Big River Salmonid Rearing Habitat and Large Wood Enhancement Project Designs 2020

Introduction:

Trout Unlimited, Inc. (Permittee) will implement the Big River Salmonid Rearing Habitat and Large Wood Enhancement Design Project. The goal of the project is to restore salmonid habitat complexity in a three-mile reach of mainstem Big River by installing moderate to large-scale engineered log jam structures (ELJ). These structures will be used to create habitat diversity and flow complexity for Coho Salmon, steelhead trout, and Chinook Salmon to improve both summer and winter rearing conditions.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Vol. I, Part VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objectives:

The project objective is to design ELJs in a three-mile reach of Big River that, once implemented, will develop a complex channel bed with deep pools, physical shelter, promote diversity in flow velocity structure, and locally raise the water surface elevation to increase floodplain connectivity. As feasible, the proposed ELJs will be used to augment tributary off-channel habitat in two tributaries at their confluence with Big River.

Project Description:

Location:

The project is located along a section of Big River, located in the county of Mendocino, State of California. The project starts approximately 16.5-miles upstream from the Pacific Ocean and extends upstream three miles. The center point of the project is 39.3236º north latitude, -123.6396º west longitude and is located on the Mathison Peak 7.5 Minute U.S. Geological Survey (USGS) Quadrangle map.

Project Set Up:

The Permittee will provide all technical and administrative services associated with performing and completing the proposed work, including managing the grant agreement, delivering the final landowner access agreement, administering subcontracts, invoicing and payments, drafting and finalizing progress and final reports, and data management. Permittee will coordinate all communication with and between the landowner, stakeholders, and regulatory agencies, as well as provide guidance on fisheries biology and large wood loading objectives.

Subcontractor Mike Love and Associates (MLA) will lead the hydrologic, hydraulic, and fluvial geomorphic analysis, and develop the engineering plans and basis of design report. MLA will participate in field activities, and lead the risk assessment and development of designs. MLA will perform the geomorphic assessment, designing the ELJs, developing the hydraulic modeling, and conducting the force-balance calculations, prepare the project basemap, lead the preparation of design drawings for each structure, conduct surveys, drafting, processing of collected field data, performing hydrologic and force-balance calculations, and prepare figures.

Subcontractor Pacific Watershed Associates (PWA) will lead the engineering geologic investigations in support of engineering designs which aids in the assessment of geological constraints and risks to, and resulting from, implementation of the project. PWA staff will support Permittee and MLA primarily with geological site characterizations and wetlands delineations. The engineering geologic investigation includes characterizing the geology and adjacent hillslope and channel geomorphology, shallow stratigraphic conditions and grain size distributions, and physical soil and earth materials characteristics. Characterization of channel geomorphology and identification of channel materials properties will aid MLA in understanding how the proposed ELJ structures will affect flow velocities, water surface elevations, shear stress, and potential bed deformation along the project reach.

Materials:

MLA will lease use of a Trimble robotic total station for conducting a topographic survey of the project area. Materials necessary for conducting the survey include stakes, rebar, flagging, and paint for establishing and marking permanent survey monuments. PWA will procure the LSAA permit and a hollow stem auger of for subsurface geologic investigations (drilling) as well as materials associated with travel (e.g. lodging, per diem, mileage), field supplies, reporting supplies, and soil lab testing fees. Field supplies will include maps and plan prints, flagging, staking, paint, field notebooks, and photographic supplies.

Tasks:

Task 1. Geotechnical Investigation:
PWA will subcontract an environmental drilling company to utilize a track mounted drill rig to conduct subsurface investigations at Big River channel locations determined to be feasible preferred locations for ELJ design by PWA and MLA. Subsurface investigations with a hollow stem auger will be performed at up to 10 locations within the Big River channel to investigate subsurface conditions and stratigraphy, identify potential limitations to pile placement depth, and collect samples and site data to inform the design process. In-situ standard penetration testing will be performed to measure penetration resistance of

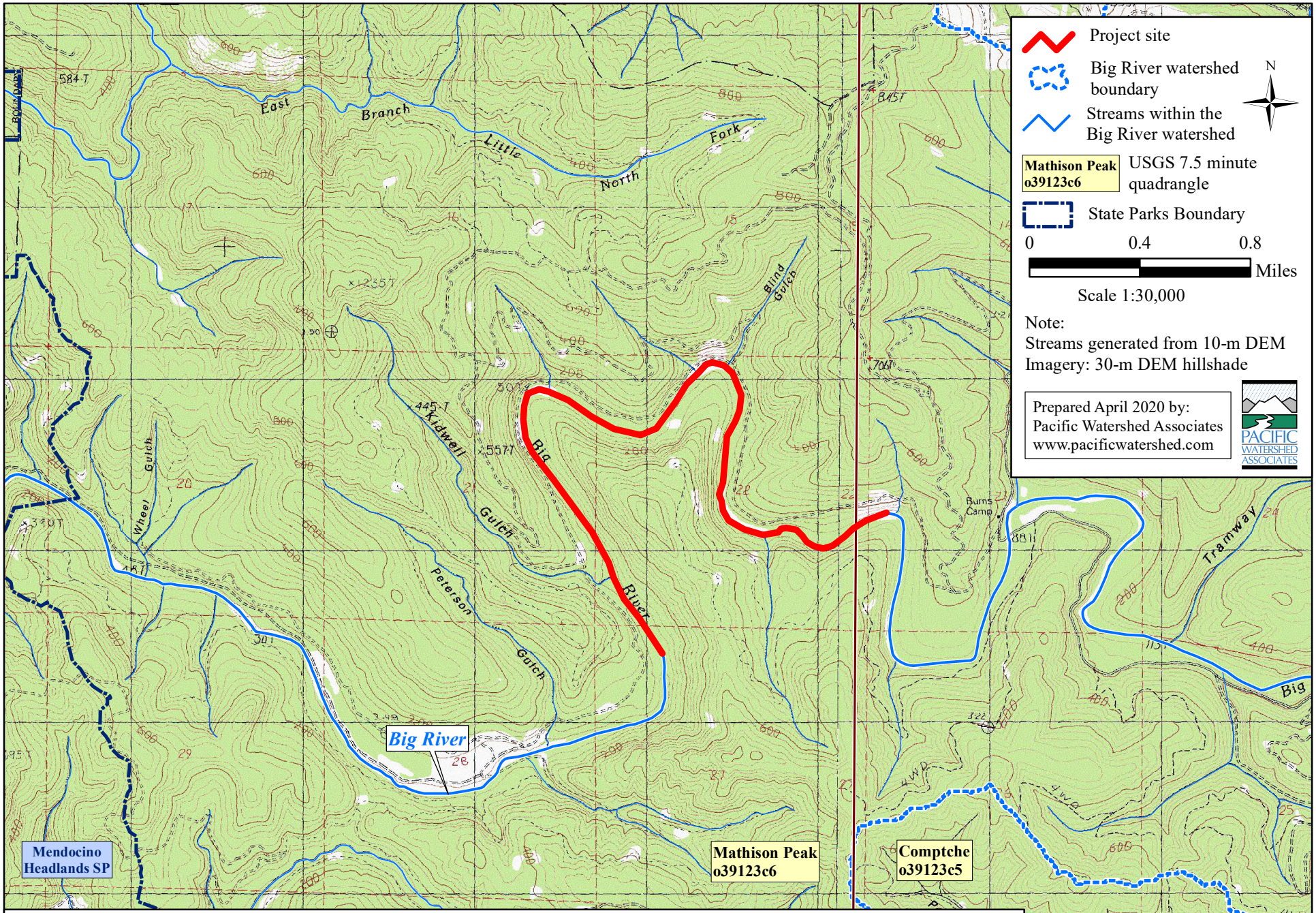
channel materials and correlation with materials engineering properties. PWA will provide exclusion and/or relocation of fish and amphibians as necessary to permit the drill rig to make limited crossings of shallow water to access investigation areas. PWA staff will employ turbidity, water quality and erosion control measures as necessary to protect aquatic habitat and water quality during subsurface investigations. If desirable ELJ locations are identified where conditions are found to not permit suitable drill rig access to channel investigation sites, PWA may subcontract a backhoe, small excavator, or portable drill rig to conduct alternate subsurface investigations. PWA will use a hand auger or heavy equipment in the investigation and sampling of streambank materials to characterize and evaluate engineering properties of bed and bank materials for application in bank-supported design components.

Deliverables:

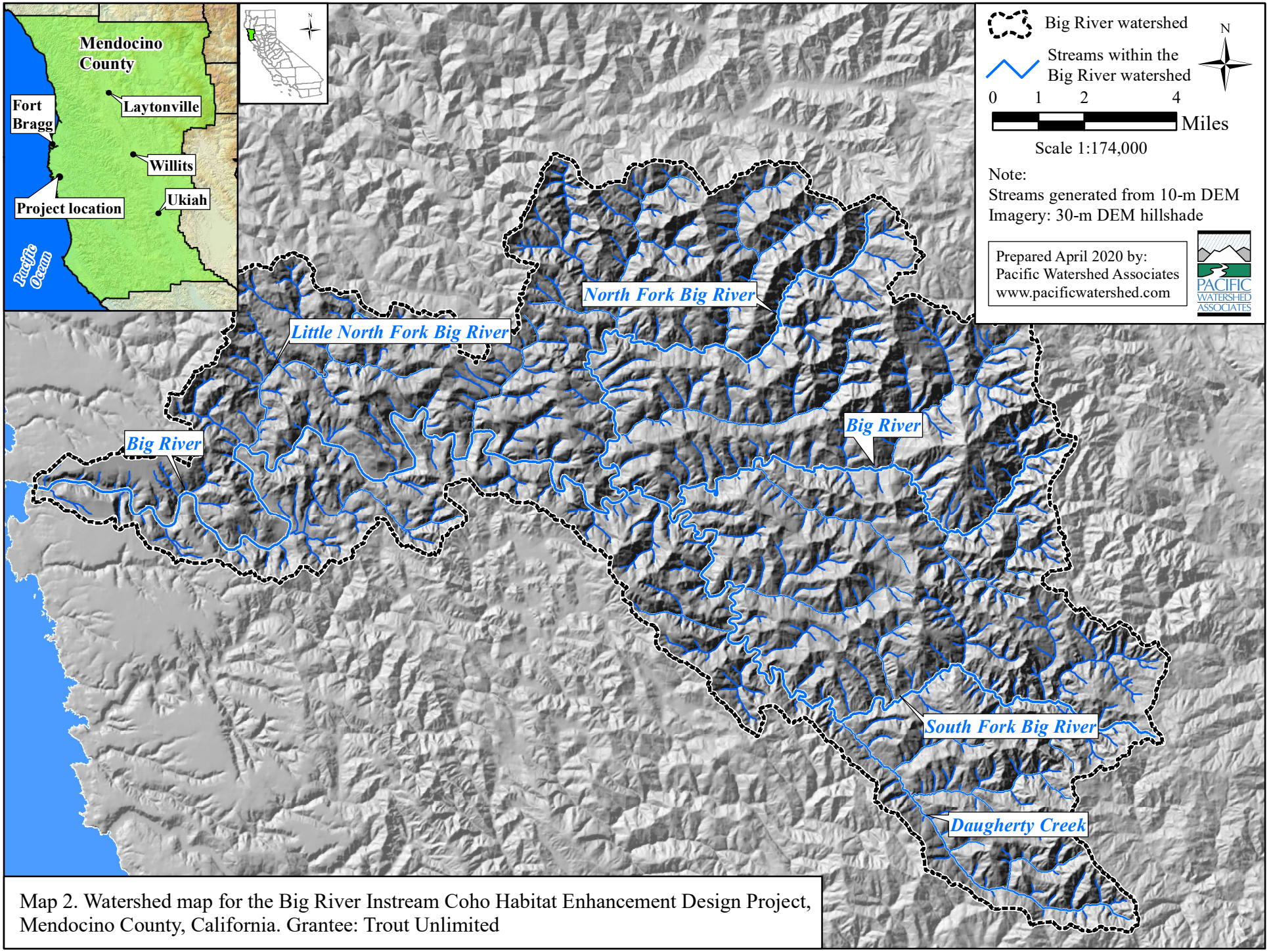
Engineering Geologic Technical Memorandum. The background studies, site geologic characterization, subsurface investigation, and soil and substrate conditions analysis will all be summarized into a brief engineering geologic technical memorandum (TM) that includes the methods, findings, constraints and recommendations for design and construction. The TM will be used by the project engineers to develop technical specifications and identify potential project constraints for the proposed large wood habitat enhancement project. A draft report will be submitted to the stakeholders and finalized upon addressing written comments received by the group.

Timelines:

July 29, 2022 through October 28, 2022, PWA will conduct surface investigations.



Map 1. Project Location Topographic Map for the Big River Instream Coho Habitat Enhancement Design Project, Mendocino County, California. Mathison Peak USGS 7.5' quadrangles. Grantee: Trout Unlimited



Map 2. Watershed map for the Big River Instream Coho Habitat Enhancement Design Project, Mendocino County, California. Grantee: Trout Unlimited

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Mathison Peak (3912336) OR Elk (3912326) OR Albion (3912327) OR Mendocino (3912337) OR Fort Bragg (3912347) OR Noyo Hill (3912346) OR Northspur (3912345) OR Comptche (3912335) OR Navarro (3912325))

Possible species within the Mathison Peak and surrounding quads for 1723369 - Big River Salmonid Rearing Habitat and Large Wood Enhancement Project Designs, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos nummularia ssp. mendocinoensis pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Atractelmis wawona Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
Blennosperma nanum var. robustum Point Reyes blennosperma	PDAST1A022	None	Rare	G4T2	S2	1B.2
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3G4	S1	
Calamagrostis crassiglumis Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
Calileptoneta wapiti Mendocino leptonetid spider	ILARAU6040	None	None	G1	S1	
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	PDCON040D2	None	None	G4T2T3	S2S3	1B.2
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Carex californica California sedge	PMCYP032D0	None	None	G5	S2	2B.2
Carex lenticularis var. limnophila lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Carex livida livid sedge	PMCYP037L0	None	None	G5	SH	2A
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2
Castilleja ambigua var. humboldtiensis Humboldt Bay owl's-clover	PDSCR0D402	None	None	G4T2	S2	1B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chorizanthe howellii Howell's spineflower	PDPGN040C0	Endangered	Threatened	G1	S1	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Cornus canadensis bunchberry	PDCOR01040	None	None	G5	S2	2B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Cuscuta pacifica var. papillata Mendocino dodder	PDCUS011A2	None	None	G5T1	S1	1B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erigeron supplex supple daisy	PDAST3M3Z0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Fratercula cirrhata tufted puffin	ABNNN12010	None	None	G5	S1S2	SSC
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Grand Fir Forest Grand Fir Forest	CTT82120CA	None	None	G1	S1.1	
Helminthoglypta arrosa pomoensis Pomo bronze shoulderband	IMGASC2033	None	None	G2G3T1	S1	
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Juncus supiniformis hair-leaved rush	PMJUN012R0	None	None	G5	S1	2B.2
Kopsiopsis hookeri small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3
Lasthenia californica ssp. bakeri Baker's goldfields	PDAST5L0C4	None	None	G3T1	S1	1B.2
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
Lavinia symmetricus navarroensis Navarro roach	AFCJB19023	None	None	G4T1T2	S2S3	SSC
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Mendocino Pygmy Cypress Forest Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	
Microseris borealis northern microseris	PDAST6E030	None	None	G5	S1	2B.1
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Noyo intersessa Ten Mile shoulderband	IMGASC5070	None	None	G2	S2	
Oceanodroma homochroa ashy storm-petrel	ABNDC04030	None	None	G2	S2	SSC
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Packera bolanderi var. bolanderi seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Phacelia insularis var. continentis North Coast phacelia	PDHYD0C2B1	None	None	G2T2	S2	1B.2
Pinus contorta ssp. bolanderi Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Plebejus idas lotis lotis blue butterfly	IILEPG5013	Endangered	None	G5TH	SH	
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Puccinellia pumila dwarf alkali grass	PMPOA531L0	None	None	G4?	SH	2B.2
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Sanguisorba officinalis great burnet	PDROS1L060	None	None	G5?	S2	2B.2
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
Sidalcea malviflora ssp. purpurea purple-stemmed checkerbloom	PDMAL110FL	None	None	G5T1	S1	1B.2
Speyeria zerene behrensii Behren's silverspot butterfly	IILEPJ6088	Endangered	None	G5T1	S1	
Sphagnum Bog Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viola palustris alpine marsh violet	PDVIO041G0	None	None	G5	S1S2	2B.2

Record Count: 96

Bear Creek Sediment Reduction and Salmonid Recovery Project 2020

Introduction:

The Trout Unlimited, Inc. (TU) will decommission 3.5-miles of streamside riparian road to prevent potential future delivery of 6,555 cubic yards of sediment to Bear Creek. The project will also lightly upgrade 1.53-miles of road including five stream crossings to allow access to the project area. Sixteen acres of upslope area will be treated including eighteen (18) stream crossings and twelve (12) potential fill failures.

This project is necessary because excessive sediment inputs from legacy timber practices continue to adversely impact the channel geomorphology and fish habitat of the Bear Creek watershed, in the form of intermittent channel-stored sediments within the upper main stem and its tributaries, and as high turbidity levels during wet weather conditions (NMFS, 2008; PWA 2018). Decommissioning the highest threat roads in Bear Creek, would achieve a 35% reduction in overall road density, which exceeds the numeric target of 10% reduction outlined in Action Step UC-NCSW-23.2.3.1 from the Coastal Multispecies Plan and Recovery Action 23.2.3.1 from the CCC Coho Recovery plan.

The Permitee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* Volume II, Part X CDFG (2002) [https://www.wildlife.ca.gov/Grants/FRGP/Guidance].

Objective(s):

This project will result in the permanent removal of 3.5-miles of streamside riparian road which represents almost 100% of the streamside road along Bear Creek. Crews will also lightly upgrade 1.53-miles of midslope truck road to provide the only access to the project area. The project will prevent 6,555 cubic yards of future anthropogenic sediment from entering a focal species stream.

Project Description:

Location:

The Bear Creek Watershed is located west of Leggett, California in the Usal Creek Watershed intersects Usal Creek approximately 3.5-miles upstream of its confluence with the Pacific Ocean. Streamside road removal will occur on the mainstem and the largest tributaries for approximately 3.5-miles. The project is located in the Hales Grove and Piercy United States Geologic Survey Quadrangle maps.Project coordinates are 39.8757º north latitude, -123.8377º west longitude at the center point of the project.

Project Set Up:

TU Project Management:

- The Trout Unlimited Project Manager will provide all grant and contract oversight and administration tasks including but not limited to obtaining permits, securing contracts (e.g. grantors, subcontractors, landowner, etc.), scheduling, implementation oversight, invoicing, reporting, and agency and landowner communications. All reporting and billing will be pursuant to the grant and regulatory guidelines. Upon final execution of the Grant and prior to receiving a Final Notice to Proceed, deliver the landowner access agreement, subcontracts, and assure all permits are finalized (if required). This task will occur throughout the life of the project
- The TU Project Manager will assist the TU Project Coordinator with processing invoices, financial tracking, and reporting.
- TU Project Coordinators, will assist in processing general grant management and reporting.
- TU's California Director will be the authorized agent to sign the agreement.
- Pacific Watershed Associates (construction manager) will complete implementation of the road decommissioning.
- PWA Engineering Geologist will provide project and construction oversight and QA/QC of project products.
- PWA Associate Scientist (Project Manager) will manage project layout, construction oversight, monitoring, and reporting tasks.
- PWA Natural Resource Specialists (Project Biologists) will assist with biological resource identification and mitigation (i.e. amphibians, birds, fish), conduct electrofishing, and conduct wetland identification, protection and overall avoidance measures as needed.
- PWA Senior. Scientist (paleontologist) will provide paleontology surveys for CEQA.
- PWA Staff Scientists will conduct surveys, be on-site to layout the proposed heavy equipment construction treatments in the project area, construction oversight, pre-, during-, and post-construction monitoring (as required by the FLAR focus), and data entry.
- PWA GIS staff will provide field layout maps, digitize layout and as-built project data, and develop report maps.
- PWA clerical staff will track and monitor hours and create invoices during the project.
- PWA Principal Geologist will supervise all PWA work elements. The will be done by the
- PWA Engineering Geologist and Associate Scientist will work on final reporting of the project with assistance and oversight from the Trout Unlimited Project Manager.
- Wylatti Resource Management will be the heavy equipment contractor for the project and will be providing all heavy equipment for the project

including Excavator, Dozer, Water Truck, Dump Truck, Low Boy, Pilot Car, Labor for erosion control, and truck and trailer.
- Woodbenders Revegetation will conduct revegetation.
- The Redwood Forest Foundation, Inc (RFFI) Botanist will lead a botanical resource assessment of the project area.
- The William Rich and Associates (WRA) Principal Investigator and Research Associate will conduct the required archaeological surveys to meet the requirements of CEQA.

Materials:

- Approximately 1267 trees (provided by RFFI as cost share) will be planted by Woodbenders Revegetation.
- Rip-Rap sized material will be required to construct armored fill stream crossings and slope protection on upgraded stream crossings on the access road.
- Approximately 218 bales of straw mulch and approximately 150 pounds of native seed will be used to re-plant bare earth areas and reduce surface erosion. Debris/Trash Pump used during construction to pump clean stream flow around the construction features and manage turbidity.
- Pressure washer to be used to decontaminate heavy equipment.
- 500ft. of 6ft. flex pipe to be used for stream dewatering.
- 240ft of 24” diameter culvert to upgrade one stream crossings on the access road and to construct Spittler crossings where the road network crosses flowing streams site.
- Electrofishing gear to conduct fish relocations including a 3` centrifugal pump, exclusion fencing and water quality testing equipment.

Tasks:

Task 1 - Grant Administration and Project Management:
Trout Unlimited personnel will provide all contracting oversight and administration as pursuant to grant and regulatory guidelines. This includes but is not limited to obtaining permits, securing contracts, scheduling, implementation oversight, invoicing, reporting, and agency and landowner communications. Upon Final execution of the Grant and prior to receiving a Final Notice to Proceed, TU personnel will deliver the landowner access agreements, executed subcontracts, and assure all permits are secured. Additionally, the TU Project Coordinator will be available to assist with invoicing and financial tracking. This task will occur throughout the life of the project.

Task 2 - Environmental Compliance, Pre-project layout, and Equipment Mobilization:
PWA will coordinate with RFFI and WRA to conduct the appropriate surveys for listed species and archeological resources. RFFI and WRA staff will complete necessary cultural resource and botanical surveys of the project area. Prior to implementation all required botanical, biotic, cultural, and paleontological survey information will be provided to TU and CDFW. TU will be responsible for securing the CDFW 1600 LSAA from the Grant Manager prior to requesting the Notice to Proceed with project implementation. Interim CEQA reports and biotic survey results will be provided to the CDFW Grant Manager with the LSAA application as required. No equipment work shall occur in advance of the final NTP. Exclusionary fencing for salmonids and other aquatic species will be installed at the confluence of flowing tributaries to prevent upstream migration into the construction areas as deemed necessary by the grant manager, PWA NR Specialist, and the PWA Associate Scientist. This component of the project may require fish and amphibian exclusion and relocation. This task will be conducted by the PWA NR Specialist. PWA will flag heavy equipment access routes and construction boundaries (layout) as well as spoils disposal sites, equipment exclusion areas for biologic, wetland, or cultural resource protection, and LWD staging areas. They will also document the existing conditions on a subset of the stream crossings and setup photo point monitoring stations at the construction locations for final reporting. Pre-construction monitoring will be performed by PWA in a manner consistent with CDFW guidelines and as required by the FLAR focus.

Road opening, feature treatment, and erosion control - PWA will work with Wylatti heavy equipment operators to reopen the proposed road sites for equipment access and decommissioning treatments. All treatment prescriptions proposed in the project follow guidelines in the "Handbook for Forest, Ranch, and Rural Roads" (Weaver et al., 2015), and the "California Salmonid Stream Habitat Restoration Manual, Chapters 9 and 10" (CDFW, 1998; Weaver et al., 2006). Additionally, all equipment, vehicles and materials used to implement this project will be cleaned and treated in accordance with the TU Aquatic Invasive Species Decontamination Plan included in the supplemental documents with this proposal. Personal field gear and heavy equipment working in or near a stream will be decontaminated as well. Several methods will be employed to avoid the spread of invasive species during the implementation of the project. During this phase of the project, a qualified Biologist from PWA (NR Specialist), in coordination with the CDFW Project Manager, will install exclusionary fencing and remove any aquatic species form wetted channels where prudent. We anticipate this occurring on 1 class one stream crossing and possibly 3 other class II streams which may or may not exhibit surface flow during the construction window. Water quality parameters will be measured during this component of the project, if prudent, to assure protection of downstream resources.

Task 3 - Project Construction:
This task will be completed by Wylatti Resource Management with direct oversight from PWA staff. Low bed trucks will be used to move heavy equipment in and out of the project area at the beginning and end of the work season, these will require two pilot cars to move through the road system. An excavator and bulldozer will be used to reopen the road proposed for decommissioning by removing the vegetation and developing temporary stream crossings if prudent. A gasoline powered water pump will be used to protect water quality during installation of temporary crossings; these will be managed by a laborer. The excavator, bulldozer and dump truck will be used to remove the anthropogenic road fill material from the proposed stream crossing decommissioning features and other site-specific features specified for treatment. Similarly, they will be used to treat and restore all road surface drainage as they work their way out from the end of the road. A gas-powered water pump will be used to divert flow and protect water quality during decommissioning of live stream crossings; these will be managed by a laborer. Concurrently working with the excavator and bulldozer, the dump truck will end haul spoil from decommission areas to designated spoil disposal sites. The water truck will be used for achieving soil compaction and dust abatement to protect water quality and riparian vegetation, and laborers will be used to spread seed and straw, and plant trees and shrubs at completed construction sites. In accordance with the invasive species protocol included in this proposal, all heavy equipment will be cleaned before and after entering/leaving the work area.

Task 4 - Post-Implementation Surveys and Revegetation:
Post-construction monitoring, including photographic monitoring, and stream crossing profiles, will be performed by PWA consistent with the CDFW guidelines and as required by the FLAR focus. PWA will conduct post-decommissioning surveys on a subset of the stream crossings and reoccupy photopoints to document pre- and post-conditions at the feature locations. Where tree planting is required for erosion control, Woodbenders staff will complete planting activities during the winter intermediately following construction as soon as conditions allow.

Task 5 – Reporting:
TU and PWA will develop project reports (annual and a final project report), based on CDFW requirements, that documents work completed and the total costs to implement the project. Progress reports will be supplied to the Grant Manager for review in approval with reimbursement requests (no more frequently than monthly), Annual Reports will be submitted annually by December 1, and a Final Project Report will be prepared and submitted prior to grant close-out (including Final Project Budget and Final Invoice). Annual and final reports will include summaries of the following information as required: (1) general grant information, (2)location of work,(3) project access, (4)participating landowners name and address, (5) a description and analysis of the restoration and planning

person hours expended,(6) a quantified description of the results of the project, including as-built site information, (7) dates of work and the number of person hours expended, (8) labeled before-and-after photos of constructed sites, (10) GIS generated maps and shapefiles of the project area, and (11)monitoring checklists, databases, spreadsheets and any other data products produced during the grant term.

Deliverables:

Task 1 - Grant Administration and Project Management:
Project deliverables will be provided to the CDFW Grant Manager and includes the information listed below as well as any other documents pursuant to Grant requirements during the life of the project: Final Landowner Access Agreements; Notification and payment of LSAA/1600 Agreement Application; Progress Reports submitted with invoices, Annual Reports, and a Final Report, including Final Project Budget. The Final Report will include required information for the HU Project Type, such as as-built road log, actual performance measure by site, and project monitoring data (i.e. pre-/post-project photographs, pre-/post-project cross sectional profiles).

Task 2 - Environmental Compliance, Pre-project layout, and Equipment:
Final Site layout: Interim cultural resource, botanical, biological, wetland, and paleontological reports (completed prior to receiving Notice to Proceed); Fish relocation and water quality monitoring information (as required); CDFW LSAA Agreement; Final Notice to Proceed with project construction.

Task 3 - Project Construction:
Treatment of 32 specific sediment source features and permanent decommissioning 3.5 mi of abandoned road, and upgrade 5 stream crossings on the only available access road. The project will result in the total treatment of 5.3-miles of road.

Task 4 - Post-Implementation Surveys and Revegetation:
Actual performance measures by site, as-built road log, before and after photos, stream crossing profiles.

Task 5 – Reporting:
Progress Reports (pdf format); Annual Reports (pdf format); and Final Grant Report (cd and hard copy), including all pre-and post-project data produced as a part of the project; Final Invoice and Final Budget.

Timelines:

Task 1 - Grant Administration and Project Management. March 1, 2021 to February 28, 2023.

Task 2 - Environmental Compliance, Pre-project layout, and Equipment. April 15, 2021 to August 1, 2022.

Task 3 - Project Construction. June 30, 2021 to October 31, 2022**.**

Task 4 - Post-Implementation Surveys and Revegetation. July 30, 2021 to February 20, 2023.

Task 5 - Reporting. March 1, 2021 to February 28, 2023.

Additional Requirements:

The Permitee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the California Department of Fish & Wildlife *Aquatic Invasive Species Decontamination Protocol.*

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

The Permitee shall notify the Grantor Project Manager a minimum of five working days before the project site is de-watered and the stream flow diverted. The notification will provide a reasonable time for Grantor personnel to oversee the implementation of the water diversion plan and the safe removal and relocation

of salmonids and other fish life from the project area. If the project requires dewatering of the site, and the relocation of salmonids, the Permitee will implement the following measures to minimize harm and mortality to listed salmonids:

a. Fish dewatering and relocation activities shall only occur between June 15 and October 31 of each year.
b. Additional measures to minimize injury and mortality of salmonids during fish relocation and dewatering activities shall be implemented as described in Part IX, pages 52 and 53 of the *California Salmonid Stream Habitat Restoration Manual*.
c. The Permitee shall minimize the amount of wetted stream channel dewatered at each individual project site to the fullest extent possible as approved by the CDFW Grant Manager and pursuant to conditions in the USACE Regional General Permit and NMFS Biological Opinion.
d. All electrofishing shall be performed by a qualified fisheries biologist and conducted according to the National Marine Fisheries Service, Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
e. USFWS Approved fisheries biologists will provide fish relocation data via the Permitee to the CDFW Grant Manager on a form provided by CDFW.

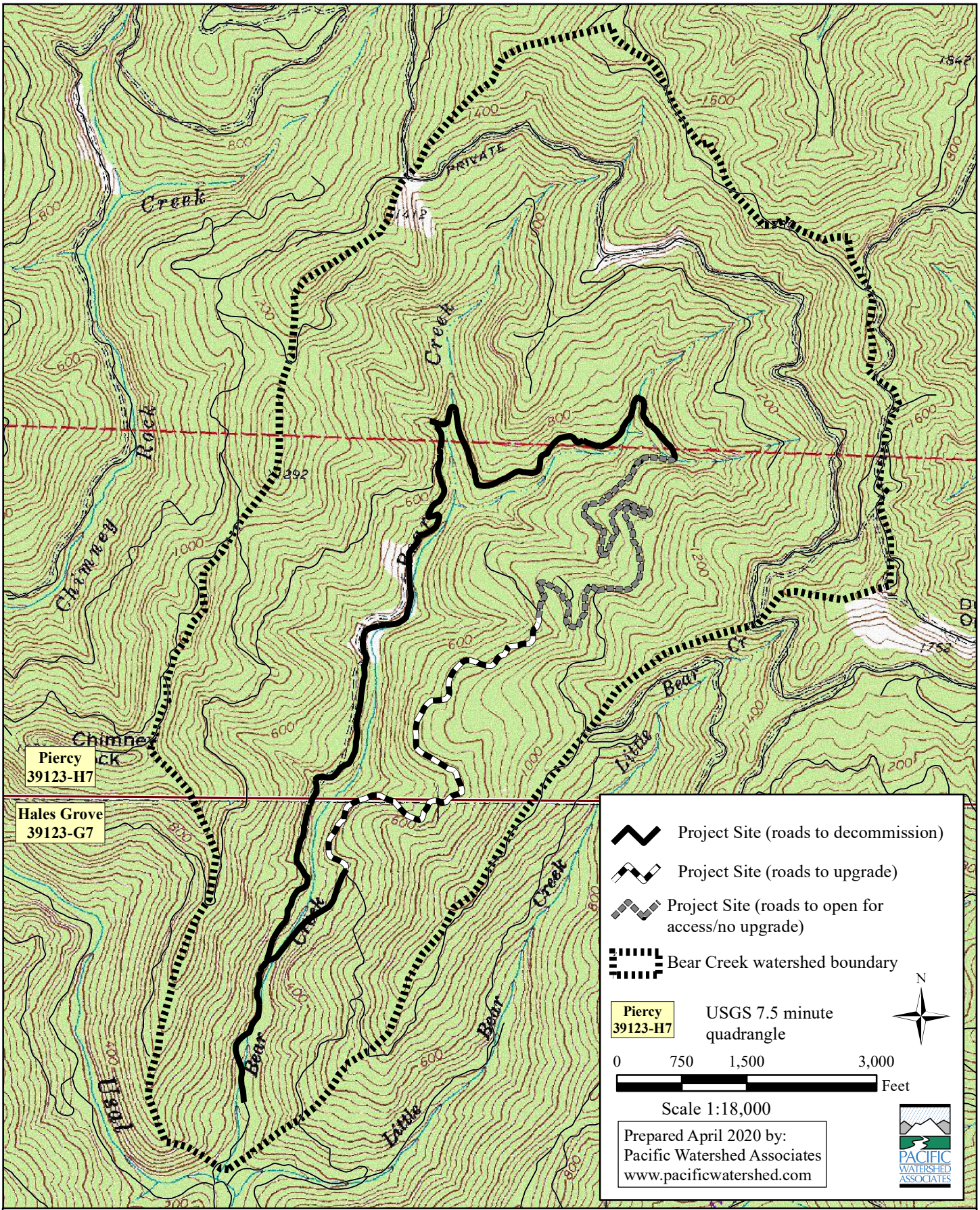
All road decommissioning will be done in accordance with techniques described in the Handbook for Forest and Ranch Roads, (PWA, 1994c.) and the *California Salmonid Stream Habitat Restoration Manual*, Volume II, Part X. All road upgrade and decommissioning sites and techniques shall be approved by the Grantor Project Manager before any equipment work takes place.

