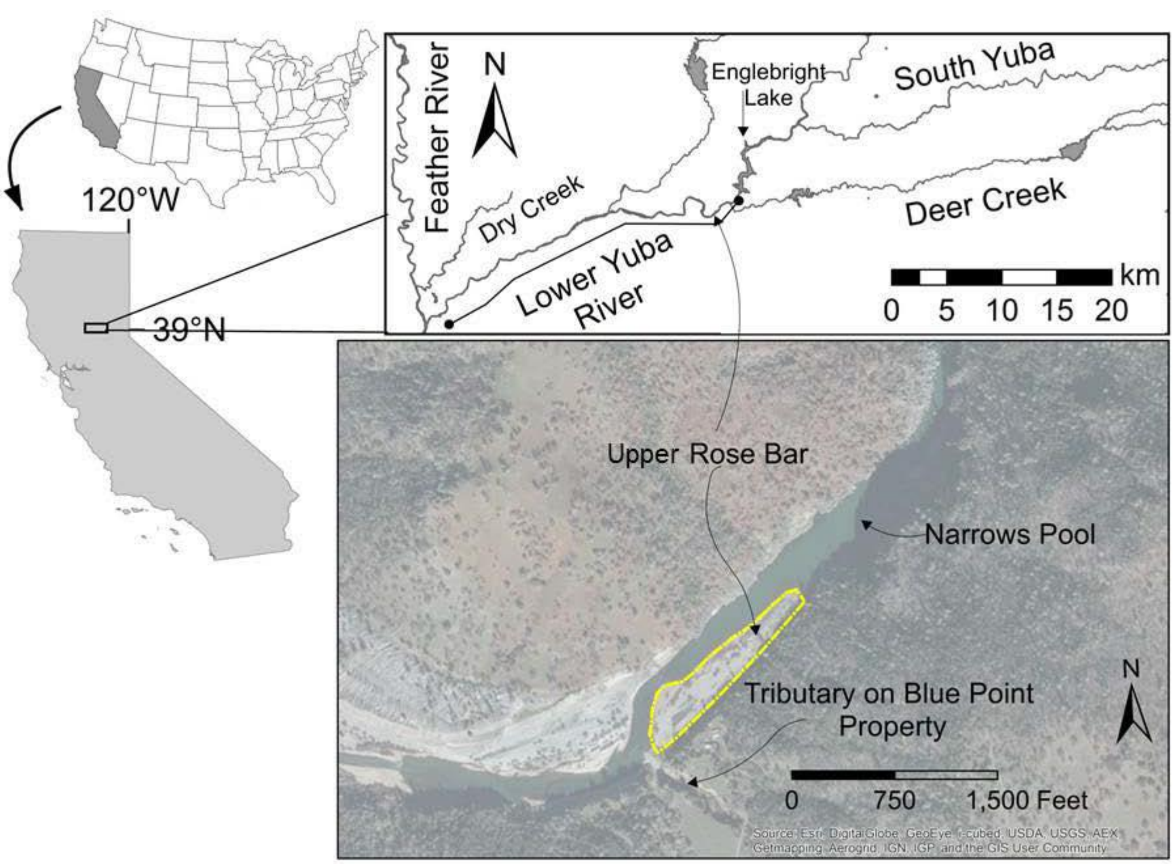

Figure 1. Proposed Project boundary on the lower Yuba River. Source: ESA 2016.

1.1 PROJECT LOCATION

The Proposed Project with a boundary of 26.3 acres is located on private property owned by Blue Point Properties along the lower Yuba River near the community of Smartsville in Yuba County, California (**Figure 1**). The survey area encompasses the Proposed Project boundary (**Figure 1**). The survey area is located on the gravel bar on the north side of the lower Yuba River between 39°13'7.52"N, 121°18'1.36"W (downstream limit) and 39°13'21.87"N, 121°17'40.08"W (upstream limit). The survey area occurs within Section 28, Township 16 North, and Range 6 East, Mount Diablo Principal Meridian in the "Smartsville, CA" U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle(quad). The survey area is at river mile (RM) 15, approximately 8.9 river miles downstream of Englebright Dam (RM 23.9).

1.2 PROJECT DESCRIPTION

The U.S. Fish and Wildlife Service (USFWS) Anadromous Fish Restoration Program (AFRP), through the Central Valley Project Improvement Act (CVPIA), was mandated to make all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term sustainable basis (USFWS 2001). The Yuba River still provides valuable spawning and rearing habitat for Central Valley (CV) fall-run and spring-run Chinook Salmon (*Oncorhynchus tshawytscha*) and California Central Valley (CCV) steelhead (*Oncorhynchus mykiss*). CV spring-run Chinook Salmon and CCV steelhead are both listed as threatened under the federal Endangered Species Act (ESA) and fall-run Chinook Salmon are considered a species of concern under the California Endangered Species Act (CESA). The Yuba River is accessible to anadromous fishes for the first 23.9 river miles with access terminating at Englebright Dam. Habitat rehabilitation proposed by this Project will support spawning by spring-run and fall-run Chinook Salmon and CCV steelhead.

The Proposed Action is designed to restore and enhance ecosystem processes, with a primary focus on improving productive salmonid spawning habitat to increase natural production of CV fall- and spring-run Chinook salmon and CCV steelhead in the lower Yuba River (LYR). The Proposed Action would directly address the doubling goal of the USFWS AFRP, the National Marine Fisheries Service (NMFS) priority action YUR-2.4 to create and restore off-channel spawning areas in the Yuba River for CV Chinook salmon and steelhead (NMFS 2014), and test hypotheses regarding a variety of habitat enhancement techniques and subsequent response of adult salmonids to restored spawning habitats.

The Proposed Action, including design, permitting, construction, and monitoring, is funded and directed by the Bella Vista Foundation, Pacific Gas and Electricity, and the California Department of Fish and Wildlife through the Proposition 68 grant program. The Proposed Action is being led by the South Yuba River Citizens League (SYRCL), cbec eco-engineering (cbec), and Cramer Fish Sciences (CFS). The success of the Propose Action hinges on continued working partnerships with landowners and local and regional stakeholders and state and federal agencies. The Proposed Action team will finalize the Propose Action design plans, develop the effectiveness monitoring plan, coordinate all regulatory compliance, conduct public outreach activities, implement the project, and document project success through a scientifically robust monitoring program. The Proposed Action team will also coordinate with adjacent landowners, resource agencies, stakeholders, and the local community to recover function habitat for salmonids, garner public support, and demonstrate benefits of river habitat restoration.

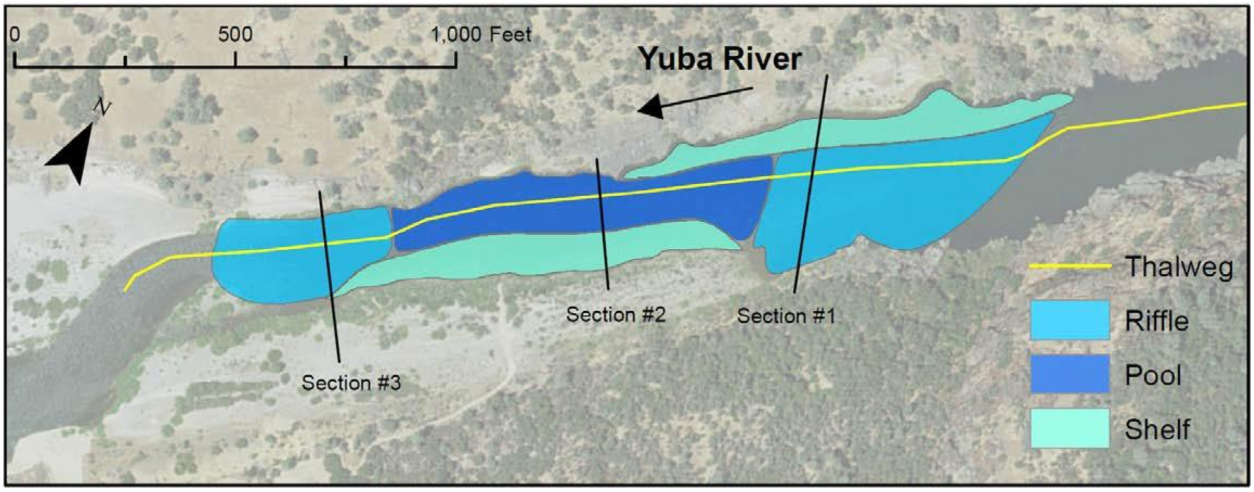

Figure 2. Conceptual restoration design for the Upper Rose Bar Salmonid Spawning Habitat Restoration Project. Source: ESA 2016.

2.0 REGULATORY SETTING

The Corps has primary federal responsibility for administering regulations that concern Waters of the U.S., including wetlands, under Section 404 of the CWA. Section 404 regulates the discharge of dredged and fill material into Waters of the U.S. The Corps requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the ordinary high-water mark (OHWM). The Corps has established a series of nationwide permits (NWPs) that authorize certain activities in waters. Wetlands and other water features that lack a hydrologic connection to navigable Waters of the U.S. and that lack a nexus to interstate and foreign commerce are not regulated by the CWA and do not fall under the jurisdiction of the Corps. These features are called “isolated wetlands.”

In addition, a Section 401 Water Quality Certification Permit was established to comply with CWA Sections 301, 302, 303, 306, and 307, and is typically regulated by the California Regional Water Quality Control Board (RWQCB). Anyone proposing to conduct a project that may result in discharge to U.S. surface waters and/or “waters of the state,” including wetlands (all types), year-round and seasonal streams, lakes, and all other surface waters, must obtain a federal permit or water quality certification. At a minimum, any beneficial uses lost must be replaced by a mitigation project of at least equal function, value, and area.

Waters of the U.S. are defined as "all waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters" (Section 404 of the CWA; 33 Code of Federal Regulations (CFR) Part 328). The limit of Corps jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the OHWM. The OHWM is defined as "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (Section 404 of the CWA; 33 CFR Part 328).

Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Section 404 of the CWA; 33 CFR Part 328).

The Corps and Environmental Protection Agency (EPA) issued the U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook on 30 May 2007 to provide guidance based on the Supreme Court's decision regarding Rapanos v. United States and Carabell v. United States (Rapanos decision) (Rapanos vs. U.S., No. 04-1034 [June 19, 2006] and Carabell vs. U.S., No. 04-1384 [September 27, 2004]) (CORPS and EPA, 2007). The decision provides standards that distinguish between traditional navigable waters (TNWs), relatively permanent waters (RPWs) with perennial or seasonal flows, and non-relatively permanent waters (non-RPWs). Wetlands and non-TNWs adjacent to TNWs are subject to CWA jurisdiction if: the water body is relatively permanent, or if a water body abuts or is tributary to a RPW, or if a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs. The significant nexus standard will be based on evidence applicable to ecology, hydrology, and the influence of the water on the "chemical, physical, and biological integrity of downstream traditional navigable waters" (CORPS and EPA 2007). Isolated wetlands are not subject to CWA jurisdiction based on the Supreme Court's decision regarding the Solid Waste Agency of Northern Cook County (SWANCC decision) (Solid Waste Agency of Northern Cook County vs. U.S. Army Corps of Engineers, No. 99-1178, January 9, 2001) (USDOE, 2003).

In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water are generally not defined as Waters of the U.S. because they are not tributaries or they do not have a significant nexus to downstream TNWs (45, 48, and 51 CFR subsections 62732, 62747, 21466, 21474, 41206, and 41217).

3.0 METHODOLOGY

The information presented in this report was prepared in accordance with the Minimum Standards for Acceptance of Preliminary Wetland Delineations (Corps 2001). This report was also prepared in accordance with the Corps of Engineers Wetland Delineation Manual (WTI, 1995), the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Region Supplement) (Corps 2008), and the U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook (Rapanos Guidance) (Corps and EPA 2007). The boundaries of potential Waters of the U.S. were delineated through aerial photograph interpretation and standard field methodologies (i.e., paired data set analyses), and all wetland data were recorded on Wetland Determination Data Forms - Arid West Region. A color aerial photograph (ArcMap ESRI online server 2019) was used in the field to assist with the delineation. Munsell Soil Color Charts (Munsell Color 2009) were used in the field to identify hydric soils. Plant identification and nomenclature followed The Jepson Manual: Higher Plants of California (Baldwin et al. 2012).

3.1 DELINEATION

Cramer Fish Sciences biologist Kirsten Sellheim, M.S. and SYRCL biologist Tyler Goodearly conducted the delineation on 8 October 2020. Meandering transects were walked throughout the study area to determine locations of potential wetlands and/or Waters of the U.S. During the delineation, six wetland and three upland data point sets were sampled to determine if the three-parameter criteria (vegetation, soil, and hydrology) supported a wetland or upland determination. At the paired data point locations, one point was within the limits of a potential wetland area and the other point was located outside the potential wetland area. Data point global positioning system (GPS) locations were recorded for each sample using a Trimble 6000 Series GeoXT.

3.2 ROUTINE DETERMINATIONS

As mentioned previously, wetlands and/or other Waters of the U.S. within the study area were determined based on the following three-parameter criteria:

- the majority of dominant plant species are wetland associated species;
- hydric soils are present; and
- hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.

3.3 VEGETATION

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). Prevalent vegetation is characterized by the dominant plant species comprising the plant community (WTI 1995). The dominance test is the basic hydrophytic vegetation indicator and was used at each data point location. The "50/20 rule" was used to select the dominant plant species from each stratum of the vegetation community. This rule states that for each stratum in the community, dominant plant species are the most abundant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional plant species that individually comprise 20 percent or more of the total in the stratum (Corps and EPA 2007).

Dominant plant species observed at each data point were classified by their indicator status (i.e., probability of occurring in a wetland) (**Table 1**) according to the USFWS National List of Vascular Plant Species That Occur in Wetlands: California (Region 0; Reed 1988). If the majority (greater than 50 percent) of dominant vegetation on-site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), the site was considered to be dominated by hydrophytic vegetation. Pursuant to the Arid West Supplement, plus (+) and minus (-) modifiers were not used (i.e., FAC- and FAC+ plant species are all considered FAC) and plant species not listed in Reed (1988) were assumed to be upland (UPL) species (Corps and EPA 2007).

In instances where indicators of hydric soil and wetland hydrology were present but the plant community failed the dominance test, the vegetation was re-evaluated using the prevalence index. The prevalence index is a weighted-average wetland indicator status of all plant species in the sample area, where each indicator status is assigned a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighted by percent cover (Corps 2010).

Table 1. Classification of Wetland-Associated Plant Species (adopted from Reed 1988).

Plant species classification	Abbreviation	Probability of occurring in a wetland
Obligate	OBL	> 99%
Facultative wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative upland	FACU	1-33%
Upland	UPL	1%

3.4 SOILS

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (Environmental Laboratory 1987). Frequently observed indicators of hydric soils include (but are not limited to) histosols, histic epipedon, hydrogen sulfide, stratified layers, depleted below dark surface, depleted matrix, redox dark surface, depleted dark surface, redox depressions, vernal pools, etc. Soil pits were excavated to the depth necessary to observe and document hydric soils indicators, to confirm the absence of indicators, or until an impermeable layer was encountered. The soils at each data point were examined for the presence or absence of these indicators. The colors of the examined soils were determined while the soils were moist using the Munsell Soil Color Charts (Munsell Color 2009).

3.5 HYDROLOGY

Wetlands are seasonally or perennially inundated or saturated at or near (within 12 inches) the soil surface. Primary indicators of wetland hydrology include (but are not limited to) visual observation of surface water, high water table, saturation, water marks (nonriverine), sediment deposits (nonriverine), drift deposits (nonriverine), surface soil cracks, inundation visible on aerial imagery, water stained leaves, salt crust, biotic crust, aquatic invertebrates, hydrogen sulfide odor, oxidized rhizospheres along living roots, etc. Secondary indicators of wetland hydrology include water marks (riverine), sediment deposits (riverine), drainage patterns, dry-season water table, crayfish burrows, etc. Observation of at least one primary indicator or two secondary indicators is required to confirm the presence of wetland hydrology.

4.0 ENVIRONMENTAL SETTING

In general, Yuba County has a Mediterranean climate regime characterized by hot, dry, sunny summers and cool, rainy winters. The mean annual maximum and minimum temperature for Marysville, California, located roughly 16 miles west from the study area, are approximately 75°F and 49°F, respectively (WRCC 2020a). The average maximum temperature for Marysville peaks in July at 96.3°F (WRCC 2020a). The average annual precipitation for Marysville is approximately 21.0 inches, with a maximum of approximately 11.5 inches on average that occurs from December through February based on climate data collected during 1897-2007 (WRCC 2020b).

The study area is located in Yuba County adjacent to the lower Yuba River. The Yuba River is a tributary to the Feather River in the northern portion of the California's CV. The river, which drains an approximately 1,300 square mile (mi^2) [3,367 square kilometer (km^2)] watershed, has three forks; north, middle, and, south, which each originate in the Sierra Nevada mountain range. Elevations in the watershed range from 9,148 ft [2,788 meter (m)] on Mt. Lola at the crest of the Sierra Nevada to 60 ft (18 m) at the confluence with the Feather River in Marysville. The Middle Fork flows into the North Fork downstream of New Bullards Bar reservoir, forming the main Yuba River which then flows into Englebright Reservoir. The South Fork of the Yuba River flows into Englebright Reservoir. The lower Yuba River begins below Englebright Dam and flows for ~24 miles before joining the Feather River near Marysville. The lower Yuba River has two major tributaries: Deer Creek, which flows in ~ 1 mile below Englebright Dam, and Dry Creek, which flows in near Hammon Grove Park. Long-term average annual unimpaired run-off of the lower Yuba River at Smartsville is 2,370,000 acre-feet (YCWA 2009) but this value is reduced by 534,000 acre-feet when out of basin transfers are considered (YCWA 2009). Similar to many rivers in California, the natural hydrologic processes within the Yuba River have been disrupted by the presence of dams (cbec 2013). Englebright Dam, located on the Yuba River at RM 23.9 (measuring from the confluence with the Feather River), lies upstream of the study area and serves as the upstream migration barrier to anadromous fish.

The study area is situated in a rural residential setting near the community of Smartsville. The area was historically used for gold mining and is quite remote, with only a few scattered rural residences within a 0.5-mile radius of the Proposed Project footprint. The Yuba River flows from east to west below the southern boundary of the study area. The study area is dominated by a large gravel bar with scattered stands of riparian vegetation. There is scattered riparian vegetation throughout the gravel bar and an ephemerally flowing gully that feeds into the Yuba River.

The study area is located within the northern Sierra Nevada Foothills (n SNF) geographic province, which is characterized by blue-oak/foothill-pine woodlands and chaparral (Baldwin et al. 2012).

4.1 HABITAT TYPES

The study area is dominated by an unvegetated gravel bar. Three terrestrial vegetation habitat types were observed within the study area: Interior Mixed Hardwood,Valley Foothill Riparian and Riparian Willow Scrub. Despite the study area being in the northern Sierra Nevada Foothills floristic province, it is close to the border of the Sacramento Valley (ScV) floristic province and riparian communities found in the Sacramento Valley extend into foothill riparian areas, particularly along major rivers. These terrestrial habitat types are further discussed below, as adapted from *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) and Manual of California Vegetation (CNPS 2000). Just outside of the northern boundary of the study area the Fremont cottonwood woodland transitions into blue oak woodland. The aquatic habitat types observed within the study area include the main channel of the Yuba River and a gully that flows ephemerally during the rainy season. Acreages for the aquatic habitat types in the study area will be quantified when the Project designs are completed.

Interior Mixed Hardwood

The Valley Interior Mixed Hardwood plant community covers approximately 1.5 acres along the upper boundaries and steep slopes of the Proposed Action Area. The dominant tree species are interior live oak (*Quercus wislizeni*) and blue oak (*Q. douglasii*) with infrequent ponderosa pines (*Pinus ponderosa*). Shrub species included California buckeye (*Aesculus californica*), poison oak (*Toxicodenron diversilobum*), and Himalayan blackberry (*Rubus armeniaucus*).

Valley Foothill Riparian

The Valley Foothill Riparian plant community is the second-most common plant community found within the Proposed Action Area, covering 4.1 acres. It is distributed along the gentler slopes of both drainages. The dominant tree species is Fremont cottonwood (*Populus fremontii*) with occasional interior live oaks (*Quercus wislizeni*). Shrub species included California buckeye (*Aesculus californica*), poison oak (*Toxicodenron diversilobum*), and Himalayan blackberry (*Rubus armeniaucus*).

Riparian Scrub

Riparian Scrub is the most common plant community found within the Proposed Action Area, covering 7.5 acres, and is distributed along the edge of the Yuba River and scattered throughout the gravel bar. This community is dominated by narrowleaf willow (*Salix exigua)*, dusky willow (*S. melanopsis)*, and yellow willow (*S. lasiolepis)* with scattered California ash (*Fraxinus dipetala*).

4.2 SOIL TYPES

According to the U.S. Department of Agriculture (USDA) National Resources Conservation Service (NRCS) online Soil Survey of Yuba County, California, the dominant soil types mapped within the study area are riverwash, water, and dumps/mine tailings (**Appendix 3**, USDA 2020). Riverwash soil type consists of recent depositions of gravel, sand, and silt alluvium along major rivers and streams. Gravel bars comprise the majority of these areas. Mine tailings consist of riverwash that has been dredge mined and typically formed into regular windrows. The process of dredge mining typically results in the larger substrates (cobble and gravel) being left on the surface while the smaller substrates (small gravel and sand) are buried below the larger material. At present, riverwash and mine tailings are not identified in the NRCS National Hydric Soil List for Yuba County (USDA 2019).

4.3 NATIONAL WETLANDS INVENTORY

The USFWS National Wetlands Inventory (NWI) online mapping tool was used to detect any previously mapped aquatic features within the study area (NWI, 2021). The NWI map of the study area is shown in **Figure 3**. The NWI map depicts Riverine as the dominant wetland type occurring within the study area.

