

Introduction:

Grantee will implement the Mattole Flow Program – Tributary Water Storage and Forbearance Project. This project will restore, improve, and protect juvenile anadromous fish habitat and fish passage through installation of multiple storage tanks totaling 250,000 gallons and placing restrictions on corresponding seasonal water rights to prevent summertime water diversion. The project will improve summer stream flows to provide connectivity between pools.

The Mattole River headwaters are the key spawning and summer rearing habitat for threatened salmonids in the river system and both McKee Creek and Ravashoni Creek are high priority tributaries in the headwaters. This key habitat is threatened by an emerging pattern of extreme summertime low flows beginning in 1999. Low flows are recognized as the most acute threat to the survival of listed salmonids in the watershed by the Recovery Strategy for California Coho Salmon, North Coast Watershed Assessment Program (NCWAP) Mattole River Watershed Assessment Report, Mattole Watershed Plan, and the Upper Mattole River and Forest Cooperative Draft Coordinated Resource Management Plan. Reduced instream flows are also recognized as a significant threat to salmonid recovery throughout North Coast streams by National Oceanic and Atmospheric Administration (NOAA) Fisheries in their draft recovery plan, Recovery Plan for the Southern Oregon and Northern California Coast Evolutionary Significant Unit of Coho Salmon (2012). The Mattole Coho Recovery Strategy (2011) prepared by the Mattole River and Range Partnership, identifies low summer flows as a key constraint to coho recovery.

The Grantee will not proceed with on the ground implementation until all necessary permits, consultations, and Notice to Proceed are secured. Work in flowing streams is restricted to June 15 through October 31. All habitat restoration improvements will follow techniques in the California Salmonid Stream Habitat Restoration Manual. Actual project start and end dates, within this timeframe, are at the discretion of the Grantor.

Objective(s):

The specific objective of this project is to install multiple storage tanks totaling 250,000 gallons and placing restrictions on corresponding seasonal water rights to prevent summertime water diversion. Additionally this project will protect juvenile salmonids from injury by properly screening all diversions associated with the project.

The goal of this project is to directly improve juvenile anadromous fish habitat and passage by increasing summer stream flows and providing connectivity between pools during the low flow time of year. These goals will be accomplished by providing incentives to an institutional landowner to protect habitat and reduce summer water withdrawals. Specifically the project will enable them to forbear

from pumping during the low flow season by increasing the size of their water storage system sufficient to last during the forbearance season. The institutional landowner and associated representatives will be educated on how to operate the water storage system, including water use reductions through conservation and leak proofing, along with guidelines for habitat protection while filling and topping their tanks. The landowner will sign a legally enforceable forbearance agreement with restrictions that protect fish habitat, including the following: minimum stream flows below which no pumping is allowed; maximum pumping rates and minimum bypass flows; assigned pumping days to minimize cumulative impacts; and pump intake screens that comply with Grantor 2000 criteria.

Project Description:

Location: The Grantee will conduct work in the Mattole River headwaters in the village of Whitethorn, located approximately 10 miles due west of Highway 101 on the Mendocino and Humboldt County border. The four diversion sites adjoin McKee Creek and Ravashoni Creek. The McKee Creek sites are located approximately 2900 feet upstream of the confluence of McKee Creek with the Mattole River, at coordinates 40.06765° north latitude and -123.958171° west longitude and 40.068618° north latitude and -123.958801° west longitude. The Ravashoni Creek site is located approximately 2700 feet upstream of the confluence of Ravashoni Creek with the Mattole River, coordinates are 40.03707° north latitude and -123.947816° west longitude, as depicted in the Project Location Map

Project Set Up: The Grantee will be the project lead and primary responsible organization for the project. The Project Manager will manage the overall project including subcontracts, grant agreements, permits, and supervision of grantee supporting staff. The project manager will be responsible for successful implementation of the project including deliverables, permits and reports. The Coordinator will work with the landowners to develop and execute the forbearance agreement and finalize the water management plan, supervise all contractors, order materials and coordinate delivery, and procure all required permits and water rights. The Landowner monitor will manage all landowner notifications for the forbearance program, perform annual monitoring and manage all landowner files. The Bookkeeper/Grant Manager will track budgets and prepare all invoicing.

A subcontracted legal consultant will assist with landowner specific forbearance agreements and consult on landowner issues and all water rights and permit requirement questions.

A subcontracted engineer will perform site evaluations and specifications for tank site grading; provide input and review on tank and water system design and assist with county permits if needed based on extent of grading and size of tanks. The engineer will review and approve construction drawings.

The Subcontracted Electrician and Plumber will provide input on system design and prepare construction drawings as well as implement all plumbing and electrical tasks needed to facilitate use of the stored water. Plumbing tasks include but are not limited to installation of piping from tank to house; installation of pressure pump and small pressure tank, tank manifold and valves, leak safety systems, meters, CDFW/NOAA compliant fish screen fabrication and installation; and filtration system installation. Electrical tasks include but are not limited to installation of operational controls and wiring to connect pumps to the controls.

The Subcontracted Heavy Equipment and Labor will provide input on system design and performs all installation tasks not performed by the electrician and plumber. Installation tasks include but are not limited to site and tank pad preparation; tank installation; trenching; assisting plumber with pipe laying; backfilling trenches; winterizing system and erosion control.