All crossings treated in fish bearing reaches of streams will follow the National Marine Fisheries Service (NMFS 2001) Guidelines for Salmonid Passage at Stream Crossings and the criteria for adult and juvenile salmonid fish passage as described in Volume II, Part IX of the *California Salmonid Stream Habitat Restoration Manual.*

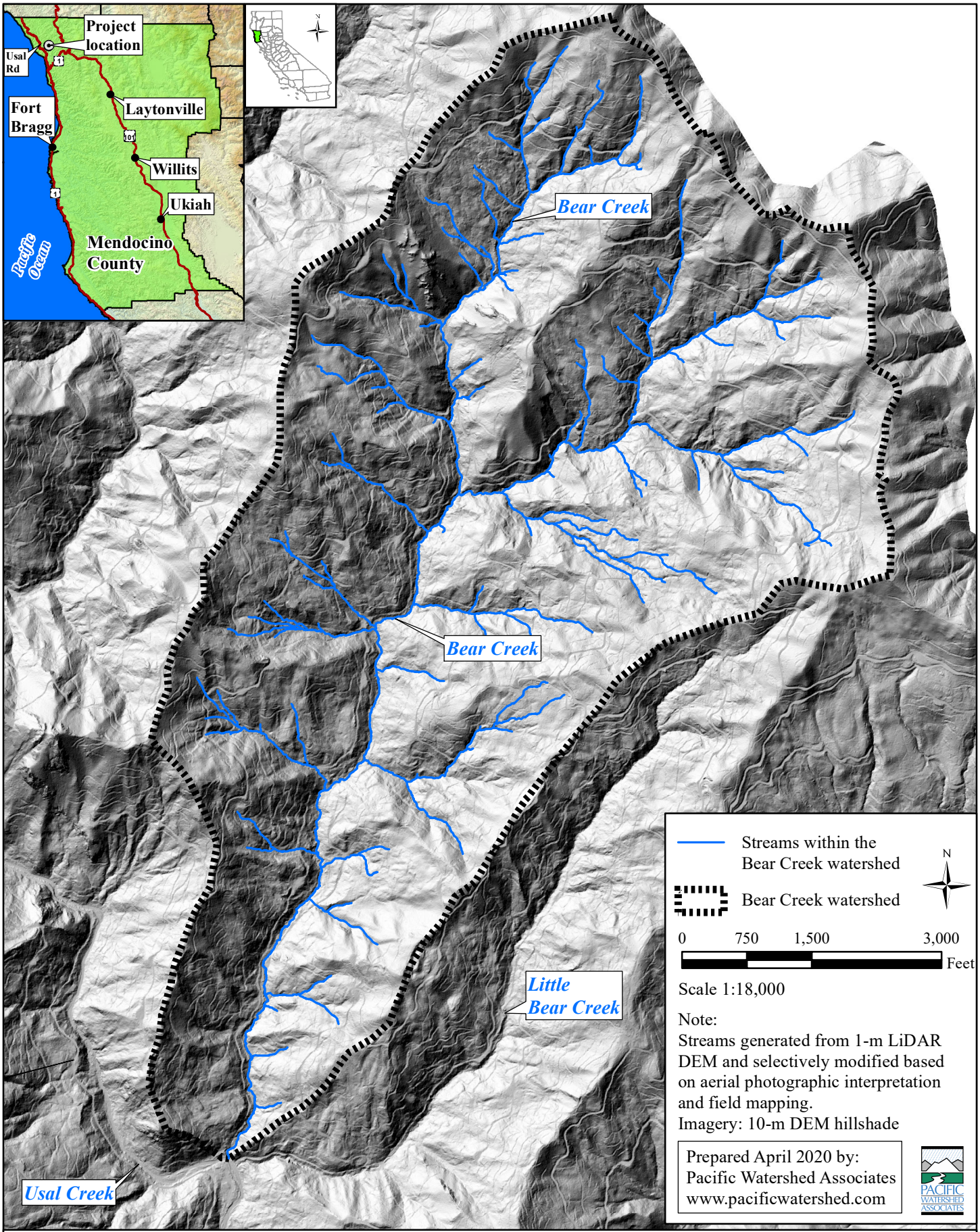
Seeding and mulching of all exposed soils shall be done for all slopes which may deliver sediment to a stream. Woody debris will be concentrated on finished slopes adjacent to stream crossings. The standard for success is 80% ground cover for broadcast planting of seed, after a period of three years. Mulching and seeding will take place as sites are completed to avoid unforeseen erosion. Planting of tree seedlings will take place after December 1 or when sufficient rainfall has occurred to insure the best chance of survival of the seedlings.

Sites that are expected to erode and deliver sediment to the stream are the only locations where work will be authorized for reimbursement under the terms of this agreement. Reimbursement will not be authorized for work done to improve aesthetics only.

The landowner or responsible party must sign an access agreement stating they agree to maintain the erosion control project for a period of not less than 10 years. Maintenance will consist of repair to the road or stream crossing to a level that will effectively reduce sediment from entering the stream. In the event of an act of nature which results in partial or complete failure of the project, the landowner or applicant will not be held responsible for costs incurred after the act of nature. Acts of nature include, but are not limited to floods, earthquakes, volcanic eruptions, and windstorms.



Map 1. Project location topographic map for the Bear Creek Sediment Reduction and Salmonid Recovery Project, Mendocino County, California. (Piercy and Hales Grove USGS 7.5' topographic quadrangles; Grantee/Applicant: Trout Unlimited)



Map 2. Watershed map for the Bear Creek Sediment Reduction and Salmonid Recovery Project, Mendocino County, California. Grantee/Applicant: Trout Unlimited

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Piercy (3912387) OR Hales Grove (3912377) OR Mistake Point (3912378) OR Bear Harbor (3912388) OR Briceland (4012318) OR Garberville (4012317) OR Harris (4012316) OR Noble Butte (3912386) OR Leggett (3912376))

Possible species within the Piercy and surrounding quads for 1723370 Bear Creek Sediment Reduction and Salmonid Recovery Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Anodonta californiensis California floater	IMBIV04020	None	None	G3Q	S2?	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arabis mcdonaldiana McDonald's rockcress	PDBRA06150	Endangered	Endangered	G3	S3	1B.1
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos stanfordiana ssp. raichei Raiche's manzanita	PDERI041G2	None	None	G3T2	S2	1B.1
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Carex arcta northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Ceanothus foliosus var. vineatus Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum kelloggii Kellogg's buckwheat	PDPGN083A0	None	Endangered	G2	S2	1B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
Gentiana setigera Mendocino gentian	PDGEN060S0	None	None	G2	S2	1B.2
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Montia howellii Howell's montia	PDPOR05070	None	None	G3G4	S2	2B.2
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Northern Interior Cypress Forest Northern Interior Cypress Forest	CTT83220CA	None	None	G2	S2.2	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2	
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sedum laxum ssp. eastwoodiae Red Mountain stonecrop	PDCRA0A0L1	None	None	G5T2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
Silene campanulata ssp. campanulata Red Mountain catchfly	PDCAR0U0A2	None	Endangered	G5T3Q	S3	4.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Thermopsis robusta robust false lupine	PDFAB3Z0D0	None	None	G2	S2	1B.2
Upland Douglas Fir Forest Upland Douglas Fir Forest	CTT82420CA	None	None	G4	S3.1	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 53

Bear Creek Instream Habitat Enhancement Project 2020

Introduction:

Trout Unlimited, Inc. (TU) will install 50 large woody debris (LWD) structures, containing 189 key pieces of LWD along 1.9-miles of Bear Creek. Of the proposed 50 features, 19 will be installed utilizing accelerated recruitment (direct falling) and 31 will use heavy equipment installation techniques. Large wood restoration in Bear Creek is a recommended restoration action in the CDFW Stream Invetory Report (1995) and in state and federal salmonid recovery plans (NMFS Coastal Multispecies Plan 2016, NMFS CCC Coho Recovery Plan 2012). The existing quantity of key LWD pieces currently in Bear Creek is 133 pieces/mile with many key pieces located in a few large debris accumulations (LDA's) that are not well distributed throughout the basin. By this project adding 189 pieces of LWD to the proposed reach, the overall density of key pieces in Bear Creek will increase to 233 pieces/mile, or ~14.5 pieces/100 meters, resulting in a "Very Good" target rating according to the NFMS Coastal Multispecies Recovery Plan (11+ key pieces per 100m).

TU shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* Volume I, Section VII (https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

The objective is to install 189 key pieces of wood at 50 locations in 1.9-miles of Bear Creek. This project will increase stream habitat complexity, pool frequency, pool depth, high-flow refugia, and over-summer rearing habitat for salmonids in an important tributary in the Usal Creek watershed.

Project Description:

Location:

The Bear Creek Watershed is located west of Leggett, CA in the Usal Creek Watershed Bear Creek intersects the North Fork (NF) of Usal Creek approximately 3.5-miles upstream of its confluence with the Pacific Ocean. The project reach begins near the confluence with NF Usal Creek and extends upstream approximately 1.9-miles. The project is located in the Hales Grove and Piercy 7.5 Minute U.S.Geological Survey Quadrangle maps. Project coordinates are: 39.8757º north latitude, -123.8377º west longitude at the center of the project work reach on mainstem Bear Creek.

Project Set Up:

The TU Project Manager will provide all grant and contract oversight and administration tasks including but not limited to obtaining permits, securing contracts (e.g. Premitees, subcontractors, landowner, etc.), scheduling, implementation oversight, invoicing, reporting, and agency and landowner communications. All reporting and billing will be pursuant to the grant and regulatory guidelines. Upon final execution of the grant and prior to receiving a Final Notice to Proceed, deliver the landowner access agreement, subcontracts, and assure all permits are finalized. This task will occur throughout the life of the project.

- TU Project Coordinator will assist with processing invoices, financial tracking, and reporting.
- TU Project Coordinators, will assist in processing general grant management and reporting.
- TU's California Director will be the authorized agent to sign the agreement.
- Pacific Watershed Associates (PWA) Associate Scientist and Principal Geologist will lead the construction of features.
- PWA Project Scientists and Staff Scientists will provide project layout and construction oversight.
- The PWA Associate Scientist and Project Scientist will manage project layout, construction oversight, monitoring, and reporting.
- PWA Staff Scientists will conduct surveys, complete layout, provide construction oversight, and complete monitoring work pre-, during-, and post-project and any data entry.
- PWA GIS staff will provide field layout maps, digitize layout and as-built project data, and develop report maps.
- PWA Natural Resource Specialists will identify and provide avoidance measures for wetlands, survey for and develop plans to protect fish and amphibians at the spittler crossing, and monitor water quality during excavation of live streams.
- PWA Clerical staff will track and monitor hours and create invoices during the project.
- The PWA Senior Scientist will conduct the Paleontology review for CEQA. All PWA work elements will be supervised by a PWA Principal.
- PWA Associate Scientist and PWA Project Scientist with assistance and oversight from the assigned TU Project Manager will conduct annual and final reporting of the project.
- Wylatti Resource Management will be the heavy equipment contractor for the project providing all heavy equipment for the project including Excavator, Dozer, Low Boy, Pilot Car, Sawyer (Tree Faller), Laborer for erosion control and feature anchoring, and truck and trailer.
- Woodbenders Revegetation will conduct revegetation.

- The Redwood Forest Foundation, Inc. (RFFI) Botanist will lead a botanical resource assessment of the project area.
- The William Rich and Associates (WRA) Principal Investigator and Research Associate will conduct the required archaeological surveys to meet the requirements of CEQA.

Materials:

- Approximately 150 trees will be planted by Woodbenders Revegetation.
- Approximately 189 pieces of in-kind large woody material (LWM) will be installed.
- Approximately 28 bales of straw mulch and Approximately 6 pounds of native seed will be used.
- PWA will procure anchoring materials such as rebar, nuts, and plates for anchoring log features.

Tasks:

Task 1 - Grant Administration and Project Management:
Trout Unlimited will provide all contracting oversight and administration as pursuant to grant and regulatory guidelines. This includes, but is not limited to, obtaining permits, securing contracts, scheduling, implementation oversight, invoicing, reporting, and agency and landowner communications. Upon Final execution of the Grant and prior to receiving a Final Notice to Proceed, TU personnel will deliver the landowner access agreements, subcontracts, and assure all permits are finalized. Additionally, the TU Project Coordinator will be available to assist with invoicing and financial tracking. This task will occur throughout the life of the project.

Task 2 - Environmental Compliance and CEQA Surveys:
Pacific Watershed and Associates (PWA) will coordinate with TU, CDFW, and RFFI to conduct the appropriate surveys for special status species, cultural resources, botanical resources, and paleontological resources. TU will prepare and submit the CDFW LSAA 1600 application and permit fee for authorization. PWA NR Specialists will identify and flag equipment exclusion zones at any potential wetland location, as necessary. The results of these surveys and any required actions will be included in draft technical memos and delivered to the CDFW project manager prior to start of implementation. Interim reports will be submitted to the CDFW Project Manager with the 1600 LSAA application, and final CEQA reports will be provided to the CDFW as necessary prior to grant expiration.

Task 3 - Pre-Implementation Project Layout and Surveys:
Following approval by CDFW of site-specific design plans, PWA will flag heavy equipment access routes, construction boundaries, equipment exclusion areas and LWM staging areas. Final layout will be guided by the results of CEQA and biotic surveys as needed. Final project layout will be subject to the approval of the CDFW Grant Manager. PWA will also document the existing conditions at the proposed feature locations and setup photo point monitoring stations at the construction locations for final reporting. Pre-construction monitoring will be performed by PWA in a manner consistent with CDFW guidelines and as required by the FLAR focus.

Task 4 - Project Construction:
Most of the features will be constructed with heavy equipment but in some locations, features may be constructed via directional falling of streamside trees by the Wylatti professional sawyer (tree faller). In general, excavator and bulldozer operators from Wylatti will create access routes to the proposed LWM features and construct said features. The features will be constructed with an excavator with a log tong attachment. To conduct the install, the excavator and bulldozer will create access to the streamside areas and the excavator will install the logs while the dozer will deliver logs to the construction site from the adjacent road. The excavator will grapple each log with the log tongs and weave it through the existing riparian forest with the intention of providing naturalized anchoring for the features. In locations where equipment access is limiting, trees will be incorporated into the creek by direct falling. Where prudent, small, and medium sized tree fragments that do not meet the criteria for "key logs" will be incorporated into the spider jams as pre-racked and loose material. These racked and loose logs/branches will reduce the spider jams porosity and more closely mimic naturally developed wood features. Once the primary architecture of the features has been completed, PWA in coordination with the CDFW project manager will determine if hard anchor points will be required at each of the constructed features. Hard anchor points will be installed by Wylatti with direct oversight from PWA, as necessary. Possible anchor locations have been provided in the feature sketches included with the supplemental information of this proposal. Following final approval of installed features by the CDFW Project Manager, the excavator and dozer will winterize each feature access point by decompacting the disturbed ground surface and mulching all bare areas with native wood slash and/or straw. Native seed will be distributed in the bare areas to provide short to medium term erosion control. Trees (Sequoia sempervirens) will also be planted in disturbed areas as required.

Task 5 - Post-Implementation Surveys and Revegetation:
Post-construction monitoring, including photographic monitoring, and documentation of as-built conditions, will be performed by PWA consistent with the CDFW guidelines and as required by the FLAR focus. As-built drawings will include structure placement and alignment, representative cross sections, and

longitudinal profiles on a subset of the features, and the size, type, and quantity of installed materials. Some sites may require tree planting for erosion control following equipment use. Woodbenders planting staff will complete planting activities in the winter following construction as soon as conditions allow.

Task 6 – Reporting:
TU and PWA will develop project reports (annual and a final project report), based on CDFW requirements, that documents work completed and the total costs to implement the project. Progress reports will be supplied to the Grant Manager for review in approval with reimbursement requests (no more frequently than monthly), Annual Reports will be submitted annually by December 1, and a Final Project Report will be prepared and submitted prior to grant close-out (including Final Project Budget and Final Invoice). Annual and final reports will include summaries of the following information as required: (1) general grant information, (2)location of work,(3) project access, (4)participating landowners name and address, (5) a description and analysis of the restoration and planning person hours expended,(6) a quantified description of the results of the project, including as-built site information, (7) dates of work and the number of person hours expended, (8) labeled before-and-after photos of constructed sites, (10) GIS generated maps and shapefiles of the project area, and (11) monitoring checklists, databases, spreadsheets and any other data products produced during the grant term.

Deliverables:

Task 1 - Grant Administration and Project Management:
Project deliverables will be delivered to the CDFW Project Manager and includes the Final Landowner Access Agreements; Notification and payment of LSAA/1600 Agreement Application; Progress Reports submitted with invoices, annual Reports, and Final Report as well as any other documents pursuant to Grant requirements during the life of the project.

Task 2 - Environmental Compliance and CEQA Surveys:
Interim cultural resource, botanical, biological, and paleontological reports; final cultural resource, botanical, and paleontological reports as required; Preparation and payment of CDFW LSAA/1600 Agreement Application.

Task 3 - Pre-Implementation Project Layout and Surveys:
Flagged staging areas and equipment exclusion zones; Final layout and design of LWM features and access routes; Documentation of pre-construction existing conditions for all LWM features.

Task 4 - Project Construction:
Installation of 50 LWD jams over a 1.9-mile stream reach, containing approximately 189 key pieces of wood.

Task 5 - Post-Implementation Surveys and Revegetation:
Actual performance measures by site, as-built drawings, before and after photographs, representative post-project longitudinal profiles and cross sections for a subset of the constructed features.

Task 6. Reporting:
Progress Reports (pdf format); Annual Reports (pdf format); and Final Grant Report (cd and hard copy), including all pre-and post-project data produced as a part of the project; Final Invoice and Final Budget.

Timelines:

Task 1 - Grant Administration and Project Management. March 1, 2021 to February 28, 2023.

Task 2 - Environmental Compliance and CEQA Surveys. April 15, 2021 to August 1, 2022.

Task 3 - Pre-Implementation Project Layout and Surveys. June 15, 2021 to July 1, 2022.

Task 4 - Project Construction. June 15, 2021 to October 31, 2022.

Task 5 - Post-Implementation Surveys and Revegetation. July 30, 2021 to February 15, 2023.

Task 6 – Reporting. June 15, 2021 to February 28, 2023.

Additional Requirements:

The Permitee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

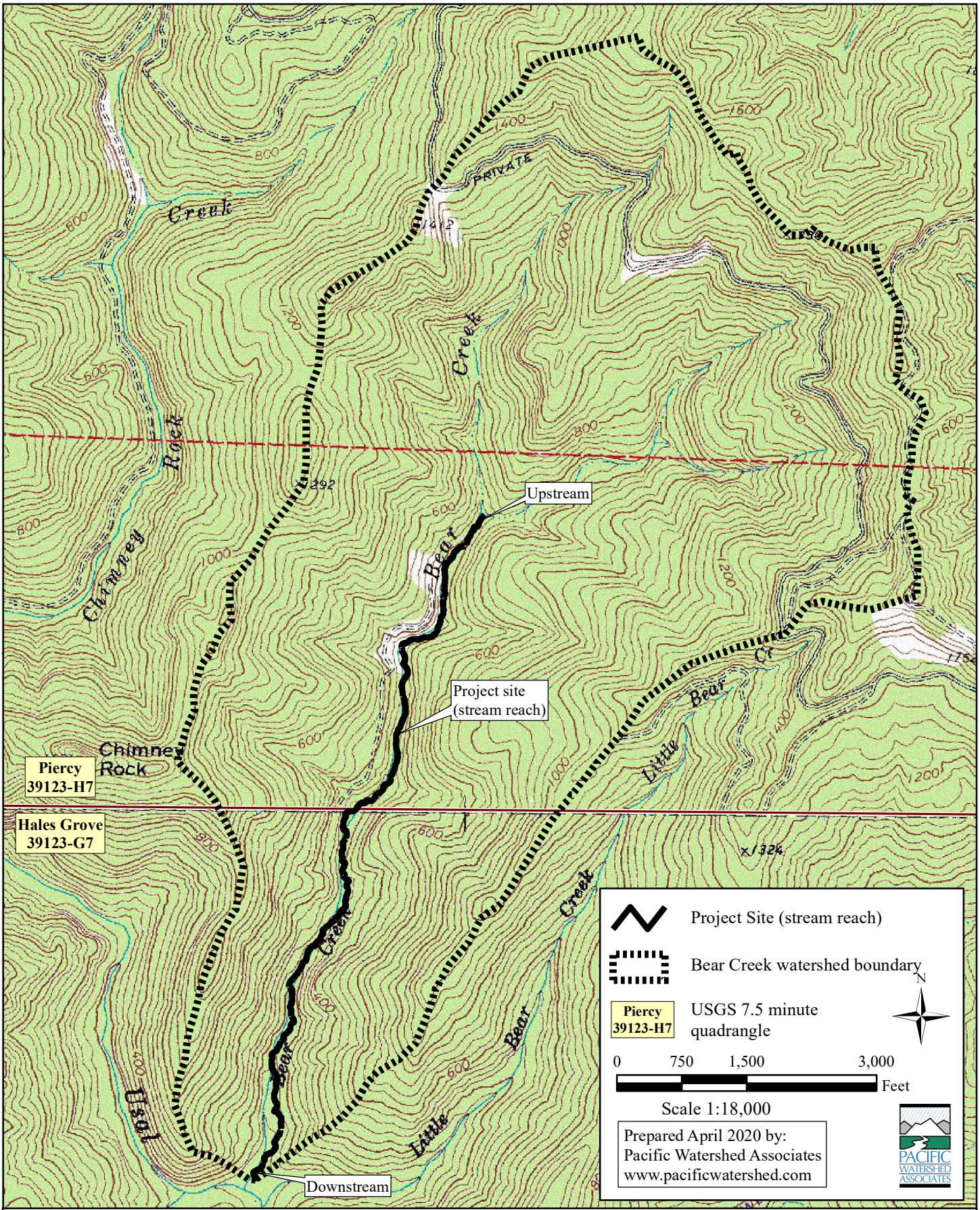
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the California Department of Fish & Wildlife *Aquatic Invasive Species Decontamination Protocol.*

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

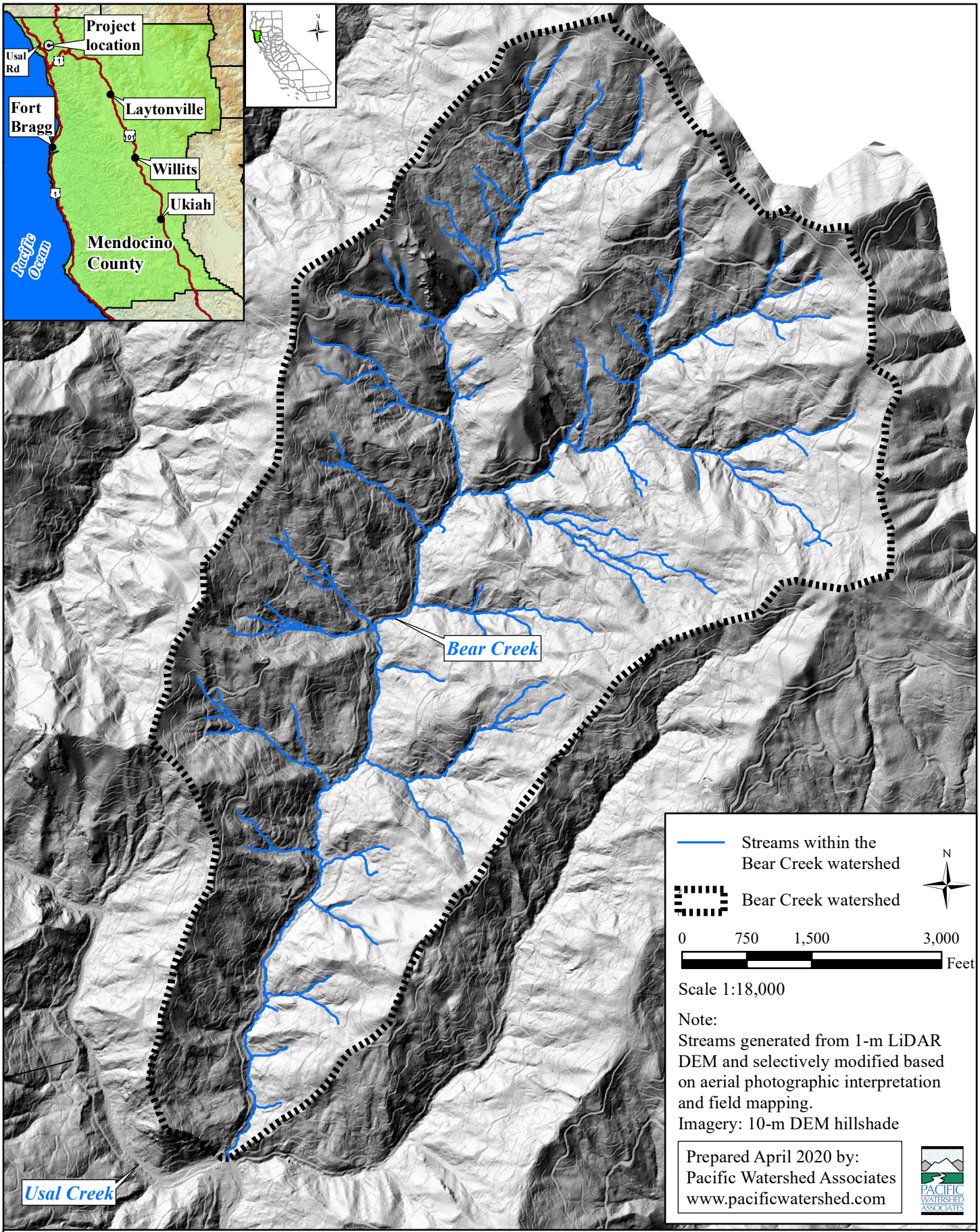
The Permitee shall notify the CDFW Project Manager a minimum of five working days before the project site is de-watered and the stream flow diverted. The notification will provide a reasonable time for CDFW personnel to oversee the implementation of the water diversion plan and the safe removal and relocation of salmonids and other fish life from the project area. If the project requires dewatering of the site, and the relocation of salmonids, the Permitee will implement the following measures to minimize harm and mortality to listed salmonids:

a. Fish dewatering and relocation activities shall only occur between June 15 and October 31 of each year.
b. Additional measures to minimize injury and mortality of salmonids during fish relocation and dewatering activities shall be implemented as described in Part IX, pages 52 and 53 of the *California Salmonid Stream Habitat Restoration Manual*.
c. The Permitee shall minimize the amount of wetted stream channel dewatered at each individual project site to the fullest extent possible as approved by the CDFW Grant Manager and pursuant to conditions in the USACE Regional General Permit and NMFS Biological Opinion.
d. All electrofishing shall be performed by a qualified fisheries biologist and conducted according to the National Marine Fisheries Service, Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
e. USFWS Approved fisheries biologists will provide fish relocation data via the Permitee to the CDFW Grant Manager on a form provided by CDFW.

Final structure design and placement will be determined by field consultation between the Permitee and the CDFW Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual.*



Map 1. Project location topographic map for the Bear Creek Instream Habitat Enhancement Project, Mendocino County, California. (Piercy and Hales Grove USGS 7.5' topographic quadrangles; Grantee/Applicant: Trout Unlimited)



Map 2. Watershed map for the Bear Creek Instream Habitat Enhancement Project, Mendocino County, California. Grantee/Applicant: Trout Unlimited

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Piercy (3912387) OR Hales Grove (3912377) OR Mistake Point (3912378) OR Bear Harbor (3912388) OR Briceland (4012318) OR Garberville (4012317) OR Harris (4012316) OR Noble Butte (3912386) OR Leggett (3912376))

Possible species within the Piercy and surrounding quads for 1723371 - Bear Creek Instream Habitat Enhancement Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Anodonta californiensis California floater	IMBIV04020	None	None	G3Q	S2?	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arabis mcdonaldiana McDonald's rockcress	PDBRA06150	Endangered	Endangered	G3	S3	1B.1
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos stanfordiana ssp. raichei Raiche's manzanita	PDERI041G2	None	None	G3T2	S2	1B.1
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Carex arcta northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Ceanothus foliosus var. vineatus Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum kelloggii Kellogg's buckwheat	PDPGN083A0	None	Endangered	G2	S2	1B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
Gentiana setigera Mendocino gentian	PDGEN060S0	None	None	G2	S2	1B.2
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Montia howellii Howell's montia	PDPOR05070	None	None	G3G4	S2	2B.2
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Northern Interior Cypress Forest Northern Interior Cypress Forest	CTT83220CA	None	None	G2	S2.2	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sedum laxum ssp. eastwoodiae Red Mountain stonecrop	PDCRA0A0L1	None	None	G5T2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
Silene campanulata ssp. campanulata Red Mountain catchfly	PDCAR0U0A2	None	Endangered	G5T3Q	S3	4.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Thermopsis robusta robust false lupine	PDFAB3Z0D0	None	None	G2	S2	1B.2
Upland Douglas Fir Forest Upland Douglas Fir Forest	CTT82420CA	None	None	G4	S3.1	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 53

East Branch North Fork Big River Coho Habitat Enhancement Project - Large Wood (Phase II) 2020

Introduction:

The California Conservation Corps (Permittee) will complete the project to accomplish the listed task, “Install properly sized large woody debris to meet targets specified in recovery plan” as described in *Recovery Plan for Central CA Coast Coho Salmon* (NOAA Final Sept 2012) through the installation of 54 large wood features within 4,995-feet of East Branch North Fork Big River. The large woody debris (LWD) structures will improve habitat complexity by adding high quality shelter and enhancing pools for adult and juvenile salmonids. Additionally, this project aims to provide velocity refugia, promote sinuosity, sort spawning gravels, and improve overall geomorphic function.

The features will be comprised of 167 pieces of appropriately sized LWD, 81 of which classify as key pieces. This project will bring the stream reach from an existing rating of “poor”, at 1.7 key pieces/100 meters, up to 7.0 key pieces/100 meters to meet the “good” target as outlined in the Central California Coast Coho Salmon Recovery Plan (NOAA Final Sept. 2012). Additionally, the project will exceed the “very good” target for LWD and key pieces, as defined in the NOAA Fisheries Southern Oregon & Northern California Coast Coho Salmon Recovery Plan 2014. These targets will be met by utilizing redwood and Douglas-fir trees from the adjacent forest lands to ensure appropriate size and type specified in recovery plans. Suitable pieces of LWD will also be salvaged from the forest floor and utilized in features where applicable. Large wood features will be constructed in accordance with the California Salmonid Stream Habitat Restoration Manual 4th edition. Meeting these LWD density targets will sufficiently treat the project reach so that no additional large wood treatment will be needed in the next ten years, or in the foreseeable future.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* -Volume I, Section VII. https://www.wildlife.ca.gov/Grants/FRGP/Guidance.

Objective(s):

One hundred and sixty seven pieces of large wood, consisting of 81 key pieces, will be utilized to create 54 instream features within 4,995-feet of East Branch North Fork Big River. The addition of large wood will achieve the wood loading target criteria outlined in coho recovery plans. These instream features will increase the quantity, quality, and complexity of salmonid spawning and rearing habitat.

East Branch North Fork Big River Coho Habitat Enhancement Project - Large Wood (Phase II) 2020

Project Description:

Location:

East Branch North Fork Big River's legal description at the confluence with North Fork Big River is T17N R15W S20. It is a third order stream and has approximately 6.3-miles of blue line stream. The project location is approximately 10.5 west southwest of Willits CA, Mendocino County. The confluence of Big River and North Fork Big River is approximately 26.8-miles upstream from where Big River enters the Pacific Ocean in the town of Mendocino, Mendocino County, CA. The East Branch North Fork Big River enters North Fork Big River approximately 2.67-miles upstream of North Fork Big River's confluence with mainstem Big River. Right Bank tributary number #5, as designated by CDFW's Habitat Inventory Report, enters East Branch North Fork Big River approximately 2.14-miles upstream of the confluence with North Fork Big River. The downstream end of the project reach is at Tributary #5. The project reach extends upstream 5,485-feet and ends 160-feet downstream of Frykman Gulch. Two short sections of stream were excluded from the project reach where the a logging road comes near the stream making the treatment reach 4,995 feet in length. Mendocino Redwood Company (MRC) has an active logging road (75-EB) which parallels the project reach on the right bank. There is a significant stand of timber between the road and the stream, acting as a buffer for the majority of the project length. Project coordinates are: 39.32625 North Latitude and -123.51935 West Longitude.

Project Set Up:

Permittee laborers duties include: Task 5, implementation. Under the direct supervision of the crew supervisor (Conservationist 1), Permittee Corpsmembers will move LWD into place utilizing wire rope rigging techniques, grip hoists, and other hand tools. Permittee Corpsmembers will also anchor and/or pin the features according to designs. Fisheries Technical Assistant (TA) duties include: Tasks 1,1a,1b,1c,2,3,3a,3b,3c,4,5,6,7. With guidance from Fish Habitat Specialist (FHS) the TA will; submit permit applications, assist with reporting and invoices, provide other administrative support services, and help to coordinate CEQA surveys; work with forester to identify trees, update site designs, flag feature locations and prepare tools and materials for implementation; provide technical support to Permittee crews and crew supervisor at project site during implementation; provide logistical support by delivering tools, materials, and spike supplies as needed; collect metrics data and longitudinal profiles as needed to meet reporting requirements. Conservationist I (CI) duties include: Task 5. The CI will be the direct crew supervisor and oversee crew operations during implementation. CI accrues overtime for overseeing crew while spike camping. The Permittee covers C1 benefits at 43% for overtime pay. Mendocino Redwood Company (MRC) Forester duties include: Task 1c,3a. Approves

selected trees to be felled for project sites. The forester also helps to coordinate spike camp and land access logistics. MRC Hydrologist duties include: Task 1c. Provides occasional assistance with access, general stream/project area information and informs of any other potential operations in the area.All in 1 Tree & Timber (LTO) duties include: Task 5a. Under direction from Permittee fisheries staff (FHS and/or TA), the LTO will fell flagged redwood and Douglas-fir trees at feature locations. William Rich and Associates duties include: Task 2. Pursuant to the California Environmental Quality Act (CEQA), the Principal Investigator, Research Associate (Archaeology), and Research Associate (Botany) will conduct archeological and botanical surveys/investigations throughout the project reach. Reports will be prepared to document potentially significant impacts on archaeological and botanical resources. and describe subsequent avoidance/minimization measures. Pacific Watershed Associates duties include: Task 2. Pursuant to the California Environmental Quality Act (CEQA), The senior geologist will conduct a paleontological investigation of the project reach. A report will be prepared documenting any significant findings and subsequent avoidance/minimization measures. MRC Aquatic Biologist duties include: Task 2. MRC Aquatic Biologist will perform species surveys, relocation and on-site monitoring as needed as well as any measures required by the CDFW's Lake and Streambed Alteration Agreement (LSAA).