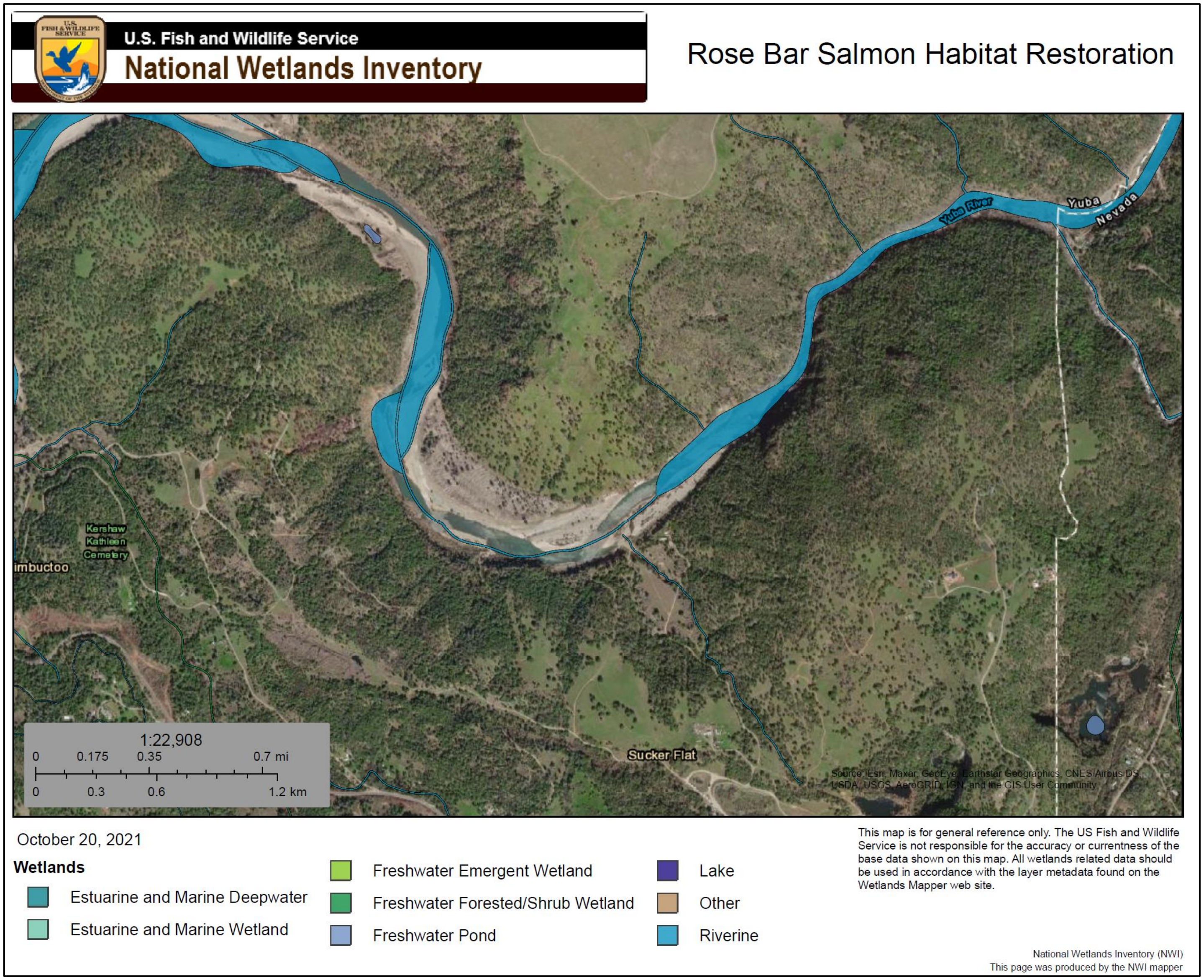

Figure 3. National Wetlands Inventory Map of the Proposed Project study area. Source: NWI 2021.

5.0 RESULTS

5.1 EXISTING CONDITIONS

At the time of the delineation, the large gravel bar within the study area was not inundated. Vegetation associated with the wetlands was readily identifiable to the degree necessary to determine the presence or absence of hydrophytic vegetation. All wetland vegetation was identifiable to the genus or species level. However, upland grasses (Poaceae) could not be identified past the family level due to the absence of reproductive life stages. For all sites, the vegetation observed was sufficient to determine indicator status and conduct the vegetation portion of the delineation. Normal circumstances were present within the study area. The wetland delineation data forms compiled in the field are included as **Appendix 4** and a list of plant species observed within the study area is included as **Appendix 1**. Site photos taken during the delineation are included as **Appendix 2**.

5.2 WETLANDS AND OTHER WATERS OF THE U.S. OCCURRING WITHIN THE STUDY AREA

Jurisdictional wetlands and other Waters of the U.S. observed within the study area were the main channel of the Yuba River, which has been identified previously by the NWI and freshwater scrub/shrub wetland on the gravel bar. A detailed description of the river channel and wetlands are included below.

WETLANDS

A variety of wetlands were documented within the study area. The gravel bar/floodplain was not connected to the main channel at the flows observed during the time of the survey but showed evidence of being inundated during high flow events in winter 2020, including drift vegetation and trash trapped in tree branches. Scattered throughout the study area were stands of freshwater scrub/shrub wetlands which were dominated by willows. The OHWM has been determined to be 26,000 cfs for the lower Yuba River. The majority of the study area where construction will occur is below the OHWM, except for portions of the gully and some upland areas.

Willows (*Salix* spp.) were the dominant vegetation and were observed in all six of the wetland points (**Appendix 4**). W-6 also contained Fremont cottonwood (*Populus fremontii*; FACW) and W-2 contained Alder (*Alnus rhombifolia*; FACW) (**Appendix 4**). Upland sites contained oaks (*Quercus wislezina*; FACU), mission fig (*Ficus carica*; FACU), and Fremont cottonwood (*Populus fremontii*; FACW) (**Appendix 4**).

The primary indicators of wetland hydrology observed within wetland sampling points were variable. W-1, W-2, W-4, and W-6 all had the primary indicator of inundation visible on aerial imagery; W-1 and W-2 also had the secondary indicators of sediment deposits and drainage patterns and W-6 had drainage patterns (**Appendix 4**). W-3 and W-5 lacked any primary indicators but had the secondary indicators of drainage patterns and sediment and drift deposits (**Appendix 4**).

The soil matrix color observed within the wetlands varied across the sites. A table listing depth, matrix colors, soil texture, and hydric soil indicators used to determine wetland hydrology for each of the wetland sampling points is included in **Table 2**. None of the paired upland soil samples corresponding to each of the wetlands satisfied the wetland hydrology, hydrophytic vegetation, or hydric soils criteria.

Table 2. Soil matrix color, texture and indicators used to delineate wetland features within study area. Color codes followed Munsell Color (2009).

Feature	Depth (inches)	Color	Texture	%	Hydric soil indicators	Hydric Soil present?
W-1	0-12	--	Gravel	85	N/A	No
W-1	0-12	--	Coarse sand	15	N/A	No
W-2	0-6	--	Cobble	90	N/A	No
W-2	0-6	--	Sand	10	N/A	No
W-3	0-6	--	Gravel/Cobble	100	N/A	No
W-4	0-6		Cobble	95	N/A	No
W-4	0-6	--	Sand	5	N/A	No
W-5	0-6	--	Cobble/Gravel	95	N/A	No
W-5	0-6	--	Sand	5	N/A	No
W-6	0-6	--	Cobble/gravel	95	N/A	No
W-6	0-6	--	Sandy loam	5	N/A	No
U-1	0-10	10YR3-3	Loamy clay	100	N/A	No
U-2	0-6	--	Cobble/Gravel	50	N/A	No
U-2	0-6	10YR3-3	Loamy sand	50	N/A	No
U-3	0-6	--	Cobble/Gravel	50	N/A	No
U-3	0-6	10YR4-6	Sandy loam	50	N/A	No

YUBA RIVER

The Yuba River has been previously identified as a jurisdictional water of the U.S. by the NWI (**Figure 3**). The river channel adjacent to the study area is relatively wide and confined by a training wall forming its southern bank. The Yuba River floodplain adjacent to the study area is comprised of a gravel bar with stands of willows. There is a gully that runs seasonally into the Yuba River mainstem.

6.0 DISCUSSION AND ANALYSIS

6.1 POTENTIALLY JURISDICTIONAL AND NON-JURISDICTIONAL FEATURES

Cramer Fish Sciences and SYRCL biologists conducted a delineation of potential jurisdictional Waters of the U.S. within the study area on 8 October 2020. The main channel of the Yuba River and freshwater scrub/shrub wetlands were identified within the study area. These features appear to be jurisdictional under Section 404 of the CWA. A discussion of the preliminary determination of these features is presented below.

The lower section of the Yuba River downstream of Englebright Dam is considered a jurisdictional Water of the U.S. This portion of the Yuba River serves as a tributary to the Feather River which is a tributary to the Sacramento River which flows into San Francisco Bay, then into the Pacific Ocean. The Yuba River within the study area may therefore be used for international navigation, and hence constitutes a "Water of the U.S.," under the definition presented in Section 2.0. The gravel bar/floodplain adjacent to the main channel was not inundated during the time of the survey, but is likely to connect with the main channel under relatively high flows as evidenced by debris deposited in trees during high flows as well as obvious recent scour and deposition on the gravel bar. The gravel bar/floodplain supports riparian forest and scrub/shrub vegetation which are associated with wetlands as well as isolated pools; some with fringing emergent vegetation. The gravel bar, including the riparian wetlands, becomes connected to the main channel of the Yuba River during high flows as evidenced by the aerial imagery. The riparian wetlands and the Yuba River perennial channel appear to be jurisdictional under Section 404 of the CWA. However, the final determination of jurisdictional status of these features within the study area is at the discretion of the Corps.

6.2 INTERSTATE COMMERCE CONNECTION

As discussed in Section 6.1, the Yuba River is a jurisdictional aquatic resource because it is a traditional navigable waterway, and an international commerce connection is present. The adjacent floodplain is also tentatively a jurisdictional aquatic resource because it becomes connected to the Yuba River during high flow events.

7.0 CONCLUSION

Implementation of the Proposed Project would benefit salmonid species through targeted habitat restoration activities. Such activities would include juvenile salmonid spawning habitat enhancement by building riffles. Because the intent of the Proposed Project is to restore and enhance non-tidal open waters to increase aquatic resources, the project may be recommended as representative of projects that qualify under Regional General Permit 16 for Anadromous Salmonid Fisheries Restoration (Corps 2019).

The Yuba River, adjacent floodplain (below the OHWM), and wetlands qualify as jurisdictional aquatic resources under Section 404 of the CWA. Final determination of the status of these aquatic resources must be approved by the Corps. If the Corps concurs with the determination, it has regulatory authority over the Yuba River and floodplain containing wetlands.

Before implementation of restoration activities, a final jurisdictional determination must be approved by the Corps.

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APPENDIX 1: PLANT SPECIES OBSERVED WITHIN STUDY AREA

Scientific name	Common name	Classification
BETULACEAE	BIRCH FAMILY	
Alnus rhombifolia	White Alder	FAC W
FAGACEAE	BEECH FAMILY	
Quercus wislizeni	Interior Live Oak	FAC U
MORACEAE	FLOWERING PLANT FAMILY	
Ficus carica	Fig	FAC U
ROSACEAE	ROSE FAMILY	
Rubus armeniacus	Himalayan blackberry	FAC
SALICACEAE	WILLOW FAMILY	
Salix exigua	Sandbar willow	FAC W
Salix melanopsis	Dusky willow	OBL
Salix lasiolepis	Arroyo willow	FAC W
Populus fremontii	Fremont cottonwood	FAC W

APPENDIX 2: PHOTOS OF STUDY AREA

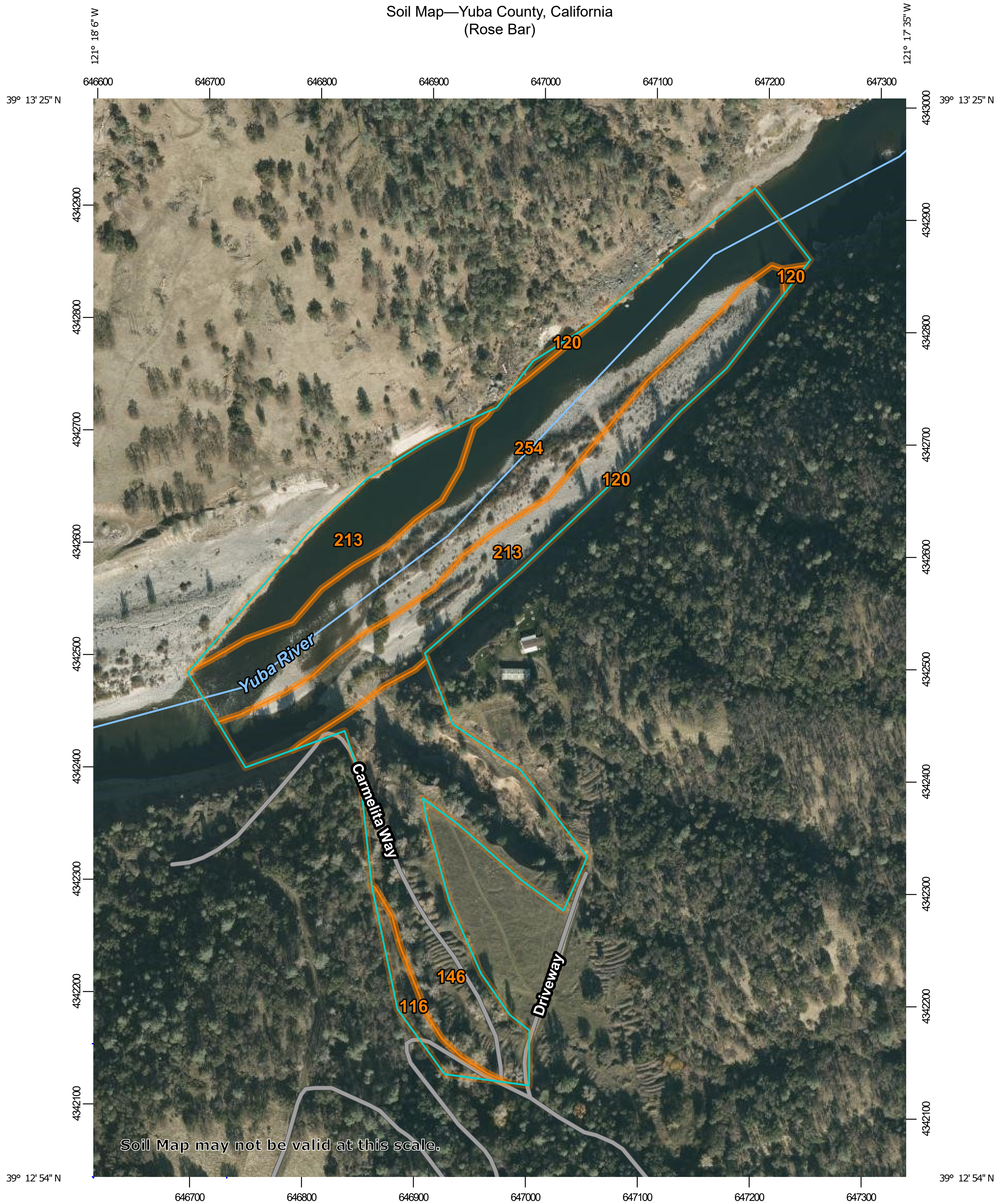
A1. Example wetland sample location.

A2. Example upland sample location.

A3. Yuba River main channel adjacent to study area.

APPENDIX 3: NRCS SOIL SURVEY REPORT

Soil Map—Yuba County, California
(Rose Bar)



Map Scale: 1:4,680 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 50, 100, 200, 300

Feet: 0, 200, 400, 800, 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Yuba County, California
Survey Area Data: Version 14, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 6, 2018—Dec 12, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
116	Auburn-Sobrante complex, gravelly, 30 to 50 percent slopes	0.8	2.7%
120	Auburn-Sobrante-Rock outcrop complex, 50 to 75 percent slopes	0.2	0.6%
146	DUMPS, MINE TAILINGS	8.6	28.7%
213	RIVERWASH	9.6	32.0%
254	WATER	10.9	36.1%
Totals for Area of Interest		**30.1**	**100.0%**

APPENDIX 4: FIELD DATA SHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/2020
Applicant/Owner: SYRCL State: CA Sampling Point: W1
Investigator(s): KIRSTEN SELLHEIM Section, Township, Range: S28 T16N R6E
Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): CONVEX Slope (%): 5
Subregion (LRR): ARID WEST Lat: 39.219401 Long: -121.2991439 Datum: WGS84
Soil Map Unit Name: RIVER WASH NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?		X
Wetland Hydrology Present?	X	

Is the Sampled Area within a Wetland? Yes X No ____

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX LASIOLEPIS	100	Y	FACW
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	1	x 2 = 2
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	1 (A)	2 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	NA	85					GRAVEL	
0-12	NA	15					COARSE SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/20

Applicant/Owner: SYRCL State: CA Sampling Point: W2

Investigator(s): KIRSTEN SOLLHEIM Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): FLOOD PLAIN Local relief (concave, convex, none): NONE Slope (%): 2

Subregion (LRR): ARID WEST Lat: 39.220134 Long: -121.298288 Datum: WGS 84

Soil Map Unit Name: WATER NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?		X
Wetland Hydrology Present?	X	

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX MELANOPSIS	50	Y	OBL
2. ALNUS RHOMBIFOLIA	20	N	FACW
3.			
4.			
Total Cover:	70		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. RUBUS ARMENIACUS	20	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	20		
Woody Vine Stratum			
1.			
2.			
Total Cover:	90		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	20	x 2 =	40
FAC species	20	x 3 =	60
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	90 (A)		150 (B)

Prevalence Index = B/A = 1.7

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: W2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	–	90					COBBLE	
	–	10					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks:

COULD NOT DIG BELOW SURFACE WITH HAND TOOLS

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/20

Applicant/Owner: SYRCL State: CA Sampling Point: W3

Investigator(s): KIRSTEN SELLHEIM Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): CONCAVE Slope (%): 5

Subregion (LRR): ARID WEST Lat: 39.221399 Long: -121.296180 Datum: WGS84

Soil Map Unit Name: WATER NWI classification: RIVERINE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX MELANOPSIS	90	Y	OBL
2.			
3.			
4.			
Total Cover:	90		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. RUBUS ARMENIACUS	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	10		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	90	x 1 = 90
FACW species	–	x 2 =
FAC species	10	x 3 = 30
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	100 (A)	120 (B)

Prevalence Index = B/A = 1.2

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: W3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	—	100					COBBLE/LG GRAVEL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
X Sediment Deposits (B2) (**Riverine**)
X Drift Deposits (B3) (**Riverine**)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/20

Applicant/Owner: SYCL State: CA Sampling Point: W4

Investigator(s): KIRSTEN SELLHEIM Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): NONE Slope (%): 0

Subregion (LRR): ARID WEST Lat: 39.222232 Long: -121.295102 Datum: WGS84

Soil Map Unit Name: WATER NWI classification: RIVERINE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX MELANOPSIS	100	Y	OBL
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	100	x 1 = 100
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: W4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	–	95					COBBLE	
	–	5					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No X

Remarks:

COBBLE FIELD, COULD NOT DIG

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
X Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
X Drift Deposits (B3) (**Riverine**)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/20

Applicant/Owner: SYRCL State: CA Sampling Point: W5

Investigator(s): KIRSTEN SELLHEIM, TYLER GOODEARLY Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): WASH Local relief (concave, convex, none): CONCAVE Slope (%): 30

Subregion (LRR): ARID WEST Lat: 39.218721 Long: -121.298740 Datum: WGS84

Soil Map Unit Name: DUMPS, MINE TAILINGS NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

NO PICTURE OF DATASHEET

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX EXIGUA	100	Y	FACW
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	100	x 2 = 200
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	100 (A)	200 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: W5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6		95					COBBLE / GRAVEL	
		5					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: COBBLE

Depth (inches): SURFACE

Hydric Soil Present? Yes ___ No X

Remarks:

COULD NOT DIG - MOSTLY COBBLE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/9/2020

Applicant/Owner: SYRCL State: CA Sampling Point: W6

Investigator(s): TYLER GOODEARLY/KIRSTEN SELLHEIM Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): WASH Local relief (concave, convex, none): CONCAVE Slope (%): 40

Subregion (LRR): ARID WEST Lat: 39 218395 Long: -121.298053 Datum: WGS 84

Soil Map Unit Name: DUMPS, MINE TAILINGS NWI classification: RIVERINE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. POPULUS FREMONTII	50	Y	FACW
2. SALIX LASIOLEPUS	50	Y	FACW
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	100	x 2 = 200
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	100 (A)	200 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: W6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	COBBLE/GRAV	95					CO/GR	
0-6	SANDY/LOAM	5					SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: COBBLE

Depth (inches): SURFACE (0)

Hydric Soil Present? Yes ___ No X

Remarks:

COULD NOT DIG DUE TO COBBLES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/2020

Applicant/Owner: Steel State: CA Sampling Point: U1

Investigator(s): TYLER GOODEARLY / KIRSTEN SELLHEIM Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONVEX Slope (%): 20

Subregion (LRR): ARID WEST Lat: 39.218208 Long: -121.298923 Datum: WGS84

Soil Map Unit Name: AUBURN - SOBRANTE COMPLEX NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland?	Yes ___ No X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. QUERCUS WISLIZENI	100	Y	FACU
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	100	x 4 = 400
UPL species		x 5 =
Column Totals:	100 (A)	400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: U1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR3-3	100					Loamy/clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ____________

Water Table Present? Yes ______ No X Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ____________

Wetland Hydrology Present? Yes ______ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

10/8/2020

Project/Site: ROSE BAR City/County: YUBA Sampling Date: [illegible]

Applicant/Owner: SYRCL State: CA Sampling Point: U2

Investigator(s): TYLER GOODENOUGH / KIRSTEN SELLHEIM Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONVEX Slope (%): 5

Subregion (LRR): ARID WEST Lat: 39.217922 Long: -121.298958 Datum: WGS 84

Soil Map Unit Name: AUBURN - SOBRANTE COMPLEX NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. FICUS CARICA	100	Y	FACU
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	100	x 4 = 400
UPL species		x 5 =
Column Totals:	100 (A)	400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: U2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	——	50					COBBLE/GRAVEL	
"	10YR 3-3	50%					LOAMY/SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: ROSE BAR City/County: YUBA Sampling Date: 10/8/2020

Applicant/Owner: SYRCL State: CA Sampling Point: U3

Investigator(s): TYLER GOODEARLY / SELLHEIM, KIRSTEN Section, Township, Range: S28 T16N R6E

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 30

Subregion (LRR): ARID WEST Lat: 39.2182266 Long: -121.2978977 Datum: WGS84

Soil Map Unit Name: AUBURN - SOBRANTE COMPLEX NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

SITE IS HIGH ABOVE OHWM

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. POPULUS FREMONTII	70	Y	FACW
2. QUERCUS WISLIZENI	30	N	FACU
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	70	x 2 = 140
FAC species		x 3 =
FACU species	30	x 4 = 120
UPL species		x 5 =
Column Totals:	100 (A)	260 (B)

Prevalence Index = B/A = 2.6

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: ___________

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	—	50					COBBLE/GRAVEL	
	10YR 4-6	50					SANDY/LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? **Yes** ______ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): ___________

Water Table Present? Yes _____ No X Depth (inches): ___________

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): ___________

Wetland Hydrology Present? Yes ______ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix E

Cultural Resources Report

Cultural Resources Identification and Evaluation Report for the Rose Bar Restoration Project on the Yuba River, Yuba County, California

PREPARED FOR:
Avery Scherer, Senior Ecologist
Cramer Fish Sciences
7525 NE Ambassador Pl., STE C
Portland, OR 97220

PREPARED BY:
Samantha Dunham, B.A.
Jessica Neal, M.A., RPA
Rachael Nixon, M.A., RPA
Kleinfelder/Garcia and Associates
435 Lincoln Way
Auburn, California 95603

KLEINFELDER
Bright People. Right Solutions.
GANDA
GARCIA and ASSOCIATES

April 2022

STATEMENT OF CONFIDENTIALITY

This report identifies the locations of cultural resources, which are confidential. As nonrenewable resources, archaeological sites can be significantly impacted by disturbances that can affect their cultural, scientific, and artistic values. Disclosure of this information to the public may be in violation of both federal and state laws. To discourage damage resulting from vandalism and artifact looting, cultural resources locations should be kept confidential and report distribution restricted. Applicable U.S. laws include, but are not limited to, Section 304 of the National Historic Preservation Act (NHPA) (16 USC 470w-3) and California state laws that apply include, but are not limited to, Government Code Sections 6250 *et seq.* and 6254 *et seq.*

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
AMSL	above mean sea level
APE	area of potential effects
C	Concentration
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historic Places
CSU	California State University
DNA	deoxyribonucleic acid
DPR	Department of Parks and Recreation
EIR	Environmental Impact Report
F	Feature
ft	feet/foot
Kleinfelder/GANDA	Kleinfelder/Garcia and Associates
GLO	Bureau of Land Management General Land Office
GPS	Global Positioning System
M.A.	Master of Arts
MOA	Memorandum of Agreement
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
NCIC	North Central Information Center
n.d.	no date
NHPA	National Historic Preservation Act
No.	number
OHP	Office of Historic Preservation
Project	Rose Bar Restoration Project in Yuba County, California
PRC	Public Resources Code
RPA	Registered Professional Archaeologist
SHPO	California State Historic Preservation Officer
SLF	Sacred Lands File
TCR	Tribal Cultural Resource(s)
USACE	United States Army Corp of Engineers
USGS	United States Geological Survey
WST	Western Stemmed Tradition

MANAGEMENT SUMMARY

Cramer Fish Sciences proposes the Rose Bar Restoration Project in Yuba County, California (Project). The Project includes gravel augmentation designed to create and enhance spawning habitat on a private parcel (Accessor Parcel Number 006-310-001-000) and below the ordinary highwater mark of the Yuba River. The Project is still being finalized but the conceptual design includes creating an additional riffle at the upstream bar head and enhancing the existing riffle entrance slope at the downstream end of Upper Rose Bar. The design embeds features within the existing variability of the river corridor by adding material, with no cutting of the channel or bar topography. Estimates suggest instream work would involve placing ~50,000-100,000 cubic yards of material; the source material for gravel augmentation will come from the hillslopes of two incised ephemeral streams that cut through tailing piles within the Project area.