The Water delivery subcontractor will deliver water in the event of catastrophic loss to a forbearance participant during the forbearance season when no water can be pumped. Additionally delivered water will be used to partly fill and stabilize tanks if winter weather has started without sufficient rainfall and flow to divert water into the tanks for stabilization.

Materials: A total of three 50,000-gallon water storage systems including three source pumps, three 1300 gallon staging tanks, three source pump retrofits, three pressure pump and tanks, 6000 feet of plastic pipe, three leak safety and valves, three fish screens, five water clarity filters, three electrical controls and associated parts, three water meters, 65 yards of sand, 390 yards of gravel, and three mulch and erosion control.

Tasks: Install five 50,000-gallon water storage systems in the Mattole headwaters for three landowners, with accompanying forbearance agreements that prohibit pumping during the dry season (August 1 through November 15). The following tasks will be completed for all participants:

- Complete Participant Water Management Plan: Finalize development of participant Water Management Plan including type and size of tank storage, exact location of tank and trench locations (requiring archaeology and botany site clearance first), system components needed to connect storage to existing system, leak safety and controls, and participant cost share tasks and responsibilities.

- Finalize and record forbearance agreement: Landowner specific information is entered into the template forbearance document. After review by participant and land trust attorneys, documents are signed and recorded, securing the interest in the land.
- Apply for and obtain site specific permits: Using the pre-determined permitting process, site specific applications are submitted and necessary permits are obtained. Water rights for storage will be developed based on purpose of water use with a different process for residential participants and institutional participants.
- Install tank and associated water system improvements: The tank or tanks are installed along with other plumbing needed to facilitate use of the stored water. Installation tasks include site preparation; tank assembly; trenching and piping from tank to house; pressure pump and small pressure tank installation if needed; plumbing and electrical hook-ups; meter installation; Grantor/NOAA compliant fish screen installations; and filtration system installation.
- Finalize water management plan: The template water management plan is modified to reflect the specifics of the final configuration of the upgraded water system and the water consumption patterns of the participant.
- Prepare documentation of water system and conduct landowner education on system operation.
- Conduct post project photo documentation.
- Conduct landowner compliance monitoring and operation of seasonal forbearance.
- Perform landowner notifications for seasonal management of forbearance program.
- Perform landowner compliance monitoring annually. Assist with landowner emergency water loss and provide technical assistance for adaptive management as needed.

Deliverables:

- Copies of three executed forbearance agreements
- Three landowner Water Management Plans
- Installation of five 50,000 gallon water storage systems
- Installation of Grantor compliant fish screens for all diversions associated with the project
- Documentation of Compliance Monitoring
- Final Project Report

Mattole Flow Program – Tributary Water Storage and Forbearance

2016

Timelines:

June 1, 2016 through June 31, 2017: finalize pumping restrictions and permit process. Develop and finalize water system and water management plan, execute forbearance agreement, obtain permits, water rights and 1602 notification

August 1, 2016 through December 30, 2018: Install water tanks, water system modifications and CDFW compliant fish screens at the diversion point

June 2016 – December 2018: Operate seasonal storage and forbearance program including new landowner participants from this proposal.

February 2019: Final Reports

Additional Requirements: The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee to the CDFW Grant Manager on a form provided by CDFW.

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*.

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

California Department of Fish and Wildlife

Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Briceland, Honeydew, Ettersburg, Miranda, Shelter Cove, Garberville, Bear Harbor, and Piercy for: Mattole Flow Program- Tributary Water Storage and Forbearance T5S, R2E, Section 9 and 33, Briceland Quad, Humboldt County, USA.

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 American peregrine falcon <i>Falco peregrinus anatum</i>	ABNKD06071	Delisted	Delisted	G4T4	S3S4	
2 Cone Peak bedstraw <i>Galium californicum ssp. lucicense</i>	PDRUB0N0E3			G5T3	S3	1B.3
3 Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040			G5	S4	
4 Davidson's bush-mallow <i>Malacothamnus davidsonii</i>	PDMALOQ040			G2	S2	1B.2
5 Hardham's evening-primrose <i>Camissoniopsis hardhamiae</i>	PDONA030N0			G2	S2	1B.2
6 Hickman's checkerbloom <i>Sidalcea hickmanii ssp. hickmanii</i>	PDMAL110A2			G3T2	S2	1B.3
7 Howell's montia <i>Montia howellii</i>	PDPOR05070			G3G4	S3	2B.2
8 Humboldt milk-vetch <i>Astragalus agnicidus</i>	PDFAB0F080		Endangered	G3	S3	1B.1
9 Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420			G4	S4	4.2
10 Oregon coast paintbrush <i>Castilleja litoralis</i>	PDSCR0D012			G4G5T4	S3	2B.2
11 Oregon goldthread <i>Coptis laciniata</i>	PDRAN0A020			G4	S3	4.2
12 Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6			G5T3T4	S2	1B.2
13 Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010			G4	S3S4	SC
14 San Antonio collinsia <i>Collinsia antonina</i>	PDSCR0H010			G1	S1	1B.2
15 Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030			G3	S3	SC
16 Ten Mile shoulderband <i>Noyo intersessa</i>	IMGASC5070			G2	S2	
17 Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010		Candidate Threatened	G3G4	S2	SC
18 Upland Douglas Fir Forest	CTT82420CA			G4	S3.1	
19 Valley Oak Woodland	CTT71130CA			G3	S2.1	
20 Whitney's farewell-to-spring <i>Clarkia amoena ssp. whitneyi</i>	PDONA05025			G5T1	S1	1B.1
21 arroyo toad <i>Anaxyrus californicus</i>	AAABB01230	Endangered		G2G3	S2S3	SC
22 coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0			G4	S3	2B.2
23 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	