Materials:

All materials are to be purchased by applicant unless specified otherwise:

1. Permittee Laborer Meals (food): To feed Corpsmember crews while on spike. Half of food costs will be covered as cost share.
2. Portable Toilets: To be used while crew is camping on Mendocino Redwood Company Property near project site. Required as a condition of camping on the property.
3. Spike Supplies (propane, lights, tarps, tent repair, water filters, hoses, batteries etc.): Used for preparing Corpsmember meals and providing any miscellaneous ammenities necessary for a camp of 12-16 individuals. Permittee provides half as cost share.
4. Logs: The logs are the material used for the in-stream habitat enhancement features. All LWD used will meet or exceed size definitions of LWD in the DFG California Salmonid Stream Habitat Restoration Manual, Section VII, and will consist of redwood and Douglas-fir logs. Key logs meet the specificatlon of NOAA Fisheries CCC Coho Recovery Plan 2012.
5. Root-wads: The root-wads are the material used for in-stream habitat enhancement features. All LWD used will meet or exceed size definitions of LWD in the CDFW *California Salmonid Stream Habitat Restoration Manual,* Section VII, and will consist of redwood and Douglas-fir logs root-wads. Root-wads are cost share from Mendocino Redwood Company.

6. One inch diameter by 8-foot length threadbar: Used for anchoring in-stream structures. Threadbar is the structural component of the anchor used to fasten logs to each other and to live trees on the bank. Anchors are used to provide structural integrity, resist buoancy, and hold structures in place, thereby increasing overall feature effectiveness.
7. Steel Hex Nuts: Used for anchoring in-stream structures. Nuts get fastened on ends of Threadbar, over washers, to secure logs together, and/or to live trees on the bank.
8. Plates (washers): Used for anchoring in-stream structures. Washers are placed on the ends of the threadbar before the nuts, allowing the nuts to lock into place.
9. Wood Auger Bits: Used for drilling holes through logs/root-wads/trees for installation of threadbar during in-stream structure anchoring process.
10. Car Wash-Tool/Gear Decontamination: Used for pressure washing tools to prevent spread of aquatic invasive species and sudden oak death as required in contract.
11. Decontamination chemicals: Used for decontamination of tools/gear as per contract requirements to prevent the spread of aquatic invasive species and sudden oak death.
12. Safety & 1st Aid Supplies for Permittee crew: (gloves, hard hats, ear protection, chaps, safety glasses, etc.) Used to prevent and/or treat personal injuries. Permittee provides half as cost share.
13. Hand Tools, Supplies, and associated expendable miscellaneous items (chain, bar oil, files, hacksaws, pipe wrenches, shearpins, GFI's, chokers, peaveys, hammers, chizels, etc.) (bulk) These hand tools are essential for setting logs and anchoring operations. The Permittee contributes half the cost of hand tools as cost share.
14. Tool/Equipment Service/Repair: To maintain/repair tools/equipment used during project implementation (repair of griphoists, drills, wire rope, generators, lifting slings, drill bits, etc.). Tools need to be repaired and serviced in order to complete construction.
15. Office Supplies (paper, printer supplies, etc.): Used for creating designs, work-plans, all pertinent documents relating to the project, reporting, etc. Permittee provides half as cost share.
16. Permittee Mileage (vehicle): All mileage traveled, commuting to/from project site to complete tasks 3 - 6. Permittee cost share.
17. William Rich and Associates: Mileage (vehicle) for travel to and from project site to complete Archaelogical and Botanical surveys (task 2) required to comply with the California Environmental Quality Act (CEQA). Mileage to be purchased by subcontractor.
18. Northwest Information Record Search: Used in Archaelogical and botanical investigations to complete task 2, which is required to comply with the California Environmental Quality Act (CEQA). Purchased by subcontractor.

19. LSAA (1600 Permit): Required for all projects involving construction of in-stream structures (requested amount reflects an aniticipated 5% increase from current fee schedule to fee at time of purchase).

Tasks & Deliverables:

Task 1. Grant Oversight:
Contract oversight and administrative activities will be conducted by the Permittee Fisheries Technical Assistant and the Fish Habitat Specialist. This task includes, but is not limited to securing permits and subcontracts, reporting, scheduling Permittee crews, coordinating and scheduling with subcontractors and landowners, and budget management. This task will be conducted throughout the life of the project.

Deliverables: Landowner access agreements, subcontracts, permits, annual reports, quarterly invoices and progress reports, final report.
Start Date: 04/01/2021
End Date: 03/31/2025

Task 1a. Reports and Invoices:
Permittee Fish Habitat Specialist and Fisheries Technical Assistant will create and submit reports and invoices, assuring adherence to requirements in grant contract. Progress reports will be submitted with every billing invoice on a quarterly basis. Fisheries staff will also submit annual reports.

Deliverables: Submission of invoices, progress reports, and annual report.
Start Date: 04/01/2021
End Date: 03/31/2025

Task 1b. Permits and Agreements:
Permittee fisheries staff (TA and/or FHS) will acquire appropriate agreements and permits, including but not limited to subcontractor agreements for CEQA surveys, licensed timber operator (LTO) subcontractor agreement, and the CDFW's LSA agreement. Documents will be submitted consistent with requirements in agreement.

Deliverables: Subcontracts with All-in-1 Tree and Timber, William Rich and Associates, and Pacific Watershed Associates. Lake and Streambed Alteration Agreement with CDFW.
Start Date: 04/01/2021
End Date: 06/15/2021

Task 1c. Landowner Communications:
Permittee fisheries staff will communicate with landowner, MRC to verify combinations, entry policies and procedures, and coordinate logistics of any MRC operations that may coincide with Permittee crew operations. Additionally, the Permittee will notify landowner before entry to property, for the duration of the project. This task will occur when accessing the property for implementation preparation, implementation, and data collection. This task may occur annually until project completion.

Deliverables: Land access (gate combinations, spike camp agreements).
Start Date: 04/01/2021
End Date: 03/31/2025

Task 2. CEQA:
William Rich and Associates will conduct archeological and botanical surveys of the project reach, utilizing mileage and northwest information search findings, and per diem costs. Pacific Watershed Associates will conduct a paleontological investigation of the project area. MRC Aquatic Biologist will perform species surveys, relocation and on-site monitoring as needed as well as any measures required by the CDFW's Lake and Streambed Alteration Agreement (LSAA Surveys will be conducted and interim survey reports will be delivered to CDFW Grant Manager prior to receiving a Notice to Proceed. Final archaeological, botanical, and paleontological survey reports will be delivered to the grantee for submittal with the final grant report or any time prior to the Final Report due date.

Deliverables: CEQA compliance, reports for archeological, botanical, and paleontological resources.
Start Date: 04/01/2021
End Date: 07/09/2021

Task 3. Pre-project Design and Data Collection:
Implementation preparation will be conducted by the Permittee TA and FHS. Final feature locations and designs will be prepared, and applicable metrics will be collected.

Deliverables: Final feature designs, pre-implementation photos and metrics to meet approval of grant manager.
Start Date: 04/01/2021
End Date: 07/09/2021

Task 3a. Tree Identification:
Permittee fisheries staff will walk the project reach with the MRC forester to get approval for trees to be cut at project feature locations. Trees will be selected with consideration for riparian canopy and positioning once felled for efficient manipulation to feature locations. Trees will be marked and flagged in preparation of felling operations by LTO.

Deliverables: Progress report to accompany invoice for Technical Assistant time and other materials.
Start Date: 04/12/2021
End Date: 10/29/2021

Task 3b. Design and Site Preparation:
Permittee fisheries staff will walk project reach and finalize feature designs based on changes in local stream conditions over the winter. Additionally, feature design or location changes may occur as a result of CEQA survey findings, and associated impacts to local resources. Any changes to project designs or locations will be discussed with CDFW grant manager. Anchor points will be painted, and flags will be hung at feature locations. Any avoidance areas that may have resulted from CEQA surveys will be clearly designated with flagging. TA and NOAA/Vet Corps Member will collect pre-construction stream longitudinal profile data, metrics at modified features, and pre-implementation photos. This task may occur annually for the duration of the contract.

Deliverables: Final feature designs to meet approval of grant manager, pre-implementation photos and metrics.
Start Date: 04/15/2021
End Date: 10/29/2021

Task 4. Materials Acquisition:
TA and FHS will purchase materials (hardware), spike supplies, hand tools, drill bits, safety supplies, office supplies, and decontamination chemicals. Additionally, the Technical Assistant will service drill bits to have welded fixed extensions, repair tools needed for implementation, rent Porta - Potty. Permittee crew meals will be coordinated prior to each spike. Additional tools and materials may be purchased or repaired as needed throughout implementation.

Deliverables: Tools and materials used to construct instream features, invoices, and progress reports.
Start Date: 04/01/2021
End Date: 09/30/2024

Task 5. Implementation:
Permittee Corpsmembers will install large wood features following the Conceptual Designs (see supplemental docs). 54 instream features consisting of 167 pieces of large wood will be installed within a 4,995-foot section East Branch North Fork Big River. Under the direction of the Conservationist 1 (C1), Fisheries Technical Assistant and Fish Habitat Specialist, Permittee hand crews will utilize labor hours constructing in-stream LWD features and completing site rehab and erosion control. This will include travel, setting up spike camp, and breaking down of spike-camp at project completion. The C1 will be responsible for direct crew supervision and operation. This task may occur annually for duration of the contract.

Deliverables: 4,995-feet of East Branch North Fork Big River treated with LWD. Treatment will sufficiently achieve and exceed targets identified in recovery plans so that no re-treatment will be necessary.
Start Date: 07/10/2021
End Date: 10/31/2021

Task 5a. LWD Acquisition:
LTO will fell flagged trees near project features as specified in site designs. Trees will be selected to minimize impacts on stream canopy, bank stability, and effects on wildlife. The majority of trees will be felled away from the channel and later pulled into the channel with the larger diameter end of log in the water.

Deliverables: Invoice and progress report for subcontractor time.
Start Date: 07/10/2021
End Date: 12/21/2021

Task 5b. Place LWD and Install Anchors:
Before beginning construction, MRC Aquatic Biologist will perform species surveys, relocation and on-site monitoring as needed. Prior to moving logs, felled trees will be cut to length according to feature specific work plans. Logs and root-wads will be moved into place and anchored, per design, to living trees and/or stumps along the stream banks. Logs will be moved by using grip-hoist and wire rope rigging techniques or heavy equipment if available. The anchoring of LWD will require holes to be drilled through both LWD and anchor trees requiring the use of a generator to operate electric drills. One-inch diameter Thread bar will be inserted through the logs and anchor trees, then secured with nuts and washers. All pieces of LWD to be used in feature construction are currently located in or near the riparian corridor or road and would likely not recruit naturally. All features will be built in accordance with CDFW *California Salmonid Stream Habitat Restoration Manual,* Section VII and will consist of redwood and Douglas-fir logs or root wads which also meet the criteria for LWD according to the manual. This task may occur annually for the life of project.

Deliverables: 54 LWD features consisting of 167 pieces of LWD within 4,995-feet of East Branch North Fork Big River.
Start Date: 07/10/2021
End Date: 10/31/2021

Task 5c. Install Small Woody Debris (SWD)

Available slash and small woody debris (SWD) will be installed into features as applicable to provide immediate cover for salmonids present at time of construction. SWD will be branches and tops of felled redwoods ranging from three to 11-inches in diameter. SWD will also be installed at specific features to capture additional floating debris, increasing the volume of wood in the channel and the associated geomorphic effects. To prevent erosion and introduction of fine sediment into the stream channel, exposed dirt resulting from construction of features will be covered/mulched using on-site forest materials. This task will occur in years of implementation.

Deliverables: Completion of features, invoice, and progress report for Corpsmembers hours and C1 Overtime.
Start Date: 07/10/2021
End Date: 10/31/2021

Task 5d. Decontamination:
To address potential spread of aquatic invasive species and Sudden Oak Death (SOD), personal gear as well as tools/equipment used in the field will be properly decontaminated before moving to a new location in order to comply with CDFW and CA Oak Mortality Task Force disinfection/decontamination protocol Requirements. This task will occur annually in years of implementation.

Deliverables: Adherence to protocols and permits, invoicing for decontamination materials, progress report.
Start Date: 07/10/2021
End Date: 10/31/2021

Task 6. Data Collection:
Upon completion of the project or summer work period, TA, and NOAA Fisheries Veteran will collect longitudinal profile data, photo documentation, required quantitative metrics, and any other required data required for the final and annual reports report. This task may occur annually as implementation takes place.

Deliverables: Invoices with progress reports, compiled information to be included in annual and final reports.
Start Date: 08/02/2021
End Date: 11/12/2021

Task 7. Final Report:
Permittee Fisheries Technical Assistant and Fish Habitat Specialist will prepare and submit the final report and invoice to CDFW grant manager. Report will include performance measures per site, as built drawings, before and after photos on CD, post-project longitudinal profiles, project map, and any other additional required documents as per the contract.

Deliverables: Final report will include:
- The grant agreement number
- USGS 7.5-minute topographical map of work location
- Specific project access routes and landowner name and address
- Description and analysis of applied restoration and planning techniques
- Description of results
- Dates of work and number of personnel hours expended
- Detailed account of grant dollars spent, contributed, and expended as in-kind services
- Performance measures per site
- Overall project performance measure
- As built drawings
- Before and after photos on CD
- Post-project longitudinal profiles
- Any other additional required documents or information as per the contract.

Start Date: 11/15/2021
End Date: 03/31/2025

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and floodplain areas at the end of each workday.

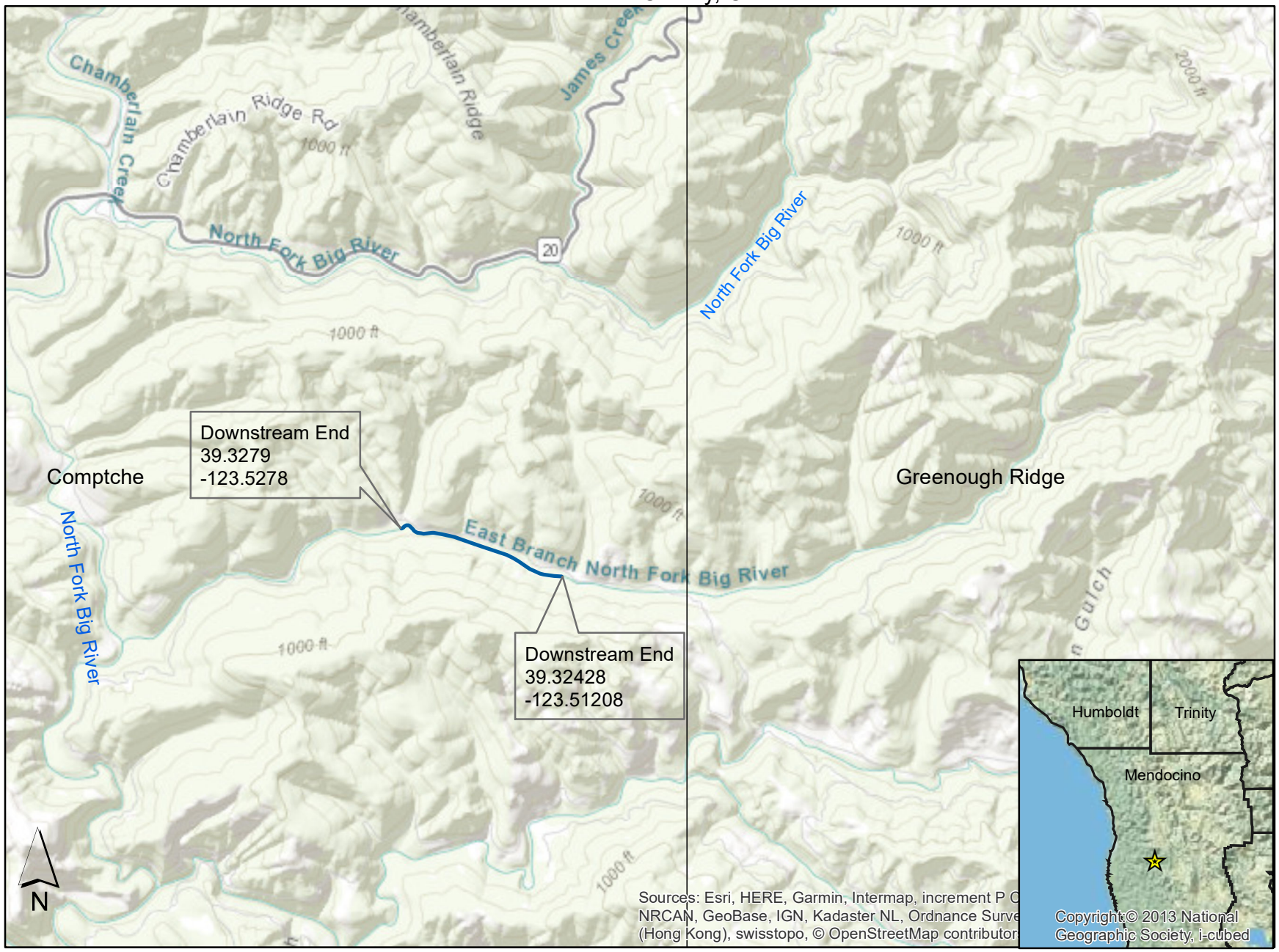
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the

standards detailed in the California Department of Fish & Wildlife *Aquatic Invasive Species Decontamination Protocol*.

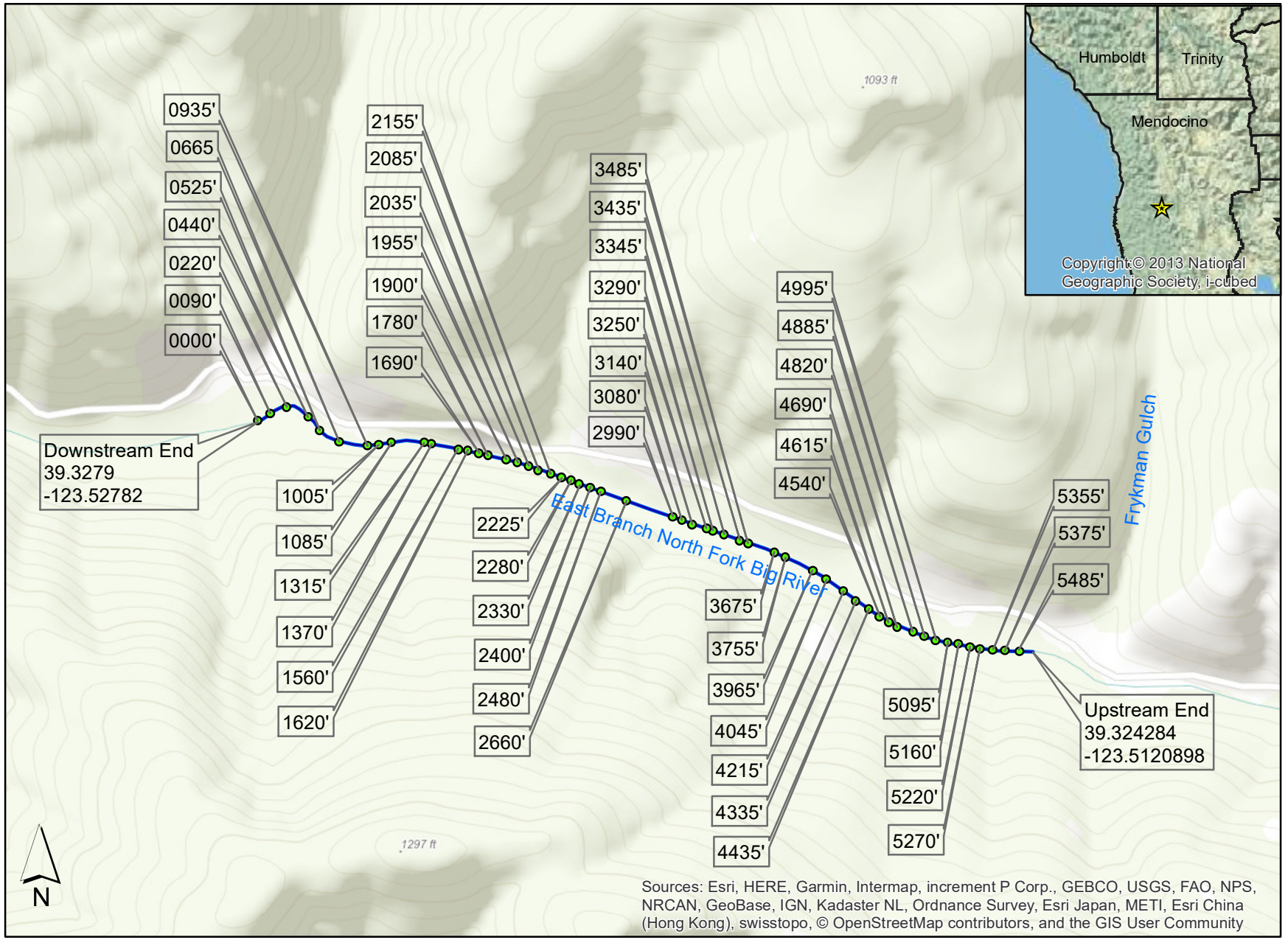
During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

Final structure design and placement will be determined by field consultation between the Grantee and the Grantor Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual.*

Map 1. Watershed View
East Branch North Fork Big River Coho Habitat Enhancement Project - Large Wood (Phase II)
California Conservation Corps
East Branch North Fork Big River, Comptche Quad
Mendocino County, CA



Map 2. Features
East Branch North Fork Big River Coho Habitat Enhancement Project - Large Wood (Phase II)
California Conservation Corps
East Branch of North Fork Big River, Comptche Quad
Mendocino County, CA



Large Wood Features
Project Reach

0 0.125 0.25 0.5 Miles

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Comptche (3912335) OR Navarro (3912325) OR Elk (3912326) OR Mathison Peak (3912336) OR Noyo Hill (3912346) OR Northspur (3912345) OR Burbeck (3912344) OR Greenough Ridge (3912334) OR Bailey Ridge (3912324))

Possible species within the Comptche and surrounding quads for 1723379 - East Branch North Fork Big River Coho Habitat Enhancement Project - Large Wood (Phase II), Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Alisma gramineum grass alisma	PMALI01010	None	None	G5	S3	2B.2
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos nummularia ssp. mendocinoensis pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Atractelmis wawona Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Calileptoneta wapiti Mendocino leptonetid spider	ILARAU6040	None	None	G1	S1	
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Carex californica California sedge	PMCYP032D0	None	None	G5	S2	2B.2
Carex lenticularis var. limnophila lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fissidens pauperculus minute pocket moss	NBMUS2W0U0	None	None	G3?	S2	1B.2
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Grand Fir Forest Grand Fir Forest	CTT82120CA	None	None	G1	S1.1	
Helminthoglypta arrosa pomoensis Pomo bronze shoulderband	IMGASC2033	None	None	G2G3T1	S1	
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Hesperolinon adenophyllum glandular western flax	PDLIN01010	None	None	G2G3	S2S3	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Kopsiopsis hookeri small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lavinia symmetricus navarroensis Navarro roach	AFCJB19023	None	None	G4T1T2	S2S3	SSC
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1
Mendocino Pygmy Cypress Forest Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Packera bolanderi var. bolanderi seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Pinus contorta ssp. bolanderi Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Sanguisorba officinalis great burnet	PDROS1L060	None	None	G5?	S2	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Speyeria zerene behrensii Behren's silverspot butterfly	IILEPJ6088	Endangered	None	G5T1	S1	
Sphagnum Bog Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2

Record Count: 69

Upper Hollow Tree Wood Loading Project 2020

Introduction:

The Eel River Watershed Improvement Group (ERWIG) will implement the Upper Hollow Tree Wood Loading Project. Hollow Tree Creek supports populations of endangered coho salmon. The purpose of the project is to improve habitat in Hollow Tree Creek. Salmonid recovery plans recommend increasing stream habitat complexity in these streams by installing large woody debris (LWD). Adding LWD to Hollow Tree Creek will enhance pools, increase gravel sorting, and provide increased habitat complexity.

The Permitee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Part VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

The objective of this project is to construct 76 LW features along 2.1-miles of Hollow Tree Creek. These features will contain 271 pieces of large wood (LW), including 90 key pieces and 60 pieces with rootwads attached. The addition of these structures will enhance spawning and rearing habitats for both adult and juvenile salmonids.

Project Description:

Location:

This project is located on Hollow Tree Creek, a tributary to the South Fork Eel River. It is located near the town of Leggett, CA in Township 22 North, Range 17 West, Sections 23, 24, 25, and 26 of the Lincoln Ridge 7.5 Minute U.S. Geological Survey Quadrangle. The downstream extent of the project reach is at the confluence with Huckleberry Creek. The project reach extends upstream 2.1-miles. Project coordinates are: 39.736697 North and 123.707005 West.

Project Set Up:

ERWIG Staff:-ERWIG Executive Director: Task 1. Contract oversight and reporting will be conducted by ERWIG Executive Director with assistance from the ERWIG Project Manager.-ERWIG Project Manager: Tasks 1, 3, 4, 6, and 7. Will assist with contract oversight, invoicing, and reporting. Will manage all aspects of project implementation.Subcontractors:-Edwards Excavation & Restoration (LTO & EO): Tasks 3 and 4. Will be responsible for falling trees as the source of LW. Will also be responsible for placing logs and boulders according to design plans when equipment access is available. -California Conservation Corps (CCC): Task 4. Under supervision of the Conservationist 1, CCC corpsmembers will anchor the structures according to design and anchoring

specifications. Corpsmembers will also move logs into position using a griphoist come-along.-Ross Taylor & Associates: Task 3. Will conduct fish relocation at stream crossing locations. Will prepare fish relocation report.-Paleontologist TBD: Task 2. Will conduct paleontological surveys and prepare CEQA report.-Archaeologist/Botanist TBD: Task 2. Will conduct botanical and archaeological surveys and will prepare CEQA report.-Registered Professional Forester (RPF): Task 4. Will make sure trees chosen for project use are appropriate.-Woodbenders: Task 5. Will plant the trees for the project.

Materials:

All materials will be purchased by applicant. Anchoring Hardware: 1` rebar, 5/8` wire rope, 5/8` wire rope clips, nuts and plates (washers), these items are used to anchor logs to live trees, boulders, bedrock and other logs.Tools: Portable band saws, wood drills, timber bits, chainsaws: these items are used to construct the anchoring portion of the structures. Wood drills and timber bits are used to drill holes in live trees and logs for rebar attachment. Portable band saws are used to cut rebar to length. Chainsaws are used to buck trees, remove hazard trees and trim branches.Portable generators: Used to power the power tools that are used during the anchoring process.Spittler crossing materials: Culvert, geotextile fabric and straw will be used to construct the Spittler crossing over Butler Creek.Misc items: Small items such as chuck keys, allan wrenches, socket wrenches, shear pins, epoxy glue and band saw blades, which are used during construction. Other misc items include field supplies such as waders, boots, laser distance measurer and flagging.Erosion control materials: Straw, wattles and/or other erosion controls that will help keep sediment from entering watercourses.Permits: LSAA permit will need to be paid for to meet permitting requirements.ERWIG Mileage: Reimbursement for miles driven by ERWIG staff to and from project site in order to manage project. Boulders, logs, and rootwads: Will be used in the construction of the habitat structures in order to provide habitat and will be anchored together. Most of the logs will be sourced from riparian redwoods and Douglas firs. Boulders will be purchased from the Garberville quarry and sourced on site. Purchased boulders will average 2 tons in weight.Griphoist: Used to move logs into final position after placement by excavator or after falling a live tree.Forklift Rental: Used in Task 3 to remove purchased rebar and nuts from delivery truck.Water Pump and Accessories Rental: Used to dewater channel before Spittler crossing installation. Rental costs were found to be significantly less than an outright purchase.YSI water quality meter: Used in Task 4 to monitor water quality during construction. Redwood seedlings and native plants: Will be used to plant areas disturbed by project activities and areas within the project reach that are lacking canopy cover. Species will include coast redwood (*Sequoia sempervirens*), salal (Gaultheria shallon), evergreen huckleberry (*Vaccinium ovatum*), azalea (*Rhododendron sp*.), thimbleberry (*Rubus parviflorus*), and western sword fern (*Polystichum munitum*).

Tasks:

Task 1 – Administration:
Grant oversight including invoicing and reporting will be conducted by Grantee Executive Director and Project Manager (Staff). Upon final execution of the Grant and prior to receiving a Notice to Proceed, Grantee shall deliver the following items to the CDFW Grant Manager: 1. Request to spend project funds in order to prepare for implementation (e.g., obtain permits, secure subcontracts, purchase supplies, apply for a Streambed Alteration Agreement, etc.). Requests shall be sent by email or telephone. 2. Access agreement that will be project specific and meet grant agreement requirements. 3. Subcontractor Agreements. A written copy of the sub agreement shall be submitted to the CDFW Grant Manager. The subcontract shall include specific language which establishes the rights of the auditors of the State to examine the records of the subcontractor relative to the services and materials provided under the grant. 4. CEQA survey interim reports for archaeological and botanical surveys. Interim reports shall be delivered prior to receiving notice to proceed, as part of the Notification of Lake or Streambed Alteration Application (LSAA) package. Final Archaeological, botanical, and paleontological surveys shall be delivered prior to the End Term date. 5. Send Grantor LSAA with a check for the most current permit fee. The Grantee shall notify the CDFW Grant Manager a minimum of 10 business days prior to the beginning of project implementation. ERWIG Staff will write and deliver annual reports, a draft final report, and a final report.

Task 2 – CEQA Surveys:
Archaeological, botanical, and paleontological subcontractors will conduct research and surveys within the project reach to fulfill CEQA requirements for FRGP. Interim survey reports will be delivered to CDFW Grant Manager prior to receiving a Notice to Proceed. Botanist will note wetland habitat to avoid.

Task 3 - Site Preparation:
The ERWIG Project Manager will finalize site-specific designs based on channel morphology, equipment access, and LW availability. They will submit designs for CDFW Project Manager approval. The ERWIG Project Manager will flag sites for wood selection, staging, and installation, clear brush as needed, and designate staging areas for wood along the project reach. Pre-project photos and metrics will be collected by ERWIG. Tools and materials will be purchased by ERWIG prior to the start of implementation and on an as-needed basis throughout the project. Before the excavator uses stream crossings, ERWIG staff will set up exclusion fencing. In conjunction with CDFW, Ross Taylor and Associates will remove fish and amphibians from five stream crossing locations and release them at appropriate locations upstream or downstream of crossings. Ross Taylor and Associates will write all reports necessary for the e-fishing activities. Four of the stream crossings used by equipment will be wet fords and will only be crossed by one excavator two times. If necessary, an ATV will be used to bring fuel to the excavator, fueling will happen outside of the high-water area. The

crossing over Butler Creek will be a Spittler crossing with a culvert, logs, geotextile fabric, straw, and a layer of driving surface. This will be constructed by the equipment operator as part of Task 4.

Task 4 – Large Wood Structure Construction:
Upon approval from the CDFW Project Manager, construction will begin on 76 LW features under the direction of the ERWIG Project Manager. Some features may involve cutting down or uprooting trees, which will be accomplished by the LTO or the licensed equipment operator, respectively. The RPF will sign off on trees chosen for use in the project. The heavy equipment operator will build a Spittler crossing across Butler Creek. After fish exclusion fencing is set-up and fish and amphibians are relocated, about 50 feet of Butler Creek will be de-watered to facilitate installation. Two appropriately sized culverts will be placed in the stream channel, followed by logs geotextile fabric, and driving surface (gravels & fines). This crossing will be used to access the upstream half of the project reach. With approval from the grant manager, the licensed equipment operator will place logs into the stream in accordance with design plans.

When necessary, CCC Corpsmembers will move logs into position using a grip hoist come-along. Site construction, wood placement, and anchoring will be in accordance with the CDFW California Salmonid Stream Habitat Restoration Manual, Section VII (Flosi et al. 2010). The project will utilize living riparian trees as anchors by wedging the logs between them where feasible. CCC Corpsmembers will anchor the sites according to design and anchoring specifications. Corpsmembers will use one- inch threaded rebar to anchor logs to mature riparian trees and other logs. Holes will be drilled through the logs and their anchor trees using a wood drill, timber bit, and drill bit extensions when necessary. One-inch rebar will be inserted through the log and secured with nuts and washers. Corpsmembers will be supervised by a trained Conservationist 1 (C1) and the ERWIG Project Manager. Erosion control methods will be employed by the CCC as required at each structure and along equipment corridors to eliminate the possibility of sediment transport to the stream. To address concerns over invasive species this project will follow the ERWIG Aquatic Invasive Species Decontamination Protocol, which is in line with the CDFW Aquatic Invasive Species Decontamination Protocol. ERWIG staff will monitor water quality when necessary.

Task 5 – Post-Implementation:
Post-construction monitoring, including photographic monitoring, and documentation of as-built conditions, will be performed by PWA consistent with the CDFW guidelines and as required by FRGP. Field reviews with partners and CDFW Grant Manager will be conducted. Woodbender will be conducting revegetation throughout the 1.9-mile reach where disturbance has happened as a result of implementation.

Task 5.1 – Riparian Planting:
Woodbenders will return in the winter following project implementation to plant 300 redwood seedlings and 100 native plants, with a primary focus in areas lacking sufficient conifer cover or riparian vegetation.

Task 6 - Post Project Photo & Data Collection:
Following implementation ERWIG will take post-project photos and quantitative implementation metrics will be collected which satisfy the Project Annual Progress Reports and Final Report.

Deliverables:

Task 1 – Administration:
1600 Permit, Subcontractor Agreements, Access Agreements, Invoices, Invoice Progress Reports, Annual reports, draft final report in electronic format, final report in electronic and hard copy formats.

Task 2 – CEQA Surveys:
Interim and Final Survey Reports.

Task 3 – Site Preparation:
Finalized design plans, flagged equipment access routes, pre-project photos and metrics, fish re-location report.

Task 4 – Large Wood Structure Construction:
76 LW structures made up of 271 logs. Water quality monitoring data sheets.

Task 5 – Riparian Planting:
Three hundred redwoods and 100 native plants planted along the project reach.

Task 6 – Post Project Photo & Data Collection:
Post-project metrics and photos.

Timelines:

Task 1 – Administration – 4/1/2021 to 2/28/2023.

Task 2 – CEQA Surveys – 4/30/2021 to 12/31/2021.

Task 3 – Site Preparation – 5/3/2021 to 7/31/2021.

Task 4 – Large Wood Structure Construction – 7/10/2021 to 10/31/2021.

Task 5 – Riparian Planting – 12/1/2021 to 2/1/2023.