Although the Project is located on private property, it will affect waters of the United States, thus the Project must meet the requirements of Sections 401 and 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. Due to the need for federal permitting, Section 106 of the National Historic Preservation Act (NHPA) is also required. Section 106 of NHPA requires that the lead federal agency account for the effects of its undertakings on historic properties. Since the US Army Corps of Engineers (USACE) is the lead federal agency and the Project is an "undertaking," as defined by Title 36 Code of Federal Regulations (CFR), Section 800.16(y), and the undertaking has the potential to cause effects on historic properties (36 CFR 800.3[a]), it is necessary to identify, evaluate, and mitigate effects to cultural resources within the Area of Potential Effects (APE). USACE is the lead federal agency and it is understood they conduct consultation with the State Historic Preservation Officer and Native American tribes, as appropriate.

Kleinfelder/Garcia and Associates (Kleinfelder/GANDA), contracted through Cramer Fish Sciences, has prepared this document in accordance with Section 106 of the NHPA, the California Environmental Quality Act (CEQA), and the Yuba County guidelines as they pertain to the Project and cultural resources. This study identifies historic properties and historic-period archaeological and architectural resources more than 45 years of age, per 36 CFR §800.4, within the APE. The APE is the maximum extent of for the Project which is 42.071 acres. The APE includes both the footprint of ground disturbance (18.089 acres) and the Project footprint where gravel augmentation will be conducted, but no ground disturbance will occur (23.982 acres). For the purposes of this study the direct and indirect APE are equivalent.

Efforts to identify cultural resources within the APE include a record search with the North Central Information Center (NCIC) of the California Historical Resources Information System, Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search, field survey, resources identification and evaluation, and management recommendations. Background research conducted at the NCIC located at California State University (CSU), Sacramento in Sacramento, California included a search of previously conducted cultural resources studies and findings on file. The record search included the APE and a 0.50-mile radius surrounding. The results (NCIC File Number: YUB-20-29) found one cultural resource intersecting the APE and 32 cultural resources within the 0.50-mile radius. One previous cultural resource study has been conducted within a portion of the APE and six previous cultural resource studies have been conducted within the 0.50-mile radius.

A Sacred Lands File search of the APE was initiated on August 20, 2020, with the NAHC. The NAHC responded on August 26, 2020 via email, indicating the area was negative for sacred lands and provided a list of Native American contacts to reach out to for more information regarding the APE. No further Native American outreach was conducted for this project, as it is assumed government to government consultation will be conducted by USACE, as needed.

An intensive pedestrian survey was conducted on September 29 and October 8, 2020, July 12, 2021, and March 17, 2022, by Kleinfelder/ GANDA archeologists Jessica Neal and Samantha Dunham. Ms. Neal meet the Secretary of Interiors professional qualification in archaeology and served as the field lead. The survey was conducted using 15-meter-wide parallel transects. No vehicles were used other than on paved, dirt, or gravel roads. The intensive pedestrian survey resulted in updating and evaluating one historic-period cultural resource (P-58-000692; the Rose Bar mining community), within a portion of the APE. The updated portion of P-58-000692 is a mining resource that consists of a historic-period ditch; a depression with a small oven, non-native plants, and refuse; a raised flat area with a refuse concentration; a trail; berms; remnants of a concrete water conveyance system; tailings piles with another refuse concentration, and hydraulic mining cuts. The portion of P-58-000692 that falls within the APE is recommended not eligible for listing on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR). As such, Kleinfelder recommends a finding of no historic properties affected for this undertaking.

Even though this portion of the archaeological site is recommended not eligible for listing on the CRHR and NRHP, there is the potential for subsurface components to have been buried under sediments in the Yuba River riverbed from historical flooding and hydraulic mining. Therefore, archaeological spot-check monitoring is recommended during ground-disturbing activities. With the implementation of the following conditions, the Project would result in a less than significant impact to cultural resources.

- A qualified archaeologist shall provide an archaeological tailboard to any construction crew working on site during ground disturbing activities.
- A qualified archaeological monitor shall conduct spot-check monitoring as needed during ground-disturbing activity as determined by a qualified archaeologist.
- If archaeological components are encountered during ground-disturbing activities, all ground-disturbing work at the find location and 100-foot buffer placed around the area until a qualified archaeologist can assess the significance of the finding and provide (if needed) avoidance and/or data recovery plan.
- Pursuant to California Health and Safety Code §7050.5, if human remains are encountered, all ground-disturbing work must cease in the vicinity of the discovery, and the County Coroner shall be contacted. The respectful treatment and disposition of remains and associated grave offerings shall be in accordance with Public Resource Code (PRC) §5097.98. The project owner is responsible for implementation PRC §5097.98 and coordination with the likely descendant (MLD) identified by the Native American Heritage Commission. PRC §5097.98 also outlines next steps should the landowner and MLD not reach an agreement to the final disposition of the remains.
- In the event the Project design changes and ground disturbance is anticipated beyond the APE as it is currently defined, further surveys shall be conducted in those new areas to assess the presence of cultural resources. Any newly discovered or previously recorded sites within the additional survey areas shall be recorded (or updated) on appropriate Department of Parks and Recreation 523-series forms. If avoidance of these resources is not feasible, then an evaluation and/or data recovery program shall be drafted and implemented.

TABLE OF CONTENTS

TABLES

APPENDICES

1.0 INTRODUCTION

Cramer Fish Sciences proposes the Rose Bar Restoration Project in Yuba County, California (Project). The following includes the Project description, background and objectives, and location. The Project is still being finalized and the following description was received November 5, 2020.

1.1 PROJECT BACKGROUND AND DESCRIPTION

The Yuba River is a high-profile watershed for Chinook salmon and steelhead habitat restoration. Historically, the Yuba River supported large numbers of spring- and fall-run Chinook salmon and steelhead. However, the fisheries suffered enormous losses as a result of mining during the Gold Rush, and later the construction of Englebright Dam. Salmonid spawning is heavily skewed towards the upstream reaches of the Yuba River, where natural instincts drive returning adults to spawn as high in the watershed as possible. Upper Rose Bar is one of the last alluvial bars in the Lower Yuba River and is located at the upstream end of the Timbuctoo Reach, just below the Narrows Pool (Figure a). There is currently a lack of suitable spawning habitat at Upper Rose Bar due to a lack of upstream sediment supply, ongoing reach-scale incision, and overly coarse substrate outside the size range preferred by salmonids.

In 2016, South Yuba River Citizens League completed a feasibility study and conceptual designs for a habitat restoration project at Upper Rose Bar demonstrating a gravel augmentation project could create and enhance spawning habitat. This report found that the hydrogeomorphic setting of Upper Rose Bar is appropriate for the design of geomorphic landforms used by spawning salmonids. The purpose of the Project is to complete restoration designs and environmental compliance, prepare permit applications, and conduct stakeholder outreach for a future implementation project to restore spawning habitat at Upper Rose Bar. Conceptual design scenarios presented in the 2016 report serve as a starting point for design development; these included creating an additional riffle at the upstream bar head and enhancing the existing riffle entrance slope at the downstream end of Upper Rose Bar (Figure b). This concept proposes embedding features within the existing variability of the river corridor by adding material, with no cutting of the channel or bar topography. Estimates suggest instream work would involve placing ~50,000-100,000 cubic yards of material. Two small creeks enter the Lower Yuba River at the downstream end of Upper Rose Bar after passing through the heavily mined Blue Point Mine area. Both ephemeral creeks are rapidly incising gullies, eroding through remnant mining debris. The source material for gravel augmentation will come from the hillslopes of these two ephemeral streams (Figure a). This approach will allow the Project to help stabilize the slopes of the tributary streams, decreasing the risk of mercury contributions to the Lower Yuba River and minimizing the risk of sedimentation of the Project area. Material will be sorted by size and washed to ensure that clean gravel of the appropriate size for spawning is added.

1.2 AREA OF POTENTIAL EFFECT

The Area of Potential Effects (APE) is 42.071 acres and includes the Project footprint and the full extent of ground disturbance, the staging area, and an area where gravel augmentation will be completed but no ground disturbance will occur. The APE is located on Accessor Parcel Number 006-310-001-000 within Township 26 North, Range 6 East, Sections 22, 27, and 28 on the Smartsville, California, 7.5-minute United States Geological Survey (USGS) quadrangle (USGS 1995). The APE currently consists of historical mining tailings, the remnants of a mining community on the south bank of the Yuba River, two intermittent creeks located in incised gullies, and the Yuba River. It is bordered to the north by the north bank of the Yuba River, Blue Gravel Mine, Mammoth Mine, and Williams Bar Dredge; to the west by Peerless Mining Company, the Yuba River, and primarily undeveloped land crisscrossed by dirt roads; to the south by Carmelita Way and historical tailings; and, to the east by a quail hatchery, the Yuba River, and primarily undeveloped land crisscrossed by dirt roads. See Appendix A, Figures 1, 2, and 3.

2.0 REGULATORY CONTEXT

The following section presents a condensed review of Section 106 of the National Historic Preservation Act (NHPA).

2.1. SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the NHPA (36 CFR §800) requires that projects undertaken by federal agencies (and/or federally funded or where federal land or permit approval is required) consider the effects of their actions on properties that may be eligible for listing or are listed in the National Register of Historic Places (NRHP). To determine whether an undertaking could affect NRHP-eligible properties, cultural resources (including archaeological and architectural properties) must be inventoried and evaluated for listing in the NRHP. Although compliance with Section 106 is the responsibility of the lead federal agency, in this case the USACE, others may undertake the work necessary to comply with Section 106. The Section 106 process entails four primary steps, listed below.

1. Initiation of consultation with consulting parties (36 CFR §800.3).
2. Identification and evaluation of historic properties within the APE (36 CFR §800.4).
3. Assessment of adverse effects on historic properties within the APE (36 CFR §800.5). If there are historic properties that will be affected, consult with the California State Historic Preservation Officer (SHPO) regarding adverse effects on historic properties. If there are no historic properties that will be affected, implementation of the project in accordance with the findings of no adverse effect shall proceed (36 CFR 36 §800.5[d][1]).
4. Resolve adverse effects on historic properties within the APE (36 CFR 800.6). Continue consultation among the federal agency and consulting parties to avoid and mitigate adverse effects. The Advisory Council on Historic Preservation (ACHP) provides comments to the head of the federal agency, and the ACHP comments must be considered when the final agency decision on the undertaking is made (move forward with the project, stop pursuant to mitigation, step back through Section 106 process) (36 CFR 800.7). 2.2 State Regulations

The following sections provide an overview of the state regulatory requirements that are applicable to cultural resources and this Project.

2.2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970, AS AMENDED

The California Environmental Quality Act (CEQA) requires State and local agencies to identify and reduce, if feasible, the significant, negative environmental impacts of land use decisions.

<u>CEQA Guidelines: Title 14 California Code of Regulations (CCR) Section 1427</u>

This section of CEQA recognizes that California's archaeological resources are endangered by urban development; the legislature finds that these resources need preserving; it is a misdemeanor to alter any archaeological evidence found in any cave, or to remove any such materials from a cave.

<u>CEQA Guidelines: Title 14 CCR Section 15064.4 subsection (b)</u>

This section of CEQA defines "historical resource," addresses reburial options for Native American remains, and presents the preferred mitigation of historical resources.

<u>CEQA Guidelines: Title 14 CCR Section 15064.5</u>

This section of CEQA identifies which resources are considered cultural resources, as stated below.

- Resource(s) listed or eligible for listing on the California Register of Historic Places (CRHR) (Title 14 CCR Section 15064.5(a)(1).
- Resource(s) either listed in the NRHP or in a "local register of historical resources" unless "the preponderance of evidence demonstrates that it is not historically or culturally significant," (Title 14 CCR Section 15064.5(a)(2)).

- Resources identified as significant in a historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code (PRC) [Title 14 CCR Section 15065.5(a)(2)].

In addition, Subdivision (g) provides the guidelines referenced below regarding historical surveys.

A resource identified as significant in a historical survey may be listed in the CRHR if the survey meets all the following criteria:

- The survey has been or will be included in the California Register of Historical Resources (CRHR),
- The survey and the survey documents were prepared in accordance with procedures and requirements of the California Office of Historic Preservation (OHP),
- The resource is evaluated and determined by OHP to have a significance rating of Category 1 to 5 on the Department of Parks and Recreation (DPR) Historic Resources Inventory Form,
- If the survey is five years or older at the time of its nomination for inclusion in the CRHR, the survey is updated to identify historic resources that have become eligible or ineligible due to changed circumstances or further documentation and those which have been demolished or altered in a manner that substantially diminished the significance of the resource; and
- Resources identified during such surveys are presumed to be historically or culturally significant unless the preponderance of evidence demonstrates otherwise.

A final category of "historical resources" may be determined at the discretion of the lead agency when:

- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, education, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record [Title 14 CCR Section 15064.5(a)(3)].

When a proposed project identifies the existence of, or the probable likelihood of, Native American human remains within a project, the lead agency shall work with the appropriate Native Americans as identified by Native American Heritage Commission (NAHC). An applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by NAHC (Title 14 CCR Section 15064.5(d)).

<u>CEQA Guidelines: Title 14 CCR Section 15064.5(b)</u>
This section addresses mitigation, and states that the preferred mitigation for historical resources is treatment in a manner consistent with Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings. The preferred mitigation for archaeological sites is preservation in place.

<u>CEQA Guidelines: Title 14 CCR Section 15064.7 "Thresholds of Significance"</u>
This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term "cumulatively significant".

<u>CEQA Guidelines: Title 14 CCR Section 15126.4 "Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects", sub-section (b) "Mitigation Measures Related to Impacts on Historical Resources"</u>
Subsection (b) discusses:

- Impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource,
- Documentation as a mitigation measure, and
- Mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible; data recovery must be conducted in accordance with an adopted data recovery plan.

The AB 52 process entails the following:

- The CEQA lead agency must begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if the tribe has requested such notification to the lead agency, in writing. The notification request requires that the lead agency inform tribes who that requested such notification within the geographic area in which they identified. Additionally, there are timelines in the legislation for notification, response to request for consultation, and initiation of consultation. Specifically, the lead state agency is required to notify tribe(s) that have requested project notification under AB 52 within 15 days of determining there is a project; the tribe(s) then have 30 days to respond to this notification and request consultation: upon receipt of a request for consultation the lead agency must then initiate consultation with the tribe(s) within 30 days.
- AB 52 applies to the following CEQA documents: Negative Declaration, Mitigated Negative Declaration, or Notification of Preparation of an Environmental Impact Report (EIR). Such documents cannot be released for public review before tribal consultation has concluded.
- The legislation also stipulates that any information identified by the consulting tribe not be disclosed to the public without permission from the tribe.

AB 52 further defines the following legislative terms:

PRC 21074 (Tribal Cultural Resource [TCR]): The statute identifies TCR as separate and distinct category of resource, separate from a historical resource. New PRC Section 21074 further defines a TCR as any of the following under its subsections (a) through (c):

a) Sites, features, places, and objects with cultural value to descendant communities or cultural landscapes that are any of the following:
    - Listed on the CRHR.
    - Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
    - Deemed to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1.

b) Sacred places, including, but not limited to, Native American sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines that meet either of the following criteria:
    - Listed on the California NAHC's Sacred Lands File (SLF) pursuant to Section 5097.94 or 5097.96 and a California Native American tribe has submitted sufficient evidence to the lead agency demonstrating that significance to the California Native American tribe or contain known graves and cemeteries of California Native Americans.
    - Listed or determined pursuant to criteria set forth in subdivision (g) of Section 5024.1 to be eligible for listing in the CRHR.

c) A cultural landscape is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

d) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "non-unique archaeological resource" as defined in subdivision (h) of Section 21083.2, also may be a TCR if it conforms with the criteria of subdivision (a).

2.2.2 PUBLIC RESOURCES CODES

The following provide a summary of California PRCs that apply to cultural resources.

PRC Section 5020.1

This section defines several terms, including those provided below.

"Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

"Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired.

PRC Section 5024.1

This section establishes the CRHR. A resource may be listed as a historical resource in the CRHR if it meets the NRHP criteria or the following state criteria:

- is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage,
- is associated with the lives of persons important in our past,
- embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values, or
- has yielded, or may be likely to yield, information important in prehistory or history.

PRC Section 5097.5

This section states that any unauthorized removal or destruction of archaeological or paleontological resources on sites located on public land is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the State, or any city, county, district, authority or public corporation, or any agency thereof.

PRC Section 5097.98

This section discusses the procedures that need to be followed upon the discovery of Native American human remains. The NAHC, upon notification of the discovery of human remains by the County coroner, is required to notify those persons it believes to be most likely descended from the deceased Native American. It enables the descendant to inspect the site of the discovery of the Native American human remains and to recommend to the land owner (or person responsible for the excavation) means of treating, with dignity, the human remains and any associated grave goods.

PRC Sections 5097.99, 5097.991

These sections establish that it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions. The sections also mandate that it is the policy of the State to repatriate Native American remains and associated grave goods.

PRC Section 21083.2

This section states that under CEQA, the lead agency is responsible for determining whether a project may have a significant effect on historical and archaeological resources. Section 21083.2 states that if the lead agency determines that the project may have a significant effect on "unique" archaeological resources, an EIR shall be prepared to address these resources. A unique archaeological resource is an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that the resource meets one of the following criteria:

- contains information needed to answer important research questions and that a demonstrable public interest exists in that information,
- has a special and particular quality, such as being the oldest or best example of its type, and/or
- is directly associated with a scientifically recognized important prehistoric or historic event or person.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require that reasonable efforts be taken to preserve these resources in place or provide conditions or mitigation measures to protect them.

PRC Section 21084.1

This section sets forth that a project that may cause a significant adverse change in a significant historical resource is a project that may be considered to have adverse effects on the environment. Historical resources not listed on the CRHR or other local lists may still be considered historical resources at the discretion of the lead agency on the project.

Senate Concurrent Resolution Number 43

This resolution requires state agencies to cooperate with archaeological survey and excavation programs, and to preserve known archaeological resources whenever reasonable.

Senate Bill 18 (Burton 2004)

This bill requires protection and preservation of Native American traditional cultural places during city and county general plan development.

Health and Safety Code Section 7050.5

This code establishes that any person who knowingly mutilates, disinters, wantonly disturbs, or willfully removes any human remains in or from any location without authority of the law is guilty of a misdemeanor. It further defines procedures for the discovery and treatment of Native American remains.

Health and Safety Code Sections 8010-8011

This code is intended to provide consistent state policy to ensure that all California Native American human remains and cultural materials are treated with dignity and respect. The code extends policy coverage to non-federally recognized tribes, as well as federally recognized groups.

California Penal Code Section 622.5

This code states that anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.

2.3 YUBA COUNTY GENERAL PLAN

The Yuba County 2030 General Plan (Mallen, et al 2011) was created for development and conservation in the unincorporated areas of Yuba County. California law requires each California city and county to prepare a general plan to provide comprehensive, long-term guidance "for the physical development of the county or city, and any land outside of its boundaries which in the planning agency's judgement bears relating to its planning" (see Government Code Section 65300). The Yuba County 2030 General Plan provides the necessary information and analysis to allow decision makers in the public to identify consensus goals for the future and identifies the policies and actions that are necessary to achieve these goals between the present and 2030, while fulfilling the legal requirements in California for comprehensive planning. The Yuba County 2030 General Plan provides adequate background information about the kinds, locations, and intensities of land uses as well as applicable resource protection and development policies. According to California law, a general plan must contain at least seven elements: land use, open space, conservation, housing, circulation, noise, safety, and other elements that a county wishes to adopt. The Yuba County General Plan contains the following relevant policies and actions related to the protection of cultural resources:

Policy NR6.1 The County will require environmental assessment and mitigation to reduce or avoid impact to significant cultural resources, as feasible, per state and federal legislation and regulations.

Policy NR6.2 If potential paleontological or prehistoric resources are detected during construction, work shall stop and consultation is required to avoid further impact.