California Department of Fish and Wildlife

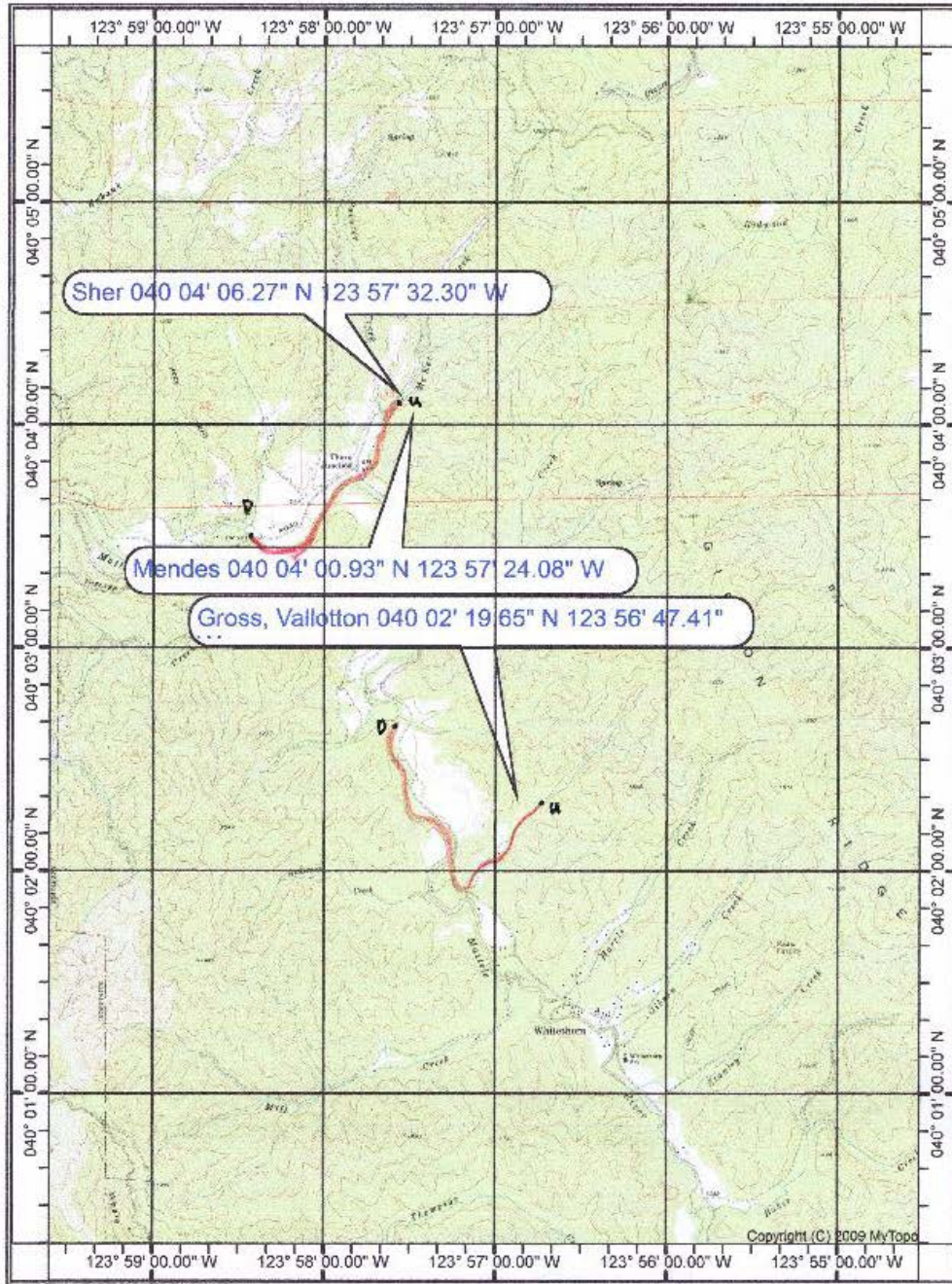
Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Briceland, Honeydew, Ettersburg, Miranda, Shelter Cove, Garberville, Bear Harbor, and Piercy for: Mattole Flow Program- Tributary Water Storage and Forbearance T5S, R2E, Section 9 and 33, Briceland Quad, Humboldt County, USA.