Task 6 – Post Project Photo & Data Collection – 10/1/2021 to 2/1/2023.

Additional Requirements:

The Grantee will not proceed with on the ground implementation until all necessary permits and consultations are secured and a “notice to proceed” letter has been received from the Grantor Project Manager. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the Grantor.

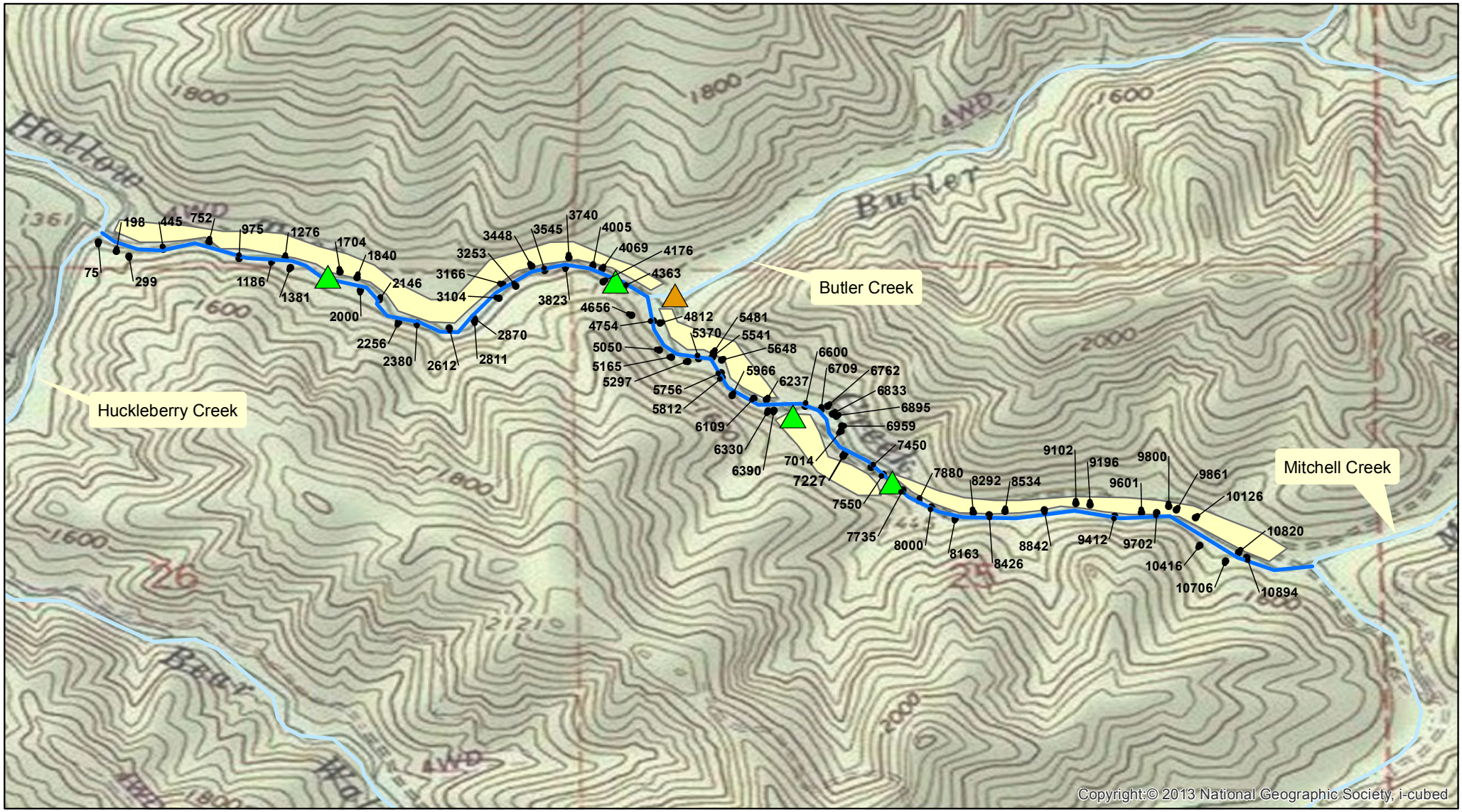
No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday when there is a threat of heavy rains which will cause flooding.

All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the California Department of Fish & Wildlife *Aquatic Invasive Species Decontamination Protocol.*

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

Final structure design and placement will be determined by field consultation between the Grantee and the Grantor Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*.

Project Location Topographic Map
Upper Hollow Tree Wood Loading Project
Lincoln Ridge Quad



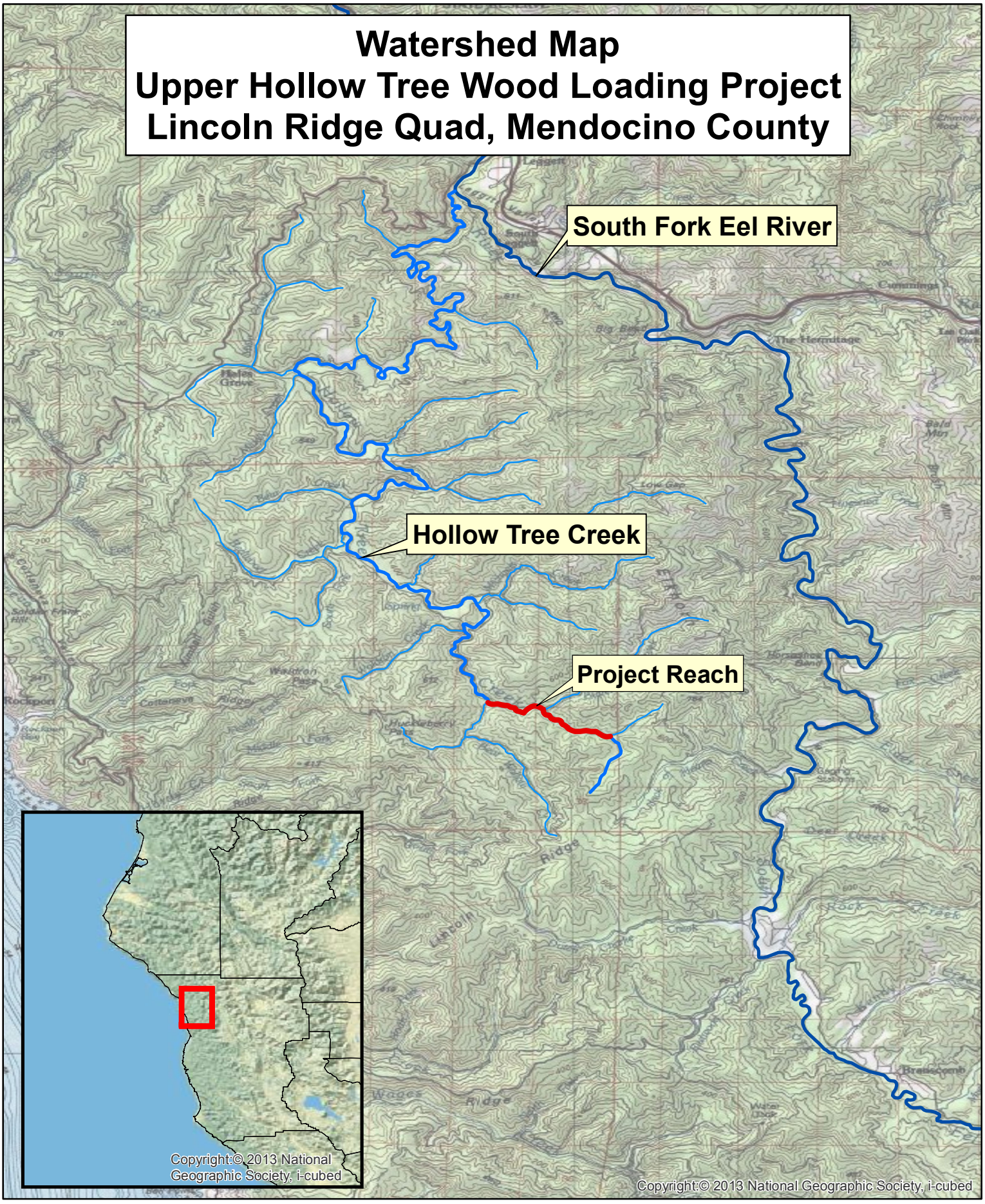
- Feature Locations
- Equipment Crossings (Wet Ford)
- Equipment Crossing (Spittler)
- Hollow Tree Creek Project Reach
- Planting Area

0 0.5 1 Miles

N

Eel River Watershed Improvement Group
March 2020

Watershed Map
Upper Hollow Tree Wood Loading Project
Lincoln Ridge Quad, Mendocino County



Project Reach

Hollow Tree Creek

South Fork Eel River

0 0.5 1 2 3 4 Miles

Eel River Watershed Improvement Group
March 2020

N

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Lincoln Ridge (3912366) OR Dutchmans Knoll (3912356) OR Inglenook (3912357) OR Westport (3912367) OR Hales Grove (3912377) OR Leggett (3912376) OR Tan Oak Park (3912375) OR Cahto Peak (3912365) OR Sherwood Peak (3912355))

Possible species within the Lincoln Ridge and surrounding quads for 1723383 - Upper Hollow Tree Wood Loading Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Alisma gramineum grass alisma	PMALI01010	None	None	G5	S3	2B.2
Anodonta californiensis California floater	IMBIV04020	None	None	G3Q	S2?	
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos manzanita ssp. elegans Konocti manzanita	PDERI04271	None	None	G5T3	S3	1B.3
Arctostaphylos stanfordiana ssp. raichei Raiche's manzanita	PDERI041G2	None	None	G3T2	S2	1B.1
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3G4	S1	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Calamagrostis crassiglumis Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2
Carex viridula ssp. viridula green yellow sedge	PMCYP03EM5	None	None	G5T5	S2	2B.3
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Ceanothus foliosus var. vineatus Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chorizanthe howellii Howell's spineflower	PDPGN040C0	Endangered	Threatened	G1	S1	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Entosphenus tridentatus Pacific lamprey	AFBAA02100	None	None	G4	S4	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum kelloggii Kellogg's buckwheat	PDPGN083A0	None	Endangered	G2	S2	1B.2
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
Fen Fen	CTT51200CA	None	None	G2	S1.2	
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Grand Fir Forest Grand Fir Forest	CTT82120CA	None	None	G1	S1.1	
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia californica ssp. bakeri Baker's goldfields	PDAST5L0C4	None	None	G3T1	S1	1B.2
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
North Central Coast Fall-Run Steelhead Stream North Central Coast Fall-Run Steelhead Stream	CARA2631CA	None	None	GNR	SNR	
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Noyo intersessa Ten Mile shoulderband	IMGASC5070	None	None	G2	S2	
Oenothera wolfii Wolf's evening-primrose	PDONA0C1K0	None	None	G2	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Phacelia insularis var. continentis North Coast phacelia	PDHYD0C2B1	None	None	G2T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Potamogeton epihydrus Nuttall's ribbon-leaved pondweed	PMPOT03080	None	None	G5	S2S3	2B.2
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. purpurea purple-stemmed checkerbloom	PDMAL110FL	None	None	G5T1	S1	1B.2
Silene campanulata ssp. campanulata Red Mountain catchfly	PDCAR0U0A2	None	Endangered	G5T3Q	S3	4.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thermopsis robusta robust false lupine	PDFAB3Z0D0	None	None	G2	S2	1B.2
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Upland Douglas Fir Forest Upland Douglas Fir Forest	CTT82420CA	None	None	G4	S3.1	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Viburnum ellipticum	PDCPR07080	None	None	G4G5	S3?	2B.3
oval-leaved viburnum						

Record Count: 83

North Fork Noyo River Tributary Complex - Large Wood Habitat Enhancement Project | 2020

Introduction:

The California Conservation Corps (Permittee) will implement the North Fork (NF) Noyo River Tributary Complex - Large Wood Habitat Enhancement Project. The lack of large wood in the stream channel has affected the quality and quantity of salmonid habitat within Dewarren Creek, Middle Fork North Fork (MFNF) Noyo River and Gulch Seven by reducing the amount of large, channel-forming features and the loss of complex cover for salmonids. Recovery plans and assessments recommend adding large wood to these tributaries of the NF Noyo River. California Department of Fish and Wildlife (CDFW) stream habitat inventory reports recommend increasing woody cover in the pools and flatwater habitat units to enhance both summer and winter salmonid habitat. Additionally, large wood (LW) was found to be lacking in each stream reach with the addition of LW being a top priority restoration action according to the most recent CDFW stream inventory reports and Albin 2006 *Assessment of Stream Habitat Conditions, and Recommendations for Improvement, in the Noyo River Hydrologic Sub-Area*.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Volume 1, Part VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

The specific objective of this project is to improve the quality and quantity of spawning and rearing habitat for coho salmon by installing large wood in three separate streams in the NF Noyo River Watershed. This project will result in a total of 124 large wood features consisting of 340 pieces of wood over 11,780-feet (2.23-miles) of stream, exceeding the “very good” category in all three streams for LW frequency, as outlined in federal coho recovery plans. The total LW count will increase from an existing 13 pieces (22.8/mile), to 95 (167.2/mile) on Dewarren Creek, 36 (46.3/mile) to 148 (190.36/mile) on MFNF Noyo River, and 17 (19.2/mile) to 163 (184.09/mile) pieces on Gulch Seven. The addition of appropriately sized wood to meet target criteria will enhance the quality, quantity, and complexity of spawning and rearing habitat for salmonids.

North Fork Noyo River Tributary Complex - Large Wood Habitat Enhancement Project | 2020

Project Description:

Location:

The project is located on three tributaries to NF Noyo River, tributary to Noyo River, in the county of Mendocino, State of California. Gulch Seven enters NF Noyo River 3.0-miles upstream from where NF Noyo River enters mainstem Noyo River. MFNF Noyo River enters NF Noyo River 2.4-miles upstream of Gulch Seven. Dewarren Creek enters NF Noyo River 0.7-miles upstream of where MFNF Noyo River enters NF Noyo River. The center point for the Dewarren Creed project reach is 39.48436º north latitude and -123.55384º west longitude. The center point for the MFNF Noyo River project reach is 39.47799º north latitude and -123.53834º west longitude. The Gulch Seven project reach is 39.45901º north latitude and -123.51375º west longitude. Project reaches are located on the Northspur 7.5 Minute U.S. Geological Survey (USGS) Quadrangle map.

Project Set Up:

The Permittee staff will provide all project oversight, administration and implementation. The Permittee staff will move LW into place utilizing wire rope rigging techniques, grip hoists, and other hand tools. The Permittee staff will also anchor and/or pin the features according to designs. The Permittee will help to coordinate CEQA surveys, work with forester to identify trees, update site designs, flag feature locations and prepare tools and materials for implementation. Permittee Conservationist I (CI) will be the direct crew supervisor and oversee crew operations during implementation.

Subcontractor Mendocino Redwood Company Forester will approve selected trees to be felled for project sites. The forester also helps to coordinate spike camp and land access logistics.

Subcontractor Licensed Timber Operator (LTO), under direction from Permittee staff, will fell flagged redwood and Douglas-fir trees at feature locations.

Materials:

A total of 124 large wood features consisting of 340 pieces of large wood and root wads will be constructed and anchored with 1” threaded rebar, nuts, washers, 5/8” galvanized cable, cable clamps, and waterproof epoxy glue, or by wedging into riparian trees without using anchoring materials. Trees left unanchored will be at least 1.5 times the average bankfull width per CDFW Stream Restoration Manual specifications for unanchored large wood (Part VII-23).

Tasks:

Task 1. Large Wood Acquisition:
LTO will fell flagged trees near project features as specified in site designs. Trees will be selected to minimize impacts on stream canopy, bank stability, and effects on wildlife. The majority of trees will be felled away from the channel and later pulled into the channel with the larger diameter end of log in the water.

Task 2. Install Instream Habitat Features:
Install 34 features including 82 pieces of LW within 3,000 feet of Dewarren Creek, 36 features including 112 pieces of LW within 4,105 feet of MFNF Noyo River and 54 features including 146 pieces of LW within 4,675 feet of Gulch Seven. Work will consist of the following:

- Permittee staff will construct instream log structures according to the site-specific plans to be provided, using locally available logs or logs from other locations.
- Nuts, washers, plates, cable, glue, and rebar will be ordered as applicable.
- Location of all project large wood will be documented.
- Various anchoring techniques, which will be approved by CDFW prior to the initiation of work, may be used to hold multiple logs together to form complex structures. Anchoring techniques will include wedging logs into existing rocks and logs along the riparian banks; anchoring to live mature trees growing on riparian banks; or anchoring to existing boulders. Anchoring materials will consist of 1” threaded rebar, cable, nuts and washers, and waterproof epoxy.

Task 3. Install Small Woody Debris (SWD):
Available slash and SWD will be installed into features as applicable to provide immediate cover for salmonids present at time of construction. SWD will also be installed at specific features to capture additional floating debris, increasing the volume of wood in the channel and the associated geomorphic affects. SWD will consist of branches on tops of felled trees ranging from 3- to 11-inch diameter.

Deliverables:

A total of 124 instream features consisting of 340 pieces of large wood will be constructed within three tributaries to NF Noyo River. The total stream length affected will be 11,780-feet.

Timelines:

June 15 through October 31 of the years 2021, 2022, 2023, and 2024, Permittee staff will install large wood features together with SWD within approved project reaches. Erosion control will be installed as project features are completed.

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the CDFW.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

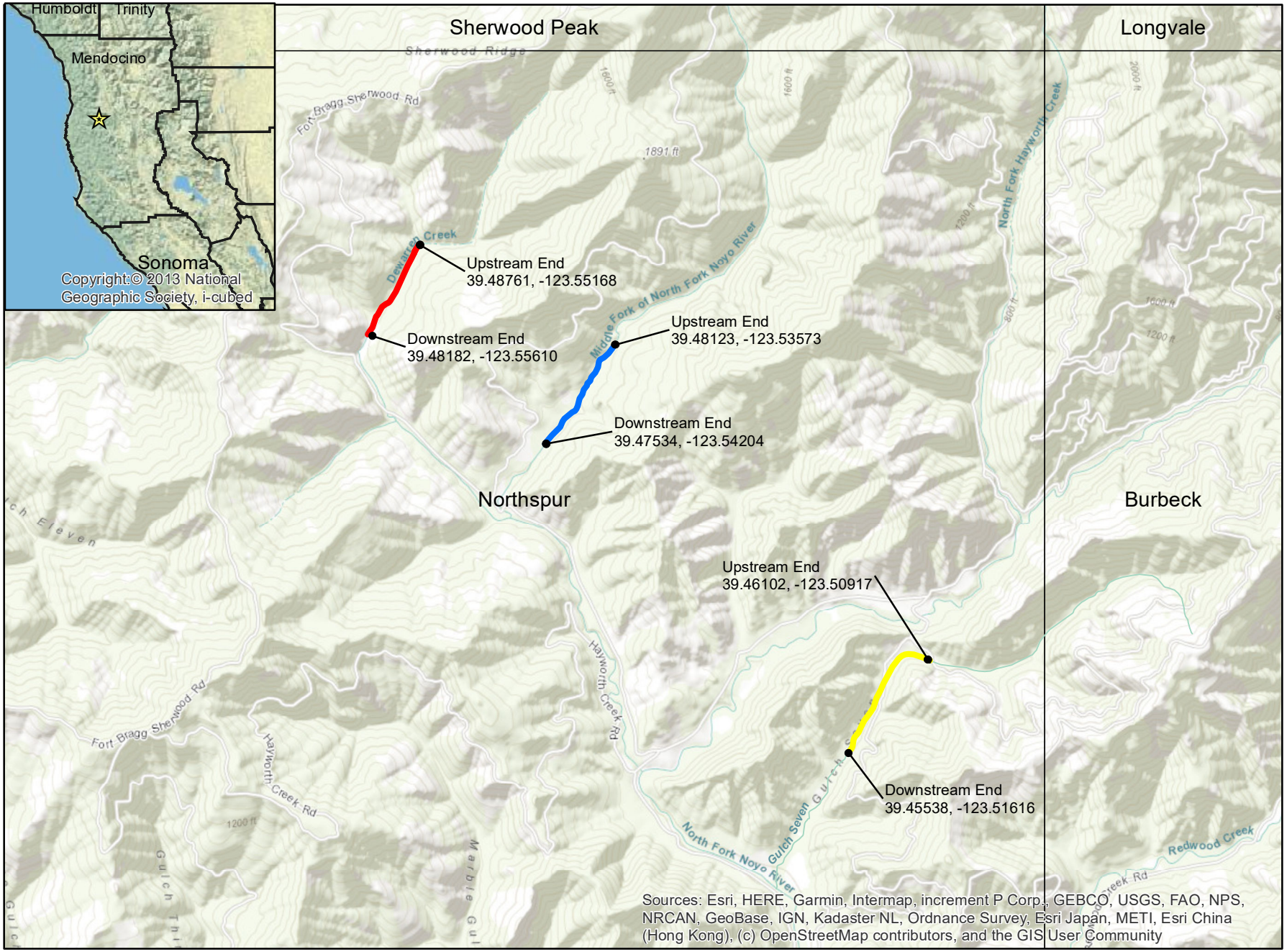
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the CDFW *Aquatic Invasive Species Decontamination Protocol*.

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

Final structure design and placement will be determined by field consultation between the Permittee staff and the CDFW Project Manager.

All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*.

North Fork Noyo River Tributary Complex Project Location Map
California Conservation Corps
North Fork Noyo River Watershed, Northspur Quad
Mendocino County, CA



Site 1: Dewarren Creek

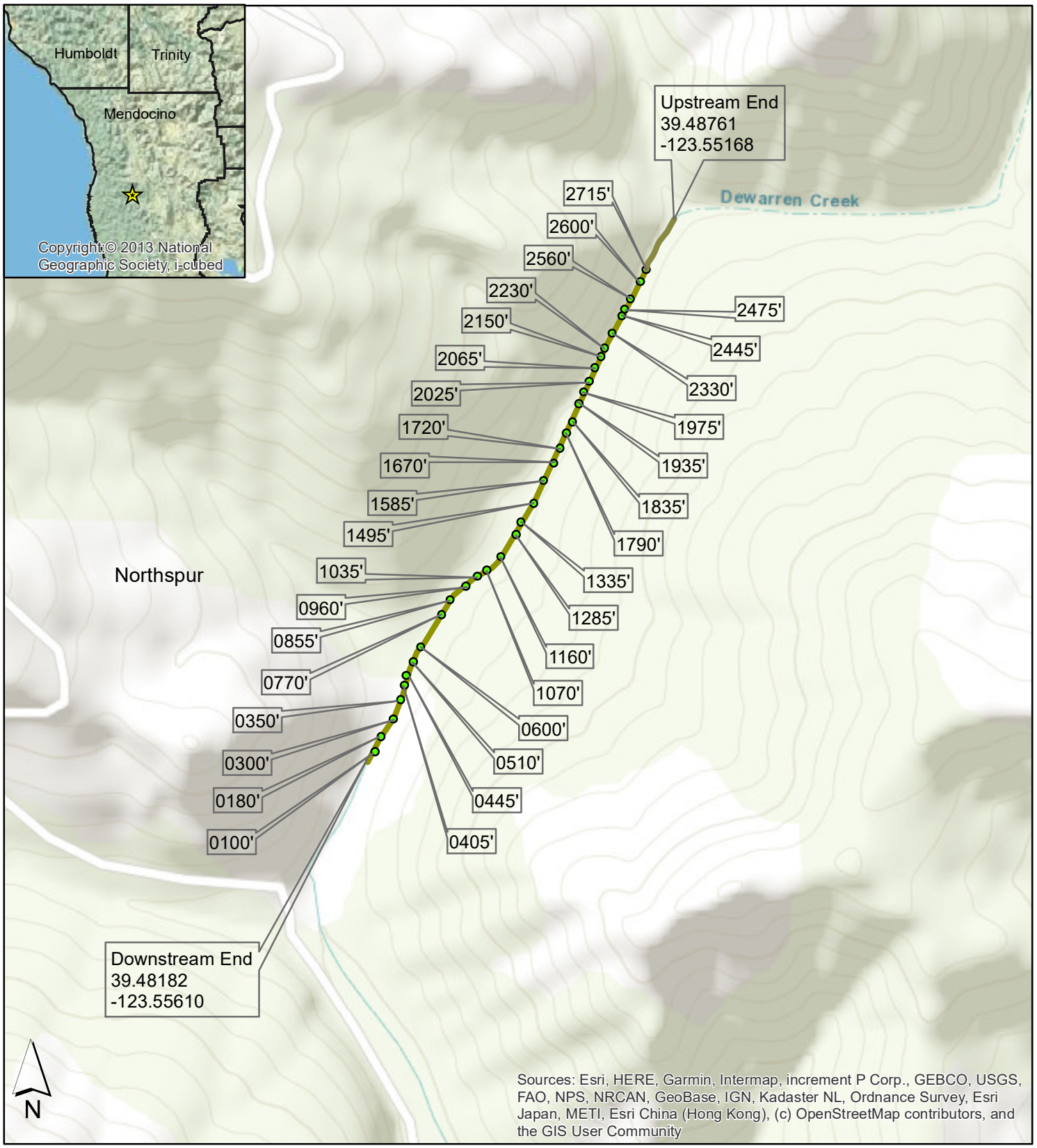
Site 2: Middle Fork of North Fork Noyo River

Site 3: Gulch Seven

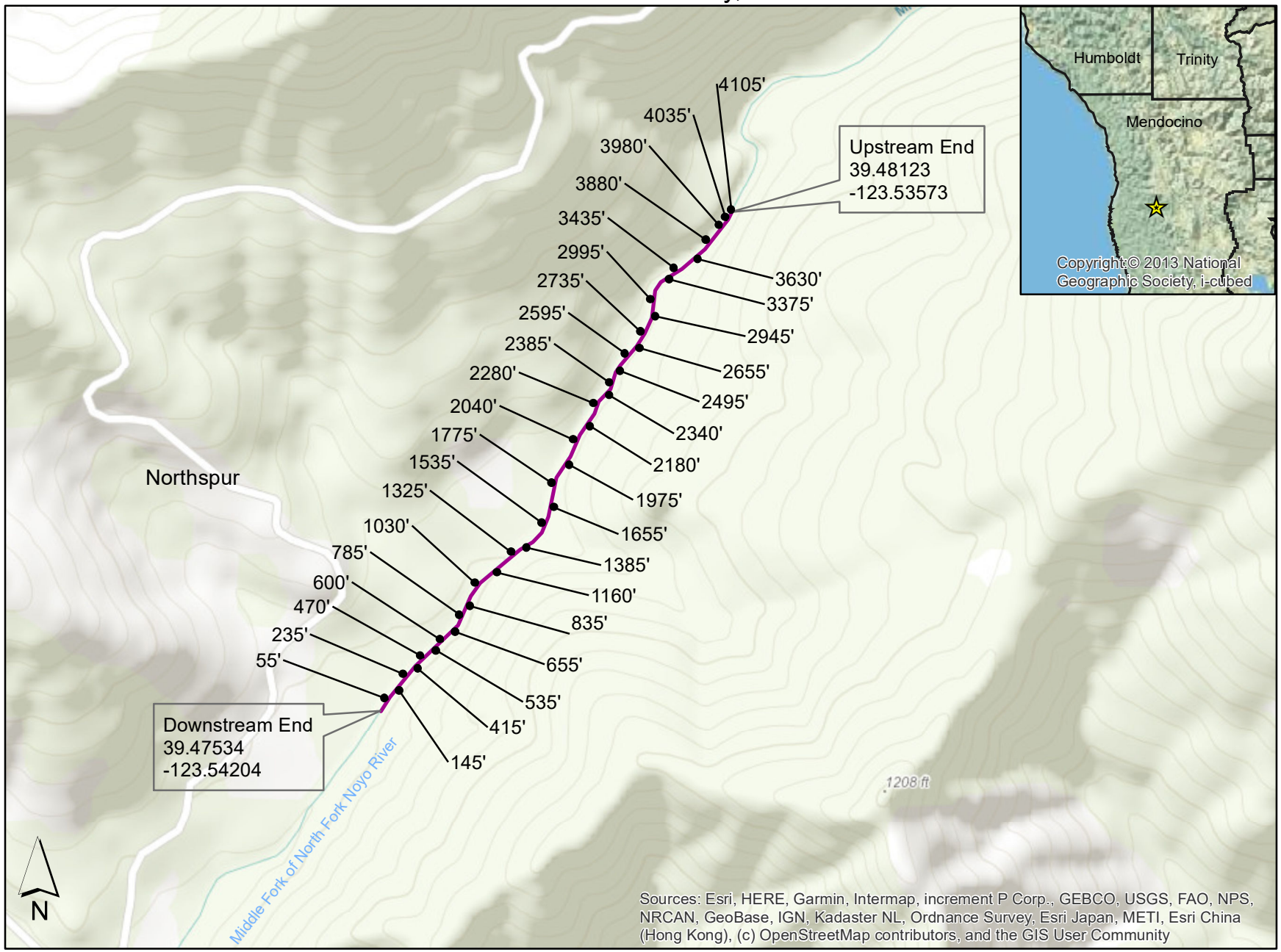
N

0 0.375 0.75 1.5 Miles

Site 1: Dewarren Creek Feature Locations Map
California Conservation Corps
Dewarren Creek, Northspur Quad
Mendocino County, CA



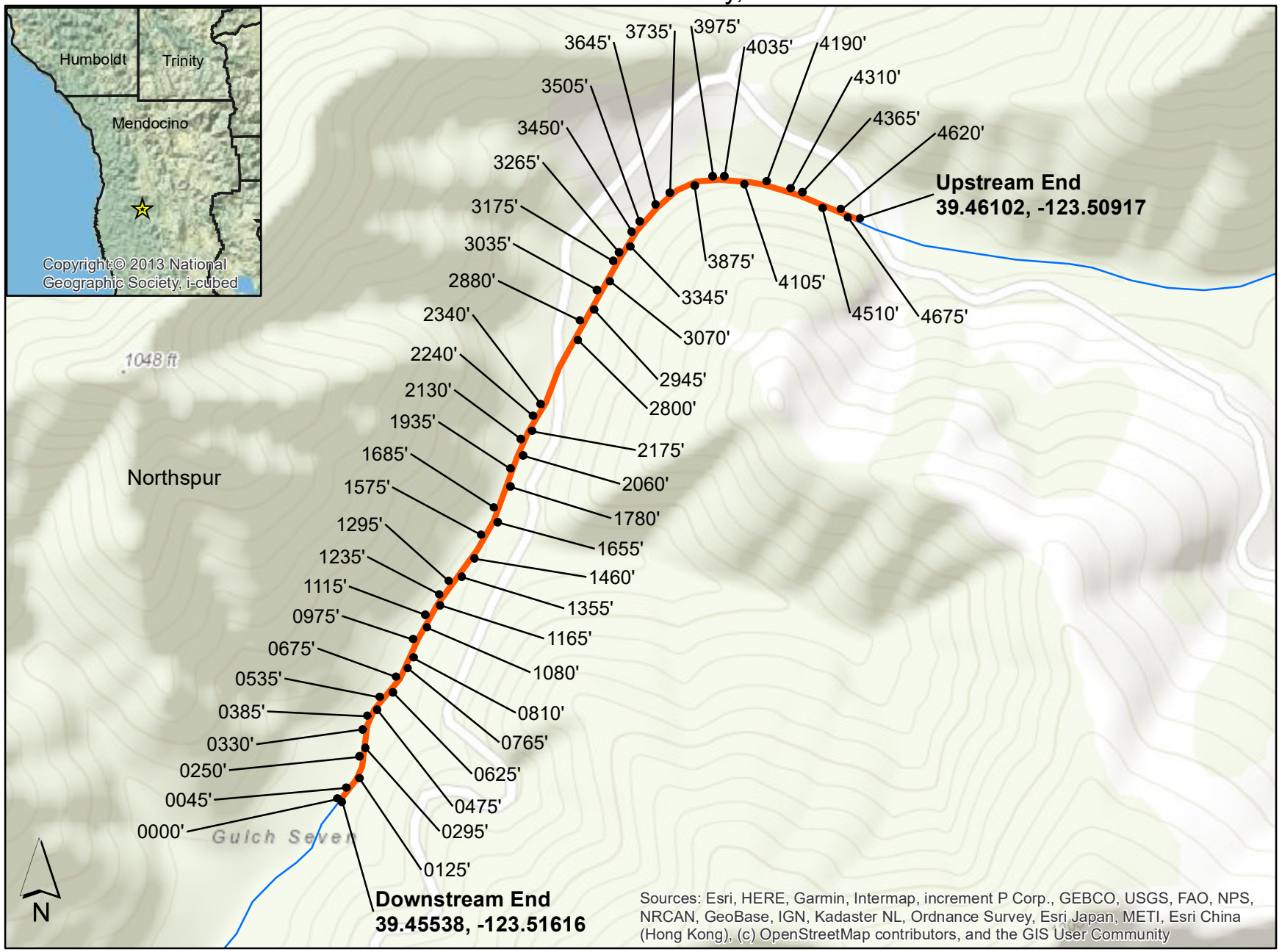
Site 2: Middle Fork of North Fork Noyo River Feature Locations Map
California Conservation Corps
Middle Fork of North Fork Noyo River, Northspur Quad
Mendocino County, CA



Project Reach

0 0.125 0.25 0.5 Miles

Site 3: Gulch Seven Feature Locations Map
California Conservation Corps
Gulch Seven, Northspur Quad
Mendocino County, CA