Policy NR6.3 New developments, roads, water and sewer lines, and stormwater infrastructure should be located to avoid impacts to significant cultural resources.

Policy NR6.4 The County will encourage adaptive reuse of historic structures in a way that maintains the character defining elements of historic structure.

Policy NR6.5 Priority investment should go to preserving or rehabilitating historic structures that are grouped in close proximity, are particularly good examples of a specific architecture style, or are associated with important people or events in the County's history.

Policy NR6.6 The County will disseminate information to property owners regarding the incentives and other federal and state programs that support the rehabilitation of historic structures.

Action NR6.1 **Environmental Review and Mitigation**
Building on the analysis in the General Plan Program EIR (Mallen, et al 2011), new development projects that could have significant adverse impacts to prehistoric or historic resources will be required to assess impacts and provide mitigation. The following steps, or those deemed equally effective by the County, will be followed:

- Request information from the NAHC regarding Native American groups that may have important sites in areas that could be affected by project development.
- Involve the local Native American community in determining the appropriate mitigation of impacts to significant prehistoric sites.
- Consult the County's historic and cultural resources database and updated information from the North Central Information Center (NCIC) Regarding

cultural resource sites, structures, or landscapes that could be affected by project activities.

- Based upon sensitivity of the subject proposed project area (see Exhibit NR-6), additional technical work may be required. Where a cultural resource survey has not been performed:
    - A pedestrian survey may be required in areas of low sensitivity
    - A pedestrian survey will be required in areas of moderate and high sensitivity; and
    - Based on findings of the pedestrian survey, additional technical studies may be required, such as geoarchaeological sensitivity analysis, Native American consultation, ethnographic studies or other analysis scaled according to the nature of the individual project.
- For new developments that would alter historic structures (structures 50 years old or older), a qualified architectural historian shall conduct a record search and assess the potential to result in significant impacts to historical resources that occur as part of the existing built environment.
- Determination of impacts, significance, and mitigation (i.e., site monitors, avoidance, and/or other measures) shall be made by a qualified professional archaeologist or architectural historian, as appropriate.
- If impacts cannot be avoided through project design, appropriate and feasible treatment measures are required. Such measures may consist of, but are not limited to actions such as data recovery excavations, photographic documentation, or preparation of design drawings documenting the resource subject to significant impacts.
- Provide the NCIC with appropriate California DPR site record forms and cultural resources reports documenting resources that may be identified through technical work performed to review projects accommodated under the 2030 General Plan.
- If human remains are discovered during construction of projects occurring under General Plan buildout, the project proponent and landowner shall comply with California Health and Safety Code Section 2050.5 and California Public Resources Code Section 7050.5.

Related Goals: Goal NR-6

Agency/Department: Community Development and Services Agency

Funding Source: Project applicant Funds

Time Frame: Ongoing, as construction occurs under the General Plan

3.0 NATURAL AND CULTURAL CONTEXT

This section provides background information pertaining to the environmental and archaeological context of the APE. It also provides an overview of regional prehistoric cultural history, local ethnography, and history. This background information describes the theme of cultural resources within the vicinity of the Study Area to create a context within which to identify and evaluate cultural resources.

3.1 ENVIRONMENT

The APE is in the western foothills of the Sierra Nevada Range, in eastern Yuba County, north of Smartsville and on the south bank of the Yuba River. The Sierra Nevada extends north to south for 400 miles and is approximately 50 miles wide. It extends to the Cascade Range to the north and joins the central Transverse Ranges in the south in southern California. The mountains are composed of batholithic and granitic rock that has been uplifted over millions of years (at higher rates in the south compared to the north) and undergone more recent glaciation. This has resulted in an abundance of older prebatholithic metamorphic rocks which are continuous in lower elevations of the western side of the northern Sierra Nevada. These older formations include quartzite, marble, slate, and schist. Younger volcanic rocks, including basalt, tend to be located in the Sierra Nevada north of Lake Tahoe. This distribution of various rock types had a direct bearing on stone procurement and production technology for prehistoric native peoples. Later on, gold-bearing deposits in the foothills of the northern and central Sierra Nevada influenced the large influx of people during the Gold Rush (Jones and Klar 2007).

Elevations in the Sierra Nevada range from 500 feet (ft) above mean sea level (amsl) in the Central Valley to 14,496 ft amsl at the highest point at Mount Whitney. Precipitation and temperature range in the Sierra Nevada depends on the elevation and the snowline varies year to year from 3,000 to 5,000 ft amsl. The temperature decreases by 1-degree Fahrenheit and the annual precipitation increases 2 to 4 inches for each 90-meter increase in elevation. The west to east movements of storms from the Pacific Ocean contributes to the precipitation and snowpack in the Sierra Nevada which in turn fills the waterways. During the winter months, heavy snow pack would make the higher elevations nearly inhospitable. The watersheds on the western slopes of the Sierra Nevada typically defined the territories of the native populations; deep river canyons trending east to west hampered north to south travel by native people in the region, with intervening ridges facilitating east to west travel. The original contours of the slopes and waterways have been largely altered by heavy amounts of historical mining. Vegetation in the western foothills includes grass, chaparral, pine, and oak (Jones and Kar 2007; Miles and Goudey 2005; Sawyer and Keeler-Wolfe 1995). Fauna includes deer, black bears, mountain lions, rabbits, coyote, squirrels, skunks, racoons, bobcat, fox, and various fish, bird, herptile, and invertebrate species. Extant native fish species including but not limited to pike minnow, suckers, speckled dace, roach, hardhead, sculpin and rainbow trout, but historically anadromous fish, including sturgeon, lamprey eels, steelhead trout, and salmon, used Sierra Nevada rivers for spawning and rearing and they still occur below man-made barriers.

The elevation in the APE ranges from 340 ft amsl to 380 ft amsl. The average temperature in the APE ranges from 36 degrees Fahrenheit in the winter to 93 degrees Fahrenheit in the summer. Precipitation averages about 38 inches of rain per year with no snow. The Yuba River intersects the APE and Deer Creek is located approximately 0.90 mile northeast of the APE, the northwest to southeast trending Squirrel Creek is located approximately 0.96 mile southwest of the APE, the northwest to southeast trending Brooks Creek is approximately 1.89 miles southwest of the APE, an unnamed north to south trending perennial stream is located approximately 1.43 miles northwest of the APE, a north to south trending unnamed perennial stream located on the northside of the APE feeding into the Yuba River, and an unnamed north to south trending perennial stream located approximately 0.5 miles northeast of the APE. Mines in the area include Blue Gravel mine 0.24 miles northwest of the APE, Mammoth

Mine 0.43 miles northwest of the APE, Williams Bar Dredge 0.48 miles north of the APE, and Peerless Mining Company 0.42 miles west of the APE. Vegetation within the APE includes include fig trees (nonnative), a dog rose bush (nonnative), oak trees, poison oak, pine trees, native grasses, and willow bushes.

3.2 Prehistoric Context

The following sections present the detailed chronological sequence of cultural complexes for the APE: Paleoindian (14,500–9,000 Before Present [BP]), Lower Archaic (9,000–4,500 BP), Martis (4,500–1500 BP), Mesilla Complex (3000–2000 BP), Bidwell Complex (2000–1200 BP), Sweetwater Complex (1200–500 BP), and the Oroville Complex (500 BP–Contact).

3.2.1 Paleoindian 14,500 to 9,000 BP

The Paleoindian Period spans the terminal Pleistocene and early Holocene. At the end of the Pleistocene, global temperatures warmed, glaciers melted, and ice sheets retreated (Meltzer 2009). One of the earliest securely dated and widely accepted archaeological resources that provide evidence for human occupation in North America is the Paisley Caves in Oregon (Grayson 2011). The Paisley Caves are a series of rock shelters that contained stone tools, Pleistocene megafauna, and coprolites containing human DNA (deoxyribonucleic acid) that have been dated to approximately 14,200 BP (Jenkins et al. 2012). This resource suggests a human presence in the Americas before the emergence of Clovis technology (Grayson 2011:63). Clovis points date from approximately 13,550 to 12,800 BP (Beck and Jones 2010; Haynes 2002; Waters and Stafford 2007), and basally thinned and fluted variants persist until approximately 11,550 BP (Fiedel 1999). Western Stemmed Tradition (WST) points date from approximately 13,240 to 9,000 BP (Beck and Jones 2010, 2012). Faunal assemblages most often associated with Clovis points consist of large mammals, such as mammoth and bison, while those associated with WST points are most often made up of medium-to-small mammals and aquatic resources.

Archaeological evidence indicates that the prehistory of northeast California extends at least as far back as 12,000 to 13,000 years ago (McGuire 2007). Temporally diagnostic artifacts dating to the Paleoindian Period in the region are represented by a single fluted projectile point and a handful of WST projectile points (Nilsson et al. 1996).

3.2.2 Lower Archaic 9,000 to 4,500 BP

The Lower Archaic Period became warmer and drier, and the warmer climate contributed to a population increase in the foothill valleys and the movement of Hokan-speaking people into the higher mountain valleys (Kowta 1988). Subsistence remains from this time demonstrate a shift toward hunting more medium-sized mammals, such as deer and pronghorn, and the increased frequency of ground stone items, such as handstones and millingslabs, are evidence of a broadening of the resource base, with a larger proportion of the diet attributed to small seeds and plant materials (Compas 2002).

3.2.3 Martis Complex 4,500 to 1,500 BP

The Middle and Upper Archaic Periods are better represented archaeologically than preceding periods; they are divided here by their regional cultural chronology. Based on the numerous prehistoric resources located in the Lake Oroville and Feather River area, Selverston et al. (2005) developed a chronological sequence for the prehistoric cultural development specific to the Oroville and Feather River regions located approximately 25 miles northwest of the APE. This sequence recognizes four separate complexes: Mesilla, Bidwell, Sweetwater, and Oroville (Compas 2002).

The Martis Complex is primarily found in the central Sierra Nevada (Compas 2002). Martis pre-dates and overlaps with the Mesilla Complex. Both display technological similarities, including the use of handstones and millingslabs, and later the introduction of the mortar and pestle, and the use of similar leaf-shaped, stemmed, and corner-notched projectile points (Compas 2002:91). However, they differ in that Martis technology also utilizes wide-stemmed points, blades, and scrapers, with a heavy reliance on basalt and metavolcanic materials (Compas 2002:91). The profuse use of basalt is one of the main distinguishing characteristics that separates Martis from other complexes.

Mesilla Complex 3,000 to 2,000 BP

The Mesilla Complex dates from 3,000 to 2,000 BP and was primarily located in the Lake Oroville area, along the Feather River. Situated in the foothills, the resources from this period contain numerous handstones and milling slabs, and few pestles and mortars. Evidence of hunting is inferred from the presence of atlatl and dart points, specifically large leaf-shaped, stemmed, and side-notched points of basalt, slate and chert. Olivella and Haliotis shell beads, charm stones, bone pins, and spatulae are also identified within the assemblages. In addition, burials were placed in flexed positions on their sides, several of which were marked by milling stones and rock cairns. This Mesilla Complex appears to coincide with the chronology and burial practices of the Middle Horizon for the Central Valley; however, it lacks the abundance of mortar and pestles often attributed to this sequence (Selverston et al. 2005).

Bidwell Complex 2,000 to 1,200 BP

The Bidwell Complex dates from approximately 2,000 to 1,200 BP, with archaeological resources appearing as relatively permanent settlements. Implements for food harvesting and preparation, such as grooved and notched sinker stones, milling slabs, wooden mortars, and steatite vessels, indicate an increasingly sedentary lifestyle, unlike the more temporary and seasonal settlements of the Mesilla Complex. The Bidwell Complex burial areas become increasingly defined as flexed burials found in formal cemeteries. Projectile points are typically large stemmed or corner-notched points manufactured from slate and basalt. Cultural deposits dating from this complex tend to be the result of an increase in reliance on hunted animals and plant foods, similar to the Middle Horizon sequence in other parts of Central California.

Sweetwater Complex 1,200 to 500 BP

The Sweetwater Complex, named after the archaeological resource of the same name (CA-Butte [BUT]-90), coincides with the introduction of the bow and arrow, and ranges from about 1,200 to 500 BP. Artifacts in this assemblage include small notched and stemmed projectile points (indicative of the advent and spread of bow and arrow usage), and mortars and pestles, which signify an increased dietary dependence on acorns. There is a significant decrease in the presence of small seed processing equipment, such as milling slabs and handstones. During this period, artifact assemblages show an increase in decorative artifacts, such as Olivella beads and Haliotis ornaments, as well as a variety of bone implements, including awls, flakers, fish gorges, pins, tubular beads and steatite cups, platters, bowls, and smoking pipes. The increase in ornamental objects in the archaeological record suggests a shift in the social organization of the population. An increase in craft specialization and decorative objects has been attributed to shifts in social stratification and an increase in sedentism from more mobile hunter-gatherer societies (Jones and Klar 2007).

Oroville Complex 500 BP to Contact

The Oroville Complex dates from approximately 500 BP to contact with Europeans, and is associated specifically with the Maidu group, particularly the Konkow or Northwestern Maidu. During this time, the toolkit represents an intensification of fishing, hunting, and harvesting of acorns. This is evidenced by the use of fishing equipment, such as hooks and gorges, the emergence of Desert-series projectile points, and an abundance of bedrock mortars. This complex is representative of numerous Late Period resources across California, which demonstrates a significant shift in settlement, subsistence, and technology, believed to be the result of a general increase in population, resource competition, a more regularized exchange system, including shell bead money, and an increase in evidence of ceremonialism. Spanish explorers and the influx of Euro-American settlers caused significant cultural disruption to the native populations who followed this adaptation in the 1800s.

3.3 NISENAN ETHNOGRAPHY

Ethnographically, the APE was part of the territory of the Nisenan (Kroeber 1925; Wilson and Towne 1978). Nisenan is part of the California Penutian linguistic family, which is further divided into four subfamilies: Wintuan, Maiduan, Yokutsan, and Utian. Nisenan belongs to the Maiduan subfamily along with Maidu and Konkow (Shipley 1978). The territory of the Nisenan, which included the drainage of the American River, extended from the crest of the Sierra Nevada in the east to the Sacramento River in the west, as far south as the Cosumnes River, and north to the divide of the North Fork of the Yuba River and Middle Fork of the Feather River (Dunham and Jordan 2020; Wilson and Towne 1978).

Nisenan is divided into the Hill and Valley socio-political groups, which were further divided into "tribelets" that exerted political control over particular geographical areas. Valley Nisenan usually located their settlements on low, natural rises, knolls along streams and rivers, or on gentle slopes with southern exposures. Nisenan lived in semi-permanent settlements, consisting of one village, or a number of smaller villages clustered around one large village. Family groups often lived away from the main village and had seasonal camps for resource procurement (Wilson and Towne 1978:388-389). Nisenan lived in houses that were conical-shaped with coverings of bark, skins, and brush. Brush shelters were used in the summer and during gathering excursions. Most villages had bedrock mortar resources and acorn granaries. The nearest village to the APE is Panpakan (Dunham and Jordan 2020; Wilson and Towne 1978:388-389).

Nisenan relied heavily on acorns, local game, and fish for subsistence. Acorns were gathered communally or individually. Deer, bear, salmon, birds, and rabbits were important in the Nisenan diet, along with insects, such as grasshoppers, crickets, and locusts. Freshwater mussels were also eaten, along with a variety of berries, wild plums, and grapes; manzanita cider was a preferred beverage (Dunham and Jordan 2020; Kroeber 1925:409-411; Wilson and Towne 1978:388).

Stone tools used by the Nisenan included knives, projectile points, arrow straighteners, scrapers, pestles, mortars, and pipes (Wilson and Towne 1978:391). Wooden digging sticks were used for procuring roots and other food resources, and wooden mortars were used for food preparation (Kroeber 1925:413-414). Tule was used for mats, netting, fish nets, and canoes. Willow and redbud were preferred materials for weaving baskets. Baskets were used for food storage and cooking, cradles, seed beaters, and cages (Dunham and Jordan 2020; Wilson and Towne 1978:391).

Nisenan first came into contact with Europeans upon the arrival of the Spanish in the late 1700s. Contact was limited to the southern edge of this territory and the effect was minimal (Wilson and Towne 1978:396). It was not until 1833, when a malaria epidemic swept through the Sacramento Valley, that the Nisenan began to feel the effects of encroaching Europeans. The epidemic was estimated to have killed 75 percent of the Valley Nisenan population, eliminating entire villages (Wilson and Towne 1978:396). Nisenan suffered further during the years following the Gold Rush when non-native peoples competed for land and resources, killing and persecuting the Nisenan, and driving survivors into the hills (Dunham and Jordan 2020; Wilson and Towne 1978:396).

3.4 HISTORIC CONTEXT

The following section presents the historic context around the APE, which includes the Contact Period (1542 to 1769), the Mission Period (1769 to 1822), the Rancho Period (1822 to 1850), the American Period (1850 to Present), and the history related specifically to the APE.

3.4.1 CONTACT PERIOD (1542 TO 1769)
In 1542, Juan Sebastian Cabrillo was the first of the exploring Europeans to sail along the California coast. During the next 125 years, the Native Americans of California had sporadic contact with European explorers. The Portolá expedition left San Diego on July 14, 1769, becoming the first Europeans to explore by land what is now California (Browning 1992). Additionally, a network of trails existed within the Yuba County region that were used by the Maidu peoples prior to the arrival of John C. Fremont. When Fremont arrived in the area, he described the Maidu, their villages, and how they provided aid to his expedition (Hoover et al. 1990)

3.4.2 MISSION PERIOD (1769 TO 1822)
The arrival of the Spanish and subsequent establishment of the missions marked the start of the rapid decline of Native American tribal life across California. Many factors led to the destruction of native culture, including the significant decimation of the population from introduced European diseases, and the replacement of the traditional social, subsistence, and settlement patterns by newly introduced mission systems, which created a dramatic disruption to traditional Native American life ways. In addition, the introduction of European plants and animals resulted in the alteration of the landscape upon which Native American culture depended.

The mission system was initiated, in part, as a way for Spain to manage the indigenous populations of Alta California, and to convert the native people of California into Catholic citizens of Spain (referred to as neophytes). In the charter of the Alta California Missions, there was a written stipulation that stated that 10 years after the establishment of a mission, the land and holdings would be transferred to the Indians for their benefit. This never came to pass (Lightfoot 2005). The northernmost missions in California were established as follows: Mission Dolores (San Francisco de Asís) in San Francisco in 1776, Mission San Rafael Arcángel in San Rafael in 1817, and Mission San Francisco Solano in Sonoma in 1823. Another plan for a mission in the Santa Rosa area was abandoned in 1827. All three of these missions are located at least 200 miles from the Project area, and although there was no direct association between these missions and the Maidu tribes, native peoples fleeing the missions and soldiers did spread disease, which likely eventually affected native populations throughout California (Milliken 1995; Silliman 2000, Lightfoot 2005).

In 1815, Russian explorers from the north were moving through the Sacramento River canyon, and it is possible that this may have been the Native peoples of this area's first exposure to European settlers and influence (Smith 1991). Russians occupied Fort Ross on the coast from 1812 until its abandonment in 1839.

3.4.3 RANCHO PERIOD (1822 TO 1850)
In 1821, the same year that Mexico declared independence from Spain, Governor Sola sent an exploration party to northern parts of California under the command of Captain Luis Arguello (who was later a governor as well). This expedition was popularly known as "Arguello's Expedition to the Columbia," and was based on the rumors of an English or American establishment south of the Columbia River, which was the only northern area in California of which the Spanish had any knowledge. Arguello traveled north across the Carquinez Straight, up the Central Valley along the east bank of the Sacramento River, and into the Sierra Nevada before heading west and returning via a southern route (Lewis Publishing Company 1891).

Although California was Spanish territory, the Spanish did not have a significant presence in northern California. The Sacramento River Valley was briefly occupied by fur trappers, from as early as 1820 (Lewis Publishing Company 1891). These early explorations made inroads into the region that would later be followed by settlers and gold seekers alike and resulted also in the introduction of foreign diseases to the native populations. A devastating epidemic that occurred between 1831 and 1833 reduced the native population by 75 percent during this time period. When the Mexican and American immigrants arrived in the coming decades, the native population was already significantly weakened (Cook 1960).

In 1822, California became a Mexican territory. From that point, the Hudson's Bay Company (1818–1853) and other parties of French and American trappers trapped and hunted throughout the region. These exploration parties were sometimes large, consisting of up to 100 people, including women and children. This activity continued until the early 1840s, when the trapping industry rapidly diminished. By 1842, the Hudson's Bay Company terminated its California operations, due in part to lower yields and reduced profits (Thompson 1957).

Following the secularization of the missions in 1834, representatives of the Mexican government distributed large land grants to selected individuals. In 1841, John A. Sutter owned a vast amount of land in parts of California west of the APE. However, Sutter's land was mapped to cover more than the Mexican laws allowed, so he sublet parts of his estate to other settlers, including lands that make up parts of modern-day Yuba County. Native Americans continued to work as laborers for landowners in the region (Beck and Haase 1988:24; Hoover et al. 1990). The land use pattern of Alta California during this period expanded to include cattle ranches, which were primarily instituted for use in the hide and tallow trade. Working in adobe workshops, both Native Americans and immigrant artisans engaged in the manufacture of such items as "leather, soap, saddles, harnesses, blankets, shoes, and wagons" (Marschner 2002:154). In 1848, California was officially annexed to the United States (Kyle et al. 2002).

3.4.4 American Period (1850 to Present)

It is estimated that in 1849 roughly 90,000 people came to California (which officially became a state in 1850), and by 1855 almost 300,000 had arrived from around the United States and abroad, including Mexico, South America, China, the United Kingdom, and Hawai'i. This influx of non-native people severely disrupted the cultures of the indigenous populations and had a significant impact on the natural environment. The discovery of gold in the Sierra Nevada by Euro-Americans ignited a major population increase in the northern half of California, specifically throughout the Sacramento River Valley, as immigrants poured into the territory seeking gold or the opportunities it presented. Native Americans, who amounted to roughly half of the mining labor force, were driven out of the mines as early as 1849. As the competition for mining rights or claims heated up, Native American miners were relegated to the margins (Cornford 1999:86-87). Gold mining camps and settlements sprang up overnight, drastically altering freshwater systems and creating a shortage of ranch workers who rushed off to seek their fortunes in the mines. This sudden loss of the ranch workforce, along with a significant increase in Euro-American squatters on the ranch lands, would ultimately contribute to the disintegration of the Mexican land grant system and eventual division and sale of land grant properties (Robinson 1979).