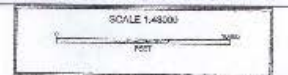
Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
<i>Oncorhynchus kisutch</i>						
24 dwarf calycadenia <i>Calycadenia villosa</i>	PDAST1P0B0			G3	S3	1B.1
25 fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SC
26 foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050			G3	S3	SC
27 golden eagle <i>Aquila chrysaetos</i>	ABNKC22010			G5	S3	
28 leafy reed grass <i>Calamagrostis foliosa</i>	PMPOA170C0		Rare	G3	S3	4.2
29 little willow flycatcher <i>Empidonax traillii brewsteri</i>	ABPAE33041		Endangered	G5T3T4	S1S2	
30 marsh pea <i>Lathyrus palustris</i>	PDFAB250P0			G5	S2	2B.2
31 mountain shoulderband <i>Helminthoglypta arrosa monticola</i>	IMGASC2035			G2G3T1	S1	
32 obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380			G4?	S1S2	
33 osprey <i>Pandion haliaetus</i>	ABNKC01010			G5	S4	
34 pale-yellow layia <i>Layia heterotricha</i>	PDAST5N070			G2	S2	1B.1
35 pallid bat <i>Antrozous pallidus</i>	AMACC10010			G5	S3	SC
36 small groundcone <i>Kopsiopsis hookeri</i>	PDORO01010			G4G5	S1S2	2B.3
37 summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B			G5T4Q	S2	SC
38 western pond turtle <i>Emys marmorata</i>	ARAAD02030			G3G4	S3	SC
39 white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050			G3	S3	1B.2

Mattole Flow Program – Tributary Water Storage and Forbearance Project
Project Location Map
T5S, R2E, Section 9 and 33, Briceland Quad, Humboldt County



Mattole Flow Program - Tributary Water Storage and Forbearance
(Affected reaches marked in red in each watershed)

Briceland Quad



Introduction: The City of Fortuna Public Works Engineering Division will construct a 40-foot long roughened rock chute downstream of the South Fortuna Boulevard crossing to raise the channel bed 2.0 feet, and cut and refors a 2.5-foot deep, 185-foot long concrete notch through the culvert, including roughness elements to reduce velocities for juvenile fish passage. The raised crest of the propose rock chute will create a 2-foot deep pool at the downstream end of the crossing and will backwater the full length of the notch.

This project is necessary because historically and currently, coho salmon, steelhead and cutthroat trout have been found in Strongs Creek. Strongs Creek is identified as a target stream to establish populations of coho salmonids. California Department of Fish and Wildlife conducted a fish passage assessment of the Strongs Creek crossing at Fortuna Boulevard and used FishXing software to assess fish passage conditions over the range of fish passage flows. The results of the analyses indicate that the crossing is a complete barrier to adult anadromous and juvenile salmonids at both low and high fish passage flows due to the drop at the downstream end of the crossing and shallow, high velocity flows within the crossing. This crossing currently restricts access to approximately 10.95 miles of historical salmonid habitat upstream of the crossing.

The Grantee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* Part IX and XII (Flosi et al 1998 and 2002).

Objectives: Objectives of this project include:

- Provide cold-water refugia from higher water temperatures in the main stem Eel River.
- Retrofit an existing culvert to provide fish passage at the South Fortuna Boulevard crossing to restore habitat connectivity.
- Provide access to 10.95 miles of historical habitat for coho salmon.

Project Description:

Location: The project site is located within a narrow riparian corridor between residential, commercial and light industrial parcels in western Fortuna on Strongs Creek. The work site spans two undeveloped parcels owned by the City of Fortuna and a private landowner. The project boundary begins upstream of the South Fortuna Boulevard crossing and extends approximately 200 feet downstream of the culvert and to the top of bank on either side of the channel. The culvert crossing is located approximately 1,500 feet upstream of the Highway 101 crossing and 1.2 miles upstream of the confluence with the Eel River. The upstream end of the culvert under South Fortuna Boulevard is located at 40.58030000 north latitude: 124.14700000 west longitude.

Project Set Up: The City of Fortuna will assist the Construction Subcontractor with interpretation of the construction documents and permit conditions during construction and provide general construction oversight and coordination as it relates to regulatory compliance. City of Fortuna personnel will provide management and administrative services, including attendance at applicable meetings.

The Engineering Subcontractor will serve as the engineer of record, project manager, perform coordination with the City of Fortuna and subcontractors, provide structural and civil engineering expertise, and lead the bid period services, construction management, on-site observation, biological clearance surveys, and project closeout tasks.

- Provide civil engineering and fish passage expertise.
- Serve as the project manager, project engineer, and on-site inspector, and perform coordination with the City of Fortuna and subcontractors.
- Provide the civil engineer and provide structural engineering expertise and on-site inspection.
- Provide quality assurance and quality control oversight, as needed.
- Provide a qualified biologist to conduct biological clearance surveys.

The Fish Passage Design Subcontractor will support the Engineering Subcontractor during the construction phase. The Fish Passage Design Subcontractor will serve as the fish passage engineers for the project. The Fish Passage Design Subcontractor will assist with preparing bid documents and selection of a Construction Subcontractor, oversight of rock chute and rock bank line construction and post implementation monitoring.

The Construction Subcontractor awarded the project will be responsible for complying with the California Environmental Quality Act (CEQA) /permit conditions.

Materials: Project materials include gravel, fabric, temporary shoring, signs, notification materials, water bags, piping, pumps, straw wattles, streambed material/rock, native backfill, structural backfill, structural concrete and reinforcement, concrete roughness blocks, 1/2 ton rock slope protection (RSP), 1 ton RSP, engineered streambed material, river run gravel (6" minus), biodegradable coir mat, seed (Brome, Rye, Wheatgrass, Fescue and Barley mix), mulch, container plants, willow staking, and straw mulch.