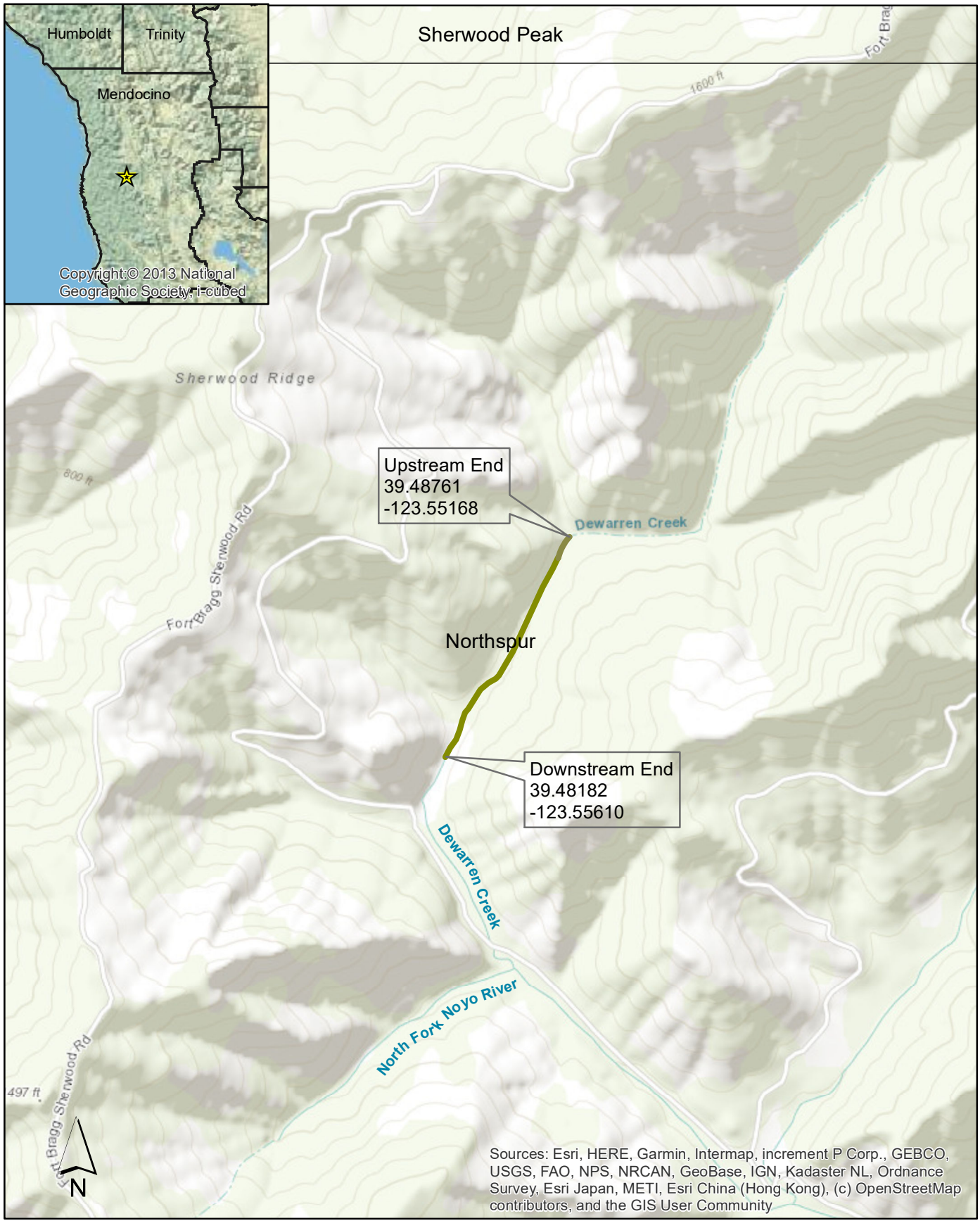


Gulch Seven Project Reach

Gulch Seven

0 0.125 0.25 0.5 Miles

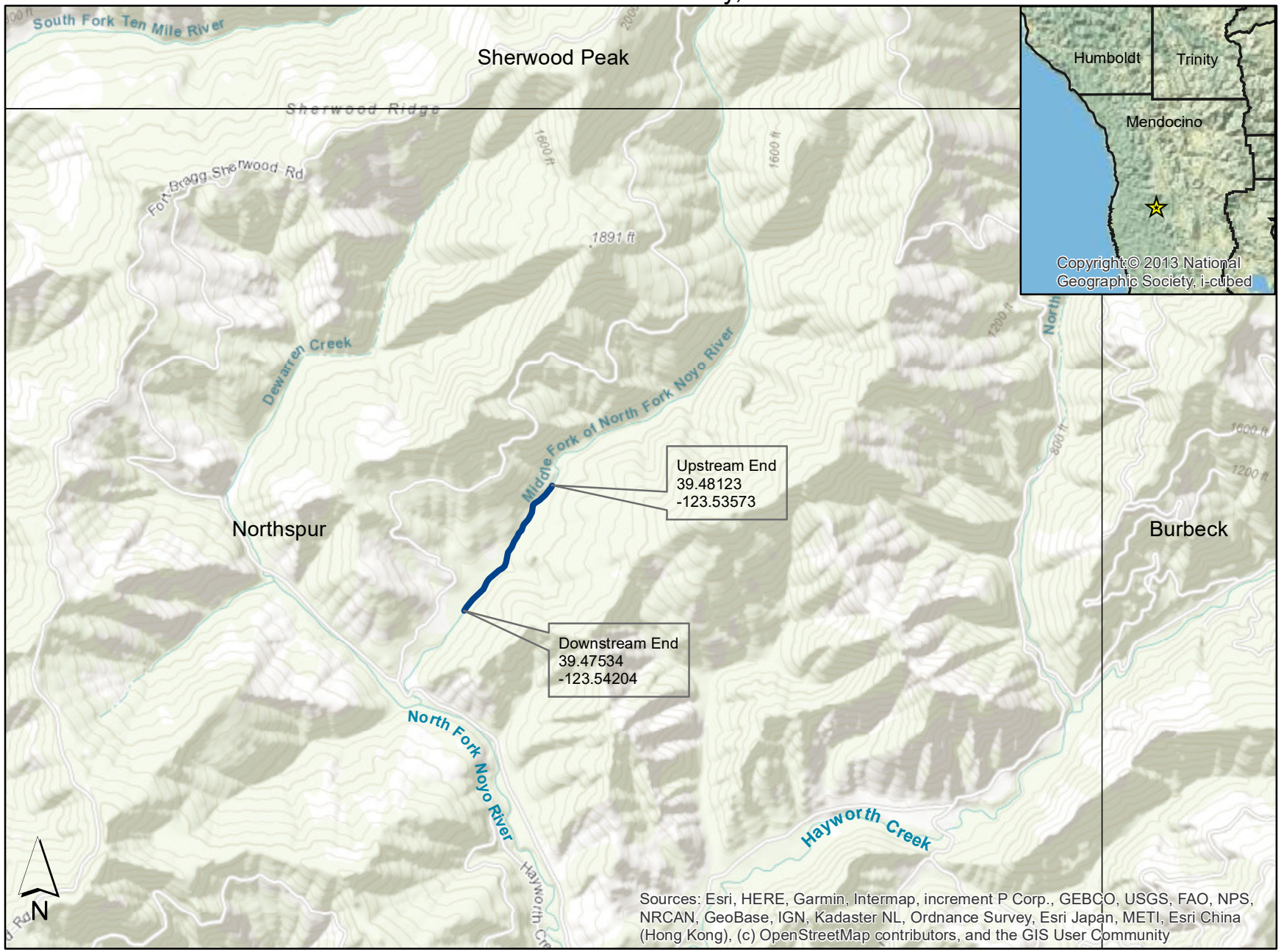
Site 1: Dewarren Creek Watershed Map
California Conservation Corps
Dewarren Creek, Northspur Quad
Mendocino County, CA



Project Reach

0 0.15 0.3 0.6 Miles

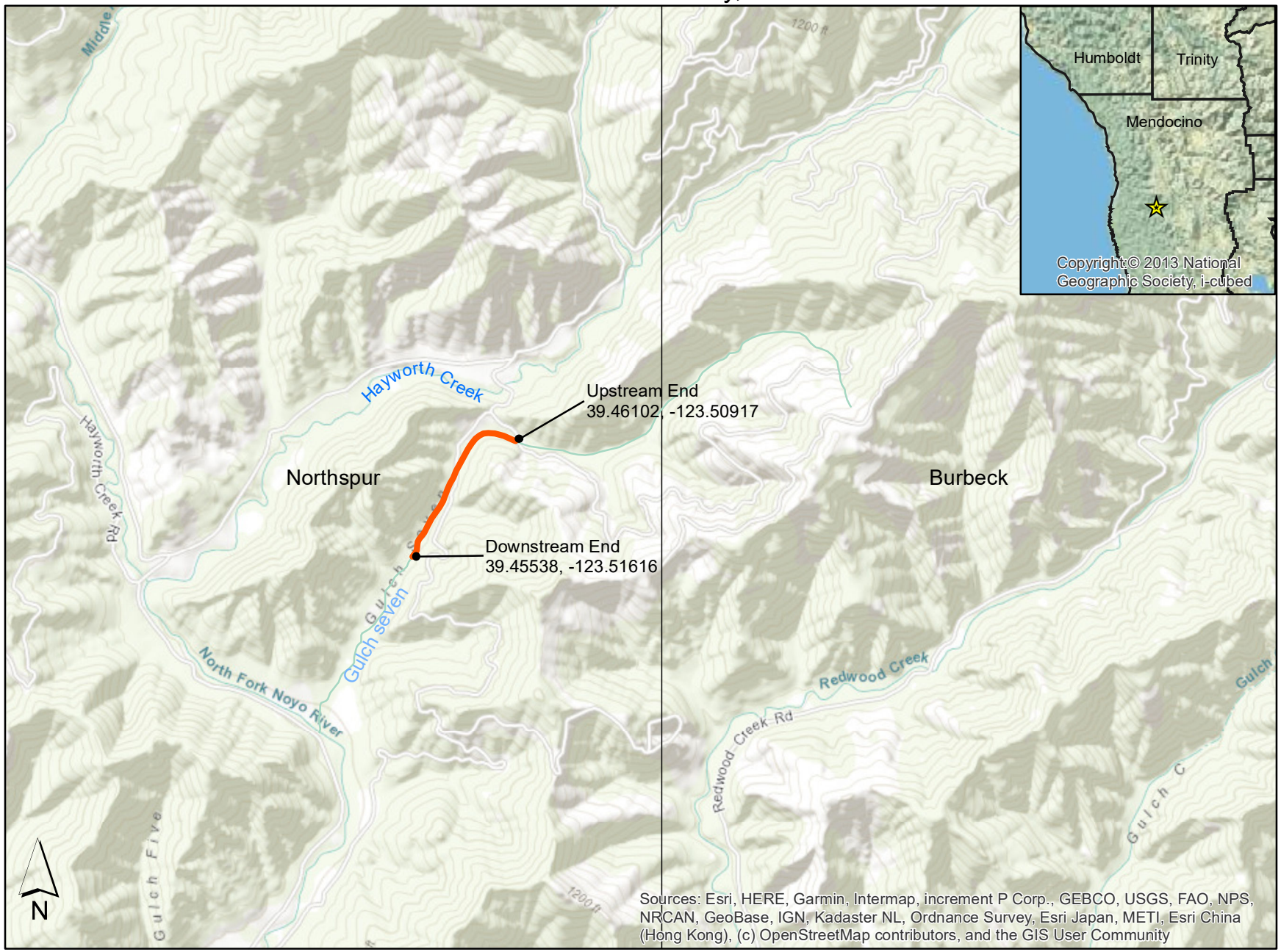
Site 2: Middle Fork of North Fork Noyo River Watershed Map
California Conservation Corps
Middle Fork of North Fork Noyo River, Northspur Quad
Mendocino County, CA



Project Reach - Middle Fork of North Fork Noyo River

0 0.25 0.5 1 Miles

Site 3: Gulch Seven Watershed Map
California Conservation Corps
Gulch Seven, Northspur Quad
Mendocino County, CA



Gulch Seven Project Reach

0 0.25 0.5 1 Miles

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Northspur (3912345) OR Comptche (3912335) OR Mathison Peak (3912336) OR Noyo Hill (3912346) OR Dutchmans Knoll (3912356) OR Sherwood Peak (3912355) OR Longvale (3912354) OR Burbeck (3912344) OR Greenough Ridge (3912334))

Possible species within the Northspur and surrounding quads for 1723402 - North Fork Noyo River Tributary Complex - Large Wood Habitat Enhancement Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Alisma gramineum grass alisma	PMALI01010	None	None	G5	S3	2B.2
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos nummularia ssp. mendocinoensis pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Atractelmis wawona Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Carex californica California sedge	PMCYP032D0	None	None	G5	S2	2B.2
Carex lenticularis var. limnophila lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Entosphenus tridentatus Pacific lamprey	AFBAA02100	None	None	G4	S4	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Hesperolinon adenophyllum glandular western flax	PDLIN01010	None	None	G2G3	S2S3	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Lupinus milo-bakeri Milo Baker's lupine	PDFAB2B4E0	None	Threatened	G1Q	S1	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1
Mendocino Pygmy Cypress Forest Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Packera bolanderi var. bolanderi seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Pinus contorta ssp. bolanderi Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Speyeria zerene behrensii Behren's silverspot butterfly	IILEPJ6088	Endangered	None	G5T1	S1	
Sphagnum Bog Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Usnea longissima	NLLEC5P420	None	None	G4	S4	4.2
Methuselah's beard lichen						

Record Count: 61

Sebbas Creek Off Channel Habitat Planning Project | 2020

Introduction:

The proposed project area is one of the few places identified within the Sebbas watershed that exhibits potential high quality aquatic off-channel habitat adjacent to a coho bearing reach. Currently, salmonid access from Sebbas Creek into the oxbow channel is likely limited to the highest of high flow flood events, which is supported by the thick vegetation within the entrance and exit of the oxbow which does not show any signs of recent flooding. Regionally, recently accomplished projects similar in nature to this one have demonstrated benefits to coho salmon.

The goal of this project is to determine the most suitable options to expand or enhance the existing habitat within this stream reach of Sebbas Creek based on a detailed biologic and geomorphic characterization of the project area. The proposed project will develop a 100% design and include a monitoring plan that would cover both biologic response as well as revegetation success. The plans will be ready for implementation upon completion of this project that when implemented, will expand the available habitat for juvenile coho salmon in the area. Implementation of the design plans will accomplish Recovery Plan for Southern Oregon/Northern California Coast Coho Salmon (NOAA Final Sept 2014) SONCC task SFER.2.2.3.2: Identify potential sites to create refugia habitats.

The Eel River Watershed Improvement Group (Permitee) shall not proceed until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual Volume I, Part VI.* (https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

Design off-channel habitat for high flow refugia and winter rearing at an abandoned oxbow site on Sebbas Creek based on detailed characterization of existing biologic and geomorphic conditions. Determine site suitability, potential locations, and configuration for LWD cover structures to be added for additional habitat complexity. Complete 100% designs including construction methods, equipment access points, a detailed biological monitoring plan and cost estimates.

Project Description:

Location:

The site is located west of Piercy, in Mendocino County, CA at Township 05 South, Range 03 East, Section 31. The abandoned oxbow is on Sebbas Creek, tributary to Indian Creek, tributary to the South Fork Eel River in remote timberlands owned by Lost Coast Forestlands (LCF). The project site is on the left bank of Sebbas Creek approximately one (1) mile from its confluence with Indian Creek. Sebbas Creek confluences with Indian Creek approximately seven

(7) miles from the Indian/SF Eel confluence. The center of the Project coordinates are: 39.97587 North latitude and -123.88725 West longitude.

Project Set Up:

Permittee Personnel:
Executive Director: Tasks 1 & 6. Will draft invoices and progress reports, track project progress, communicate with partners, secure agreements, review/verify subcontractor invoicing, write reports and magage the grant.

Project Manager: Tasks 1, 2, & 6. Will oversee fieldwork and visit site as necessary. Will provide support to Executive Director.

Subcontractor Pacific Watershed Associates (PWA) Personnel:
Principal Geologist: Tasks 1, 2, 3, 4, 5 & 6. Provide technical expertise in developing design options, geologic and geomorphic investigations, and draft and final work plan review, editing and guidance for project scientists and engineer. Also in charge of final report technical editing and review.

Senior Engineer: Tasks 1, 2, 3, 4 & 5. Lead scientist for conducting site characterization, consideration of design options, hydrologic and hydraulic analyses, development of a grading plan, design of in-stream structures for geomorphic and habitat purposes, development of a comprehensive erosion control and revegetation plan, and developing a cost estimate that includes all plans and specifications for construction of the project.

Staff Engineer: Tasks 1, 2, 3, 4, & 5. Support for Senior Engineer for conducting site characterization, consideration of design options, hydrologic and hydraulic analyses, development of a grading plan, design of in-stream structures for geomorphic and habitat purposes, development of a comprehensive erosion control and revegetation plan, and developing a cost estimate that includes all plans and specifications for construction of the project.

Associate Scientist (Project Geologist): Tasks 1, 2, 3, & 4. In overall responsible charge of geologic and geomorphic characterization, Wolman pebble counts, well installations and characterization of subsurface hydrogeological conditions with the Project Engineer. Provides input on complex geologic and geomorphic issues. Provides input on instream structures for geomorphic and habitat purposes. Collaborates with the Senior Engineer on reporting. Ensures compliance with Geologist and Geophysicist Act (California Business and Professions Code 7800).

Watershed Scientist: Task 2. Provides project support by working with the engineer and geologist to collect field data, conduct field investigations and process data.

Aquatic Biologist: Tasks 1, 2, 3, 4, & 5. Responsible for the instream habitat evaluations, identifying current limiting factors, and surveys for species identification and validation within the project study reach. Provides species specific age biological input for the project design and instream habitat improvement structures working with the Project Engineers and Geologists. Develops the fish habitat and utilization monitoring study design for the final design and implementation of the final design.

Botanical Ecologist/Botanist: Tasks 2, & 5. Responsible for conducting botanical surveys to identify rare plants and to classify the riparian vegetation community within the project area and any areas proposed to be disturbed in the final design. Develops arare plant survey report, a riparian revegetation plan, and a post - implementation revegetation and monitoring plan for the final design.

GIS/CAD Drafting Staff: Tasks 2, 3, 4 & 5. Provides project support through technical drafting of design plans, development of GIS/CAD maps and products, and produces field maps in support of site characterization.

Clerical Staff: All Tasks. Provides clerical support to Subcontractor PWA.

Materials:

Piezometer/monitoring well materials will include one or two inch diameter blank and slotted poly-vinyl- chloride well casing, clean kiln-dried #30 sand suitable for use in a potable water well, non-shrinking grout for an annular seal at the top of the well, 1½ polycarbonate core barrel sleeves, and well caps. Local organic materials will be used to camouflage the casings to reduce the chance of tampering and improve the site aesthetics.

Field supplies procured by PWA subcontractor will include t-posts with graduated markings or standard staff plates, batteries for time lapse cameras, total station rental, rental of pressure transducers and data loggers for hydrologic and hydraulic analysis, paper towels to clean the instruments, 100 meter tape, stadia rod, underwater camera, waders/wading boots/dry suit/mask and snorkel, flagging, and stakes. Office and field supplies will be used to complete the project include: photographic supplies, field maps, mylar overlays for field maps, flagging, photo duplication for final reports, copying/binding for final reports, report maps, phone, fax, email, and postage. Mapping and design drawings.

Permittee Printing Cost & Office Supplies: Necesary to print out design plans and BOD report, necessary for reporting activties.

Permittee Mileage: For travel to and from project site, will adhere to California State Reimbursement Rates.

Tasks & Deliverables:

Task 1: Meetings and Project Management:

Deliverables: Subcontractor Agreements, Access Agreements, Invoices, Invoice Progress Reports and Meeting Notes.
Start Date: 04/15/2021
End Date: 03/31/2024

Subtask 1.1 Project Management:

Description of Activities: Project management includes grant management, contracting oversight and administration, scheduling, landowner and agency communication, landowner access agreements, subcontracting, ongoing coordination with the various stakeholders and members of the project design team, preparing invoices and progress reports, tracking project costs and accomplishments and assisting with final report preparation. All reporting and billing will be pursuant to grant and regulatory guidelines.

Subtask 1.2 Project Scoping Meeting:

Description of Activities: A project meeting will be held with a technical review team composed of LCF, PWA, CDFW, Permittee and other potential stakeholders. This meeting will occur after completion of the project survey and initiation of water level data monitoring within the project area. The meeting is designed to help identify or refine project objectives and constraints, discuss different potential design options to be considered, and agree on the approach that should be used in developing the 30% design.

Subtask 1.3 30% Design Review Meeting:

Description of Activities: A project meeting will be held with the technical review team and other potential stakeholders to review the conceptual level design developed by the project team along with the findings from the site characterizations and supporting analysis.

Subtask 1.4 Additional Meetings:

Description of Activities: It is assumed that there will be up to two additional in-person meetings necessary between 30% and 100% design iteration. These meetings will review the 65% and 90% designs with the technical review team. These meetings will include other stakeholders that have provided input throughout the design process.

Task 2: Site Characterizations:

Deliverables: Draft topographic base map of the project area with 1' contours. Draft geologic report to be incorporated into the basis of design report including: subsurface geologic and hydrogeological conditions, a geomorphic map of the project area, water-level monitoring results and their constraints on the project design, an assessment of aquatic biological conditions to inform engineered designs, a plant and wetland survey, to be incorporated into the BOD to provide avoidance measures and monitoring plan. An analysis of frequency and duration of various creek stages under expected hydrologic and climactic conditions to be included in the basis of design report.
Start Date: 06/15/2021
End Date: 11/15/2022

Subtask 2.1 Subsurface investigation:

Description of Activities: To support engineering design, a limited number (up to six) of hand-augured or gouge core borings will be completed to characterize the geology and hydrogeological conditions along the preferred off-channel pond alignment(s) and/or between the existing channel and mainstem of Sebbas Creek. Where appropriate, piezometers and/or monitoring wells will be installed in the test pits and boreholes so that the groundwater levels adjacent to the existing channel and potential off-channel pond(s) can be monitored and evaluated for their hydrogeological connectivity to the mainstem channel and to determine summertime water table elevations. For the purposes of this study, a minimum of four shallow (4-10 ft. BGS) monitoring wells will be installed where appropriate and as field conditions dictate.

Subtask 2.2 Topographic Surveying and Geomorphic Mapping:

Description of Activities: A topographic survey of the project site will be conducted. The survey will capture topography of the ground within the immediate vicinity of the potential off-channel habitat proximal to and within the abandoned oxbow. The survey will also map potential construction access routes and map large trees (>18in DBH) within the potential work area. During the surveying task, field mapping will be used to characterize existing geomorphic conditions within the project study area. This will include identification of stream morphology channel features in Sebbas Creek as well as any small channels feeding into the oxbow. Mapping will also include the adjacent hillside where appropriate and informative. Finally, Wolman pebble counts will be employed in two locations on the mainstem of Sebbas Creek to characterize the bed substrate. Assumed horizontal and vertical datums will be used. Control points will be established in the project area for use during the future implementation phase of the project. The topographic survey data will be reduced and a base map and surface (DTM) will be produced in AutoCAD Civil 3D. The base map will

have a one-foot contour interval in topographically mapped areas. Line work will be used to denote mapped areas.

Subtask 2.3 Water Level and Groundwater Monitoring:

Description of Activities: Water level fluctuations will be monitored in Sebbas Creek concurrent with groundwater well monitoring for at least one full 12-month season. Water level measurements will be collected with calibrated pressure transducers and data loggers. In wells where water levels will not be measured with pressure transducers, PWA technical staff will manually measure water levels such that the water levels in each well can be correlated to each other during the rising and falling limbs of the hydrograph during varying discharge events throughout the first year of the project when physically possible. Calibration measurements will occur on average at least quarterly, and more frequently as necessary to capture specific storm events.

Subtask 2.4 Frequency and Duration Analysis of Water Levels:

Description of Activities: Collected water levels at the mouth of the oxbow will be correlated with water levels at proximal USGS stream gauges. Based on these observations we will develop a unit hydrograph specific to the Sebbas Creek catchment. Developing this relationship will allow us to use the historical long-term stage record to predict the stage at the mouth of the oxbow. With this information, estimated frequency and duration curves will be constructed for water levels at the mouth of the channel. These will be used to evaluate inundation levels into the oxbow on a seasonal basis and evaluate the hydrologic stage- discharge relationship between the project oxbow channel and Sebbas Creek. Initial analysis will be conducted by detrending the available LiDAR dataset within one quarter mile of the project site. This will provide a first cut bathtub model of inundation and identify other proximal off-channel habitat enhancement locations proximal to the project site. Within and adjacent to the project area, hydraulic and/or inundation modeling will be completed using HECRAS or compatible modeling software. This analysis will help guide the design process.

Subtask 2.5 Assessment of Existing Aquatic Habitat Conditions:

Description of Activities: Along with the geomorphic mapping, a biologic assessment will be conducted by PWA to evaluate the existing aquatic habitat proximal to the project area. The team will conduct a level II habitat inventory, spawner surveys, and snorkel surveys to determine the use levels and habitat needs within the project area and to develop an aquatic biology monitoring plan. Additionally, the PWA NR Specialists will conduct plant and wetland surveys to develop avoidance measures and monitoring plans associated with the final design.

Task 3 Preliminary Design (30% Submittal):

Deliverables: Topographic base map site with 1-foot contours, Preliminary (30%) Design Drawings and Construction Cost Estimate Plans, A Basis of Design report to accompany the proposed engineering designs.
Start Date: 11/15/2022
End Date: 06/15/2023

Subtask 3.1 Consideration of Design Options:

Description of Activities: Following site investigations and characterizations, potential design options will be considered. Consideration will be given to various factors, including frequency, timing, and ease of access into and out of the channel for juvenile salmonids, impacts to existing habitat, geomorphic stability, self-sustainability, landowner constraints, environmental disturbance, and overall project cost and complexity. Considered options will be presented to the stakeholders, along with a summary of findings from the site characterization work performed in Task 2. Through stakeholder input and review, a preferred design option will be selected. If upon completion of the site investigations and characterizations no feasible design alternatives are identified, a recommendation will be made to terminate further design work.

Subtask 3.2 Design Development and Analysis:

Description of Activities: Preliminary engineering designs (30%) will be developed for the selected design option. Design development will include establishing the general location of any activities and project elements, a summary of the alternatives analysis, preliminary design elevations for the pond(s) and or channel(s), preliminary design of wood structures and anchoring techniques in the channel(s) and or pond(s)/alcove(s), an analysis of identified project constraints, and a general grading and excavation plan for proposed improvements.

Subtask 3.3 Schematic Drawings:

Description of Activities: Schematic drawings will be developed for the selected design and shall indicate the proposed alignment and project footprint in plan. Typical cross sections and a profile will also be developed, where applicable. The drawings will be of sufficient detail to adequately convey the design concept.

A preliminary level estimate of construction cost will be developed. The estimate will include a 25% contingency to account for uncertainties associated with the project due to the preliminary stage of design and price volatility.

Subtask 3.4 Draft Basis of Design Memorandum:

Description of Activities: A Basis of Design Memorandum (BDM) will be prepared that summarizes activities and findings to-date, project goals, objectives and constraints, design options considered, justification for the selected design option, and a description of the proposed project. Supporting data and analysis will be provided as attachments.

Task 4 Intermediate Design (65% Submittal):

Deliverables: Intermediate (65%) Plan Set and Construction Cost Estimate. Cost estimate in electronic PDF format and MS Excel spreadsheet compatible format. Plans in electronic PDF format. Draft (65%) PS&E package. Cost estimate in electronic PDF format and MS Excel spreadsheet compatible format. Plans in electronic PDF format.
Start Date: 06/15/2023
End Date: 09/15/2023

Description of Activities: Following receipt of review comments on the preliminary design submittal (30%), the designs will be forwarded to the 65% completion phase.

Subtask 4.1 Design Development:

Description of Activities: The project design will be further developed and refined to a 65% level of completion. Input from the stakeholders will be incorporated into development of the design, as appropriate. Design development includes detailed plan views and profiles of any improvements, finalizing project layout and grading, developing project details, and performing additional 2D hydrologic/hydraulic analysis, if needed. Other design development activities may include developing large wood placement and anchoring details and construction access grading.

Subtask 4.2 Prepare 65% Design Plans:

Description of Activities: The 65% plan sets will be prepared in AutoCAD Civil 3D and provided in 11 x 17 format in both electronic and hard copy. The preliminary plan set will include: Title Sheet; General and Technical Notes; Existing and proposed condition plan views showing limits of disturbance, new construction, and limits of proposed grading; Profiles along construction alignment: Typical and Detail Drawings, Water Management Plan, Erosion and Sediment Control Plan, Sequence of Construction. An intermediate level estimate of construction cost will be developed. The estimate will include a 20% contingency to account for unforeseen conditions encountered during construction and cost uncertainties.

Subtask 4.3 Prepare Final Basis of Design Report:

Description of Activities: The draft Basis of Design Memorandum (from Task 3.4) will be updated based on comments and changes made to the preliminary design submittal.

Task 5 Develop Draft (90%) and Final (100%) Design Submittal:

Description of Activities: Following review and receipt of written and verbal comments on the 65% submittal, the plan set, specifications, and engineers cost estimate (PS&E) will be incorporated into the draft (90%) plans and then again for the final (100%) submittal. These plans will include replanting and monitoring plans associated with the design. Minor changes to the design will be made based on stakeholder comments on the 65% submittal. The design drawings will include: Title sheet; Symbol and abbreviation sheet; Existing and proposed condition plan view showing limits of proposed grading; Typical proposed cross sections with dimensions; Detailed grading cross sections; Construction details and material specifications; Construction access plan and sequence of construction; Water management plan; Erosion and sediment control plan Technical specifications as notes; The plans will be printed full size (11x17) sheets and provided in PDF format.

Deliverables: Draft and Final Design Report in electronic PDF format and two (2) hardcopies.
Start Date: 09/15/2023
End Date: 02/15/2024

Task 6 Project Reporting:

Description of Activities: PWA and Permittee staff will write and deliver yearly annual reports, and a draft and final report.

Deliverables: Annual reports, draft final report in electronic format, final report in electronic and hard copy formats.
Start Date: 03/01/2022
End Date: 03/31/2024

Additional Requirements:

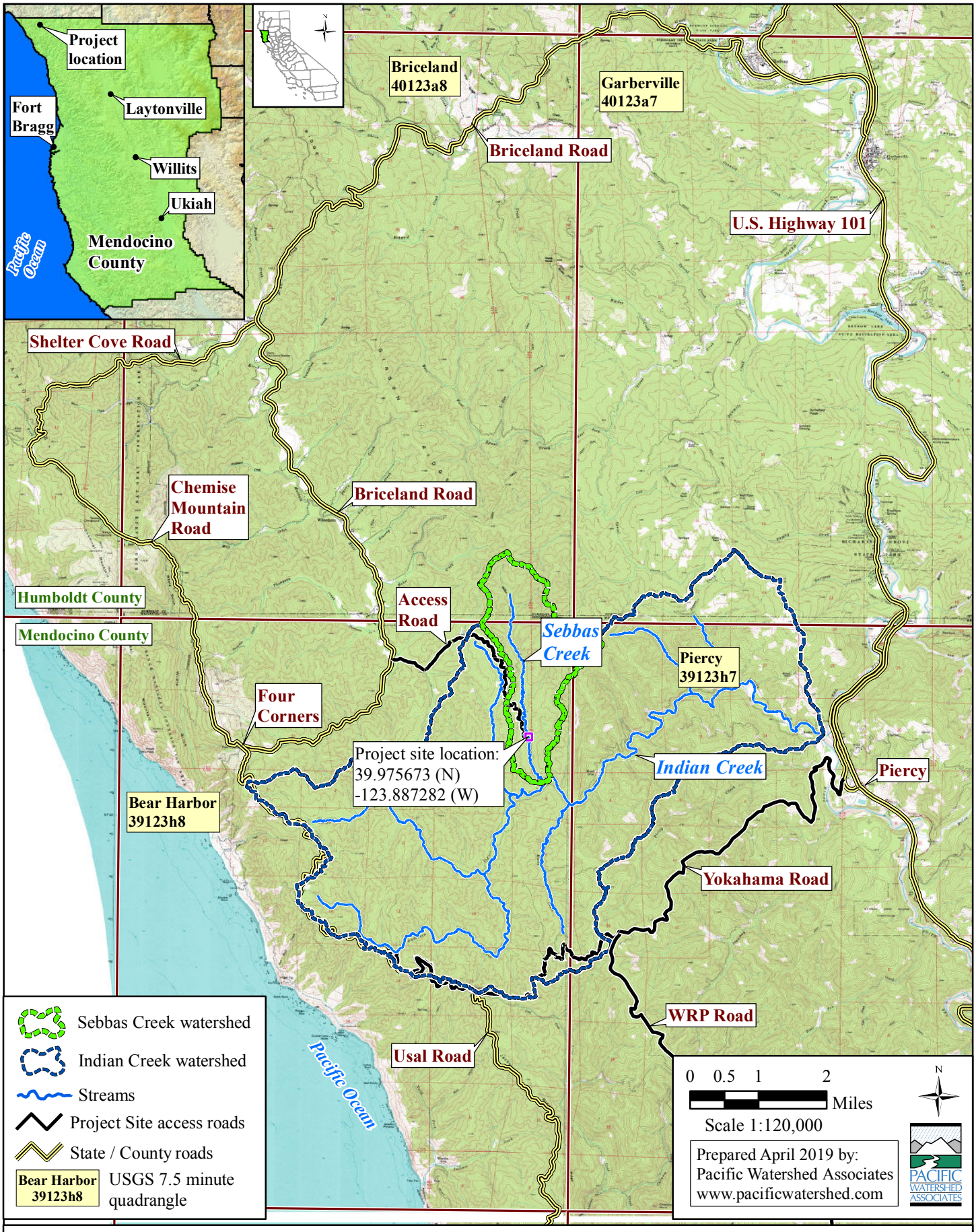
The Permitee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the United States Army Corp of Engineers (USACE) Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife (CDFW). No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil

absorbent pads, tarpaulins) will be used when refueling equipment. All equipment will be removed from the streambed and flood plain areas at the end of each workday.

All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the CDFW *Aquatic Invasive Species Decontamination Protocol*.