Yuba County was one of the original 27 counties established when California was formed as a state though Nevada, Placer, and Sierra counties were later formed from land that was part of the original Yuba County territory. In 1851, Nevada County was formed from the eastern part of Yuba County and Placer County was formed from parts of Yuba and Sutter counties. In 1852, Sierra County was formed from part of Yuba County (California State Association of Counties 2014). Marysville was established as the Yuba County seat when the county was originally formed. There are two explanations for the origins of the name Yuba. One account states that during the Gabriel Moraga expedition of 1808, he named one of the rivers flowing from the Sierra Nevada into the valley "Río de las Uvas" (River of Grapes) because of the wild grapes that grew on the banks; "Yuba" is said to be a corruption of "Uvas". The second account states that Yu-ba was the ancestral village of a Maidu

Native American tribe, located where the Feather River was joined by a great flowing river from the mountains, and that this name was used for both the river and county (Hoover et al. 1990).

Once the Gold Rush kicked off, it did not take long for river bar settlements to be dotted along the Yuba River. According to some sources, Jonas Spect was the first to find gold in Yuba County on June 2, 1848 at Rose Bar (sometimes referred to as Rose's Bar and Roses Bar), though contradictory evidence states that he actually found the first gold in Yuba County at Deer Creek, approximately 0.90 miles northeast of Rose Bar (Nevada County Historical Society 2020). Additionally, other sources state that Miles and Andrew Goodyear were the first to find gold in Yuba County in 1849 at Goodyear's Bar. Around the same time, Michael Nye and William Foster found pay gravel (gravel with a high concentration of gold and precious metals) on Dry Creek near its junction with the Yuba. By 1850, there was a camp every 1 to 2 miles, one of which was Rose Bar. John Rose and William J. Reynolds opened a store at Rose Bar in 1848; they supplied miners with goods from Sacramento as well as fresh beef and farm products from their ranch south of Marysville. In the spring of 1949, Rose bar was so overcrowded with miners that a meeting was called to limit claims to 100 square ft per man. In September 1849, a company of 50 men dammed the river so as to mine the bed; the dam was completed and work commenced by early October. However, the rains set in shortly afterwards, the water overflowed, and the dam washed way. By 1850, 2,000 men were working just Rose Bar and the town consisted of three stores, three boarding houses, two saloons, a bakery, a blacksmith shop, the Branch Hall, Masonic Temple, and three other small businesses. Decisions made at meetings at a lodge at Rose Bar had impacts on California history; one meeting resolution passed prohibited slave owners from having slaves work their claims, nor could owners file claims under their slave's names. At another meeting, anti-slavery representatives were elected to the state constitutional convention which contributed to California's admittance as a free state, in turn effecting the outcome of the Civil War. In 1850, floods drove the miners away from the sand bars to higher ground where more gold was uncovered. The Branch Hall and Masonic Temple were relocated to Smartsville. During this time, Gatesville (also known as Sucker Flat, basically an extension of Rose Bar) developed and eventually became a town by the time the bars along the river were depleted of gold. In 1851, hydraulic mining began at Rose Bar and resulted in the area being covered in tailings and mud (Fuller no date [n.d.]; Hoover et al. 1990; Merriam 1951; Western Mining History 2020a).

Evidence of the mining history is evident in the landscape with the presence of mine developments from the 1850s and the hydraulic scars from the 1860s to1870s. By 1878, the Excelsior Company at Smartsville had washed 8 million cubic yards of detritus into the Yuba River and ten times that amount remained in the company's claims when hydraulic activities ceased in 1884. Drift mining occurred during these years and continued through the early 1900s, with little work occurring afterwards. The value of the district's output is unknown though it was reported to be $13 million in 1877 (Clark 1970; Fuller n.d; Hoover et al. 1990).

Starting in 1910-1911, the Tarr Mining Corporation attempted to reopen hydraulic mining in the Blue Point Bowl (less than a mile southwest of Rose Bar) by raising $1.5 million; they dug a new ditch from Wolf Creek (since the Excelsior Water Company controlled the water in the Excelsior Ditch and would not sell any to Tarr) and brought electricity to Smartsville. The mine was designed to circumvent the Sawyer Decision of 1883, which stated that no silt, sand, or cobble rocks could be dumped into the Sacramento River or any of its tributaries, which in turn ended hydraulic mining. The Tarr Mining Corporation installed a stationary dredge at the mouth of the tunnel, a brush dam below the outlet, and a conveyor belt and aerial tram to attempt to distribute the massive quantities of cobble rock. The gravel was washed to the bucket line with hydraulic monitors and then the waste was transported by conveyor belt up to a large ore bin on the north rim of the channel. From the ore bin, the gravel was loaded into 1-yard buckets on an aerial tramway which could dump their load anywhere along the line. It was designed to fill the draw with gravel instead of washing it into the river; as a result, some of the gravels and cobbles located south of Rose Bar are attributed to Tarr Mining Corporation's operations. The mine operated briefly in 1913, only to have a storm blow out the brush dam. The Debris Commission (precursor to the USACE) ruled that the mine could not reopen until a new dam was constructed to bedrock, which was not feasible. Following this, the corporation was dissolved by 1913 (Bisnett 2020; Rigby n.d.; State of California 1907)

From 1936 to 1945, the Williams Dredging Company partook in mining activities on the north side of the Yuba River, just north of Rose Bar. The impacts of the mining also effected Rose Bar. Williams Dredging Company primarily mined for gold although silver was a tertiary material obtained (Parks Ethnographic Survey Team 1975; Western Mining History 2020b).

4.0 BACKGROUND RESEARCH AND SOURCES CONSULTED

Kleinfelder archaeologists conducted background research for the Project. Research consisted of a records search, historical maps review, and archival research. This research was conducted to identify if previous cultural resources studies and/or resources have been identified within the APE, as well as to identify the potential for such resources to occur and to better understand the prehistoric and historical context of the area. The methods and results are presented below.

4.1 RECORD SEARCH METHODS

A cultural resource records search was conducted by the NCIC at California State University (CSU), Sacramento in Sacramento, California of the California Historical Resources Information System (CHRIS) on August 28, 2020 (NCIC File Number [No.]: YUB-20-29). The records search encompassed the APE and a 0.50-mile buffer radius. The purpose of the record search was to identify if any prehistoric and/or historic-period cultural resources and studies had been previously documented in the APE and/or the surrounding 0.50-mile radius in order to better understand the archaeological sensitivity of the area. This search also included an examination of historical maps of the area. The California Points of Historical Interest, the California Historical Landmarks, the CRHR, the NRHP, and the California Inventory of Historic Resources listings were also reviewed to determine if there were any resources listed or determined to be eligible for CRHR, NRHP, or local listing within the APE.

4.2 RECORD SEARCH RESULTS

Results of the records searches indicate that one cultural resources study (see Table 1) and one previously identified cultural resource (see Table 2) are located within the APE. Six cultural resource studies have been conducted previously within 0.5 mile of the APE (see Table 3) and 31 previously identified resources (see Table 4) are located within 0.5-mile of the APE. Refer to Appendix B for record search results.

Table 1. Studies Conducted within the APE

Date	Author	Title
2011	Whatford, Charles J.	*Cultural Resource Narrative for the Kirsta Incident CANEU_015232*

Table 2. Previously Recorded Cultural Resources within the APE

Primary (P)	Trinomial	Type	Name/Description	Eligibility Status
P-58-000692	CA-Yuba (YUB)-674H	Historic-period archaeology	Mining community	Not evaluated

<u>P-58-000692 (CA-YUB-674H)</u>

This historic-period resource consists of the Rose Bar mining community. The resource was recorded by Parks Bar Ethnographic Survey Team in the summer of 1975. The site record describes the resource as a historic mining community that dates from 1849 to the 1870s; plots the resource as a single point on a 15-minutes USGS quadrangle; and mentions that the Williams Dredging Company were participating in mining activity at Rose Bar from 1936 to 1945. Details about cultural constituents observed within the site boundary were not provided in the site record. The resource has not been evaluated for NRHP eligibility.

Table 3. Studies Conducted within 0.5-mile of the APE

Date	Author	Title
1978	Johnson, Jerald J., and Dorothea J. Theodoratus	*Cultural Resources of the Marysville Lake, California Project (Parks Bar Site), Yuba and Nevada Counties, California.*

Date	Author	Title
1989	Wickstrom, C. Kristina Roer, Clinton M. Blount, Thomas L. Jackson, Dian E. Self, and Dorothea J. Theodaratus	*Cultural Resources of the Marysville Lake, California Project (Parks Bar Site), Yuba and Nevada Counties, California*
1989	Johnson, Jerald Jay	*Evaluation of Various Yuba River Reservoir Alternatives in regard to Prehistoric Cultural Resources*
2003	Applied Earthworks, Inc.	*Cultural Resources Evaluation of CA-YUB-692H, Locus 1 for the Pacific Gas and Electric Company's Colgate-Smartsville #1 60kV Transmission System Replacement Project, Yuba County, CA*
2004	Pacific Gas & Electric and Applied Earthworks, Inc.	*Cultural Resource Inventory for Pacific Gas and Electric's Proposed Colgate-Smartsville #1 60kV Transmission System Replacement Project, Yuba County, CA*
2012	Grijalva, Daniel	*Cultural Resources Inventory Report Project No: 749104124X2*

Table 4. Previously Recorded Cultural Resources within 0.5-mile of the APE

P	Trinomial	Type	Name/Description	Eligibility Status
P-58-000244	CA-YUB-226H	Prehistoric; Historic-period archaeology	Camp of Chief Bullmore (bedrock milling feature; hearths/pits); inundated by Parks Bar Dam	Not evaluated
P-58-000245	CA-YUB-227	Prehistoric archaeology	Bedrock milling feature	Not evaluated
P-58-000413	CA-YUB-395	Prehistoric archaeology	Bedrock milling feature	Not evaluated
P-58-000508	CA-YUB-490	Prehistoric archaeology	Bedrock milling feature	Not evaluated
P-58-000509	CA-YUB-491	Prehistoric archaeology	Bedrock milling feature	Not evaluated
P-58-000619	CA-YUB-601H	Historic-period archaeology	Foundations/structure pads, refuse scatter, and standing structures	Not Evaluated
P-58-000620	CA-YUB-602H	Historic-period archaeology	Foundations/structure pads	Not evaluated
P-58-000691	CA-YUB-673H	Historic-period archaeology	Mines/quarries/tailings	Not evaluated
P-58-000700	CA-YUB-682H	Historic-period archaeology	Mines/quarries/tailings; standing structures; single family properties	Not evaluated
P-58-000701	CA-YUB-683H	Historic-period archaeology	Mining settlement	Not evaluated
P-58-000702	CA-YUB-684H	Historic-period archaeology	Irish mining settlement	Not evaluated
P-58-000703	CA-YUB-685H	Historic-period archaeology	Kelly's Hill; foundations/structure pads; water conveyance system; mines/quarries/tailings	Not evaluated
P-58-000704	CA-YUB-686H	Historic-period archaeology	Water conveyance system	Not evaluated
P-58-000705	CA-YUB687H	Historic-period archaeology	Habitation debris	Not evaluated
P-58-000706	CA-YB-688H	Historic-period archaeology	Foundations/structure pads; privies/dumps/trash scatters; walls/fences	Not evaluated
P-58-000708	CA-YUB-690H	Historic-period archaeology	Historic mining community; habitation debris	Not evaluated

P	Trinomial	Type	Name/Description	Eligibility Status
P-58-000710	CA-YUB-692H	Historic-period archaeology	Smartsville; privies/damps/trash scatters; water conveyance system; mines/quarries/tailings	Not evaluated
P-58-000713	CA-YUB-695H	Historic-period archaeology	Mines/quarries/tailings	Not evaluated
P-58-000715	CA-YUB-697H	Historic-period archaeology	Mines/quarries/tailings	Not evaluated
P-58-000718	CA-YUB-700H	Historic-period archaeology	Mines/quarries/tailings	Not evaluated
P-58-000719	CA-YUB-701H	Historic-period archaeology	Mines/quarries/tailings	Not evaluated
P-58-000727	CA-YUB-709H	Historic-period archaeology	Haggerty Co	Not evaluated
P-58-000728	CA-YUB-710H	Historic-period archaeology	Hale Co; mines/quarries/tailings	Not evaluated
P-58-000736	CA-YUB-718H	Historic-period archaeology	Montague Co.; mines/quarries/tailings	Not evaluated
P-58-000743	CA-YUB-725H	Historic-period archaeology	Pittsburg and Yuba River Mining Co; mines/quarries/tailings	Not evaluated
P-58-000744	CA-YUB-726H	Historic-period archaeology	Shamrock And Dead Rabbit Company; mines/quarries/tailings	Not evaluated
P-58-000750	CA-YUB-732H	Historic-period archaeology	Peerless Min; mines/quarries/tailings	Not evaluated
P-58-000756	CA-YUB-738H	Historic-period archaeology	Taylor Co Mine; mines/quarries/tailings	Not evaluated
P-58-000760	CA-YUB-742H	Historic-period archaeology	Black Maria & Mark Anthony Mine; mines/quarries/tailings	Not evaluated
P-58-000761	CA-YUB-743H	Historic-period archaeology	Burns Mine; mines/quarries/tailings	Not evaluated
P-58-000765	CA-YUB-747H	Historic-period archaeology	Montclair Mine; mines/quarries/tailings	Not evaluated

4.3 Historical Map Review

GANDA reviewed historical maps depicting features such as towns, roads, buildings, and creeks to provide additional information regarding the potential for the presence of historic-era cultural resources within the Study Area. Historic maps are available at several online repositories, in particular the USGS' repository, the David Rumsey Map Collection, and the U.S. Department of the Interior Bureau of Land Management General Land Office (GLO) Records. The following sources were consulted during the historical map review:

- Nevada County, California. 1: 79,200. (Hartwell 1880).
- Project Area Historical Aerial (Historical Aerials 1947)
- Smartsville, California. 1:125,000 topographic quadrangle (USGS 1888, 1891, 1892, 1894, and 1895).
- Smartsville, California. 1:24,00 topographic quadrangle (USGS 1949, 1951).
- The Central Part of the State of California (Bielawski et al. 1865).
- Township 16 North, Range 6 East, Mount Diablo Meridian (GLO Plat 1867, 1876).
- Wheatland, California. 1:62,500 topographic quadrangle (USGS 1949 [ed. 1953]).

4.3.1 Historical Map Review Results

An 1865 map shows no habitation or mining evidence is within the APE, but there is historic evidence within its vicinity; additionally, no scale was provided for the map. It places the APE on the South Fork of the Yuba River, east of several structures labeled as Timbuctoo, north of several structures labeled as Sucker Flat, northwest of several structures labeled as Lander's Bar, and southwest of two structures labeled as Malay Camp. An unnamed route is plotted where Highway 20 is currently located (Bielawski, et al 1865).

The 1867 GLO Plat depicts no habitation or mining evidence is within the APE, but there is historic evidence within its vicinity. The APE is on the south bank of Yuba River, on subdivided parcels. A "live oak" tree is plotted approximately 0.25 miles northeast of the APE on the north shore of the Yuba River with a "Local Attraction" located approximately 0.30 miles northeast of that. A hatched area with a flag is labeled "Timbucto" and located approximately 0.75 miles west of the APE. A mining claim is shown approximately 0.35 miles southwest of the APE. Smartsville is located approximately 0.85 miles southwest of the APE and includes buildings labeled as Simpsons House, Gold Diggings, Carey's Gold Diggins, Clarks Hotel, and Conner's House. An unnamed east to west trending creek intersects the Yuba River 0.16 miles north of the APE (GLO 1867).

The 1876 GLO Plat plots no structures or historic occupation are present within the APE. All that is shown is a live oak within the west part of the APE and one on the north bank of the Yuba River approximately 0.14 miles north of the APE, though these are not indicative of habitation. Timbucto is no longer depicted with a flag and a mining claim is located at Timbucto. Gold diggings are plotted within Timbuctoo Bend, approximately 1 mile northwest of the APE. The mining claim approximately 0.35 miles southwest of the APE is no longer present. Smartsville is labeled as the "Town Site of Smartsville" and a flume is within the town limits. A road labeled "Upper Marysville and Nevada City Road" is located where Highway 20 is currently located, approximately 0.80 miles southwest of the APE. Gold diggings are located approximately 0.35 miles southeast of the APE (GLO 1876).

The 1880 map depicts no structures or historic occupation present within the APE, but there is historic evidence within its vicinity. The APE is approximately 0.33 miles northeast of Timbuctoo, approximately 0.33 miles north of Sucker flat, approximately 0.66 miles north of Smartsville, and approximately 0.66 miles north and 0.16 miles east of a ditch labeled "Miner's Ditch" (Hartwell 1880).

An 1888, 1891, 1892, 1894, and 1895 quadrangles shows no structures or historic occupation present within the APE, but there is historic evidence within its vicinity. The APE is approximately 1.13 miles northeast of structure labeled Timbuctoo, approximately 0.37 miles north of a structure labeled Sucker Flat, and approximately 0.56 miles north of a larger structure labeled Smartsville, The Yuba River trends northeast to southwest through the APE; the eastern section of the APE has steep banks on both sides of the Yuba River but the banks of the Yuba River are relatively level in the western section of the APE. Highway 20 is depicted as an unnamed unimproved road. A northeast to southwest trending road leads from Smartsville north up to Sucker Fat (USGS 1888, 1891, 1892, 1894, and 1895).

A 1947 aerial places the APE on the Yuba River and tailings within the APE on the south shore of the Yuba River and tailings northwest of the APE on the north bank of the Yuba River (Historical Aerials 1947).

The 1949 quadrangle maps the APE on a section of the Yuba River labeled as "Rose Bar (Site)", adjacent and east of a large southerly bend in the river; tailings are located on the north and south banks of the river and within the APE. A north to south trending unimproved road leads south from Rose Bar before branching off to the southeast and southwest. Three north to south trending power transmission lines cross the Yuba River approximately 0.18 miles west of the APE. Timbuctoo is depicted with more structures and is transected by a northwest to southeast trending light duty road; an unimproved road leads north from it through San Hills and up to Timbuctoo Bend on the Yuba River. Both Smartsville, Mooney Flat, Sicard Flat and Sucker Flat are all depicted with more structures; Blue Point Mine is plotted southeast of the APE and east of Smartsville. Forbes Ranch is located on the north bank of the Yuba River across from Timbuctoo Bend and northwest of the APE. Timbuctoo Bend is northeast of the APE on the south bank of the Yuba River. The bridge that Highway 20 uses to cross the Yuba River is no longer depicted though the highway is shown as crossing just west of Park Bar. The roads leading south from Mooney Flat and Sicard Flat are depicted as light duty roads (USGS 1949 [ed. 1953]).

The 1949 quadrangle labels the tailings near and within the APE as "Tailing" (USGS 1949).

The 1951 quadrangle updates the tailings near and within the APE as "Tailings". A prospect is plotted northeast of the APE on the north bank of the Yuba River and another one is south of the APE within the unimproved road leading south from Rose Bar (USGS 1951).

5.0 NATIVE AMERICAN HERITAGE COMMISSION CONSULTATION

On August 20, 2020, Kleinfelder sent a request for a Sacred Lands File (SLF) search to the NAHC. The NAHC responded on August 26, 2020, with a Native American contact list and indicating that the SLF indicated that there are no sacred lands within the vicinity of the APE. They provided a list of Native American contacts to outreach to for further details regarding the project area. Kleinfelder did not conduct additional outreach as it was assumed that the USACE would conduct this as is indicated in the USACE Sacramento District Section 106 guidelines. See Appendix C for NAHC consultation and response.

6.0 LOCAL HISTORICAL SOCIETY CONSULTATION

On October 17, 2020, Kleinfelder sent a consultation letter to the Nevada County Historical Society in Nevada City and to the Yuba County Museum of History in Marysville with a request for information regarding cultural resources located within the APE. On October 27, 2020, Kleinfelder followed up with phone calls to both contacts. A voicemail was left with both the Yuba County Museum of History and the Nevada County Historical Society. On November 10, 2020 the Nevada County Historical Society called to update Kleinfelder that they were looking into their archives for information about the Project area. Kleinfelder asked if Jonas Spect was the first person to identify gold on the Yuba River at Rose Bar, inquired about general information about Rose Bar, and for more information about the Tarr Mining Corporation. Later that day, the Nevada County Historical Society called back and reported that while Jonas Spect was the first miner to discover gold on the Yuba River, it was near Deer Creek (approximately 0.90-mile northeast of the APE) and not at Rose Bar. Later on, he went on to open a store at Rose Bar before moving to Colusa County. After Jonas Spect yielded little gold from mining at Rose Bar, he opted to open up a trading post there instead (Nevada County Historical Society 2020). See Appendix D for historical society consultation.

7.0 FIELD METHODS AND RESULTS

Cultural resources field methods and results are presented here followed by an updated description of the previously recorded cultural resource (P-58-000692).

7.1 FIELD METHODS

On September 29 and October 8, 2020, July 12, 2021, and March 17, 2022, Kleinfelder archeologists Jessica Neal, and Samantha Dunham conducted a pedestrian survey of the APE to identify cultural resources and assess sensitivity. Jessica Neal meets the Secretary of Interiors Professional Qualifications in archaeology and served as field crew lead for this Project. The survey was conducted using 15-meter-wide parallel transects. Bare patches of ground and rodent runs were closely inspected and occasionally troweled to inspect the soil for archaeological materials. Surrounding environment, topography, soil conditions, ground visibility, disturbances, and cultural resources were recorded using field notes, digital photographs, and a sub-meter Global Positioning System (GPS) unit. Vegetation consisted of poison oak, oak trees, pine trees, native grasses, willow bushes, fig trees, and a rose bush. On October 8, 2020, the archaeologists were accompanied by Brian Bisnett, the landowner, during the start of the survey, who provided oral history about the area.

7.2 FIELD RESULTS

Kleinfelder identified no new cultural resources within the APE; however, one previously unevaluated cultural resource (P-58-000692) was relocated and those portions within the APE were documented accordingly. Refer to Appendix A, Figure 4 for resource location map, Appendix E for the updated DPR 523 form of P-58-000692, and Appendix F for survey photographs.

P-58-000692 (CA-YUB-674-H) UPDATE

P-58-000692 was updated to measure approximately 1,670 ft north to south by approximately 699 ft east to west within the APE. Features include a historic-period ditch; a depression with a small oven, non-native plants, and refuse; a raised flat area with a refuse concentration; a trail; berms; remnants of a concrete water conveyance system; tailings piles; and a concentration of miscellaneous metal in a large level area east of the tailings. Tailings and hydraulic mining cuts were observed within the eastern edge of the site boundary. Artifacts in the site consists of glass and miscellaneous metal refuse (bottles, jars, cans, metal pails, metal buckets, metal fragments), barbed wire, milled wood, and a metal cable. The north end of the resource is on an alluvial bar along the south bank of the Yuba River. The south end is on the raised level riverbank above the Yuba River. A small intermittent creek within an incised gully enters the Yuba River from the south, within the resource's northeast boundary. A northeast to southwest trending road bisects the resource, specifically where the tailings piles are located. A modern wooden utility pole is located in the section of tailings south of the bisecting dirt road. The tailings likely date to post 1850s after hydraulic mining began while the water conveyance and camping area are likely associated with later mining from the twentieth century. The range of ages of the artifacts date from approximately 1939 to as recent as 1985. Historical seasonal flooding and hydraulic mining activities have likely washed away or buried any of evidence of the community located directly on the Yuba River, while other components of the community have been removed. Due to some components being buried and the resource extending outside of the APE onto other properties, the entire resource could not be viewed and updated.