Tasks:

Task 1 - Pre-Bid and Bid Period Assistance. The City of Fortuna will provide the Advertisement of Bid and pay any associated fees for the placement of the

bid in any newspapers or other publications. The Engineering Subcontractor will provide the following services:

- Compile bid package including FRGP programmatic CEQA/permit conditions and subcontract provided by the City of Fortuna.
- Print and distribute plans to potential Construction Subcontractors (copies to Builder's exchange and the City of Fortuna).
- Issue Addenda during bidding to answer subcontractor questions
- Organize and conduct a pre-bid site meeting
- Organize and participate in bid opening
- Review potential Construction Subcontractor bids, summarize bid results and provide recommendation to City of Fortuna for award.
- Work with the selected Construction Subcontractor on obtaining and verifying bonds and insurance.
- Work with the City of Fortuna on preparing the subcontract documents for Fortuna City Council approval:
 - Notice of Award
 - Subcontract
 - Notice to Proceed Assumptions.

Task 2 - Construction Management. The Engineering Subcontractor will provide construction management assistance throughout the construction of the project. The Engineering Subcontractor will coordinate communication between the Construction Subcontractor, the City of Fortuna and other parties throughout the course of the project. The Engineering Subcontractor will assist the City of Fortuna to respond to landowner questions/comments.

Sub-Task 2.1 - Pre-Construction Review of Construction Subcontractor Documents

- Review Construction Subcontractor's initial construction schedule for completeness, adherence to project requirements and ease of monitoring progress.
- Review Construction Subcontractor's submittals.
- Review cost breakdowns requested for lump sum items to establish the basis for payment calculation for those items.

Sub-Task 2.2 - Pre-Construction Meeting

- Conduct pre-construction meeting.
- As a part of this effort, the Engineering Subcontractor will prepare and distribute the agenda, meeting minutes and a task list to project staff.
- Summarize work and expectations of City of Fortuna including subcontract requirements and coordination required for the completion of the work including roles and responsibilities, schedule of work, submittals, work hours, notifications, safety, coordination with utilities, materials testing, etc.

- Attend additional meetings and coordinate as necessary with the City of Fortuna and the Construction Subcontractor prior to the start of construction.

Sub-Task 2.3 - Environmental Compliance Coordination

- Compile permit and regulatory documents and distribute to subcontractors.
- Respond to environmental compliance and permitting related questions during the construction period.
- Oversee permit compliance requirements and assist Construction Subcontractor interpret permit conditions and construction windows.
- Conduct environmental awareness training to Construction Subcontractor
- Schedule and coordinate biological clearance surveys.

Sub-Task 2.4 - Construction Period Tasks

- Record working days, non- working days and weather related days and issue weekly statement of working days.
- Review Construction Subcontractor monthly payment requests, resolve differences in payment quantities, and prepare and submit monthly payment recommendations to City of Fortuna.
- Maintain project records and files.
- Attend project meetings and prepare agenda and document meeting minutes.
- Coordinate and manage Submittal and Shop Drawings reviews – include maintaining submittal log.
- Review and respond to Construction Subcontractor submittals, based upon the plans and specifications.
- Monitor the Construction Subcontractor's construction schedule and progress for adherence to project schedule, coordinate with the Construction Subcontractor on maintaining activities, notify Construction Subcontractor and City of Fortuna of any schedule concerns, review any schedule revisions and negotiate time extensions if necessary.
- Coordinate with the Construction Subcontractor so Construction Subcontractor can provide City of Fortuna staff with sufficient advance notice for any construction activities which may affect or require City of Fortuna resources or coordination.
- Request For Information (RFI) & Contract Change Orders (CCO)
 - Manage Construction Subcontractor correspondence including RFIs, Potential Change Orders (PCOs) and CCOs – include technical/engineering assistance and review, maintain logs, prepare and transmit responses and coordinate with other parties to develop responses.

- Submit copy of CCO memorandum and CCOs to City of Fortuna.
- Attend on-site meetings to address construction issues, prepare agenda and meeting minutes.
- Coordinate and schedule Biologist, Construction Observer, and supporting City of Fortuna staff.

Task 3 - On-site Observation. The Engineering Subcontractor will provide the following onsite construction observation services as described below. An assumed 24-hours per week of onsite observation for an assumed 90-calendar day construction 14 period has been assumed as an initial allowance.

- Provide on-site construction observation to document Construction Subcontractor general conformance with the project plans and specifications. Prepare observation reports including digital photo logs of progress.
- Maintain routine communication with Construction Manager and City of Fortuna staff.
- Maintain a set of red line plans depicting changes noted by the construction observer.
- Conduct regulatory permitting monitoring and reporting.
- Collect and maintain material tags and testing tags/reports as required for Agreement compliance.
- Review traffic control, water management and monitor Construction Subcontractor activities.
- Reject or recommend deductions for materials not meeting the project requirements.
- Conduct spot elevation checks of grading and rock installation for conformance with plans and specifications.
- Observe seed/mulch application.
- Observe plant installation.

Task 4 - Biological Clearance Surveys. The Engineering Subcontractor will conduct biological clearance surveys for presence/absence of nesting birds prior to construction disturbance and provide as-needed avian surveys and biological monitoring during construction activities. An initial allowance of 40-hours has been allocated to this task.

Task 5 - Project Closeout and Post-Construction Fish Passage Monitoring. The Engineering Subcontractor will assist the City of Fortuna with the project closeout including final documentation, notice of completion and record drawings.