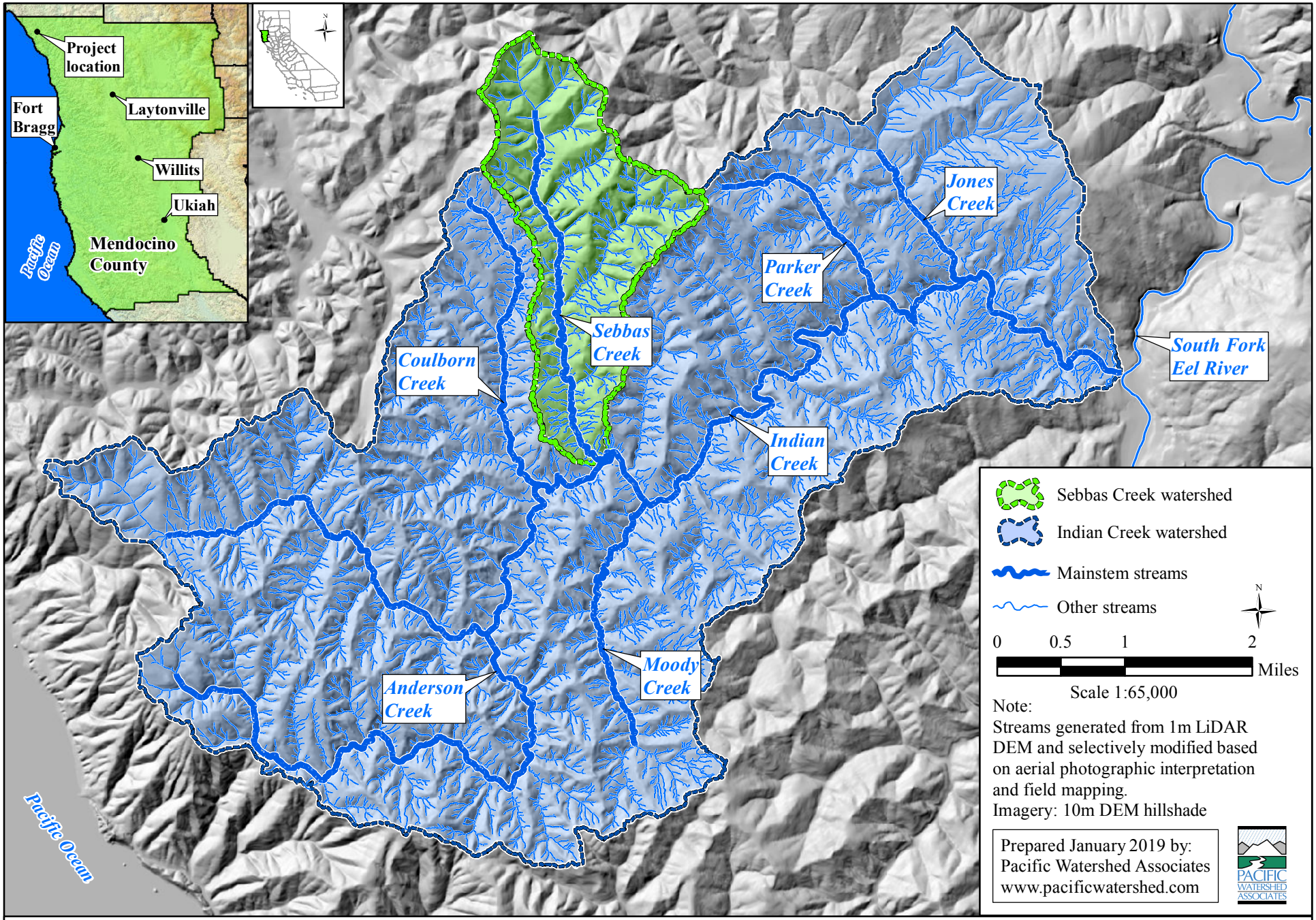
During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*, Volume I and Volume II.



Map 1. Project location topographic map for the Sebbas Creek Off-Channel Design Project, Mendocino County, California. Grantee: Eel River Watershed Improvement Group

Grantee: Eel River Watershed Improvement Group



Map 2. Watershed map for the Sebbas Creek Off-Channel Design Project, Mendocino County, California.
Grantee: Eel River Watershed Improvement Group

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Bear Harbor (3912388) OR Mistake Point (3912378) OR Shelter Cove (4012411) OR Briceland (4012318) OR Garberville (4012317) OR Piercy (3912387) OR Hales Grove (3912377))

Possible species within the Bear Harbor and surrounding quads for 1723410 - Sebbas Creek Off Channel Habitat Planning Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Carex arcta northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Montia howellii Howell's montia	PDPOR05070	None	None	G3G4	S2	2B.2
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Thermopsis robusta	PDFAB3Z0D0	None	None	G2	S2	1B.2
robust false lupine						
Usnea longissima	NLLEC5P420	None	None	G4	S4	4.2
Methuselah's beard lichen						

Record Count: 42

Coulborn and Sebbas Creeks Salmonid Habitat Assessment and Enhancement Planning and Design Project

2020

Introduction:

The Mattole Salmon Group (Permittee) will develop 100% constructible, engineered and non-engineered, plans and designs for wood loading in 6.2-miles of anadromous reaches of the Coulborn Creek and Sebbas Creek sub-watersheds. Both streams are coho salmon and steelhead trout bearing tributaries of the upper Indian Creek Watershed, one of the most prioritized watersheds in the South Fork Eel River Watershed. The plans will result in improved pool habitat and cover, rearing and spawning habitat, channel structure, hydraulic diversity, floodplain inundation, and restored fluvial geomorphic processes.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Stream Habitat Restoration Manual* (Vol. I, Section VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

This project will result in 100% design plans ready to implement along 6.2-miles of fish bearing stream in Coulborn and Sebbas Creeks. The end goal includes 100% designs for at least 190 constructed log jam features and four engineered designs utilizing Large Woody Material (LWM) in the four highest priority reaches. Development of 35%, 65%, and 100% engineered design plans will be based on hydraulic, biologic, and geomorphic characterization using a project team and technical advisory committee.

Project Description:

Location:

The project is located on Lost Coast Forestlands, LLC (LCF) property in the Indian Creek watershed located west of Piercy in northern Mendocino County. Both Sebbas Creek and Coulborn Creek are located roughly 7.7-miles upstream of the Indian Creek confluence with the South Fork Eel River. The center point of the project assessment area is 39.9745º north latitude, -123.8920º west longitude and is located on the Briceland and Bear Harbor 7.5 Minute U.S. Geological Survey (USGS) Quadrangle maps.

Coulborn and Sebbas Creeks Salmonid Habitat Assessment and Enhancement Planning and Design Project

2020

Project Set Up:

The project will be completed by a multidisciplinary team consisting of the Permittee, Pacific Watershed Associates, Inc (PWA), and the California Conservation Corps (CCC).

The Permittee will process invoices and vendor payments, grant tracking, reporting, perform periodic reviews of project progress, assist PWA in characterization and designs, conduct contracting oversight and administration, invoicing, scheduling, implementation oversight, landowner communications, selecting TAC members, coordinating TAC meetings, and agency and landowner communications. Upon final execution of the grant, and prior to receiving a final Notice to Proceed, Permittee will deliver the landowner access agreements and subcontracts. Elements of this task will continue throughout the life of the project.

Subcontractor PWA will lead assessments characterizing historic disturbances, biologic habitat and species utilization, geomorphology, riparian composition, hydrologic modeling, geomorphic mapping, risk analysis and examination of subsurface materials. Detailed topographic surveys will be conducted in at least four selected streams. Bankfull widths, hydraulic pinch points and a longitudinal profile through the project site will be surveyed to help evaluate and develop Digital Elevation Models (DEMs) and feature-specific design sketches. PWA will employ subsurface investigations and materials analysis to examine the depth to bedrock and to characterize the types and consistency of materials overlying the bedrock in the highest priority stream reaches. A hand auger will be utilized to pull core samples from the adjacent floodplain to help evaluate how the channel is carved into the underlying bedrock and to identify the current depth to groundwater.

Subcontractor CCC will brush and tree limbs to increase visibility for the topographic surveys. Exploratory test pits will be hand dug by the CCC and samples from each pit will be taken to a soils lab to determine soils texture, consistency, and composition analysis.

Materials:

Permittee's and PWA's office supplies include, but are not limited to, waterproof paper, printer toner, writing implements, Mylar overlay, plastic film laminate, laminator, large format maps.

PWA's field supplies include notebooks, maps, flagging, measuring tapes, tablets (rental), GPS devices, cameras, work trucks, first aid kits, cell booster (for communications remote in no-cell areas), waders, total station, hip chain, stadia rod, kick-net, (personal waders/boots/dry suit/mask and snorkel), laser distance measurer, brushing tools, shovels, hand auger, current meter, pressure transducers (rental), ambient pressure gage (rental), staff plates, construction materials for stream gaging stations.

CCC field supplies will include clippers, loppers, and shovels.

Tasks:

Task 1. Topographic Surveys and Water Level Monitoring:
PWA will conduct topographic surveys with a total station in at least four selected, highest priority stream reaches of Coulborn and Sebbas Creeks (1-mile total) using a total station. These surveys will characterize the topography and pool bathymetry of the channel, channel thalweg profile, riffle crests, channel banks and edges, high water marks, and floodplains in the high priority reaches. Permanent benchmarks will be established outside of any potential disturbance areas. Coverage will focus on thalweg profile and cross sections to allow for detailed hydraulic modeling. Results will be integrated with existing LiDAR data to produce a topographic base map and final digital terrain model (DTM) will be used for hydraulic modeling, geomorphic mapping, and feasibility analysis of proposed LWM structures. Brush and tree limbs that limit visibility for the topographic surveys will be brushed and trimmed by the California Conservation Corps. (CCC) stream habitat restoration group before the surveys are conducted.

Task 2. Hydraulic Modeling:
PWA will conduct hydraulic modeling within the four selected, highest priority stream reaches of Coulborn and Sebbas Creeks and will be based on stream flow measurements and modeled runoff from the most proximal relevant stream and rainfall gauges (USGS StreamStats). PWA will develop a steady-state, 2-D, HEC-RAS model to simulate water surface elevations, stream flow velocities, and shear stresses under several discharge conditions. The model will be used to estimate forces that will act on proposed LWM designs and evaluate predicted water surface elevations and floodplain inundation frequencies after construction of any proposed LWM features in the selected stream reaches. The hydraulic model will be calibrated by installing a staff plate, pressure transducer and ambient air pressure/temperature gauge at each of the selected stream reaches. The empirical data from the transducer will be used to verify and adjust the modeling results.

Task 3. Soil Analysis:
This task will be conducted to characterize the existing fluvial geomorphic/biologic conditions which ultimately provide the project team with the information needed to determine the location and construction specifications of the specific feature designs. This information will be used to quantitatively document existing conditions within the project area and focuses on field mapping, geologic and geomorphic evaluations, basemap preparations, and analysis needed to understand the project reach and anticipated response to placement of nonengineered and engineered features. Work will also include identification of site features that may affect risk associated with engineered installations. PWA will conduct subsurface investigations and materials analysis to examine the depth to bedrock and characterize the types and consistency of materials overlying the bedrock in the highest priority stream reaches. Using the CCC, exploratory test pits will be hand dug in at least four selected and prioritized stream reaches in Coulborn and Sebbas Creeks and samples from each pit will be assessed for soils texture, consistency, and composition analysis. PWA will use a hand auger to investigate and sample floodplain areas in order characterize and evaluate engineering properties of bed and bank materials for the application of bank-supported design components.

Deliverables:

Task 1. Topographic Surveys and Water Level Monitoring:
Integrated LiDAR and total station digital terrain model that can be used for 2-D hydrologic modeling, field mapping, hydrologic rating curve, and hydrograph, and will inform possible designs.

Task 2. Hydraulic Modeling:
HEC-RAS output maps of the selected project reach showing modeling results under several discharge conditions and structure designs, including existing conditions. Summary of hydrologic conditions within the selected project reaches.

Task 3. Soil Analysis:
Depth of underlying bedrock in relation to channel alignment, consistency of subsurface materials in lab report, depth to groundwater, mapped locations, and elevations.

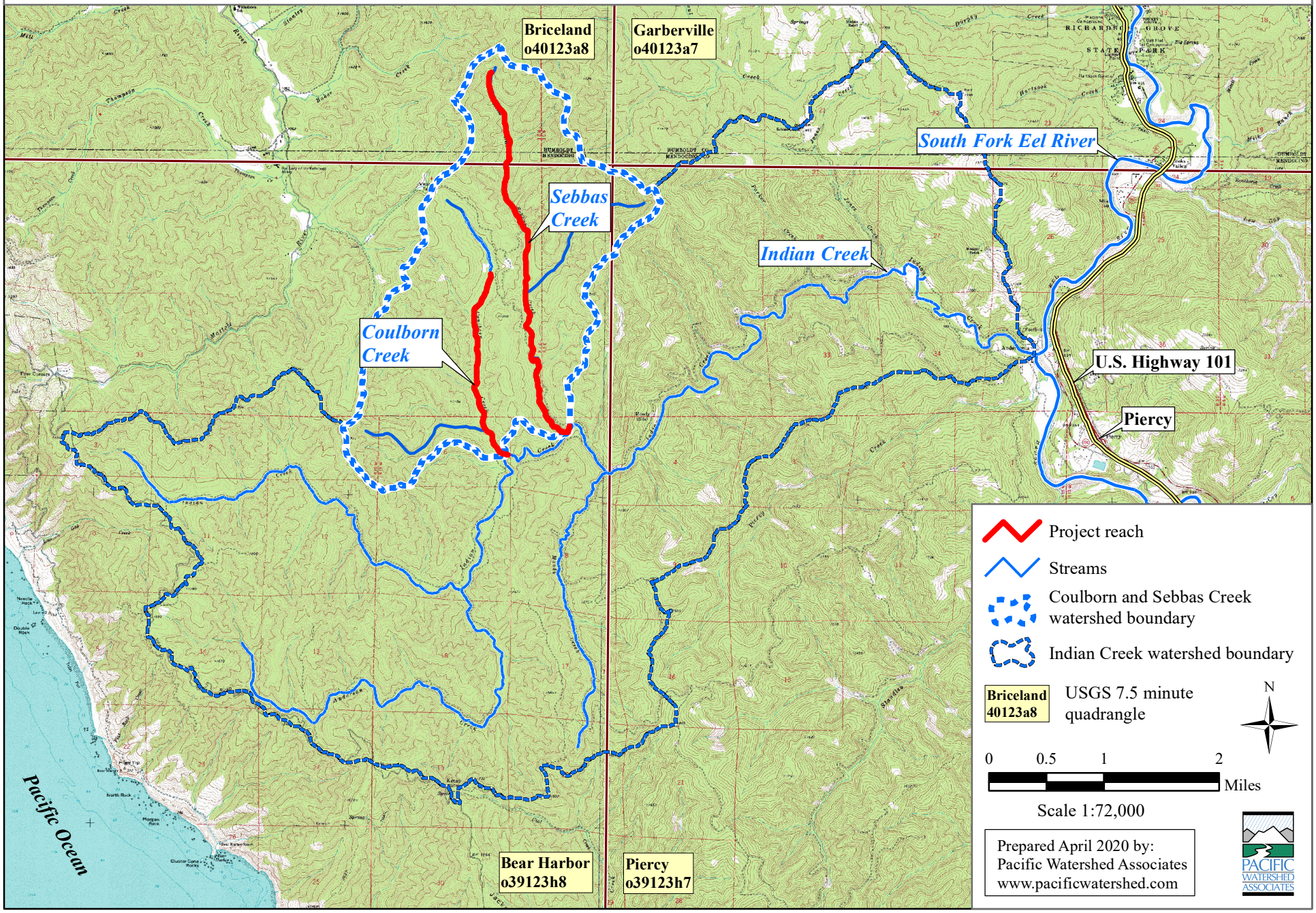
Timelines:

Task 1. Topographic Surveys and Water Level Monitoring. September 1, 2021 to May 31, 2022.

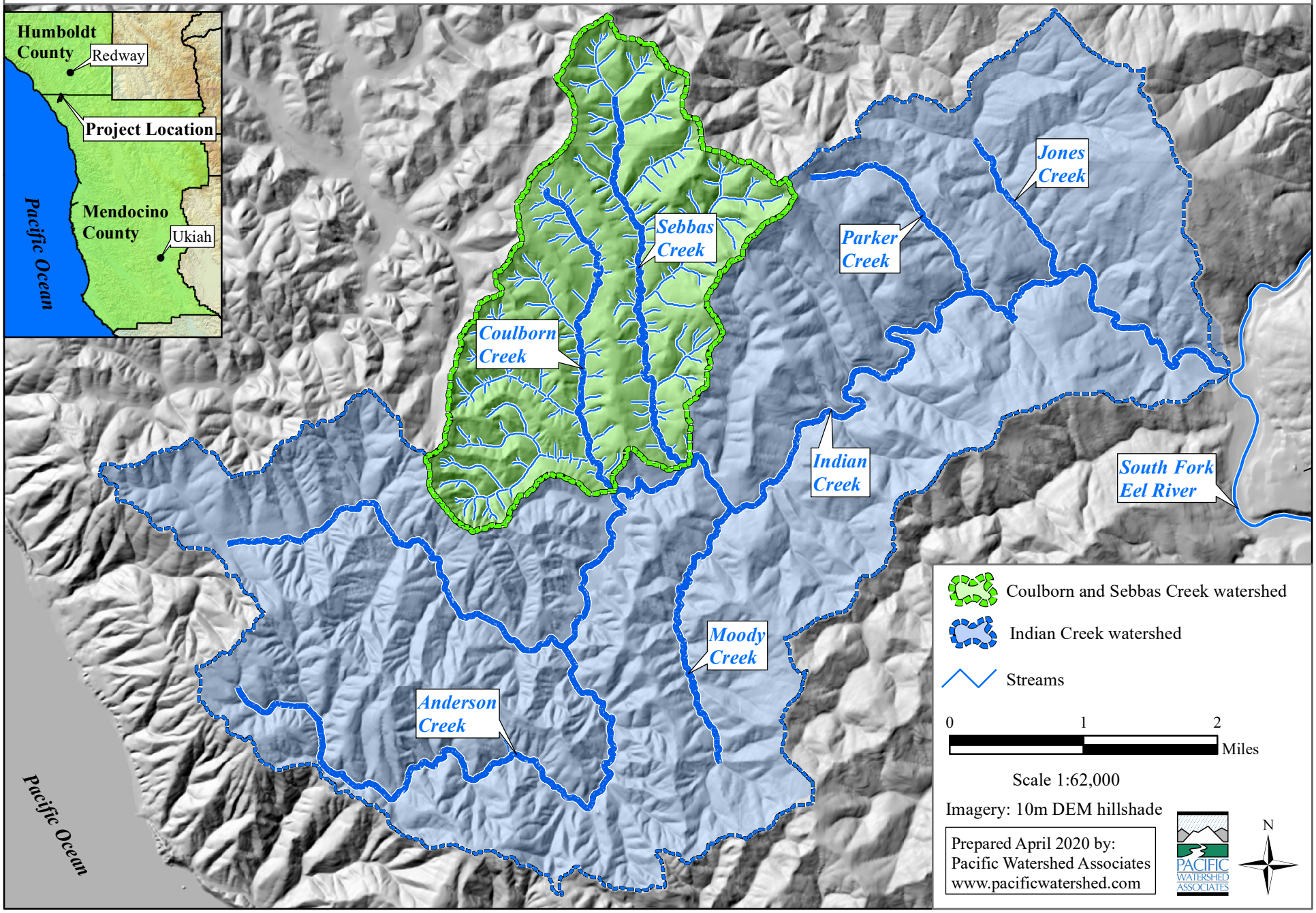
Task 2. Hydraulic Modeling. June 1, 2022 to October 15, 2022.

Task 3. Soil Analysis: June 1, 2021 to June 1, 2022.

Map 1. Project Location Topographic Map, Coulborn and Sebbas Creeks Wood Loading Design Project, Mendocino County, California. (Briceland and Bear Harbor USGS 7.5' quadrangles). Grantee: Mattole Salmon Group



Map 2. Watershed Map for Coulborn and Sebbas Creeks Wood Loading Design Project, Mendocino County, California.
Grantee: Mattole Salmon Group



Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Bear Harbor (3912388) OR Mistake Point (3912378) OR Shelter Cove (4012411) OR Briceland (4012318) OR Garberville (4012317) OR Piercy (3912387) OR Hales Grove (3912377))

Possible species within the Bear Harbor and surrounding quads for 1723435 - Coulborn and Sebbas Creeks Salmonid Habitat Assessment and Enhancement Planning and Design Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Carex arcta northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Montia howellii Howell's montia	PDPOR05070	None	None	G3G4	S2	2B.2
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Thermopsis robusta	PDFAB3Z0D0	None	None	G2	S2	1B.2
robust false lupine						
Usnea longissima	NLLEC5P420	None	None	G4	S4	4.2
Methuselah's beard lichen						

Record Count: 42

Middle Fork Cottaneva Creek Salmonid Habitat Project 2020

Introduction:

The Eel River Watershed Improvement Group (ERWIG) will add 30 instream structures containing 108 pieces of large wood (LW), including 63 key pieces and eight logs with root wads attached, along 0.8-miles (4,275 feet) of Middle Fork Cottaneva Creek. The Coastal Multispecies Recovery Plan (NMFS, 2016) identifies the watershed as impaired, but Middle Fork Cottaneva has high intrinsic potential. The 2008 CDFG Stream Inventory Report recommends “adding high quality complexity with woody cover in the pools” (CDFG, 2008).

This project will provide complex habitat for Coho and Chinook salmon as well as steelhead by increasing pool area and depth, increasing shelter complexity, sorting substrate for spawning habitat, increasing the frequency of floodplain and side channel inundation, aggrading the channel, capturing large and small wood, and providing velocity refugia during high flows. This project was designed to meet the CCC Recovery Plan of "good" with a target value of 7.3 key pieces of LW per 100 meters. A large wood survey through the project reach by ERWIG and the CCC found an average of 2.5 pieces of LW per 100 meters.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Volume I, Section VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

The objective of this project is to construct 30 LW features along 0.8-miles of Middle Fork Cottaneva Creek. These features will contain 108 pieces of LW, including 63 key pieces and eight logs with root wads attached. This project will increase habitat complexity, capture woody debris, provide velocity refugia, increase pool and flatwater shelter, increase pool and flatwater depths, sort substrate, and capture sediment.

Project Description:

Location:

This project is located on Middle Fork Cottaneva Creek, a tributary to Cottaneva Creek on the Hales Grove 7.5 minute US Geological Survey Quadrangle map. The project reach extends from the mouth of MF Cottaneva Creek to 0.8-miles upstream. Project coordinates are 39.7791º north latitude, -123.8134º west longitude at the center of the project work reach on Middle Fork Cottaneva Creek.

Project Set Up:

ERWIG:

- ERWIG Executive Director will assist with contract oversight and reporting.
- ERWIG Project Manager will assist with contract oversight, invoicing, and reporting and manage all aspects of project implementation including planting of trees and native plants.

Subcontractors:

- Edwards Excavation & Restoration, Licensed Timber Operator and Equipment Operator, will be responsible for falling trees as the source of LW and placing logs and boulders according to design plans when equipment access is available.
- California Conservation Corps (CCC) under supervision of the Conservationist 1, CCC corpsmembers will anchor the structures according to design and anchoring specifications.
- Paleontologist, TBD, will conduct paleontological research and prepare CEQA report.
- Archaeologist/Botanist, TBD, will conduct botanical and archaeological research and surveys, and prepare CEQA report.
- Registered Professional Forester (RPF) will make sure trees chosen for project use are appropriate.

Materials:

- Anchoring Materials: 1” rebar, 5/8” wire rope, 5/8” wire rope clamps, and nuts and plates (washers), Hilti epoxy glue. These items are used to anchor logs to live trees, boulders, bedrock and other logs.
- Tools: Portable band saws, wood drills, chain saws, and timber bits.
- Misc items: Small items such as chuck keys, allan wrenches, shear pins, hammers, socket wrenches and band saw blades.
- Erosion control materials: straw and native seed.
- Structure Materials: 108 logs will be donated by the landowner.
- Revegetation Materials: Trees and Native Plants will be used to plant areas disturbed by project activities and areas within the project reach that are lacking canopy cover.

Tasks:

Task 1: Project Management and Administration:
Grant oversight including invoicing and reporting will be conducted by Permittee Executive Director and Project Manager (Staff). Upon final execution of the Grant and prior to receiving a Notice to Proceed, Permittee shall deliver the following items to the CDFW Grant Manager:

1. Request to spend project funds in order to prepare for implementation (e.g., obtain permits, secure subcontracts, purchase supplies, apply for a

Streambed Alteration Agreement, etc.). Requests shall be made by email or telephone.

2. Access agreement that will be project specific and meet grant agreement requirements.
3. Subcontractor Agreements. A written copy of the subcontractor agreement shall be submitted to the CDFW Grant Manager. The subcontract shall include specific language which establishes the rights of the auditors of the State to examine the records of the subcontractor relative to the services and materials provided under the grant.
4. CEQA survey interim reports for archaeological and botanical surveys. Interim reports shall be delivered prior to receiving the notice to proceed, as part of the Notification of Lake or Streambed Alteration Application (LSAA) package. Final archaeological, botanical, and paleontological surveys shall be delivered prior to the end term date.
5. Send Grantor LSAA with a check for the most current permit fee. The Permittee shall notify the CDFW Grant Manager a minimum of 10 business days prior to the beginning of project implementation.

Task 2. CEQA Surveys and Research:
Archaeological, botanical, and paleontological subcontractors will conduct research and surveys within the project reach to fulfill CEQA requirements for FRGP. Interim survey reports will be delivered to CDFW Grant Manager prior to receiving a Notice to Proceed. Botanist will note wetland areas to avoid.

Task 3. Site Preparation:
The ERWIG Project Manager will finalize site specific designs based on channel morphology, equipment access, and large wood availability. They will submit designs for CDFW Project Manager approval. The ERWIG Project Manager will flag sites for wood selection, staging, and installation, clear brush as needed, and designate staging areas for wood along the project reach. A stream crossing across an unnamed tributary will be used to access features 1113-3364. The crossing will be built by placing logs parallel to the stream channel on both banks and a log laying parallel, but above the stream channel. This crossing will be used two times by an excavator (in and out) and approximately ten times by an ATV for excavator fueling. If there is water in the tributary during project implementation, ERWIG staff will set up fish exclusion fencing at the stream crossing. ERWIG staff will assist CDFW in fish and amphibian removal at the stream crossing. The crossing will be used for the shortest time frame possible, and for no more than two weeks, at which time ERWIG will remove the fencing and rehab the banks. Pre-project photos and metrics will be collected by ERWIG. Tools and materials will be purchased by ERWIG prior to the start of implementation and on an as-needed basis throughout the project.

Task 4. Large Wood Structure Construction:
Upon approval from the CDFW Project Manager, construction will begin on 30 LW features under the direction of the ERWIG Project Manager. Some features may involve cutting down or uprooting trees, which will be accomplished by the LTO or the licensed equipment operator, respectively. The RPF will sign off on all trees chosen for use in the project. The licensed equipment operator will place downed logs into the stream in accordance with design plans. When necessary, CCC Corpsmembers will move logs into position using a grip hoist come-along. Site construction, wood placement, and anchoring will be in accordance with the CDFW California Salmonid Stream Habitat Restoration Manual, Section VII (Flosi et al. 2010). The project will utilize living riparian trees as anchors by wedging the logs between them where feasible. CCC Corpsmembers will anchor the sites according to design and anchoring specifications. Corpsmembers will use one-inch threaded rebar to anchor logs to mature riparian trees and other logs. Holes will be drilled through the logs and their anchor trees using a wood drill, timber bit, and drill bit extensions when necessary. One-inch rebar will be inserted through the log and secured with nuts and washers. Corpsmembers will be supervised by a trained Conservationist 1 (C1) and the ERWIG Project Manager. Erosion control methods will be employed by the CCC as required at each structure and along equipment corridors to eliminate the possibility of sediment transport to the stream. To address concerns over invasive species this project will follow the ERWIG Aquatic Invasive Species Decontamination Protocol, which is in line with the CDFW Aquatic Invasive Species Decontamination Protocol. ERWIG staff will monitor water quality when necessary.

Task 5. Riparian Planting:
ERWIG staff will plant 100 redwoods and 100 native understory plants during the winter following project implementation. Trees will be planted areas lacking sufficient canopy cover or riparian vegetation and areas disturbed by project implementation.

Task 6. Post Project Photo & Data Collection:
Following implementation ERWIG will take post-project photos and quantitative implementation metrics will be collected which satisfy the Project Annual Progress Reports and Final Report.

Task 7. Reporting:
ERWIG Staff will write and deliver annual reports, a draft final report, and a final report.

Deliverables:

Task 1: Project Management and Administration:
1600 Permit, Subcontractor Agreements, Access Agreements, Invoices, Invoice Progress Reports.

Task 2. CEQA Surveys:
Interim and Final Survey Reports.

Task 3. Site Preparation:
Finalized design plans, flagged equipment access routes, pre-project photos and metrics.

Task 4. Large Wood Structure Construction:
Thirty LW structures made up of 108 logs. Water quality monitoring data sheets.

Task 5. Riparian Planting:
100 redwoods and 100 native understory plants planted along the project reach.

Task 6. Post Project Photo & Data Collection:
Post-project metrics and photos.

Task 7. Reporting:
Annual reports, draft final report in electronic format, final report in electronic and hard copy formats.

Timelines:

Task 1 Project Management and Administration. April 1, 2021 to April 30, 2023.

Task 2 CEQA Surveys and Research. April 1, 2021 to December 31, 2021.

Task 3. Site Preparation. June 14, 2021 to July 30, 2021.

Task 4. Large Wood Structure Construction. July 12, 2021 to October 31, 2021.

Task 5. Riparian Planting. December 1, 2021 to March 31, 2022.

Task 6. Post Project Photo & Data Collection. November 1, 2021 to March 31, 2022.

Task 7. Reporting. November 1, 20-21 to April 30, 2023.

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the California Department of Fish & Wildlife *Aquatic Invasive Species Decontamination Protocol*.

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

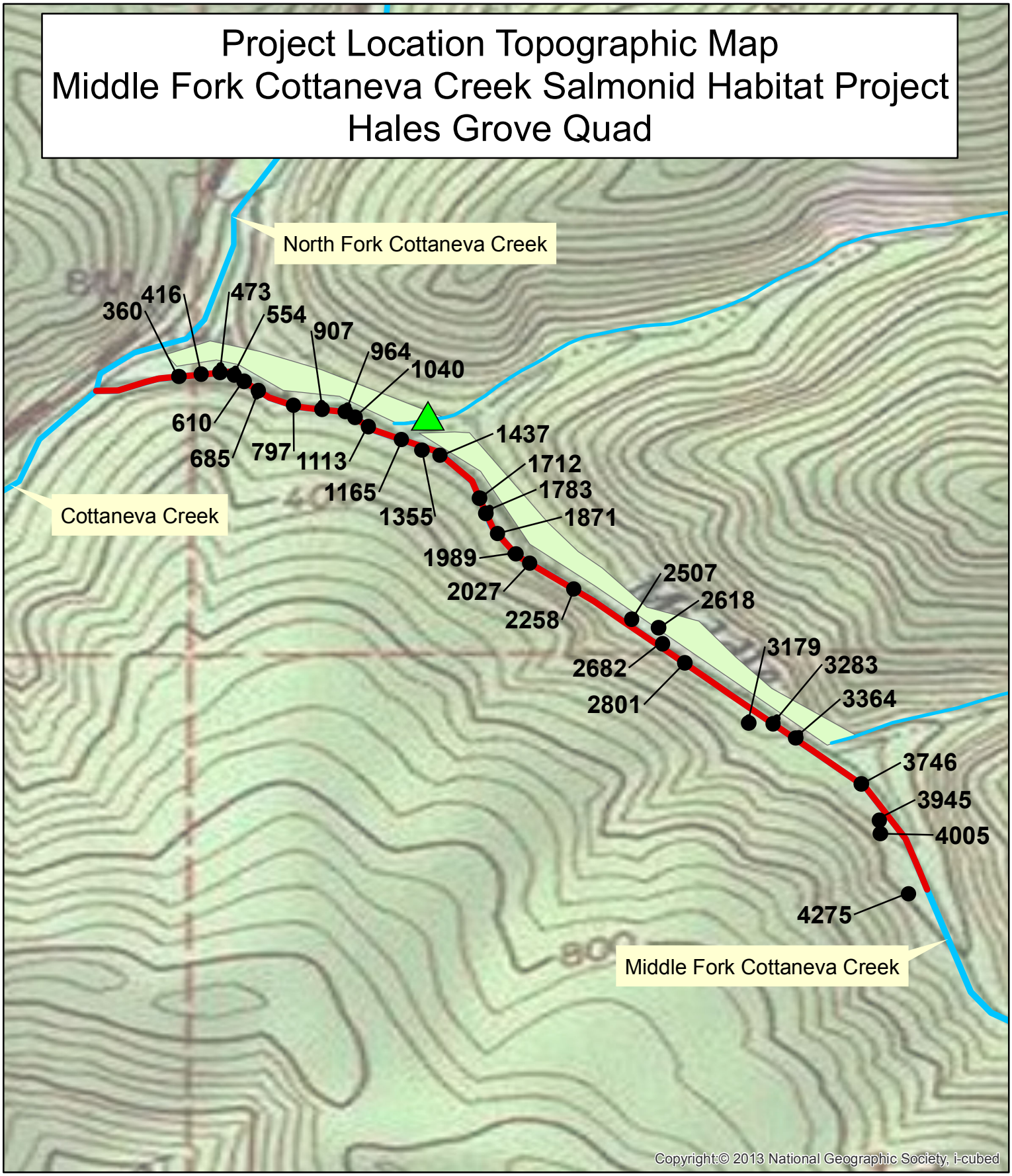
The Permittee shall notify the CDFW Project Manager a minimum of five working days before the project site is de-watered and the stream flow diverted. The notification will provide a reasonable time for CDFW personnel to oversee the implementation of the water diversion plan and the safe removal and relocation of salmonids and other fish life from the project area. If the project requires dewatering of the site, and the relocation of salmonids, the Permittee will implement the following measures to minimize harm and mortality to listed salmonids:

a. Fish dewatering and relocation activities shall only occur between June 15 and October 31 of each year.
b. Additional measures to minimize injury and mortality of salmonids during fish relocation and dewatering activities shall be implemented as described in Part IX, pages 52 and 53 of the *California Salmonid Stream Habitat Restoration Manual*.
c. The Permittee shall minimize the amount of wetted stream channel dewatered at each individual project site to the fullest extent possible as approved by the CDFW Grant Manager and pursuant to conditions in the USACE Regional General Permit and NMFS Biological Opinion.

d. All electrofishing shall be performed by a qualified fisheries biologist and conducted according to the National Marine Fisheries Service, Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
e. USFWS Approved fisheries biologists will provide fish relocation data via the Permittee to the CDFW Grant Manager on a form provided by CDFW.

Final structure design and placement will be determined by field consultation between the Permittee and the CDFW Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*.