P-58-000692 was originally recorded in 1975 by the Park Bar Ethnographic Survey Team as the Rose Bar mining community dating from 1849 to the 1870s with historical mining activity from the Williams Dredging Company dating from 1936 to 1945. For the current undertaking, Kleinfelder determined that there is no archaeological evidence of what is described in historical accounts of the Rose Bar mining community nor of what is anticipated to be present in a larger mining community such as foundations, building remnants, or large quantities of refuse and artifacts associated with a habitation dating from 1849 to the 1870s (e.g.: food cans, medicine bottles, ceramics, etc.). It has been determined that P-58-000692 is not associated with the Williams Dredging Company due to Williams Bar Dredge being located 0.48 miles north of the APE and on the opposite side of the Yuba River from P-58-000692, which is well outside of the sites original plotted location and the observed site boundary. Although older historical descriptions of Rose Bar places it in the approximate location of P-58-000692, historical maps and aerials do not indicate development specifically within the APE. Mining features (tailings) are not plotted within the APE on historical aerials until 1947 (Historical Aerials 1947) and Rose Bar is not plotted and labeled on a map until 1949 (USGS 1949 [ed. 1953]). Historical research indicates that during the late 1840s and early 1850s, meetings held at a lodge at Rose Bar discussed the exclusion of slavery in California mining which in turn contributed to California's admittance to the United States as a free state and impacted the outcome of the Civil War (Fuller n.d.). However, no direct evidence states where this meeting at Rose Bar occurred or when, and there are no structures or artifacts that can link the portions of P-58-000692 within the APE to this historic event. Other historical research indicates that P-58-000692 is associated with the first person to discover gold in Yuba County (Jonas Spect in 1848), but conflicting information states that gold was first found by other individuals elsewhere in Yuba County. As a result, there is not enough evidence to link P-58-000692 with the first account of gold being discovered in Yuba County. It seems accurate that P-58-000692 is the approximate location of the Rose Bar mining community, but little to no evidence of the larger community is present within the APE. What evidence was identified is ephemeral and represents a large date range as discussed below. As such, it appears that much of the community was cleared, removed, washed away or buried from seasonal flooding or beneath tailings, or destroyed as a result of later hydraulic mining. The artifacts and features identified indicate an association with later mining activities given the date range of the artifacts (1939-1985). These artifacts also occur on top of the tailings, as such it is assumed these are associated with hydraulic mining, which occurred after the reported occupation of Rose Bar. The National Register Criteria has been applied to those portions of the site within the APE.

Site P-58-000692 is not associated with events that have made a significant contribution to the broad patterns of the history and cultural heritage of the United States (Criterion A/1); the site is not directly associated with the lives of persons significant to the nation's past (Criterion B/2); this site does not embody distinctive characteristics of a type, period, region, or method of construction, or that represents the work of a master, or that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C/3); nor is there the potential for subsurface or additional data that could yield information important to the prehistory or history of the nation (Criterion D/4). As a result, this site is recommended not eligible under any criteria for listing on the NRHP and/or CRHR under California Historic Resource Status Code 6Z: Found ineligible for NRHP, CRHR, or local designation through survey evaluation.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The following provides the conclusions of the cultural resource inventory and recommendations for the APE.

8.1 CONCLUSION

The cultural resource inventory of the APE included a review of the natural and cultural environment including the prehistory, ethnography, and history; of historic maps; records search results from the NCIC; consultation with the NAHC, and a survey of the APE. As a result of these efforts, the study has positive results with the update of a historic-period mining site (P-58-000692). Even though the portion of the historic-period cultural resource within the APE is recommended not eligible for listing on the CRHR and NRHP, there may still be subsurface components under sediments in the Yuba River riverbed buried from historical flooding and hydraulic mining. As a result, spot check monitoring is recommended if any ground-disturbing activities are to occur within the footprint of the project.

8.2 RECOMMENDATIONS

Due to the presence of cultural resources within the Project and surrounding area, the APE is considered to be sensitive for cultural resources, despite the archaeological site being recommended not eligible for listing on the CRHR and NRHP. With the implementation of the following conditions, the Project would result in a less than significant impact to historical and/or archaeological resources.

- A qualified archaeologist shall provide an archaeological tailboard to any construction crew working on site during ground disturbing activities.
- A qualified archaeological monitor shall conduct spot-check monitoring as needed during ground-disturbing activity as determined by a qualified archaeologist.
- If archaeological components are encountered during ground disturbing activities in the riverbed, all ground disturbing work at the find location plus a reasonable buffer zone must be immediately suspended, the South Yuba River Citizens League, the USACE, and a qualified professional archaeologist will be retained to analyze the significance of the find and formulate further mitigation (e.g., Project relocation, excavation plan, and protective cover) in consultation with culturally affiliated tribes or other descendant groups, where applicable.
- Pursuant to California Health and Safety Code §7050.5, if human remains are encountered, all ground-disturbing work must cease in the vicinity of the discovery, and the County Coroner shall be contacted. The respectful treatment and disposition of remains and associated grave offerings shall be in accordance with Public Resource Code (PRC) §5097.98. The project owner is responsible for implementation PRC §5097.98 and coordination with the likely descendant (MLD) identified by the Native American Heritage Commission. PRC §5097.98 also outlines next steps should the landowner and MLD not reach an agreement to the final disposition of the remains.
- In the event the Project design changes and ground disturbance is anticipated beyond the APE as it is currently defined, further surveys shall be conducted in those new areas to assess the presence of cultural resources. Any newly discovered or previously recorded sites within the additional survey areas shall be recorded (or updated) on appropriate DPR 523-series forms. If avoidance of these resources is not feasible, then an evaluation and/or data recovery program shall be drafted and implemented.

9.0 PREPARERS QUALIFICATIONS

This report was prepared by Kleinfelder/GANDA archaeologist Samantha Dunham and reviewed by Senior Cultural Resources Manager Rachael Nixon and Senior Archaeologist Jessica Neal.

Ms. Dunham is an archaeologist with 5 years of cultural resources management experience in California. Her training and background meet the California Department of Parks and Recreation qualifications as an Associate State Archaeologist for prehistoric and historic archaeology. Her experience includes archival research; ethnographic and historical research; Native American consultation; field survey; prehistoric and historical excavation; archaeological monitoring; and writing technical documents including permits, archaeological resource management reports, historic property management plans, and archaeological treatment plans, amongst others. She prepares cultural resources technical studies pursuant to the California Environmental Quality Act (CEQA), Section 106 of the NHPA, and local policies.

Ms. Neal has over 9 years of cultural resources management experience. She has served as project manager and principal investigator. Duties include authoring and reviewing technical cultural resource inventory reports, serving as field director for cultural fieldwork including survey and monitoring, and ensuring all work complies with state and federal environmental regulations, including CEQA, Section 106 of NHPA, the National Environmental Policy Act (NEPA), and Assembly Bill 52. Jessica meets the Secretary of Interior's Professional Qualification Standards in archaeology and is a Registered Professional Archaeologist (RPA; ID No. 17230).

Ms. Nixon has over 22 years of cultural resource management experience. She has served as principal investigator on projects under CEQA, NEPA, and Section 106 of the NHPA. Rachael has directed projects that involved the identification and evaluation of hundreds of resources including paleontological, archaeological, and architectural history. She has worked with various agencies, including but not limited to; Bureau of Land Management, Bureau of Indian Affairs, California Energy Commission, Native American Heritage Commission, U.S. Army Corps of Engineers, U.S. Forest Service, U.S. Bureau of Reclamation, and the State Historic Preservation Office. She has also worked closely with Native American Tribal representatives, most likely descendants, Tribal Historic Preservation Officers, and has served as liaison between contract personnel, clients, tribal representatives, technical leads, and agency leads throughout California. She meets the Secretary of Interior's Professional Qualification Standards in archaeology and history, is listed as a principal investigator on Kleinfelder's BLM California (CA-17-27) and Nevada (N-97534) Cultural Resources Use Permit, Registered Professional Archaeologist (#15857), and meets the California State Personnel Board as a Senior Archaeologist. Registered Professional Archaeologist (RPA; ID No. 15857)

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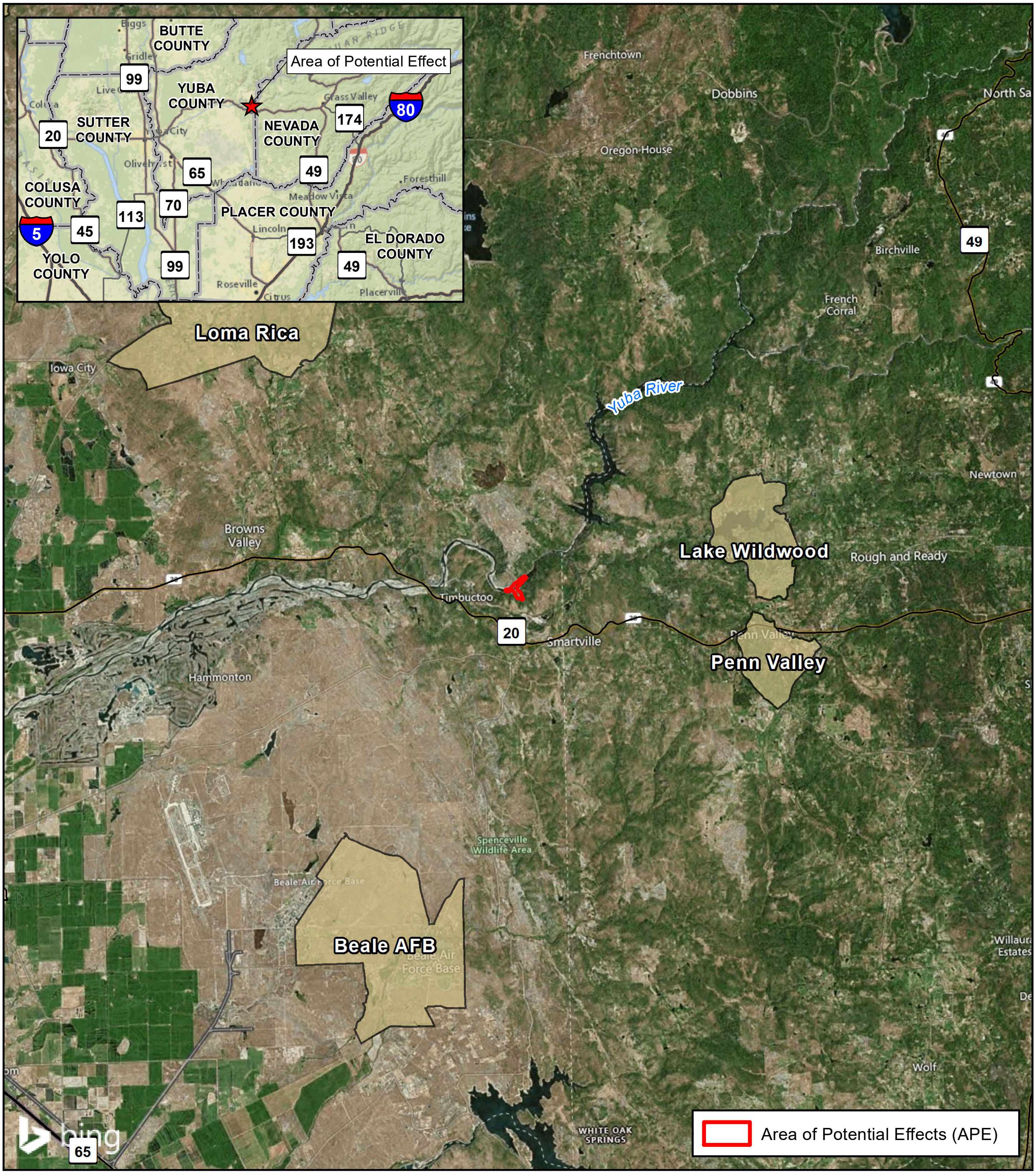
Appendix A

FIGURES



0 1.5 3 Miles

0 2.5 5 Kilometers

N

Scale 1:190,080
1 in = 3 miles

Figure 1. Regional Vicinity
Rose Bar Restoration
Yuba County, California

KLEINFELDER
Bright People. Right Solutions.

USGS 7.5' Quad: SMARTVILLE (1995)
Legal Description: T16N, R06E, SEC 22, 27, 28

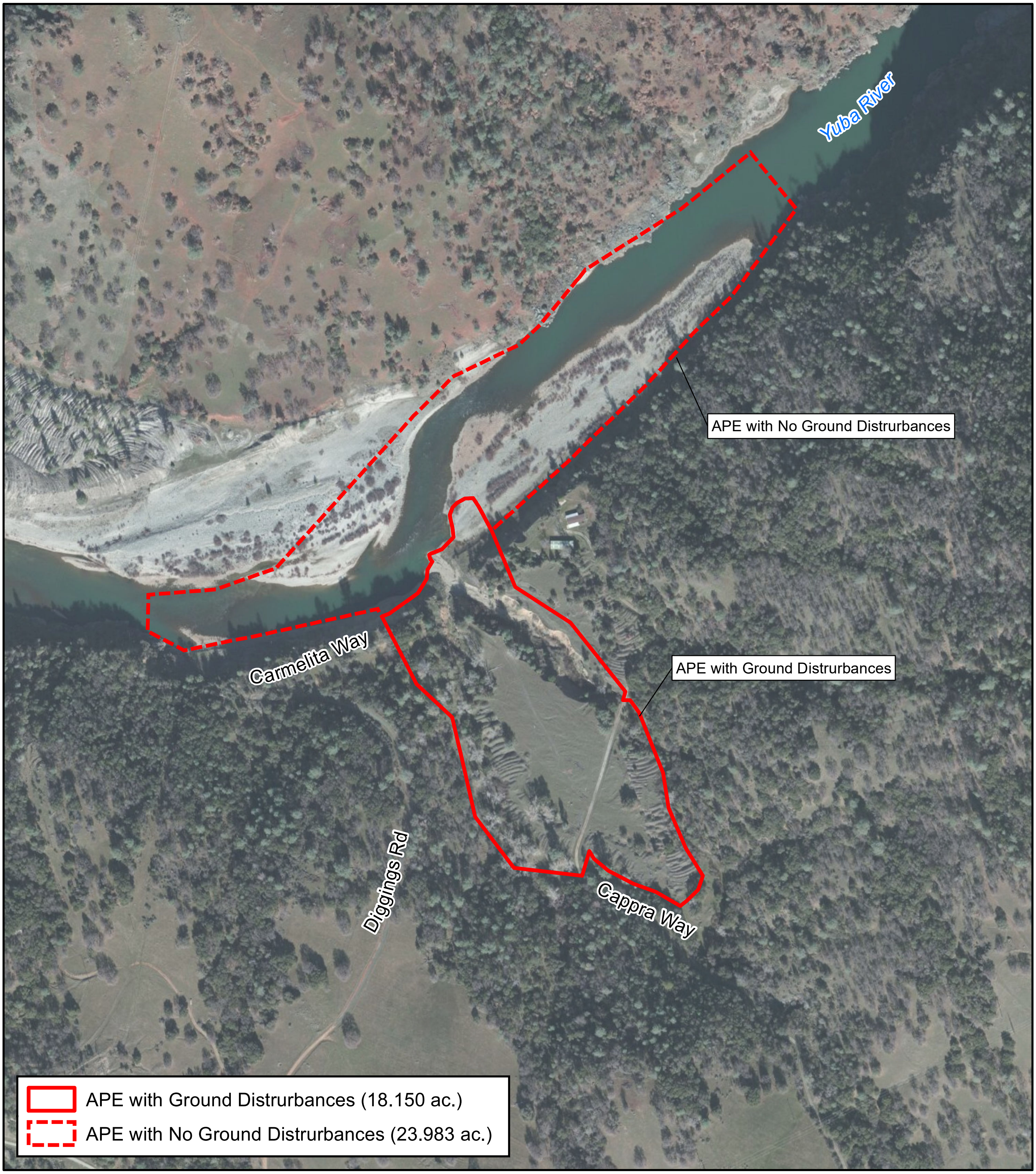
0 1,000 2,000 Feet
0 300 600 Meters

N

Scale 1:24,000
1 Inch = 2,000 Feet

Figure 2. Project Location
Rose Bar Restoration
Yuba County, California

KLEINFELDER
Bright People. Right Solutions.



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USGS 7.5' Quad: SMARTVILLE (1995)
Legal Description: T16N, R06E, SEC 27, 28

0 250 500 Feet

0 75 150 Meters

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Scale 1:6,000
1 Inch = 500 Feet

Figure 3. Area of Potential Effect
Rose Bar Restoration
Yuba County, California

KLEINFELDER
Bright People. Right Solutions.

REDACTED

The following page(s) have been removed in the redacted version of the report due to containing confidential information.

Appendix B

NORTH CENTRAL INFORMATION CENTER (NCIC) RECORD SEARCH RESULTS

REDACTED

The following page(s) have been removed in the redacted version of the report due to containing confidential information.

Appendix C

NATIVE AMERICAN HERITAGE COMMISSION (NAHC) CONSULTATION

From:	Sam Dunham
To:	nahc@nahc.ca.gov
Subject:	SLF request and contact list for 1488 Rose Bar Restoration Project, Yuba County
Date:	Thursday, August 20, 2020 10:50:00 AM
Attachments:	Rose Bar Restoration_NAHC_SLF.pdf

Hello,

I would like to please submit this SLF and contacts request for a location in Yuba County. Please see the attached request form and let me know if you have any questions.

Thanks,

Samantha Dunham
Archaeologist

Garcia and Associates (GANDA)
435 Lincoln Way
Auburn, California 95603
530 823 3151 office
530 902 0735 cell
sdunham@garciaandassociates.com
www.garciaandassociates.com

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: 1488 Rose Bar Restoration Project

County: Yuba

USGS Quadrangle Name: see below

Township: ______ Range: ______ Section(s): ______

Company/Firm/Agency: Garcia and Associates

Contact Person: Samantha Dunham

Street Address: 435 Lincoln Way

City: Auburn Zip: 95604

Phone: 530-902-0735

Fax: ______

Email: sdunham@garciaandassociates.com

Project Description:

habitat restoration project to improve the quality and quantity of spawning habitat for salmonids at the site, including specific benefits to spring-run Chinook salmon and steelhead trout.

Smartville (1995) T16N, R06 E, Section 21, 22, 27, 28. UTMs: 646945 mE/ 4342554 mN

From:	Gonzalez-Lopez, Nancy@NAHC
To:	Sam Dunham
Subject:	1488 Rose Bar Restoration Project, Yuba County
Date:	Wednesday, August 26, 2020 4:01:34 PM
Attachments:	SLF No 1488RoseBar DunhamYuba 8-26-2020 Signed.pdf 1488RoseBar DunhamYuba 8-26-2020.pdf

Regards,

Nancy Gonzalez-Lopez
Cultural Resources Analyst
Native American Heritage Commission
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 573-0168

NATIVE AMERICAN HERITAGE COMMISSION

August 26, 2020

Samantha Dunham

Garcia & Associates

Via E-mail: sdunham@garciaandassociates.com

Re: 1488 Rose Bar Restoration Project, Yuba County

Dear Ms. Dunham:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,

Nancy González-Lopez
Cultural Resources Analyst

Attachment

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

Native American Heritage Commission
Native American Contact List
Yuba County
8/26/2020

Tsi Akim Maidu Grayson Coney, Cultural Director P.O. Box 510 Browns Valley, CA, 95918 Phone: (530) 383 - 7234 tsi-akim-maidu@att.net	Maidu
United Auburn Indian Community of the Auburn Rancheria Gene Whitehouse, Chairperson 10720 Indian Hill Road Auburn, CA, 95603 Phone: (530) 883 - 2390 Fax: (530) 883-2380 bguth@auburnrancheria.com	Maidu Miwok
Colfax-Todds Valley Consolidated Tribe Pamela Cubbler, Treasurer P.O. Box 4884 Auburn, CA, 95604 Phone: (530) 320 - 3943 pcubbler@colfaxrancheria.com	Maidu Miwok
Colfax-Todds Valley Consolidated Tribe Clyde Prout, Chairperson P.O. Box 4884 none Auburn, CA, 95604 Phone: (530) 577 - 3558 miwokmaidu@yahoo.com	Maidu Miwok

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed 1488 Rose Bar Restoration Project, Yuba County.

Appendix D

LOCAL HISTORICAL SOCIETY CONSULTATION

Kleinfelder/Garcia and Associates
435 Lincoln Way
Auburn, CA 95603
(530) 823-3151

October 17, 2020

Daniel Ketcham, President
Nevada County Historical Society
161 Nevada City Hwy
Nevada City, CA 95959

Subject: Rose Bar Restoration Project, Yuba County, California

Dear Mr. Ketcham,

Kleinfelder/ Garcia and Associates (GANDA) is conducting a cultural resources investigation on behalf of Cramer Fish Sciences for the proposed Rose Bar Restoration Project (Project) near Smartsville in Yuba County, California (See Attached Figures 1-3). See the attached map that depicts the Project on the *Smartville, California* 7.5-minute United States Geological Society (USGS) (1995) Quadrangle.