Sub-Task 5.1 - Final Documentation. Prepare final project closeout documents including the following:

- Complete project photo log in CD format
- Approved submittals
- Inspection/observation logs
- Notice of Termination
- Meeting notes
- Prepare Notice of Completion and other documents for approval by City of Fortuna and submit to County for Recording
- Prepare and transmit Record Drawings (As-builts) to City of Fortuna, incorporating any noted changes, change orders or other changes deemed necessary and provide hard copies as requested and electronic Computer Aided Design (CAD) files in AutoCAD format.

Sub-Task 5.2 - Final FRGP Progress Report - A Final Report containing the following information will be included:

- Number of restoration projects proposed as a result of this project;
- Name(s) of restoration project(s) proposed as a result of this project;
- Description(s) of restoration project(s) proposed as a result of this project;
- Type(s) of treatments applied, indicate the FRGP Proposal Project Type(s);
- Acres of salmonid habitat protected/restored;
- Number of watersheds protected/restored; and
- Dollar value of habitat treatments applied.

Sub-Task 5.3 - Post-Construction Fish Passage Monitoring. The Engineering Subcontractor will conduct post-construction monitoring at two different flows during the fall/winter following construction to evaluate fish passage in the rock chute and modified culvert. The monitoring will occur within the design flow ranges for two lifestages of coho salmonids. Thalweg elevation, water depths, velocities, and flow will be surveyed within the rock chute and baffled sections of the culvert using standard United States Geological Survey field methods. Measured flow depth and velocity values within the rock chute and baffled culvert will be compared with design values, and with CDFW and National Marine Fisheries Service fish passage criteria for the appropriate lifestage of salmonid. The Engineering Subcontractor will prepare a brief memorandum summarizing the methods and results of the post-construction fish passage monitoring.

Deliverables:

Task 1 – Bid package including FRGP programmatic CEQA/permit conditions, Addenda during bidding, bid results, Notice of Award, Subcontract, and Notice to Proceed.

Task 2

Subtask 2.2- agenda, meeting minutes and a task list.

Subtask 2.3- compiled permit and regulatory documents, biological surveys.

Subtask 2.4- weekly statement of working days, monthly payment recommendations, project and site meeting agendas and meeting minutes, subcontract change order memorandums.

Task 3 – Observation reports including digital photo logs, regulatory reporting, material tags and testing tags/reports.

Task 4 – Biological clearance survey logs

Task 5 – Complete project photo log in CD format, approved submittals, inspection/observation logs, notice of termination, meeting notes, notice of completion, record drawings (as-builts) to City of Fortuna, incorporating any noted changes, change orders or other changes deemed necessary and hard copies as requested and electronic CAD files in AutoCAD format, Final FRGP Progress Report, post-construction fish passage monitoring memorandum.

Timelines:

Task 1 - Pre-Bid and Bid Period Assistance (May-June 2017)

Task 2 - Construction Management (June-October 2017)

Task 3 - On-site Observation (July-October 2017)

Task 4 - Biological Clearance Surveys (May and June 2017)

Task 5 - Project Closeout and Post-Construction Fish Passage Monitoring (October 2017 through January 2018)

Additional Requirements:

The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee to the CDFW Grant Manager on a form provided by CDFW.

The bridge (culvert) design and installation will meet flow carrying capacity required for a 100-year flood event as identified by specifications determined by

National Oceanic and Atmospheric Administration (NOAA) Fisheries and the California Department of Fish and Wildlife (CDFW), for adult and juvenile salmonid fish passage. The project will follow the National Marine Fisheries Service (NMFS 2001) Guidelines for Salmonid Passage at Stream Crossings and criteria for fish passage as described in Volume II, Part IX, of the *California Salmonid Stream Habitat Restoration Manual*. The engineered plans for the bridge (culvert) installation shall be visually reviewed and authorized by NOAA Fisheries or California Department of Fish and Wildlife engineers prior to commencement of work.

All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual*, Volume I, and Volume II Part XI and Part XII. The Grantee/landowner will maintain the new crossing, inspect the crossing in a timely manner and remove debris as necessary during the storm season.

California Department of Fish and Wildlife

Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Fortuna, Fields Landing, McWhinney Creek, Hydesville, Scotia, Taylor Peak, Capetown, Ferndale, and Cannibal Island Quads for Fish Passage Improvements at South Fortuna Boulevard, T 02N, R 01W, S 02, Fortuna, Humboldt County, United States