Project Location Topographic Map
Middle Fork Cottaneva Creek Salmonid Habitat Project
Hales Grove Quad



Feature Locations

Equipment Crossing

Middle Fork Cottaneva Creek Project Reach

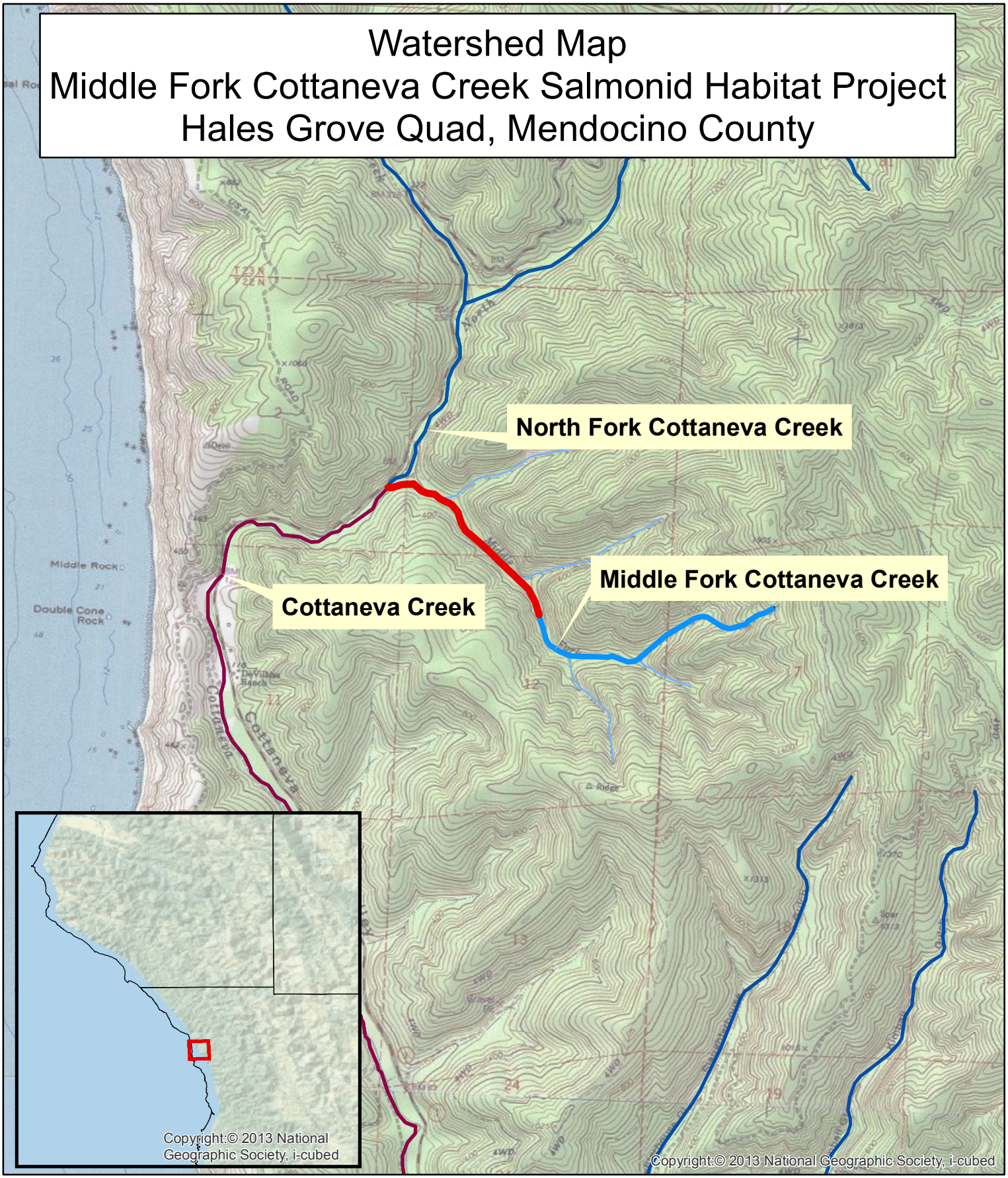
Planting Area

0 0.1 0.2 0.3 0.4 Miles

Eel River Watershed Improvement Group
April 2020

N

Watershed Map
Middle Fork Cottaneva Creek Salmonid Habitat Project
Hales Grove Quad, Mendocino County



Project Reach
North Fork Cottaneva Creek
Cottaneva Creek
Middle Fork Cottaneva Creek

0 0.3 0.6 0.9 1.2 Miles

N

Eel River Watershed Improvement Group
April 2020

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Hales Grove (3912377) OR Westport (3912367) OR Mistake Point (3912378) OR Bear Harbor (3912388) OR Piercy (3912387) OR Noble Butte (3912386) OR Leggett (3912376) OR Lincoln Ridge (3912366))

Possible species within the Hales Grove and surrounding quads for 1723436 - Middle Fork Cottaneva Creek Salmonid Habitat Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Anodonta californiensis California floater	IMBIV04020	None	None	G3Q	S2?	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arabis mcdonaldiana McDonald's rockcress	PDBRA06150	Endangered	Endangered	G3	S3	1B.1
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos stanfordiana ssp. raichei Raiche's manzanita	PDERI041G2	None	None	G3T2	S2	1B.1
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Ceanothus foliosus var. vineatus Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum kelloggii Kellogg's buckwheat	PDPGN083A0	None	Endangered	G2	S2	1B.2
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
Gentiana setigera Mendocino gentian	PDGEN060S0	None	None	G2	S2	1B.2
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
North Central Coast Fall-Run Steelhead Stream North Central Coast Fall-Run Steelhead Stream	CARA2631CA	None	None	GNR	SNR	
Northern Interior Cypress Forest Northern Interior Cypress Forest	CTT83220CA	None	None	G2	S2.2	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sedum laxum ssp. eastwoodiae Red Mountain stonecrop	PDCRA0A0L1	None	None	G5T2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Silene campanulata ssp. campanulata Red Mountain catchfly	PDCAR0U0A2	None	Endangered	G5T3Q	S3	4.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Thermopsis robusta robust false lupine	PDFAB3Z0D0	None	None	G2	S2	1B.2
Upland Douglas Fir Forest Upland Douglas Fir Forest	CTT82420CA	None	None	G4	S3.1	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 54

Hare Creek Mainstem Instream Habitat Enhancement Project 2020

Introduction:

Trout Unlimited, Inc. (Permittee) will implement the Hare Creek Mainstem Instream Habitat Enhancement Project. The goal of the project is to restore salmonid habitat complexity in a 2.9-mile reach of Hare Creek by installing large wood features to increase stream habitat complexity, pool frequency, pool depth, high-flow refugia, and over-summer rearing habitat for Coho Salmon and steelhead trout.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Vol. I, Part VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objectives:

The specific objective is to install 185 pieces of large wood at 97 distinct structure sites within 2.9-miles of Central California Coast Coho Salmon recovery habitat in Hare Creek. Implementation of this project will directly benefit Coho Salmon by enhancing the quality of instream habitats for all life stages in Hare Creek. Instream large wood is known to facilitate sorting and storage of stream gravels, as well as pool formation associated with bed scour. Studies have shown that pool formation associated with large wood can increase the quality and quantity of instream habitats for salmonids, which has been positively linked to survival rates.

Project Description:

Location:

The project is located along a section of Hare Creek, in the county of Mendocino, State of California. The project starts approximately 3.6-miles upstream from the Pacific Ocean and extends upstream 2.9-miles. The center point of the project is 39.3978º north latitude, -123.7509º west longitude and is located on the Fort Bragg 7.5 Minute U.S. Geological Survey (USGS) Quadrangle map.

Project Set Up:

Permittee staff will provide all grant and contract oversight and administration tasks including but not limited to obtaining permits, securing contracts (e.g. grantors, subcontractors, landowner, etc.), scheduling, implementation oversight, invoicing, reporting, and agency and landowner communications.

Subcontractor, Blencowe Watershed Management (BWM), will provide cull log procurement, transportation and staging services. Logs will be placed in staging areas under direct oversight from BWM. BWM will provide direct oversight of project implementation to ensure the construction of structure designs, perform

all tree felling work as deemed appropriate by the landowner, and implement structure designs.

Subcontractor, Pacific Inland Inc., Licensed Timber Operator (LTO), will perform all equipment operation for structure installation.

Subcontractor, California Conservation Corps (CCC) may move, reposition and/or bolt logs to optimize instream benefit at various locations in the reach as recommended by BWM and CCC.

Materials:

A total of 97 large wood features consisting of 185 pieces of large wood and root wads will be constructed and anchored with 1” threaded rebar, nuts, washers, 5/8” galvanized cable, cable clamps, and waterproof epoxy glue, or by wedging into riparian trees without using anchoring materials.

Tasks:

Task 1. Large Wood Installation:
Install 97 large wood features consisting of 185 pieces of large wood and root wads within 2.9-miles of Hare Creek. Direct felling and equipment placement will be utilized throughout the entire reach through directional tree felling work. CCC may move, reposition and/or bolt logs to optimize instream benefit at various locations in the reach.

Task 2. Erosion Control:
Mulching will take place as sites are completed on all exposed soils which may deliver sediment to a stream to avoid unforeseen erosion.

Deliverables:

A total of 97 instream features constructed within a 2.9-mile section of Hare Creek, consisting of 185 pieces of large wood.

Timelines:

July 9, 2021 through October 31, 2022, BWM and CCC will install large wood features. Erosion control will be installed as project features are completed.

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the CDFW.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the CDFW *Aquatic Invasive Species Decontamination Protocol.*

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

Final structure design and placement will be determined by field consultation between the Permittee and the CDFW Project Manager.

All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual.*

Hare Creek Mainstem Instream Habitat Enhancement Project Location Map

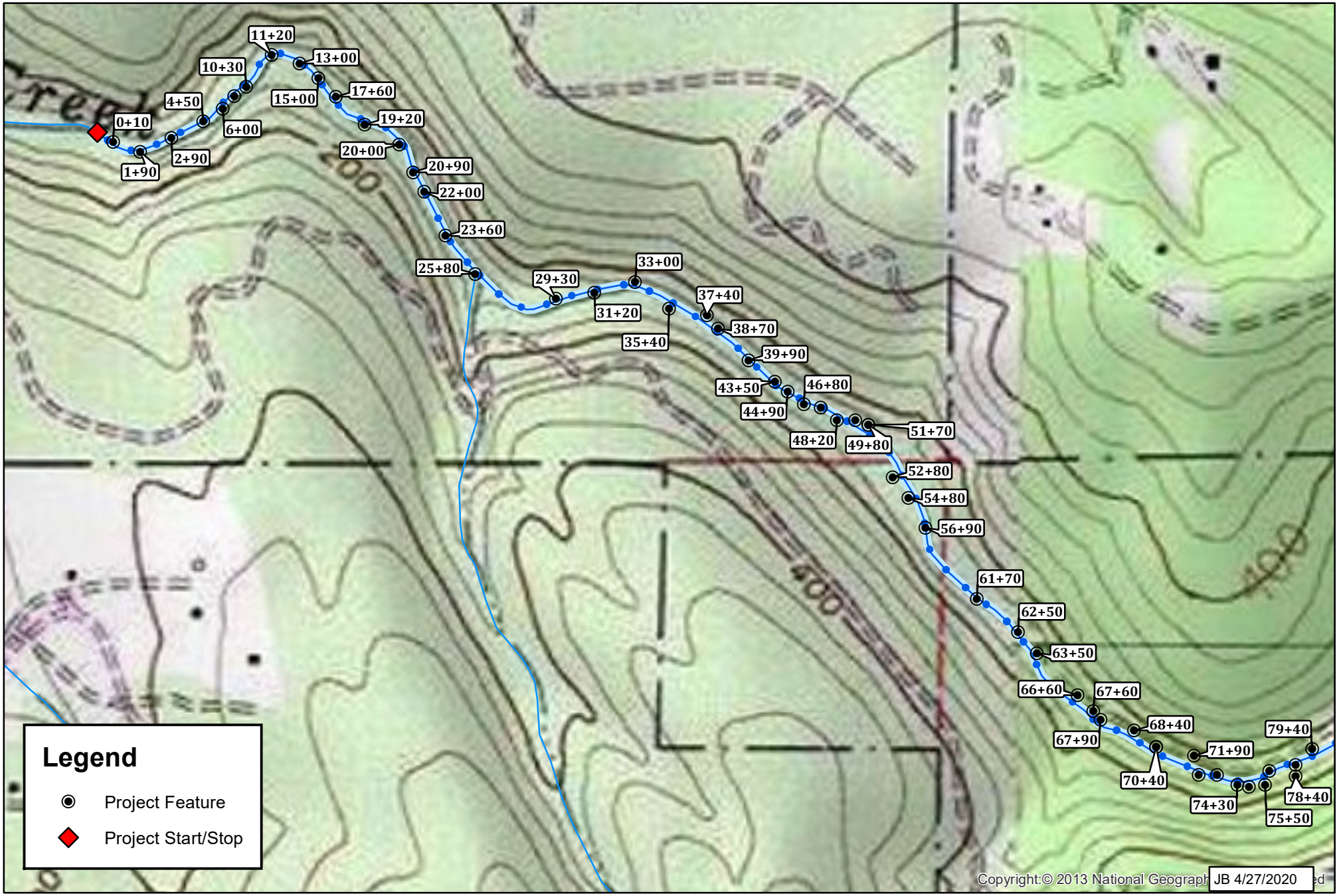
Mendocino County

Fort Bragg and Noyo Hill 7.5' USGS Quads

T18N R17W Sections 21, 26, 27 & 28 MDBM.

N

1 inch = 600 feet



Hare Creek Mainstem Instream Habitat Enhancement Project Location Map

Mendocino County
Fort Bragg and Noyo Hill 7.5' USGS Quads
T18N R17W Sections 21, 26, 27 & 28 MDBM.

N

1 inch = 613 feet

Hare Creek Mainstem Instream Habitat Enhancement Project Watershed Map

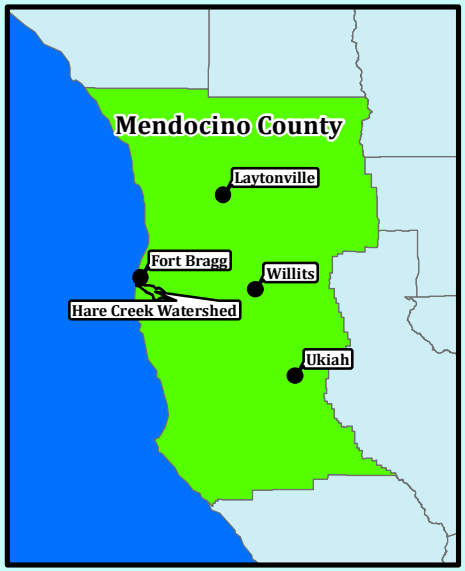
Mendocino County

Fort Bragg and Noyo Hill 7.5' USGS Quad

T18N R17W Sections 21, 26, 27 & 28 MDBM.

N

1 inch = 6,800 feet



Legend

- Project Start/Stop
- Hare Creek Project
- Hare Creek Mainstem
- Hare Creek Watershed
- Other streams

JB 4/28/2020

Fort Bragg
Noyo
Noyo Hill
Low Gap
Bunker Gulch
Brandon Gulch
Caspar
Pine Grove
Observatory Hill
Rocky Gulch
Thompson Gulch
Russian Gulch

Sources: Esri, USGS, NOAA, Sources: Esri, Garmin, USGS, NPS

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Fort Bragg (3912347) OR Inglenook (3912357) OR Dutchmans Knoll (3912356) OR Noyo Hill (3912346) OR Mathison Peak (3912336) OR Mendocino (3912337))

Possible species within the Fort Bragg and surrounding quads for 1723441 - Hare Creek Mainstem Instream Habitat Enhancement Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos nummularia ssp. mendocinoensis pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Blennosperma nanum var. robustum Point Reyes blennosperma	PDAST1A022	None	Rare	G4T2	S2	1B.2
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3G4	S1	
Calamagrostis crassiglumis Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
Calileptoneta wapiti Mendocino leptonetid spider	ILARAU6040	None	None	G1	S1	
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	PDCON040D2	None	None	G4T2T3	S2S3	1B.2
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Carex californica California sedge	PMCYP032D0	None	None	G5	S2	2B.2
Carex lenticularis var. limnophila lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Carex livida livid sedge	PMCYP037L0	None	None	G5	SH	2A
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2
Carex viridula ssp. viridula green yellow sedge	PMCYP03EM5	None	None	G5T5	S2	2B.3
Castilleja ambigua var. humboldtiensis Humboldt Bay owl's-clover	PDSCR0D402	None	None	G4T2	S2	1B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chorizanthe howellii Howell's spineflower	PDPGN040C0	Endangered	Threatened	G1	S1	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Cornus canadensis bunchberry	PDCOR01040	None	None	G5	S2	2B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Cuscuta pacifica var. papillata Mendocino dodder	PDCUS011A2	None	None	G5T1	S1	1B.2
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Entosphenus tridentatus Pacific lamprey	AFBAA02100	None	None	G4	S4	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Erigeron supplex supple daisy	PDAST3M3Z0	None	None	G2	S2	1B.2
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Fen Fen	CTT51200CA	None	None	G2	S1.2	
Fratercula cirrhata tufted puffin	ABNNN12010	None	None	G5	S1S2	SSC
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Grand Fir Forest Grand Fir Forest	CTT82120CA	None	None	G1	S1.1	
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Juncus supiniformis hair-leaved rush	PMJUN012R0	None	None	G5	S1	2B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia californica ssp. bakeri Baker's goldfields	PDAST5L0C4	None	None	G3T1	S1	1B.2
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1
Mendocino Pygmy Cypress Forest Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Microseris borealis northern microseris	PDAST6E030	None	None	G5	S1	2B.1
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Noyo intersessa Ten Mile shoulderband	IMGASC5070	None	None	G2	S2	
Oceanodroma homochroa ashy storm-petrel	ABNDC04030	None	None	G2	S2	SSC
Oenothera wolfii Wolf's evening-primrose	PDONA0C1K0	None	None	G2	S1	1B.1
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Packera bolanderi var. bolanderi seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Phacelia insularis var. continentis North Coast phacelia	PDHYD0C2B1	None	None	G2T2	S2	1B.2
Pinus contorta ssp. bolanderi Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Plebejus idas lotis lotis blue butterfly	IILEPG5013	Endangered	None	G5TH	SH	
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Puccinellia pumila dwarf alkali grass	PMPOA531L0	None	None	G4?	SH	2B.2
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Sanguisorba officinalis great burnet	PDROS1L060	None	None	G5?	S2	2B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. purpurea purple-stemmed checkerbloom	PDMAL110FL	None	None	G5T1	S1	1B.2
Sphagnum Bog Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viola palustris alpine marsh violet	PDVIO041G0	None	None	G5	S1S2	2B.2

Record Count: 91

South Fork Usal Creek Instream Enhancement Design Project 2020

Introduction:

Trout Unlimited, Inc. (TU) (Permitee) will develop 100% design plans for approximately 200 instream large wood features consisting of woven complex "spider jams" and accelerated recruitment structures along 3.5-miles of South Fork (SF) Usal Creek. Approximately five engineered log jams (ELJ's) will be designed in the lower 0.5-miles of SF Usal Creek to provide elements of instream habitat and enhance fluvial geomorphic processes. Overall, the goal of this project is to increase the availability of over-summer and over-winter juvenile rearing habitats for coho salmon and steelhead trout. The large wood structures will help increase pool frequency and depth, sort, and store stream sediments, and decrease water velocities.

TU shall not proceed with on the ground implementation until all necessary permits, consultations, and Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Vol. I, Section VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

This project will develop design plans for instream large wood features along 3.5-miles of SF Usal Creek. Based on past work in the watershed and recent field reconnaissance, this project will develop approximately 200 conceptual level designs for much of the project area. In the lowest 0.5-miles adjacent to the confluence with mainstem Usal Creek, 100% engineered design plans will be produced at approximately five locations based on detailed site investigations and analysis.

Project Description:

Location:

The SF Usal Creek Watershed is located west of Leggett, CA in the Usal Creek Watershed. SF Usal Creek intersects Usal Creek approximately 1.5-miles upstream of its confluence with the Pacific Ocean and the project reach begins at the mouth of SF Usal Creek and continues upstream for approximately 3.5-miles. The center point of the project is 39.8347º north latitude, -123.8072º west longitude and is located on the Hales Grove 7.5 Minute U.S. Geological Survey (USGS) Quadrangle map.

Project Set Up:

The TU Project Manager will provide all grant and contract oversight and administration tasks including but not limited to obtaining permits, securing contracts (e.g. grantors, subcontractors, landowner, etc.), scheduling, implementation oversight, invoicing, reporting, and agency and landowner communications.

Subcontractor Pacific Watershed Associates (PWA) will be the lead entity conducting site assessments to characterize historic disturbances, biologic habitat, geomorphology, geologic conditions, topography for engineered design development of features in the lowest 0.5-mile of the project reach. PWA staff will also lead development of conceptual site design and layout for the proposed 200 accelerated recruitment structures.

Subcontractor Heavy Equipment Operator will be responsible for digging subsurface exploration pits in lower 0.5-mile of project area.

Materials:

TU's supplies include, but are not limited to, costs associated with field supplies, meeting materials, and supporting supplies such as flagging, measuring tapes, wooden stakes, rite-in-the-rain paper, notebooks and notepads, writing utensils, charting pads, envelopes, poster board, printed meeting handouts, fastening supplies, and other meeting supplies. TU will procure funds nessecary for securing the California Department of Fish and Wildlfe (CDFW) 1600 LSAA permit for excavation of test pits.

PWA field supplies include notebooks, flagging, tablets, GPS devices, first aid kits, cameras, measuring tapes, hip chain, laser distance measurer, brush tools, survey nails/benchmarks. Total Station Rental required for topographic surveying, hydrologic assessment gear including pressure transducers, transducer housings, and flow meter are required.

PWA office supplies include, but are not limited to, rite in rain paper, printer toner, writing implements, copying/binding for reports, and is necessary for producinig final documentation of the project results.

Tasks:

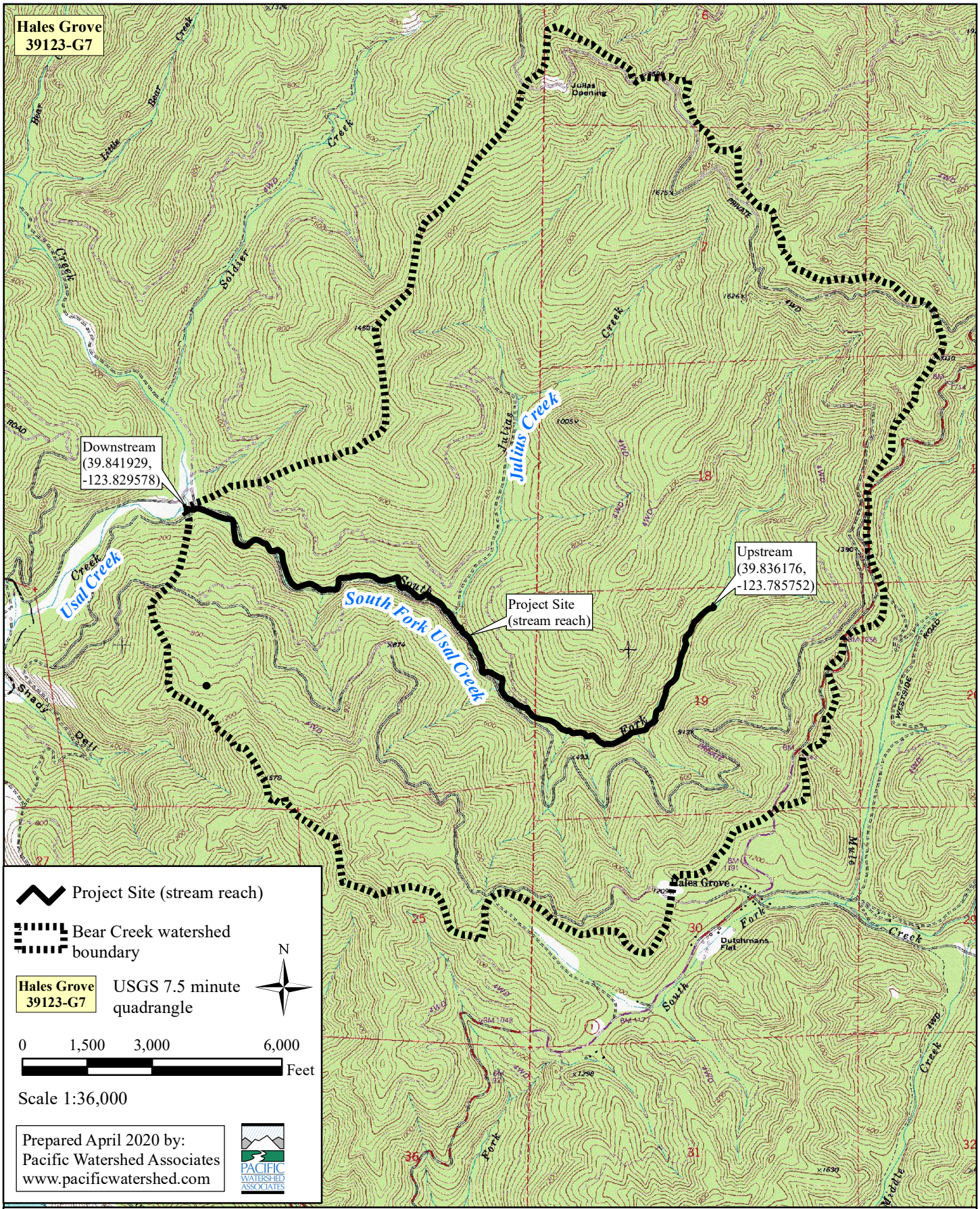
Task 1. Site Characterization:
This task will be conducted to characterize the existing fluvial geomorphic/biologic conditions, this will ultimately provide the project team with the information we need to determine the location and construction specifications of the specific feature designs. This information will be used to quantitatively document existing conditions within the project area and focuses on field mapping, geologic and geomorphic evaluations, basemap preparations, and analysis needed to understand the project reach and anticipated response to placement of nonengineered and engineered features. Work will also include identification of site features that may affect risk associated with engineered installations.

Deliverables:

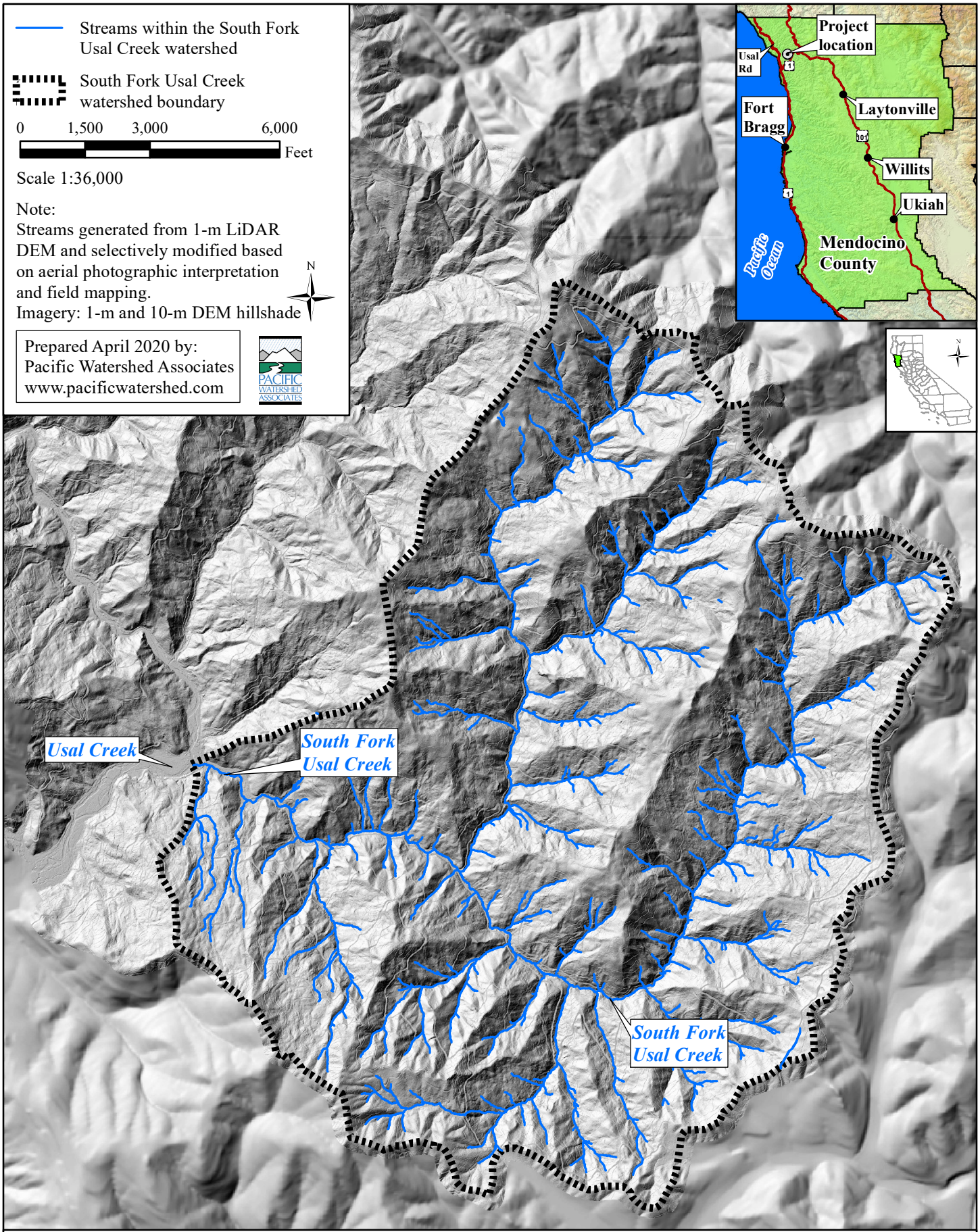
All data products associated with project site characterizations, including survey results, basemaps, habitat inventory results, characterization of existing instream features, geomorphic characterizations, characterization of hydraulic controls, and description of existing substrate conditions, and a wetland delineation.

Timelines:

Site Characterization will take place from June 1, 2021 through November 30, 2021.



Map 1. Project location topographic map for the South Fork Usal Creek Instream Enhancement Design Project, Mendocino County, California. (Piercy and Hales Grove USGS 7.5' topographic quadrangles; Grantee/Applicant: Trout Unlimited)



Map 2. Watershed map for the South Fork Usal Creek Instream Enhancement Design Project, Mendocino County, California. Grantee/Applicant: Trout Unlimited

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Hales Grove (3912377) OR Westport (3912367) OR Mistake Point (3912378) OR Bear Harbor (3912388) OR Piercy (3912387) OR Noble Butte (3912386) OR Leggett (3912376) OR Lincoln Ridge (3912366))

Possible species within the Hales Grove and surrounding quads for 1723444 - South Fork Usal Creek Instream Enhancement Design Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Anodonta californiensis California floater	IMBIV04020	None	None	G3Q	S2?	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arabis mcdonaldiana McDonald's rockcress	PDBRA06150	Endangered	Endangered	G3	S3	1B.1
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos stanfordiana ssp. raichei Raiche's manzanita	PDERI041G2	None	None	G3T2	S2	1B.1
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Ceanothus foliosus var. vineatus Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum kelloggii Kellogg's buckwheat	PDPGN083A0	None	Endangered	G2	S2	1B.2
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
Gentiana setigera Mendocino gentian	PDGEN060S0	None	None	G2	S2	1B.2
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
North Central Coast Fall-Run Steelhead Stream North Central Coast Fall-Run Steelhead Stream	CARA2631CA	None	None	GNR	SNR	
Northern Interior Cypress Forest Northern Interior Cypress Forest	CTT83220CA	None	None	G2	S2.2	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sedum laxum ssp. eastwoodiae Red Mountain stonecrop	PDCRA0A0L1	None	None	G5T2	S2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Silene campanulata ssp. campanulata Red Mountain catchfly	PDCAR0U0A2	None	Endangered	G5T3Q	S3	4.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Thermopsis robusta robust false lupine	PDFAB3Z0D0	None	None	G2	S2	1B.2
Upland Douglas Fir Forest Upland Douglas Fir Forest	CTT82420CA	None	None	G4	S3.1	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 54

Chamberlain Creek Coho Passage Design Project | 2020

Introduction:

Chamberlain Creek is a tributary to the North Fork Big River and is identified as a core recovery area in the National Marine Fisheries Services' Recovery Plan for Evolutionarily Significant Unit of Central California Coast Coho Salmon (2012). The contributing catchment to the culvert is about 2.9 square miles and approximately 1.6 stream miles of high-quality anadromous habitat are partially blocked by the existing barrier.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual Volume II, Part XII.*

Objective(s):

This project will address CDFW recovery priorities on Chamberlain Creek in the Big River watershed by designing a remedy for a fish passage barrier consisting of a corrugated metal pipe that partially prevents adult, juvenile coho, and lamprey passage to 1.6-miles of suitable upstream habitat. The project will design a new stream crossing that will meet fish passage, hydraulic capacity, and debris load requirements.

Project Description:

Location:

The site is located north of Chamberlain Creek Conservation Camp in Jackson Demonstration State Forest (JDSF). Travel west approximatly 15.5-miles on CA SR 20 from Willits to Chamberlain Creek Conservation Camp. Turn north onto Road 200A and travel approximately 1.3-miles. Turn Right onto Main Chamberlain Road (Road 250) and travel approximately 1.8-miles north to the site. Project coordinates are: 39.383409 North latitude and -123.547675 West longitude.

Project Set Up:

Contract oversight will be conducted by the Mendocino Land Trust (Permittee). All reporting and billing will be pursuant to contract and regulatory guidelines. Permittee Business Manager will process invoices from subcontractors and develop and submit invoices to the grantor. Permittee Senior Project Manager will perform periodic reviews of project progress. Permittee will ensure adherence to billing practices and project performance as stated in the CDFW Grant Agreement. Permittee Conservation Project Manager, Conservation Project Coordinator, and Business Manager will conduct all grant oversight. Grant oversight includes, but is not limited to, contracting oversight and administration, invoicing, scheduling, field visits and inspections, implementation oversight, landowner communications, and obtaining, developing and adhering to all

permits. Upon final execution of the grant, and prior to receiving a final Notice to Proceed, Permittee will deliver the landowner access agreements and subcontracts, and assure all permits are finalized. Elements of these tasks will continue throughout the life of the project (Tasks 1, 2, and 6).

Pacific Watershed Associates (PWA) Principal Earth Scientist will provide overall technical and administrative guidance for the design project including overall internal supervision and review of the design options and final design plans quality control. The PWA Senior Engineer will oversee project activities, participate in project meetings, and lead the development of alternatives and preparation of plans from the design alternatives to 30% to 100%. The PWA Staff Engineer will assist with the development of alternatives and design plan preparation. The team of PWA Engineers, Professional Geologist, Engineering Geologist, and Fisheries Biologist will conduct the field and office design activities, lead the topographic survey effort, characterize the project constraints, and assist with the preparation of alternatives and design documents, participate in project meetings with CDFW and preparation of the design documents and plans for the various phases of the project. The PWA Fisheries Biologist will assess current habitat stability through the project area, identify the salmonid and lamprey species present, participate in the meetings, and address aquatic species composition and needs in the Basis of Design (BOD). Pacific Watershed Associates will also serve as the Professional Geologist and Engineering Geologist for the geologic investigations. The Professional Geologist will complete the fieldwork including the subsurface investigation, and lead the document and report preparation, with oversight from the Engineering Geologist. The Staff Engineer will assist the Professional Geologist with field activities and the GIS/CAD Specialist will assist with the preparation of drawing, maps, and figures. The Clerical staff will assist with invoice preparation (Tasks 2, 3, 4, 5, 6).