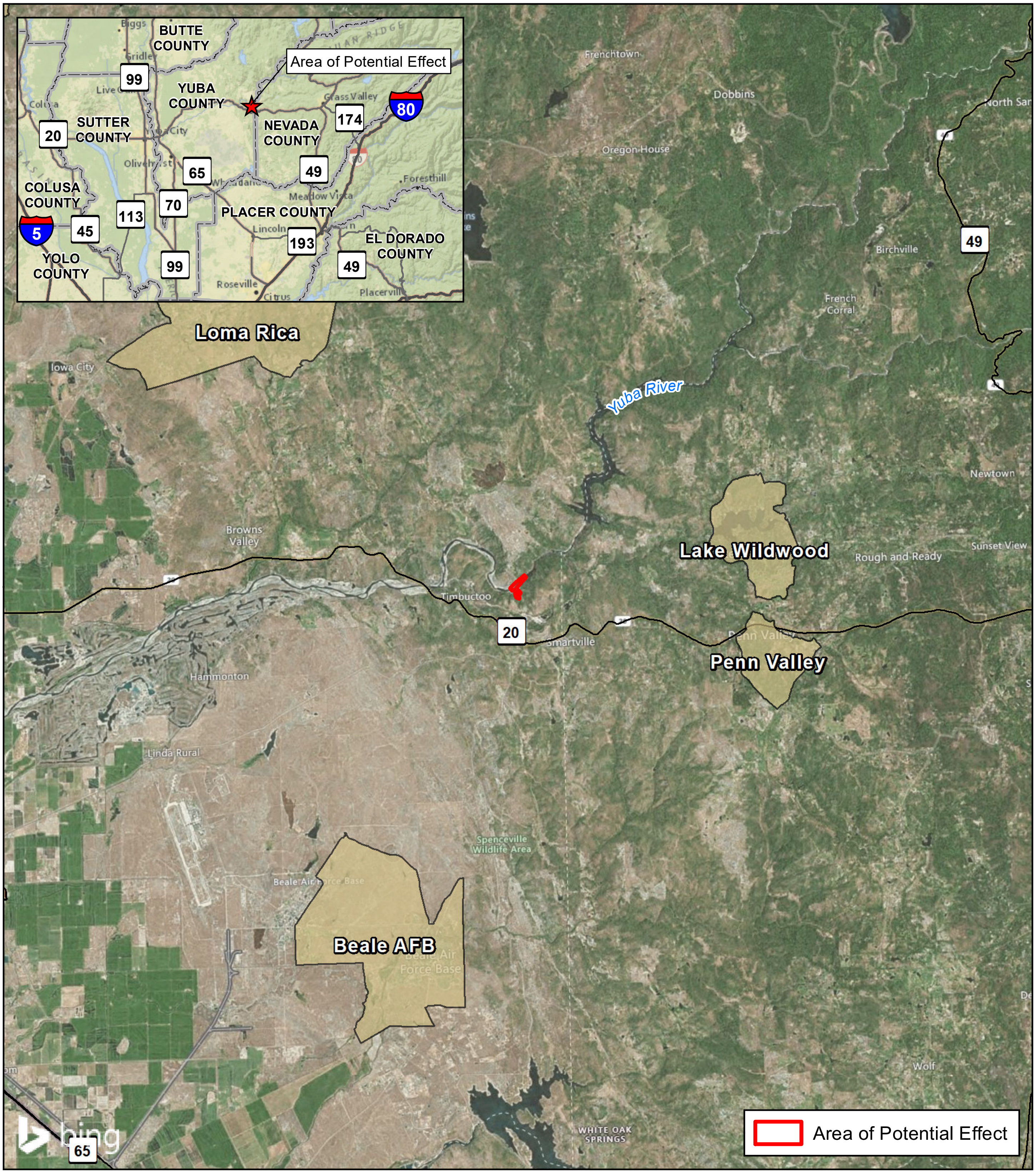
An important element of our investigation is to identify built environment resources (e.g., buildings, structures, or objects), sites, or locations of cultural, historical, or architectural importance. We would appreciate receiving any information you have concerning cultural resources located within or adjacent to the Project area. This is not a request for research; it is solely a request for public input for any concerns that the historical society may have about cultural resources that have the potential to be affected by the Project.

Thank you for your assistance with the Project. If you have any questions, please contact me at the address and phone number above or via email at sdunham@garciaandassocates.com. I look forward to hearing from you.

Sincerely,

Samantha Dunham
Staff Archaeologist

Enclosure: Figures 1-3



0 1.5 3 Miles

0 2.5 5 Kilometers

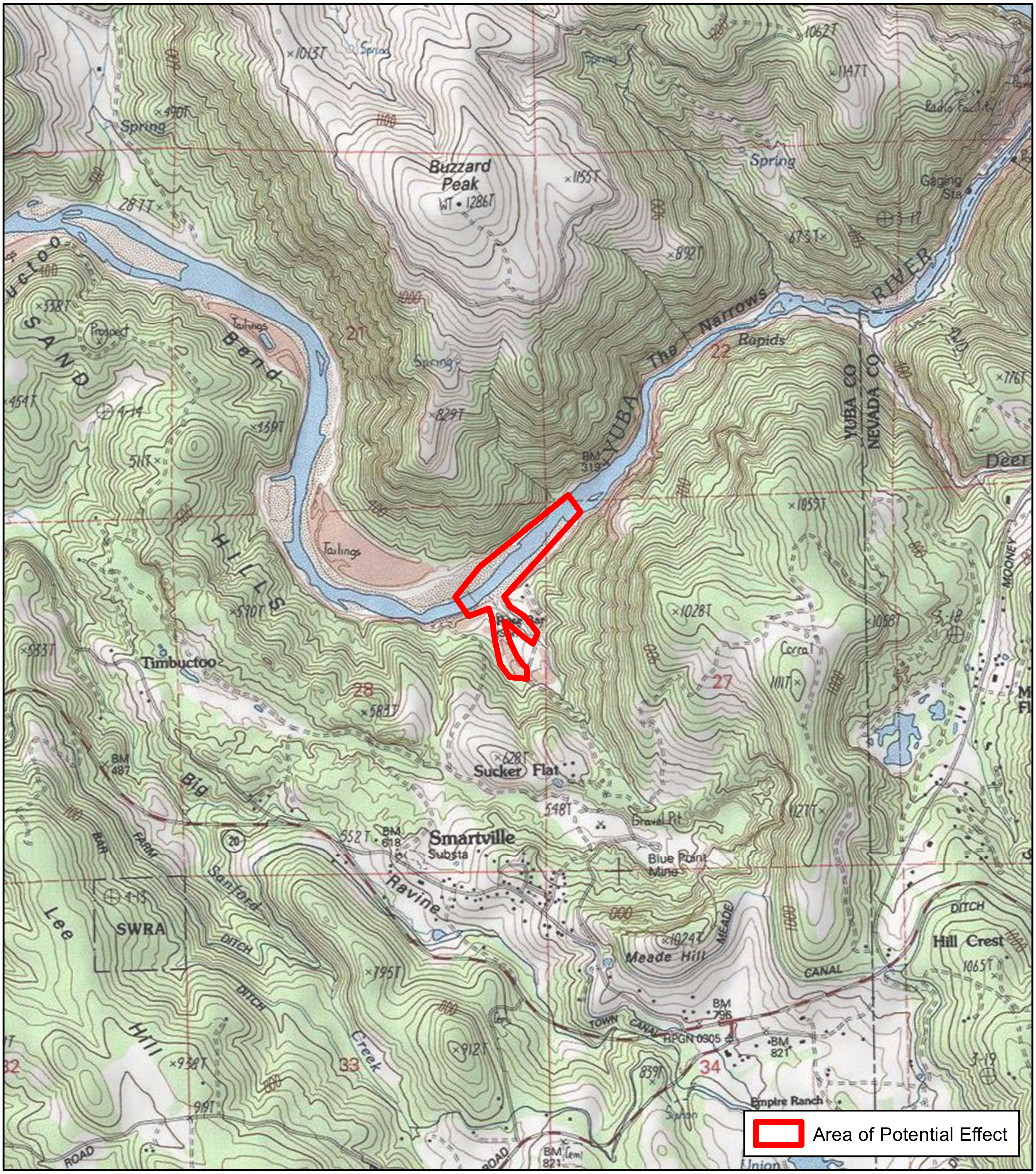
N

Scale 1:190,080
1 in = 3 miles

Figure 1. Regional Vicinity
Rose Bar Restoration
Yuba County, California

KLEINFELDER
Bright People. Right Solutions.

GANDA
GARCIA and ASSOCIATES



USGS 7.5' Quad: SMARTVILLE (1995)
Legal Description: T16N, R06E, SEC 22, 27, 28

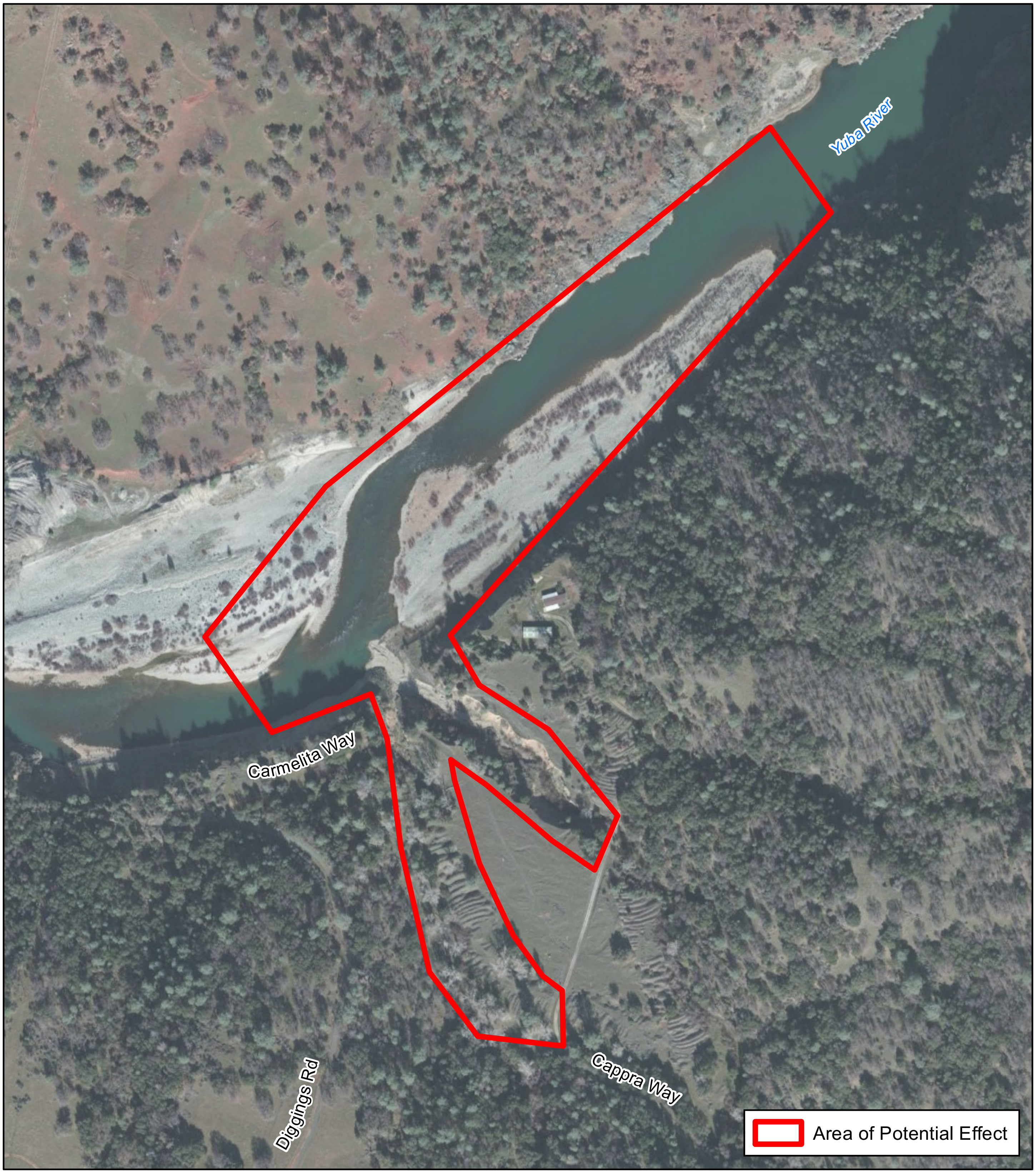
0 1,000 2,000 Feet
0 300 600 Meters

N

Scale 1:24,000
1 Inch = 2,000 Feet

Figure 2. Project Location
Rose Bar Restoration
Yuba County, California

KLEINFELDER
GANDA



Created By: C BARKERSWITZER Document Path: C:\Users\Admin\OneDrive - GANDA\Desktop\Home_Projects\1488_Rose_Bar_Current\Rose_Bar_APE_Report.mxd

USGS 7.5' Quad: SMARTVILLE (1995)
Legal Description: T16N, R06E, SEC 22, 27, 28

0 200 400 Feet
0 50 100 Meters

N

Scale 1:4,800
1 Inch = 400 Feet

Figure 3. Area of Potential Effect
Rose Bar Restoration
Yuba County, California

KLEINFELDER Bright People. Right Solutions.
GANDA GARCIA and ASSOCIATES

Kleinfelder/Garcia and Associates
435 Lincoln Way
Auburn, CA 95603
(530) 823-3151

October 17, 2020

Yuba County Museum of History
P.O. Box 5098
Marysville, CA 95901

Subject: Rose Bar Restoration Project, Yuba County, California

Dear Yuba County Museum of History,

Kleinfelder/ Garcia and Associates (GANDA) is conducting a cultural resources investigation on behalf of Cramer Fish Sciences for the proposed Rose Bar Restoration Project (Project) near Smartsville in Yuba County, California (See Attached Figures 1-3). See the attached map that depicts the Project on the *Smartville, California* 7.5-minute United States Geological Society (USGS) (1995) Quadrangle.

An important element of our investigation is to identify built environment resources (e.g., buildings, structures, or objects), sites, or locations of cultural, historical, or architectural importance. We would appreciate receiving any information you have concerning cultural resources located within or adjacent to the Project area. This is not a request for research; it is solely a request for public input for any concerns that the historical society may have about cultural resources that have the potential to be affected by the Project.

Thank you for your assistance with the Project. If you have any questions, please contact me at the address and phone number above or via email at sdunham@garciaandassocates.com. I look forward to hearing from you.

Sincerely,

Samantha Dunham
Staff Archaeologist

Enclosure: Figures 1-3

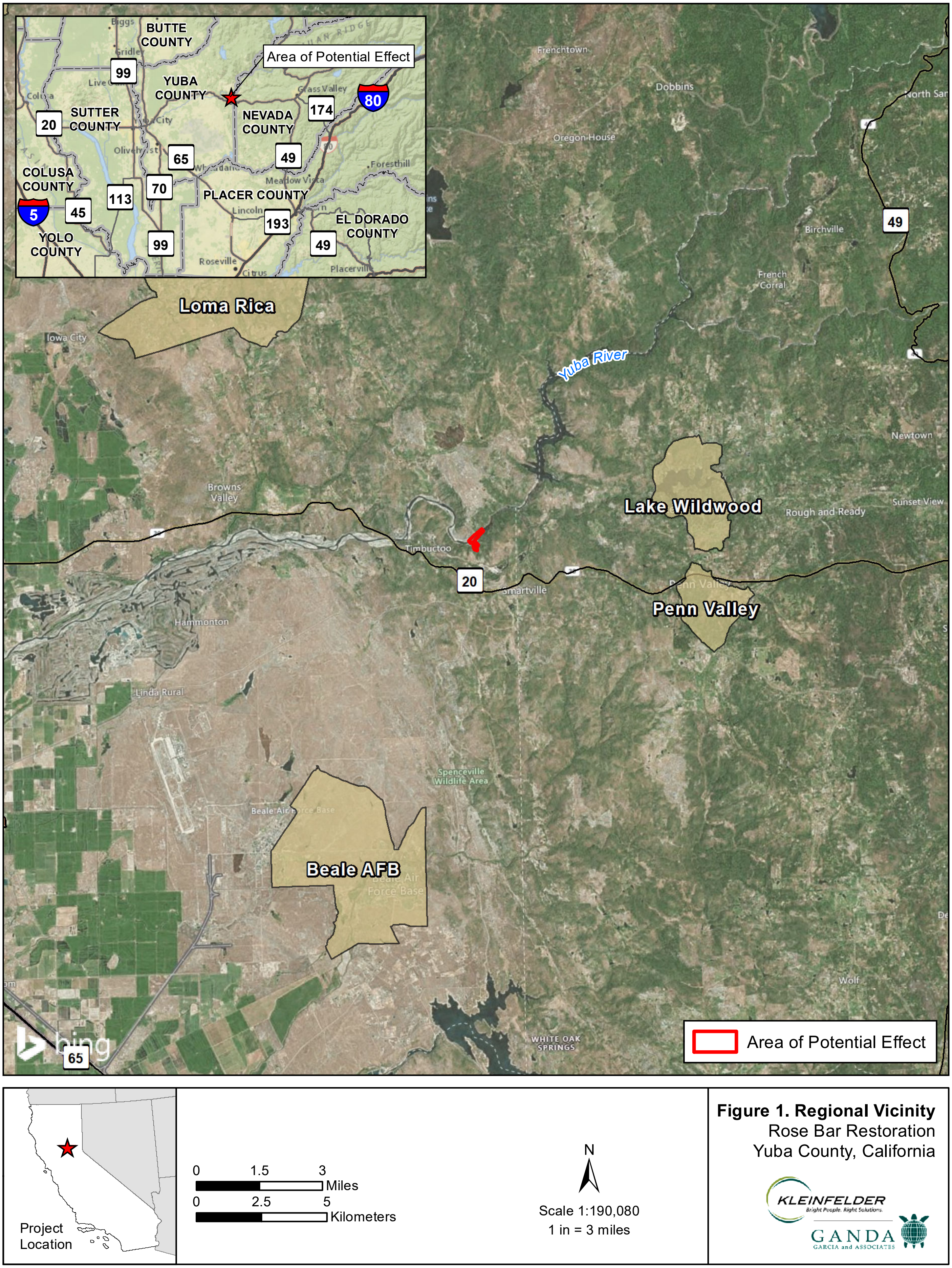
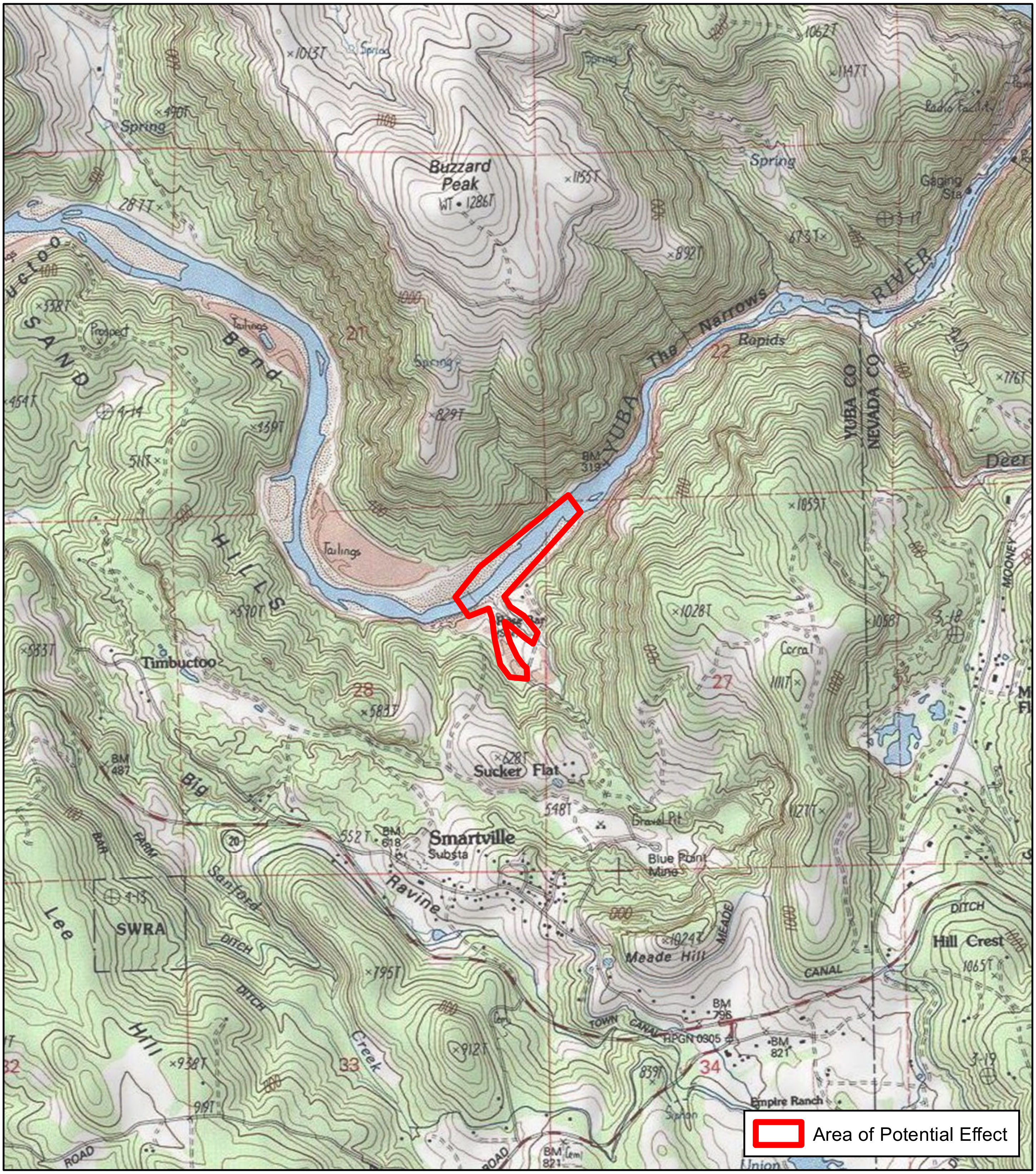