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 Coastal Terrace Prairie	CTT41100CA			G2	S2.1	
2 Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040			G5	S4	
3 Hitchcock's blue-eyed grass <i>Sisyrinchium hitchcockii</i>	PMIRI0D0S0			G2	S1	1B.1
4 Howell's montia <i>Montia howellii</i>	PDPOR05070			G3G4	S3	2B.2
5 Humboldt Bay owl's-clover <i>Castilleja ambigua var. humboldtensis</i>	PDSCR0D402			G4T2	S2	1B.2
6 Humboldt marten <i>Martes caurina humboldtensis</i>	AMAJF01012			G5T1	S1	SC
7 Lyngbye's sedge <i>Carex lyngbyei</i>	PMCYP037Y0			G5	S2	2B.2
8 Menzies' wallflower <i>Erysimum menziesii</i>	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
9 Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420			G4	S4	4.2
10 Northern Coastal Salt Marsh	CTT52110CA			G3	S3.2	
11 Oregon coast paintbrush <i>Castilleja litoralis</i>	PDSCR0D012			G4G5T4	S3	2B.2
12 Oregon polemonium <i>Polemonium carneum</i>	PDPLM0E050			G3G4	S2	2B.2
13 Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6			G5T3T4	S2	1B.2
14 Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010			G4	S3S4	SC
15 Point Reyes salty bird's-beak <i>Chloropyron maritimum ssp. palustre</i>	PDSCR0J0C3			G4?T2	S2	1B.2
16 Siskiyou checkerbloom <i>Sidalcea malviflora ssp. patula</i>	PDMAL110F9			G5T2	S2	1B.2
17 Sitka Spruce Forest	CTT82110CA			G1	S1.1	
18 Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030			G3	S3	SC
19 Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010		Candidate Threatened	G3G4	S2	SC
20 Whitney's farewell-to-spring <i>Clarkia amoena ssp. whitneyi</i>	PDONA05025			G5T1	S1	1B.1
21 Wolf's evening-primrose <i>Oenothera wolfii</i>	PDONA0C1K0			G2	S1	1B.1
22 Yuma myotis <i>Myotis yumanensis</i>	AMACC01020			G5	S4	
23 bald eagle <i>Haliaeetus leucocephalus</i>	ABNKC10010	Delisted	Endangered	G5	S2	

California Department of Fish and Wildlife

Natural Diversity Database

Selected Elements by Common Name - Portrait

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Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24 bank swallow <i>Riparia riparia</i>	ABPAU08010		Threatened	G5	S2	
25 beach layia <i>Layia carnosa</i>	PDA5T5N010	Endangered	Endangered	G2	S2	1B.1
26 black-crowned night heron <i>Nycticorax nycticorax</i>	ABNGA11010			G5	S4	
27 bristle-stalked sedge <i>Carex leptalea</i>	PMCYP037E0			G5	S1	2B.2
28 coast cutthroat trout <i>Oncorhynchus clarkii clarkii</i>	AFCHA0208A			G4T4	S3	SC
29 coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0			G4	S3	2B.2
30 coast sidalcea <i>Sidalcea oregana ssp. eximia</i>	PDMAL110K9			G5T1	S1	1B.2
31 coastal marsh milk-vetch <i>Astragalus pycnostachyus var. pycnostachyus</i>	PDFAB0F7B2			G2T2	S2	1B.2
32 dwarf alkali grass <i>Puccinellia pumila</i>	PMPOA531L0			G4?	SH	2B.2
33 eulachon <i>Thaleichthys pacificus</i>	AFCHB04010	Threatened		G5	S3	
34 fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SC
35 foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050			G3	S3	SC
36 giant fawn lily <i>Erythronium oregonum</i>	PMLIL0U0C0			G5	S2	2B.2
37 golden eagle <i>Aquila chrysaetos</i>	ABNKC22010			G5	S3	
38 great blue heron <i>Ardea herodias</i>	ABNGA04010			G5	S4	
39 great egret <i>Ardea alba</i>	ABNGA04040			G5	S4	
40 green sturgeon <i>Acipenser medirostris</i>	AFCAA01030	Threatened		G3	S1S2	SC
41 hoary bat <i>Lasiurus cinereus</i>	AMACC05030			G5	S4	
42 longfin smelt <i>Spirinchus thaleichthys</i>	AFCHB03010	Candidate	Threatened	G5	S1	SC
43 maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0			G3	S3	4.2
44 marsh pea <i>Lathyrus palustris</i>	PDFAB250P0			G5	S2	2B.2
45 minute pocket moss <i>Fissidens pauperculus</i>	NBMUS2W0U0			G3?	S2	1B.2