Materials:

Materials for Task 2,3,4,5,6 purchased by PWA include: rental of a hollow-stem drill rig and crew, laboratory testing of the physical properties of the materials, and supplies for report preparation for the Gelogical Investigation. Total Station survey equipment will be used to survey the project area including the stream crossing and associated landslide. Lake and Streambed Alteration Agreement is required for the instream geological investigation (Task 1). PWA will require mileage, lodging, and per diem to accommodate travel needs to visit the site and meet with partners and outreach meetings, as appropriate (Task 2-4). Permittee Project Manager requires mileage for four round trips to the project site to attend outreach meetings (Task 2). Permittee Field/Office Supplies required for Task 2 include, but are not limited to: charting pads, markers, printed handouts, and other meeting supplies.

Tasks & Deliverables:

Task 1 Grant Oversight:
Description of Activities: Permittee personnel will provide all contracting oversight and administration as pursuant to grant and regulatory guidelines. This includes but is not limited to obtaining permits, securing contracts (grantors, subcontractors, landowner), scheduling, invoicing, reporting and agency and landowner communications. Upon Final execution of the Grant and prior to receiving a Final Notice to Proceed, Permittee personnel will deliver the landowner access agreements, subcontracts, and assure all permits are finalized. This task will occur throughout the life of the project.

Deliverables: Meeting agendas, notes, emails.
Start Date: 07/01/2021
End Date: 11/30/2023

Task 2- Meetings and Project Management:
Description of Activities:

Meeting No. 1 – Kickoff. The project Technical Advisory Committee (TAC); including Permittee, JDSF, CDFW, and PWA staff, will attend a kickoff meeting at the project site to discuss the project with landowners and other stakeholders, obtain background information, and coordinate data collection activities. It is assumed this will coincide with the initiation of the site topographic survey.

Meeting No. 2 - Scoping of Alternatives and 30% Design for the Chamberlain Creek crossing. The project TAC (including Permittee, JDSF, CDFW, and PWA) will attend to discuss the preliminary (30%) design plans for both the Chamberlain Creek stream crossing and associated downstream slope instability. The meeting will provide an opportunity for receipt of review comments and to facilitate selection of a preferred alternative to develop to full design.

Meeting No. 3 - Present Intermediate-Level Designs for Chamberlain Creek stream crossing. The project TAC (all, as needed) will attend a meeting to present the intermediate (65%) level designs for both the selected Chamberlain Creek fish passage design alternative and associated downstream slope instability design alternative. The meeting will provide an opportunity for receipt of design review comments.

Meeting No. 4 - Present Intermediate-Level Designs for Chamberlain Creek stream crossing. The project TAC (all, as needed) will attend a meeting to present the intermediate (90%) level designs for both the selected Chamberlain Creek fish passage design alternative and associated downstream slope instability design alternative. The meeting will provide an opportunity for receipt of design review comments. Based on CDFW input, the 100% designs will be finalized.

Deliverables: 30% design, 65% design, 90% design, technical advisory committee agenda, notes and comments and the 100% design plan and BOD memo.
Start Date: 10/31/2021
End Date: 03/31/2023

Task 3 - Site Characterization:
Description of Activities: PWA staff will perform topographic and/or photogrammetric site characterizations of the road, culvert, stream profile and associated downstream slope instability. PWA staff will also perform pebble counts, discharge measurements during the survey, bank material identification and morphology, bedrock inventory, large wood identification, level II habitat suitability inventory, and descriptions of any key features identified during the survey. PWA staff will prepare topographic maps, determine catchment, and perform hydrologic and hydraulic analysis.

Topographic and Longitudinal Surveys:
PWA will conduct a topographic survey of the project area using a Total Station and assumed horizontal and vertical datums. Topographic surveys with one-foot contour resolution will be conducted within the two focus areas: Chamberlain Creek and the stream crossing in question and the associated downstream slope instability area. A single digital terrain map (DTM) will be developed in AutoCAD for the two focus areas. The survey area will extend from approximately 300 feet upstream to approximately 300 feet downstream of the stream crossing and extend along the road alignment a minimum of 300 feet in both directions from the existing crossing. The survey will include inboard ditches and other surface drainage intercepted by the crossing. It will include all trees greater than 18 inches in diameter in the potential area of disturbance. Channel features, including bankfull (ordinary high water) indicators, thalweg, grade breaks, repeating bedforms (riffles/pools), and water surface elevations will be captured in the survey. The longitudinal profile will extend beyond the influence of the existing culvert and include channel cross-sections that include tops and toes of banks, edges of active streambed, channel bed, left and right bankfull elevations, high watermarks, and flood plains and terraces, if applicable. The product of the survey efforts will be a detailed basemap created in AutoCAD with one-foot contours in the focus areas. The basemap will be used for preparation of the design plans for the project.

Geomorphic Assessment:
The channel morphology will be characterized throughout the project area. Field activities include identifying stable reference reaches upstream and downstream of both focus areas. In each reference reach, field measurements will include active and bankfull channel widths and depths and surveying several representative cross-sections to evaluate channel hydraulic geometry. In addition to the reference reaches, the geomorphic assessment will extend the full length of the channel longitudinal profile and include characterizing the channel bed

morphology, identifying channel forcing features and knickpoints, localized aggradation extents associated with the crossing and areas of bank and bed instabilities.

Biological Assessment:
PWA Fisheries Biologist will evaluate the current instream habitat for salmonids and lamprey throughout the project reach using the CDFW Protocols for Level II riffle, pool, and flatwater methodology for the survey. Additionally, snorkel surveys will be conducted to identify the salmonid and other aquatic vertebrate species present and the habitats they are utilizing, to evaluate habitat suitability for the design considerations.

Deliverables: Detailed topographic map, longitudinal profile, characteristics of channel morphology, biological assessment.
Start Date: 07/01/2021
End Date: 12/01/2021

Task 4 - Geological and Geotechnical Investigations and Recommendations:
Description of Activities: PWA will provide geological and geotechnical investigations sufficient to characterize the project area geomorphology, soils, and project constraints and provide recommendations relevant to the upgrading of the culverted stream crossing, channel and crossing design for fish passage, utilization of onsite materials for construction of streambanks and fills, and stabilization of disturbed or stockpiled materials. The downstream slope instability will also be characterized, and recommendations made to stabilize the slope to minimize future erosion and sediment delivery to Chamberlain Creek, as well as minimize the possibility of any future impact to the newly designed and installed stream crossing.

Chamberlain Creek Stream Crossing: At least four subsurface borings will be conducted at the stream crossing site b drilling rig equipped with a hollow stem auger subcontracted by PWA. All boring will be located where suitable to investigate subsurface materials and collect samples. Depth to bedrock and groundwater will be identified where observed, and the bedrock will be cored to a minimum depth of 10'. Lab testing of select samples will be conducted to identify soil mechanics such as grain size distribution, bulk density, plasticity index, soil internal friction angle, and shear strength. This information will be used to develop foundation recommendations for the proposed crossing replacement and to characterize potential project constraints.

Geological and Geotechnical Technical Memorandum:
Investigation findings and recommendations will be provided by PWA in a technical memorandum which will include, at a minimum:

- geologic mapping
- soil and sediment boring logs

- stratified textural classifications of soils using the Unified Soil Classification System
- location and descriptions of all bedrock encountered
- soil materials properties and laboratory testing results
- geotechnical properties of native and constructed streambank materials relevant to the selection of soil anchors
- allowable bearing capacities
- subgrade preparation recommendations for subgrade materials for footing design
- foundation preparation recommendations (e. g. over-excavation, backfilling, geosynthetic reinforcement)
- estimated settlement of abutment embankment or foundation soil materials
- liquefaction potential relevant to the crossing design element
- recommended seismic design criteria relevant to the design element
- limiting load factor resistance design criteria for the crossing design element
- evaluation of materials for suitability for structural and general backfill
- OSHA soil type determination for trenching and shoring
- recommendations for temporary and permanent cut slope constraints based on materials properties
- recommendations for the placement and permanent stabilization of disturbed and stockpiled earthen materials
- recommendations for aquatic biological considerations based on species present, current habitat suitability, and the conservation and protection of these species.

Deliverables: Geological and geotechnical memorandum, characterization of downstream slope instability.
Start Date: 07/01/2021
End Date: 10/01/2022

Task 5 - Chamberlain Creek Stream Crossing Design:
Description of Activities: Preliminary Design Development:
PWA will begin with pre-design as outlined in Part XII of the CDFW Salmonid Stream Habitat Restoration Manual. Establishing the low and high vertical adjustment potential for the upstream and downstream channel, Determining the design profile, which is anticipated to be a profile using grade control. Establishing the appropriate active and bankfull channel widths and depths for the project reach. Establishing the preferred crossing alignment relative to the road. Hydrologic Analysis Streamflow in Chamberlain Creek is not gauged, so standard methods for ungauged watersheds will be used. Peak flows will be calculated for return periods ranging between 1.2-years and 100-years using a combination of approaches:

1. Using peak flow records from nearby USGS gaged streams with flows scaled to the project drainage area and fit to the Log Pearson Type III distribution and
2. Using USGS regional regression equations and estimated mean annual rainfall using the PRISM generated maps. This information will be used to support the geomorphic assessments to determine the size of the new stream crossing, for scour analysis and sizing of material in potential grade control features, engineered streambed material placement, and embankment protection. Fish passage flows will be estimated following NMFS (2001) and CDFW (2002) criteria and using a regional flow duration curve. The flow data used to generate the FDC will be updated to include more recent flow records. Fish passage flows will be used for the design of the profile at the crossing.

Hydraulic Analysis:
PWA will conduct hydraulic analysis of the proposed crossing and related stream improvements. The analyses will be used for sizing of the road-stream crossing, development of any profile control, and evaluation of fish passage conditions. An initial HEC-RAS analysis will be conducted at the 30% level to support selection of the crossing type and to ensure flow conveyance of the 100-year flow event. HEC-RAS, spreadsheet computations, or uniform flow calculations will be performed during the design of the proposed profile to ensure that CDFW/NMFS hydraulic design criteria are met for the target life stages of salmonids. Additional hydraulic analysis will be conducted at the 65% design level.

Stream Crossing Selection and Layout:
The crossing type will be selected with appropriate dimensions and elevations in accordance with Part XII of the CDFW SSHRM. It is assumed that no, or only minor, changes to the road alignment will be required. The crossing will be sized to convey the 100-year flow and associated debris without submerging the lower cord of the crossing structure. Crossing selection will also be influenced by the geotechnical recommendations provided by PWA.

30% Plans and Technical Memorandum:
PWA will prepare 30% design plans and a supporting Chamberlain Creek Project Design Technical Memorandum. The plans will include the following: Title Sheet; Existing Conditions Plan; Proposed Plan; Proposed Profile; Typical sections; The TM will describe the project geomorphic and hydrologic site characterizations, description of the proposed project, design approach, target species and life stages, design criteria, and design decisions. It will summarize hydrologic, hydraulic, and geomorphic analysis that supported the preliminary design and include supporting attachments.

65% Plans and Cost Estimate:
Upon receipt of comments, PWA will prepare the intermediate level (65%) design plans, special provision specifications and engineer's opinion of probable

construction cost (OPCC). The plans will be in 11x17 format and include: Title Sheet, Legend, Abbreviations, and Notes Sheet Water Management Sheet, Existing Condition, Demolition, and Survey Control Sheet Plan Sheet, Channel Profile and Road Profile Sheet, Structural Crossing Plan, Section and Foundation Detail Sheets Typical Cross Sections, Construction Details. The OPCC will be prepared with a 20% contingency. The submittal will include a letter providing responses to comments from the 30% submittal.

90% and Final (100%) PS&E, and Final TM:
A draft final (90%) plan set, specifications and estimate will be prepared. Specifications will be included on the plans as notes. Additional structural details will be added to the 65% stream crossing sheets. An updated OPCC will be prepared with the 90% submittal and will include a 15% contingency. Structural calculations will be provided along with a finalized Project Design Technical Memorandum. The submittal will include a letter providing responses to comments from the 65% submittal. Upon receipt of comments on the 90% submittal, the plans, specifications and OPCC will be finalized to the 100% level. The plans will be sealed by a California licensed civil engineer. The final OPCC will include a 15% contingency to account for price volatility and unanticipated site conditions encountered during construction.

Deliverables: Preliminary design, 30% Plans and Technical Memorandum, 65% Plans and cost estimate, 90% Plans and after incorporating comments from TAC, 100% Final Plans and Final Technical Memorandum.
Start Date: 07/01/2021
End Date: 05/31/2023

Task 6 - Final Reporting:
Description of Activities: PWA and Permittee will prepare and submit a final report pursuant to Grant guidelines.

Deliverables: Final report
Start Date: 05/31/2023
End Date: 11/30/2023

Additional Requirements:

The Permitee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the United States Army Corp of Engineers (USACE) Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife (CDFW).

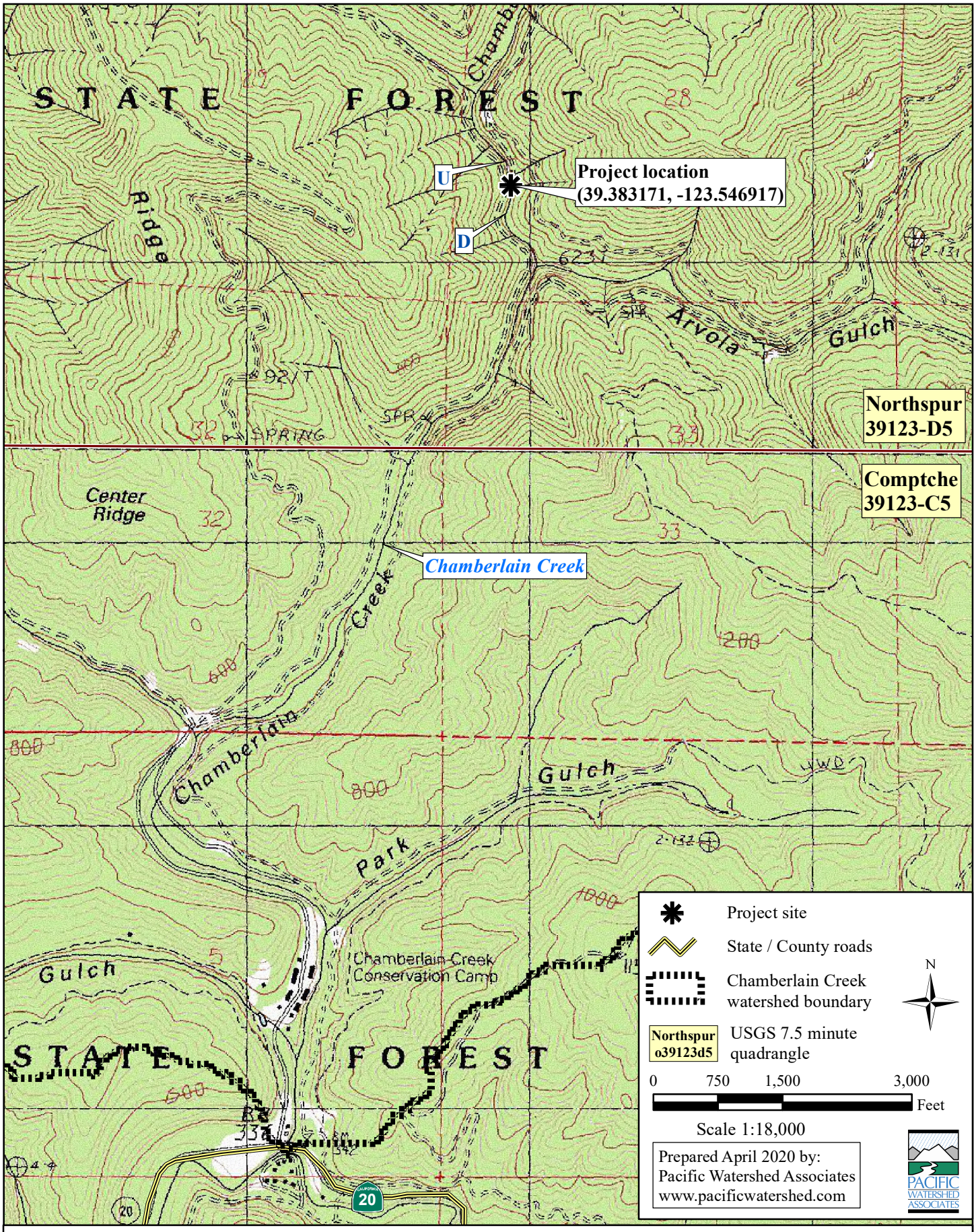
No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. All equipment

will be removed from the streambed and flood plain areas at the end of each workday.

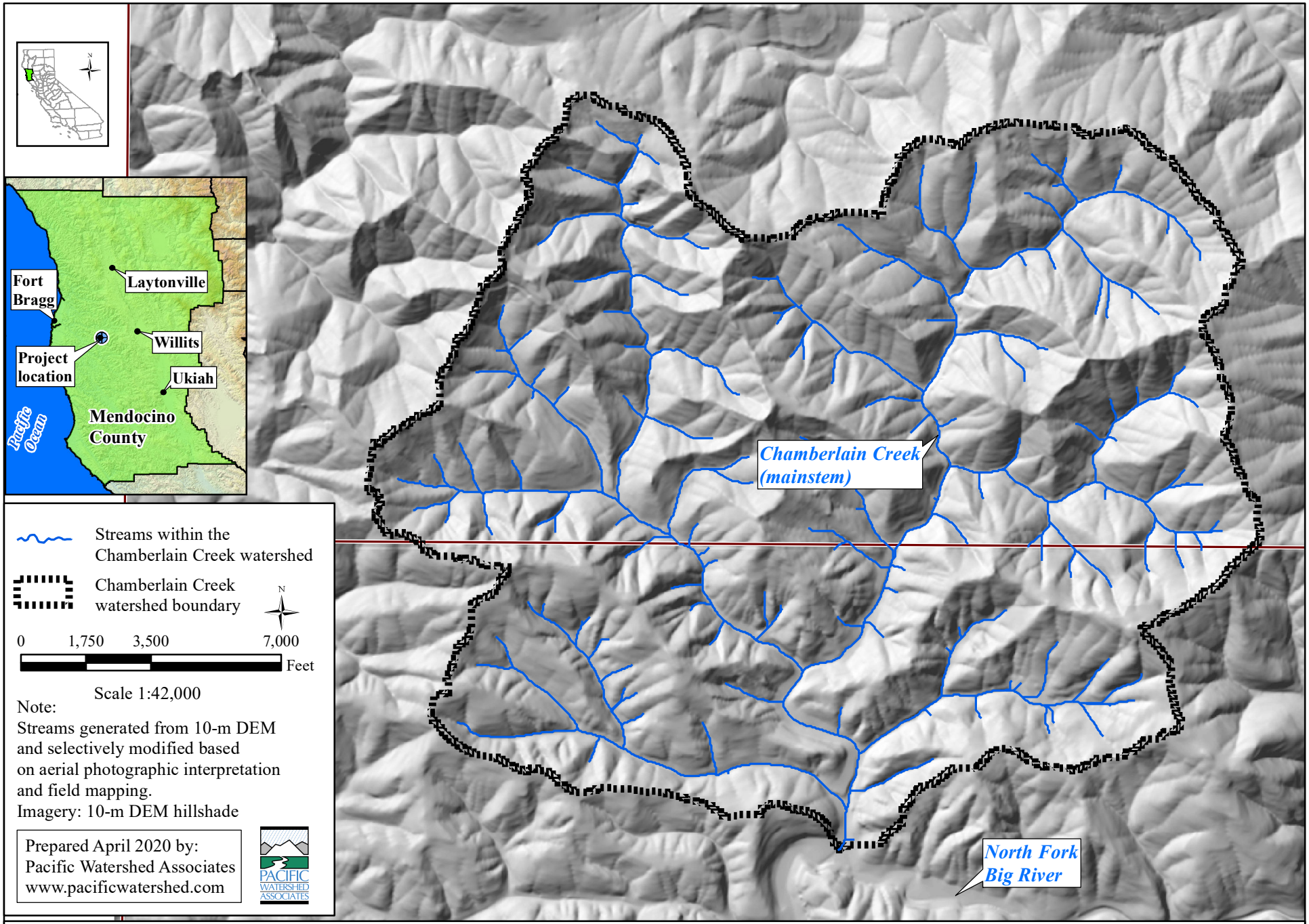
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the CDFW *Aquatic Invasive Species Decontamination Protocol*.

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*, Volume I and Volume II.



Map 1. Project location topographic map for the Chamberlain Creek Passage Fish Passage Design Project, Mendocino County, California. Grantee: Mendocino Land Trust



Map 2. Watershed map for the Chamberlain Creek Fish Passage Design Project, Mendocino County, California. Grantee: Mendocino Land Trust

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Northspur (3912345) OR Comptche (3912335) OR Mathison Peak (3912336) OR Noyo Hill (3912346) OR Dutchmans Knoll (3912356) OR Sherwood Peak (3912355) OR Longvale (3912354) OR Burbeck (3912344) OR Greenough Ridge (3912334))

Possible species within the Northspur and surrounding quads for 1723515 - Chamberlain Creek Coho Passage Design Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Alisma gramineum grass alisma	PMALI01010	None	None	G5	S3	2B.2
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos nummularia ssp. mendocinoensis pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Atractelmis wawona Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Carex californica California sedge	PMCYP032D0	None	None	G5	S2	2B.2
Carex lenticularis var. limnophila lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Entosphenus tridentatus Pacific lamprey	AFBAA02100	None	None	G4	S4	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Hesperolinon adenophyllum glandular western flax	PDLIN01010	None	None	G2G3	S2S3	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Lupinus milo-bakeri Milo Baker's lupine	PDFAB2B4E0	None	Threatened	G1Q	S1	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1
Mendocino Pygmy Cypress Forest Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Packera bolanderi var. bolanderi seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
Pinus contorta ssp. bolanderi Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Speyeria zerene behrensii Behren's silverspot butterfly	IILEPJ6088	Endangered	None	G5T1	S1	
Sphagnum Bog Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Usnea longissima	NLLEC5P420	None	None	G4	S4	4.2
Methuselah's beard lichen						

Record Count: 61

Bear Gulch Coho Stream Habitat Enhancement Project 2020

Introduction:

The Mendocino Land Trust (Permittee) will implement the Bear Gulch Coho Stream Habitat Enhancement Project. The lack of large wood in the stream channel has affected the quality and quantity of salmonid habitat within Bear Gulch by reducing the amount of large channel forming features and the loss of complex cover for salmonids. Bear Gulch is listed as a Priority One stream (highest priority) for habitat improvement in the Noyo River HSA in *Assessment of Stream Habitat Conditions, and Recommendations of Improvement, in the Noyo River Hydrologic Sub-Area* (Albin, 2006).

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Volume 1, Part VII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objectives:

The specific objective of this project is to improve the quality and quantity of spawning and rearing habitat for coho salmon by installing large wood along a section of Bear Gulch. This project will install 35 structures consisting of 87 pieces of large wood within 3,315-feet of Bear Gulch to improve spawning habitat. Installation of large wood will increase the target habitat rating from Good to Very Good for wood loading as outlined in the Southern Oregon/Northern California Coast Coho Salmon Recovery Plan (2014). The addition of appropriately sized wood to meet target criteria will enhance the quality, quantity, and complexity of spawning and rearing habitat for salmonids.

Project Description:

Location:

The project is located on Bear Gulch, begins at its confluence with the South Fork Noyo River, and extends upstream 3,315-feet. Bear Gulch is located 1.2-miles upstream from the confluence of the South Fork Noyo River with the Noyo River. The centerpoint coordinates are 39.38873º north latitude, -123.67146º west longitude. The project reach is located on the Noyo Hill 7.5 Minute U.S. Geological Survey (USGS) Quadrangle map.

Project Set Up:

Permittee staff will conduct all grant oversight. Including, but not limited to, contracting oversight and administration, invoicing, scheduling, implementation oversight, landowner communications, and obtaining, developing and adhering to all permits. Permittee will coordinate stakeholder meetings and resolve any

concerns from the landowner regarding the project, conduct field inspections and monitor project progress according to timeline and budget.

Subcontractor, Humboldt State University Cultural Resources Facility, staff will conduct sensitive plant, cultural resource surveys and foothill yellow-legged frog surveys.

Subcontractor Pacific Watershed Associates will perform the paleontological survey prior to construction.

Subcontractor, California Conservation Corps (CCC) will provide the hand labor for the in-stream large wood features.

Materials:

A total of 35 large wood features consisting of 87 pieces of large wood and root wads, will be constructed and anchored with 1" threaded rebar, nuts, washers, 5/8" galvanized cable, cable clamps, and waterproof epoxy glue, or by wedging into riparian trees without using anchoring materials. Trees left unanchored will be at least 1.5 times the average bankfull width per CDFW *California Salmonid Stream Restoration Manual* specifications for unanchored large wood (Part VII-23).

Tasks:

Task 1. Install Instream Habitat Features:
Install 35 instream features within a 3,315-foot section of Bear Gulch, consisting of 87 pieces of large wood. Work will consist of the following:

- Permittee will construct instream log structures according to the site-specific plans to be provided, using locally available logs or logs from other locations.
- Nuts, washers, plates, cable, glue, and rebar will be ordered as applicable.
- Location of all project large wood will be documented.
- Various anchoring techniques, which will be approved by CDFW prior to the initiation of work, may be used to hold multiple logs together to form complex structures. Anchoring techniques will include wedging logs into existing rocks and logs along the riparian banks; anchoring to live mature trees growing on riparian banks; or anchoring to existing boulders. Anchoring materials will consist of 1" threaded rebar, cable, nuts and washers, and waterproof epoxy.
- Available slash and woody debris will be installed into structures after site completion to provide immediate cover for salmonids present at time of construction.

Task 2. Erosion Control:
Mulching will take place as sites are completed on all exposed soils which may deliver sediment to a stream in order to avoid unforeseen erosion.

Deliverables:

A total of 35 instream features will be constructed within a 3,515-foot section of Bear Gulch, consisting of 87 pieces of large wood.

Timelines:

June 15 through October 31 of the years 2021, 2022, 2023, and 2024, CCC will install large wood features within approved project reaches. Erosion control will be installed as project features are completed.

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the CDFW.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and floodplain areas at the end of each workday.

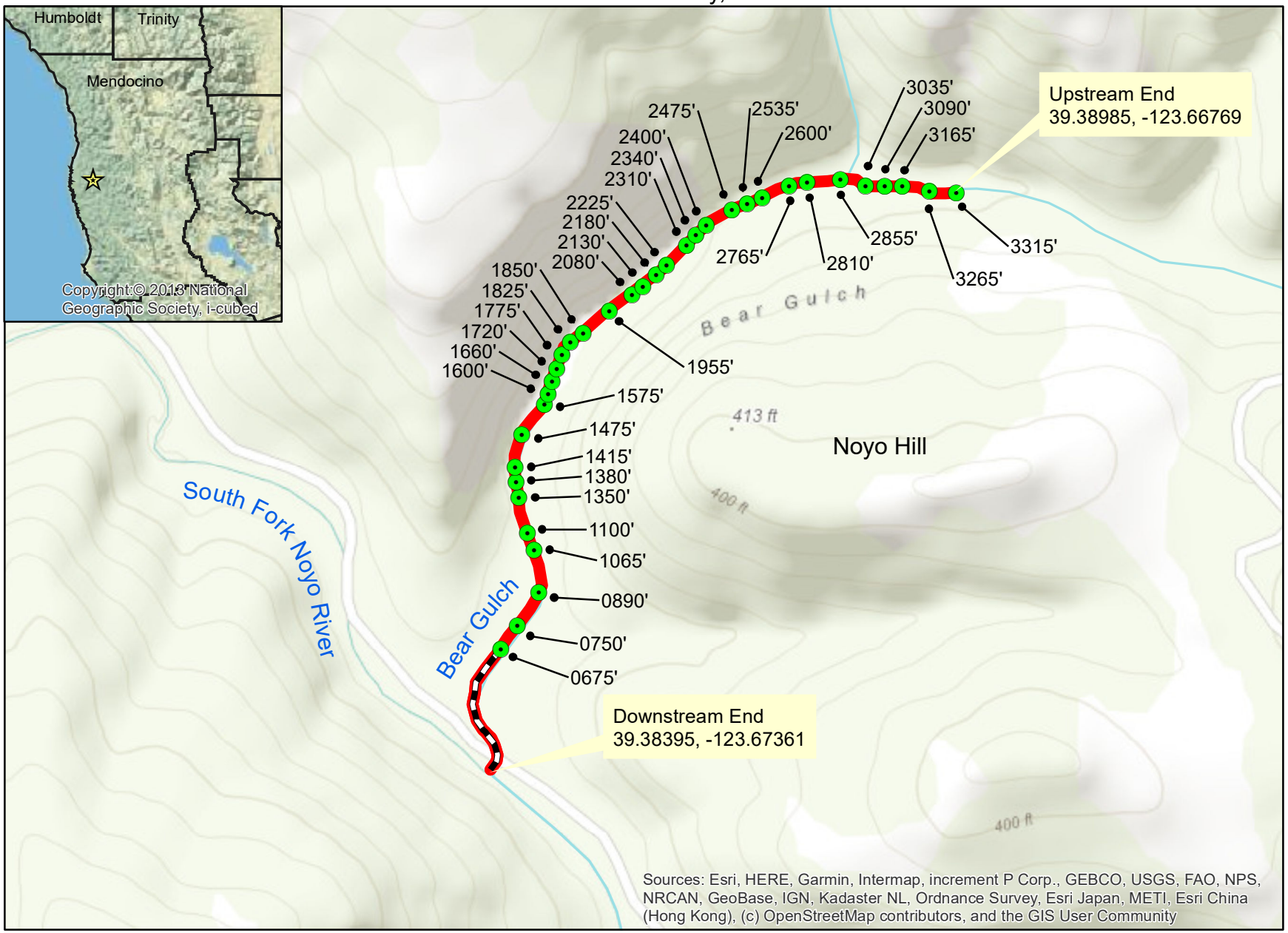
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out of the work area. All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the CDFW *Aquatic Invasive Species Decontamination Protocol.*

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

Final structure design and placement will be determined by field consultation between the Permittee and the CDFW Project Manager.

All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual.*

Feature Locations Map
Bear Gulch Coho Stream Habitat Enhancement Project
California Conservation Corps
Bear Gulch, Noyo Hill Quad
Mendocino County, CA



Bear Gulch Features
Exclusionary Zone
Bear Gulch Project Reach

N

0 0.05 0.1 0.2 0.3 0.4
Miles

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Noyo Hill (3912346) OR Mathison Peak (3912336) OR Mendocino (3912337) OR Fort Bragg (3912347) OR Inglenook (3912357) OR Dutchmans Knoll (3912356) OR Sherwood Peak (3912355) OR Northspur (3912345) OR Comptche (3912335))

Possible species within the Noyo Hill and surrounding quads for 1723545 - Bear Gulch Coho Stream Habitat Enhancement Project, Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Arctostaphylos nummularia ssp. mendocinoensis pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Atractelmis wawona Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
Blennosperma nanum var. robustum Point Reyes blennosperma	PDAST1A022	None	Rare	G4T2	S2	1B.2
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3G4	S1	
Calamagrostis crassiglumis Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
Calileptoneta wapiti Mendocino leptonetid spider	ILARAU6040	None	None	G1	S1	
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	PDCON040D2	None	None	G4T2T3	S2S3	1B.2
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Carex californica California sedge	PMCYP032D0	None	None	G5	S2	2B.2
Carex lenticularis var. limnophila lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
Carex livida livid sedge	PMCYP037L0	None	None	G5	SH	2A
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2
Carex viridula ssp. viridula green yellow sedge	PMCYP03EM5	None	None	G5T5	S2	2B.3
Castilleja ambigua var. humboldtiensis Humboldt Bay owl's-clover	PDSCR0D402	None	None	G4T2	S2	1B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chorizanthe howellii Howell's spineflower	PDPGN040C0	Endangered	Threatened	G1	S1	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Cornus canadensis bunchberry	PDCOR01040	None	None	G5	S2	2B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Cuscuta pacifica var. papillata Mendocino dodder	PDCUS011A2	None	None	G5T1	S1	1B.2
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Entosphenus tridentatus Pacific lamprey	AFBAA02100	None	None	G4	S4	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erigeron supplex supple daisy	PDAST3M3Z0	None	None	G2	S2	1B.2
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Fen Fen	CTT51200CA	None	None	G2	S1.2	
Fratercula cirrhata tufted puffin	ABNNN12010	None	None	G5	S1S2	SSC
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Grand Fir Forest Grand Fir Forest	CTT82120CA	None	None	G1	S1.1	
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
Hesperocyparis pygmaea pygmy cypress	PGCUP04032	None	None	G1	S1	1B.2
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Juncus supiniformis hair-leaved rush	PMJUN012R0	None	None	G5	S1	2B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia californica ssp. bakeri Baker's goldfields	PDAST5L0C4	None	None	G3T1	S1	1B.2
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lilium maritimum coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1
Mendocino Pygmy Cypress Forest Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	
Microseris borealis northern microseris	PDAST6E030	None	None	G5	S1	2B.1
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Noyo intersessa Ten Mile shoulderband	IMGASC5070	None	None	G2	S2	
Oceanodroma homochroa ashy storm-petrel	ABNDC04030	None	None	G2	S2	SSC
Oenothera wolfii Wolf's evening-primrose	PDONA0C1K0	None	None	G2	S1	1B.1
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Packera bolanderi var. bolanderi seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Phacelia insularis var. continentis North Coast phacelia	PDHYD0C2B1	None	None	G2T2	S2	1B.2
Pinus contorta ssp. bolanderi Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Plebejus idas lotis lotis blue butterfly	IILEPG5013	Endangered	None	G5TH	SH	
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Puccinellia pumila dwarf alkali grass	PMPOA531L0	None	None	G4?	SH	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ramalina thrausta angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Sanguisorba officinalis great burnet	PDROS1L060	None	None	G5?	S2	2B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. purpurea purple-stemmed checkerbloom	PDMAL110FL	None	None	G5T1	S1	1B.2
Speyeria zerene behrensii Behren's silverspot butterfly	IILEPJ6088	Endangered	None	G5T1	S1	
Sphagnum Bog Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viola palustris alpine marsh violet	PDVIO041G0	None	None	G5	S1S2	2B.2

Record Count: 98