Figure 1. Regional Vicinity
Rose Bar Restoration
Yuba County, California

Scale 1:190,080
1 in = 3 miles

KLEINFELDER Bright People. Right Solutions.
GANDA GARCIA and ASSOCIATES



USGS 7.5' Quad: SMARTVILLE (1995)
Legal Description: T16N, R06E, SEC 22, 27, 28

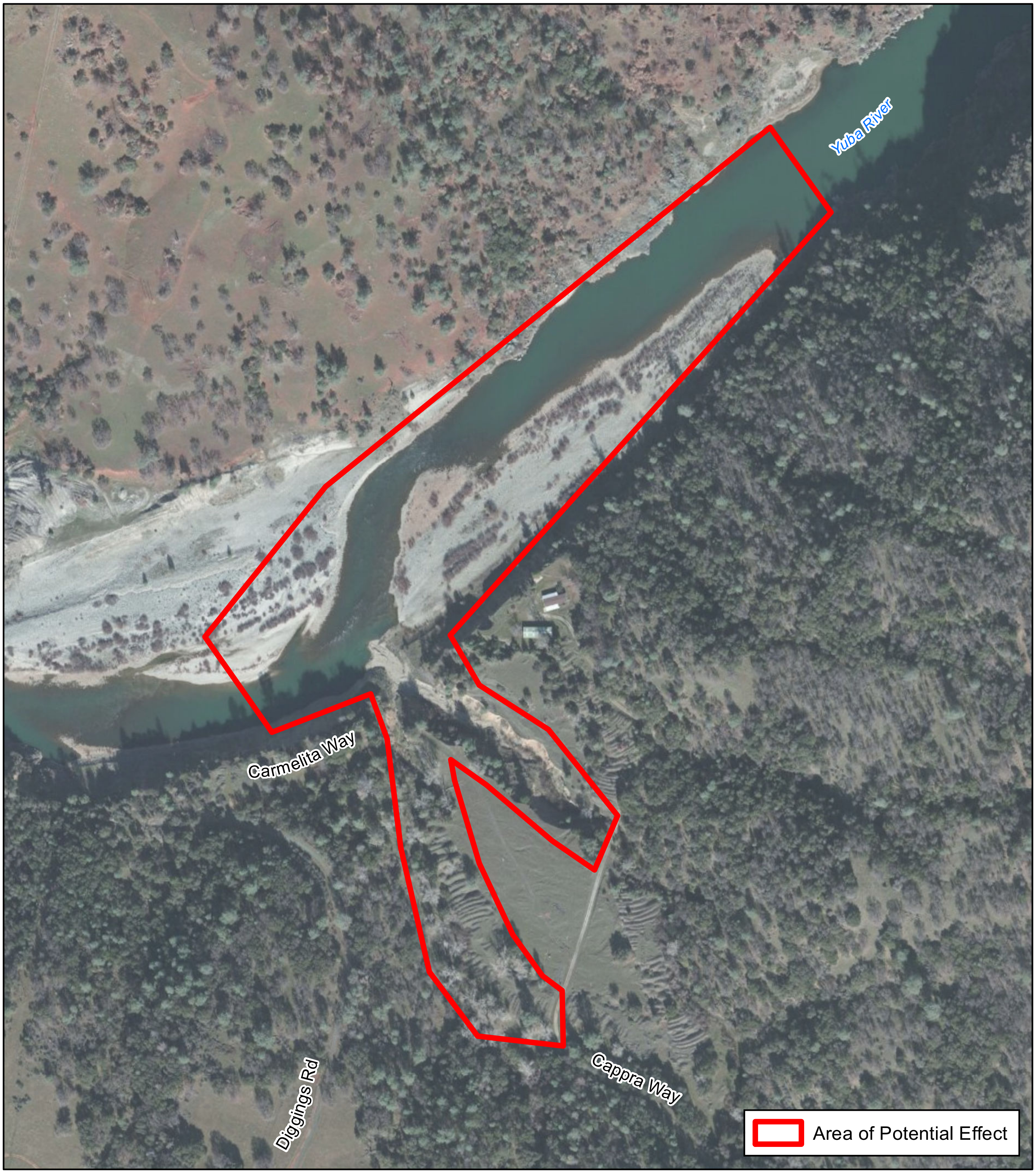
0 1,000 2,000 Feet
0 300 600 Meters

N

Scale 1:24,000
1 Inch = 2,000 Feet

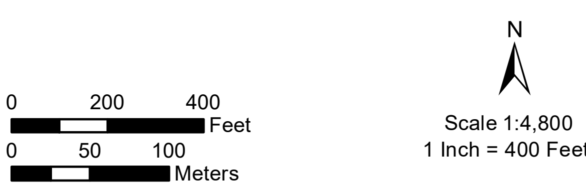
Figure 2. Project Location
Rose Bar Restoration
Yuba County, California

KLEINFELDER
GANDA



Created By: C BARKERSWITZER Document Path: C:\Users\Admin\OneDrive - GANDA\Desktop\Home_Projects\1488_Rose_Bar_Current\Rose_Bar_APE_Report.mxd

USGS 7.5' Quad: SMARTVILLE (1995)
Legal Description: T16N, R06E, SEC 22, 27, 28



Scale 1:4,800
1 Inch = 400 Feet

Figure 3. Area of Potential Effect
Rose Bar Restoration
Yuba County, California

KLEINFELDER
GANDA
GARCIA and ASSOCIATES

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City, State, ZIP+4 Marysville, CA 95091

PS Form 3800, August 2006 See Reverse for Instructions

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		$1.00
Total Postage & Fees	$	$7.40

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10/17/2020

Sent To Daniel Kethan, Nevada County Historical Society

Street, Apt. No.; or PO Box No. 161 Nevada City Hwy

City, State, ZIP+4 Nevada City, CA 95959

PS Form 3800, August 2006 See Reverse for Instructions

Appendix E

DEPARTMENT OF PARKS AND RECREATION (DPR) 523 FORMS

REDACTED

The following page(s) have been removed in the redacted version of the report due to containing confidential information.

Appendix F

SURVEY PHOTOGRAPHS


Overview of north end of survey area, facing N (9/29/2020). Photo #5.


Overview of south end of survey area (staging area), facing SE (7/12/2021). Photo #1.


Overview of Locus #1, historical camping area, facing S-SE. Photo #9.

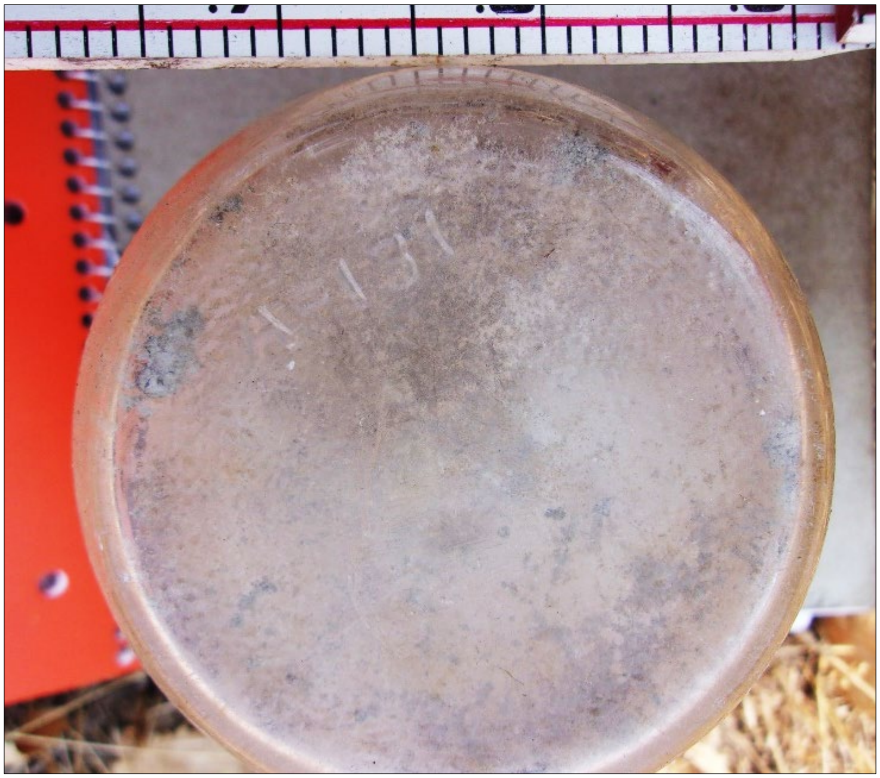

Overview of Concentration 1 in Locus 1, facing N (9/29/2020) Photo #13.

Overview of sanitary can with a design on the side, Plainview (9/29/2020). Photo #9

Overview of glass jar embossed on the base with a hatched oval in a circle and the number "21", Plainview (9/29/2020). Photo #12

Overview of crushed can with “Sparkling/ Hasta be Shasta” printed on the front, Plainview (9/29/2020). Photo #16


Overview of small stove made of cement and local medium sized cobbles, facing N (9/29/2020). Photo #17



Overview of A1, Plainview (9/29/2020). Photo #19

Overview of A2, Plainview (9/29/2020). Photo #20

Overview of A3, Plainview (9/29/2020). Photo #21

Overview of F2 looking up incised gully, facing SE (10/8/2020). Photo #2

Profile view of a segment of F2, facing (10/8/2020). Photo #9

Overview of F3, facing W-NW (10/8/2020). Photo #12

Overview of C2 in F3, facing S-SE (10/8/2020). Photo #18

Overview of C3, plan view (7/12/2021). Photo #3.

Overview of road bisecting the APE and the tailings, facing NE (7/12/2021). Photo #4.

Overview of tailings in the south end of the project area, facing N (7/12/2021). Photo #5.

Appendix F

Tribal Consultation Letters

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

December 6, 2022

Regulatory Division (SPK-2022-00548)

Honorable Chairperson Clyde Prout
Colfax-Todds Valley Consolidated Tribe
P.O. Box 4884
Auburn, CA 95604-4884
miwokmaidu@yahoo.com

Chairperson Prout:

The U.S. Army Corps of Engineers regulates certain activities in waters of the United States under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Before a permit can be issued, we must evaluate the effects of the activity on the environment and ensure it is not contrary to the public interest. As part of the evaluation process, we coordinate and consult with potentially affected Tribal Nations.

We are requesting your review and comments for the proposed *Upper Rose Bar Salmonid Spawning Habitat Restoration Project*. The permit applicant, Aaron Zettler-Mann from the California Department of Fish and Wildlife is seeking authorization from our office to discharge fill material below the ordinary high water mark on the Yuba River. The approximately 43-acre project site is located on the Yuba River, Latitude 39.21865°, Longitude -121.302733°, near the community of Smartsville, Yuba County, California (*Enclosures 1 and 2*).

Project Description

The proposed project is designed to restore and enhance ecosystem processes, with a primary focus on improving salmonid spawning habitat for Central Valley fall run and spring run Chinook Salmon (*Oncorhynchus tshawytscha*) and California Central Valley Steelhead (*O. mykiss*) in the Yuba River downstream of Englebright Dam. The project would increase the amount of spawning habitat by modifying hydraulic and substrate conditions. Backwater habitat would also be created to incorporate varying depths and low velocities to create juvenile salmonid rearing habitat. The project would be designed to mimic natural morphological features and reduce bank erosion. Instream work would involve placing an estimated 50,000 to 100,000 cubic yards of material in the river channel. An access road would also be constructed to facilitate access to the site. Material excavated during road construction would be used in the spawning riffle construction and future coarse sediment augmentation. The proposed project would require the operation of construction equipment (e.g., rubber-tired front-end loaders, excavators, articulated haulers, dozers, etc.) within the Project Area.

We are currently reviewing an application for this project. Based on the information the applicant provided, the project would result in permanent impacts to approximately 8.98 acre of the Yuba River to conduct the spawning habitat restoration; however, there would be no loss of waters of United States (*Enclosure 3*).

Cultural Resources Inventory

For the permit application, the applicant conducted a cultural resource inventory, which identified one cultural resource site located within the project area.

The previously unevaluated cultural resource (P-58-000692) includes a historic-period ditch; a depression with a small oven, non-native plants, and refuse; a raised flat area with a refuse concentration; a trail; berms; remnants of a concrete water conveyance system; tailings piles; and a concentration of miscellaneous metal. The tailings and hydraulic mining cuts likely date to post 1850s, while the water conveyance and camping area are likely associated with later mining from the twentieth century. The range of ages of the artifacts date from approximately 1939 to as recent as 1985.

Please find enclosed a copy of the applicant's document entitled, Cultural Resources Identification and Evaluation Report for the Rose Bar Restoration Project on the Yuba River, Yuba County, California dated April 2022 by Kleinfelder/Garcia and Associates. Because of confidentiality of the site locations, we ask that you do not disclose this information to the public in order to protect the sites.

We would appreciate your review and any comments you have on this project, including potential impacts to any unidentified Native American Sacred Sites, Traditional Cultural Properties, or other cultural resources that you may be aware of within the project area. If you have any concerns about this proposed project and/or potential impacts on cultural resources, please provide us with your feedback by **January 5, 2022**.

U.S. Army Corps of Engineers Tribal Policy Principles

The United States has a unique legal and political relationship with Indian tribal governments. To learn more about the Corps Tribal Policy Principles of Tribal Sovereignty, Trust Responsibility, Government-to-Government Relations, Pre-Decisional and Honest Consultation, Self-Reliance, Capacity Building and Growth and the protection of Natural and Cultural Resources, please reference the following link: http://www.usace.army.mil/Missions/CivilWorks/TribalNations.aspx.

We appreciate your input in this matter. Please refer to identification number SPK-2022-00548 in any correspondence concerning this project. If you have any questions, please contact Matthew Roberts at 310 Hemsted Drive, Suite 310, Redding, CA 96002-0935, by email at *Matthew.J.Roberts@usace.army.mil*, or telephone at (530) 223-9538. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx.*

Sincerely,

Matthew J. Roberts
Lead Project Manager
CA North Section

Enclosures
cc: (w/encls)
Pamela Cubbler, Colfax-Todds Valley Consolidated Tribe, pcubble@colfaxrancheria.com

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

December 6, 2022

Regulatory Division (SPK-2022-00548)

Cultural Director Grayson Coney
Tsi Akim Maidu
P.O. Box 510
Browns Valley, CA, 95918-0510
tsi-akim-maidu@att.net

Mr. Grayson Coney:

The U.S. Army Corps of Engineers regulates certain activities in waters of the United States under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Before a permit can be issued, we must evaluate the effects of the activity on the environment and ensure it is not contrary to the public interest. As part of the evaluation process, we coordinate and consult with potentially affected Tribal Nations.

We are requesting your review and comments for the proposed *Upper Rose Bar Salmonid Spawning Habitat Restoration Project*. The permit applicant, Aaron Zettler-Mann from the California Department of Fish and Wildlife is seeking authorization from our office to discharge fill material below the ordinary high water mark on the Yuba River. The approximately 43-acre project site is located on the Yuba River, Latitude 39.21865°, Longitude -121.302733°, near the community of Smartsville, Yuba County, California (*Enclosures 1 and 2*).

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We are currently reviewing an application for this project. Based on the information the applicant provided, the project would result in permanent impacts to approximately 8.98 acre of the Yuba River to conduct the spawning habitat restoration; however, there would be no loss of waters of United States (*Enclosure 3*).

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Sincerely,

Matthew J. Roberts
Lead Project Manager
CA North Section

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

December 6, 2022

Regulatory Division (SPK-2022-00548)

Honorable Chairperson Gene Whitehouse
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603-9403
bguth@auburnrancheria.com

Chairperson Whitehouse:

The U.S. Army Corps of Engineers regulates certain activities in waters of the United States under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Before a permit can be issued, we must evaluate the effects of the activity on the environment and ensure it is not contrary to the public interest. As part of the evaluation process, we coordinate and consult with potentially affected Tribal Nations.

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Sincerely,

Matthew J. Roberts
Lead Project Manager
CA North Section

Enclosures

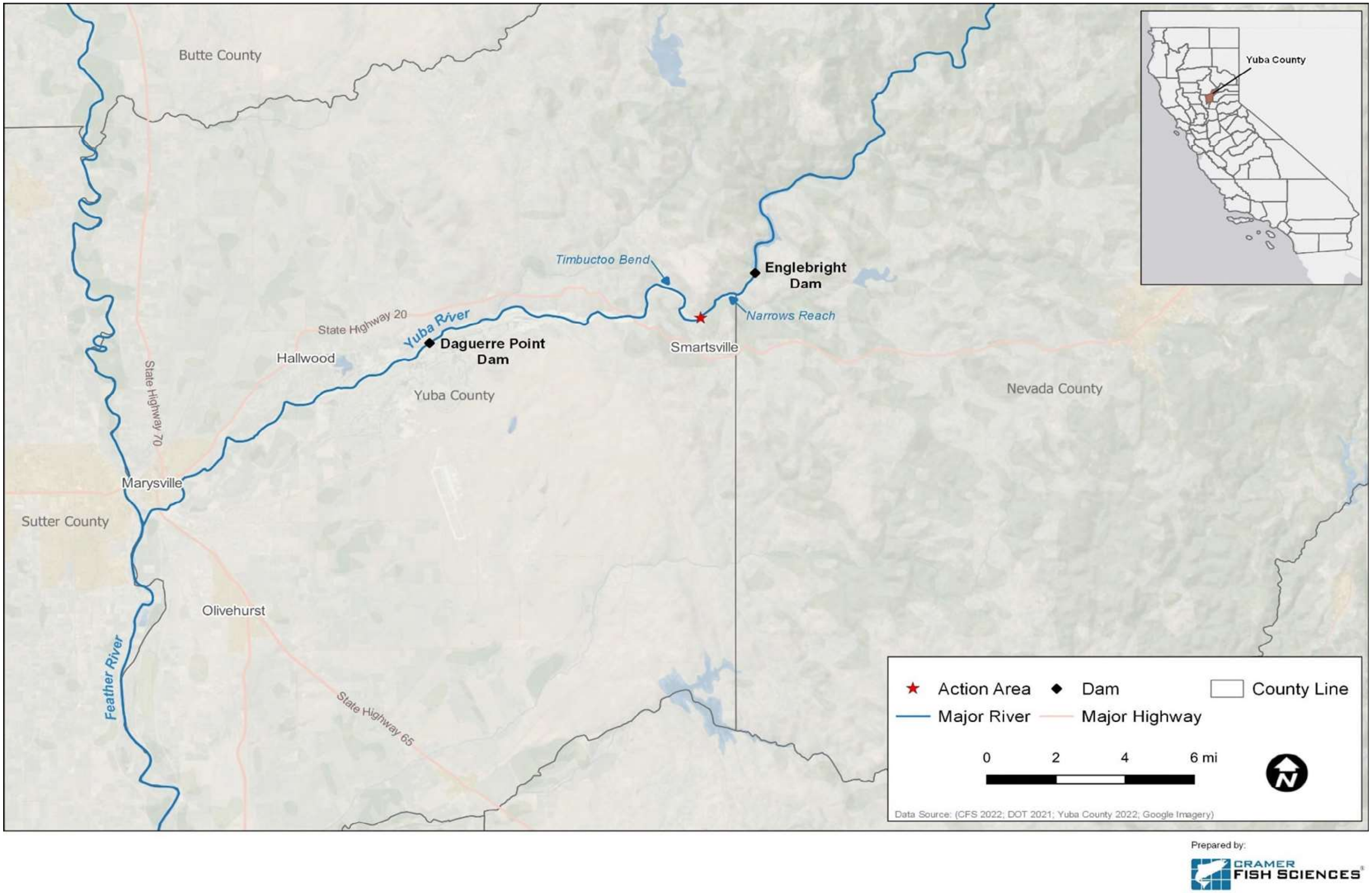
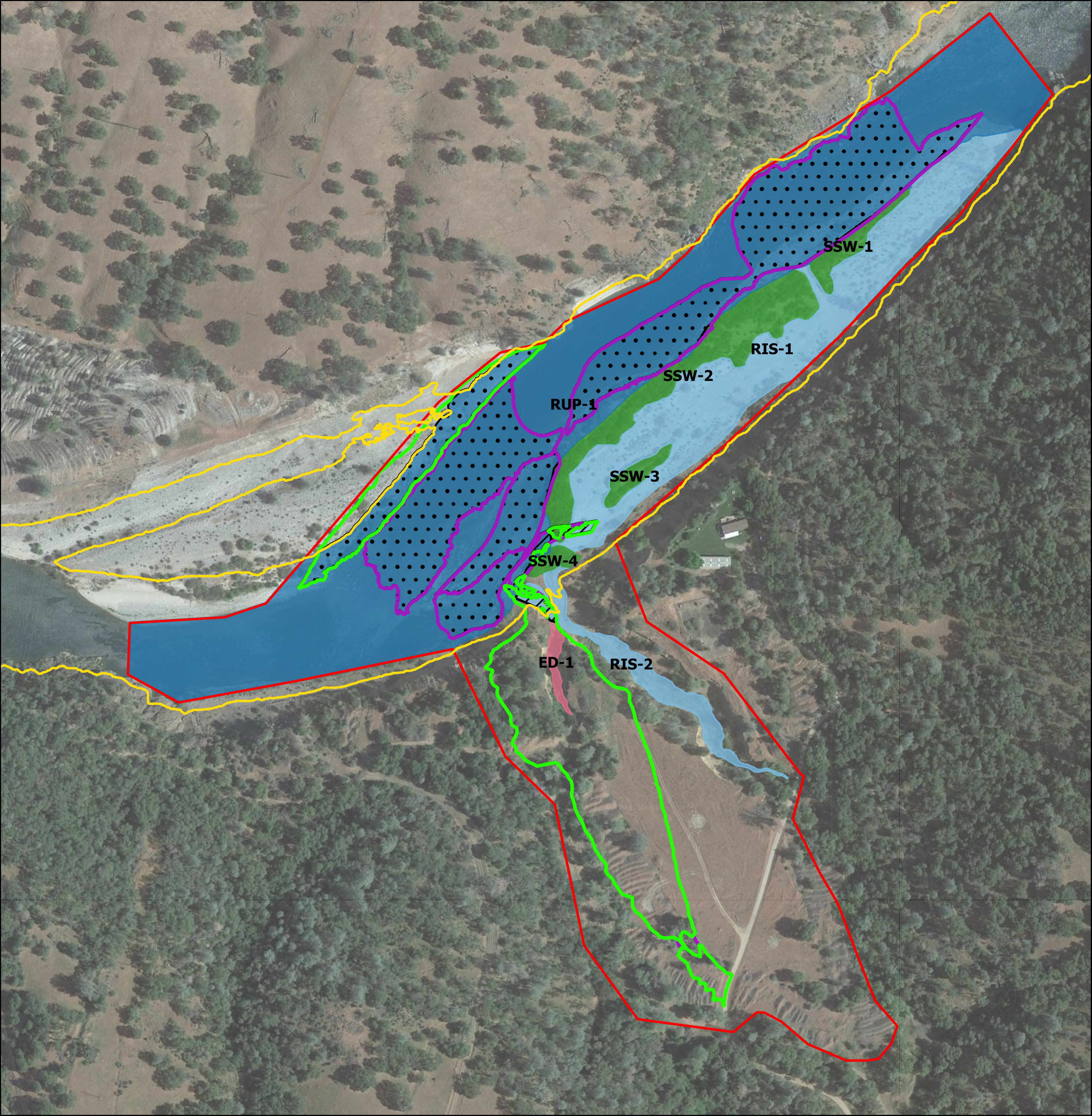


Figure 1. Upper Rose Bar Salmonid Spawning Habitat Restoration Project Location

ENC 1

Figure 2. Upper Rose Bar Salmonid Spawning Habitat Restoration Project Action Area



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An Employee Owned Consulting Company

Impacts to Wetlands and Other Waters of the U.S. for the Upper Rose Bar Salmonid Spawning Habitat Restoration Project

Legend

- Survey Area Boundary (43 acres)
- OHWM

Aquatic Resources (25.52 acres)

- Ephemeral Drainage (0.13 acres)
- Riverine - Intermittent Streambed (5.27 acres)
- Riverine - Upper Perennial (17.80 acres)
- Scrub-Shrub Wetland (2.32 acres)

Restoration Actions

- Cut (5.99 acres)
- Fill (7.93 acres)

Impacts

- Permanent (0.29 acres)
- Temporary (8.69 acres)

Coordinate System: WGS 84 Pseudo-Mercator
Projection: Lambert Conformal Conic
Datum: World Geodetic Survey 1984
Vertical Datum: NAVD88, U.S. Feet
1 inch = 450 feet
Imagery: Google 2022

0 125 250 375 500 ft

Created 31 October 2022

Made in accordance with the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program by:
Philip Colombano, Biologist
Cramer Fish Sciences

ENC 3