California Department of Fish and Wildlife

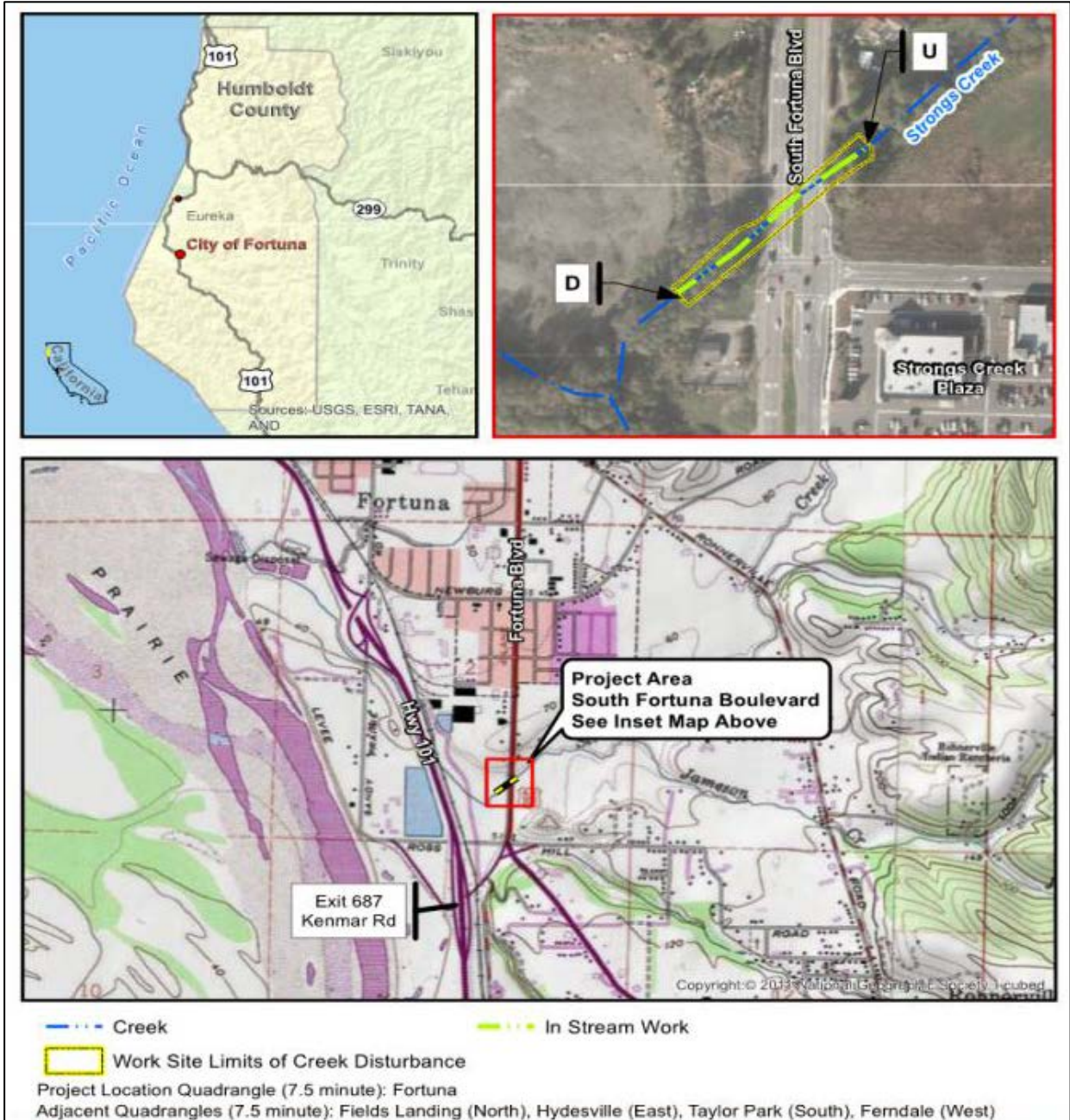
Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Fortuna, Fields Landing, McWhinney Creek, Hydesville, Scotia, Taylor Peak, Capetown, Ferndale, and Cannibal Island Quads for Fish Passage Improvements at South Fortuna Boulevard, T 02N, R 01W, S 02, Fortuna, Humboldt County, United States

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
46 northern red-legged frog <i>Rana aurora</i>	AAABH01021			G4	S2?	SC
47 obscure bumble bee <i>Bombus caliginosus</i>	IHYM24380			G4?	S1S2	
48 osprey <i>Pandion haliaetus</i>	ABNKC01010			G5	S4	
49 pallid bat <i>Antrozous pallidus</i>	AMACC10010			G5	S3	SC
50 pink sand-verbena <i>Abronia umbellata var. breviflora</i>	PDNYC010N4			G4G5T2	S1	1B.1
51 running-pine <i>Lycopodium clavatum</i>	PPLYC01080			G5	S3	4.1
52 seacoast ragwort <i>Packera bolanderi var. bolanderi</i>	PDAST8H0H1			G4T4	S2S3	2B.2
53 seaside bittercress <i>Cardamine angulata</i>	PDBRA0K010			G5	S1	2B.1
54 sharp-shinned hawk <i>Accipiter striatus</i>	ABNKC12020			G5	S4	
55 short-leaved evax <i>Hesperevax sparsiflora var. brevifolia</i>	PDASTE5011			G4T3	S2	1B.2
56 slender silver moss <i>Anomobryum julaceum</i>	NBMUS80010			G4G5	S2	4.2
57 snowy egret <i>Egretta thula</i>	ABNGA06030			G5	S4	
58 southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020			G3G4	S2S3	SC
59 tidewater goby <i>Eucyclogobius newberryi</i>	AFCQN04010	Endangered		G3	S3	SC
60 tricolored blackbird <i>Agelaius tricolor</i>	ABPBXB0020			G2G3	S1S2	SC
61 western lily <i>Lilium occidentale</i>	PMLIL1A0G0	Endangered	Endangered	G1	S1	1B.1
62 western pond turtle <i>Emys marmorata</i>	ARAAD02030			G3G4	S3	SC
63 western sand-spurrey <i>Spergularia canadensis var. occidentalis</i>	PDCAR0W032			G5T4?	S1	2B.1
64 western snowy plover <i>Charadrius alexandrinus nivosus</i>	ABNNB03031	Threatened		G3T3	S2	SC
65 western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
66 white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050			G3	S3	1B.2
67 willow flycatcher <i>Empidonax traillii</i>	ABPAE33040		Endangered	G5	S1S2	

Fish Passage Improvements at South Fortuna Boulevard
 Project Location Map
 T 02N, R 01W, S 02
 Fortuna Quad, Humboldt County



Introduction:

Sanctuary Forest will implement the McKee Creek Instream Habitat Restoration Project. The purpose of the project is to restore instream habitat through improving pool complexity, shelter, and drought resilience for summer and winter rearing of juvenile coho salmon and steelhead trout in McKee Creek. This will be accomplished through installing 18 instream structures at 13 sites in a 2100 foot long reach including 8 pool habitat and scour structures, 4 log weir structures, 3 boulder weir structures and 3 unanchored structures at accelerated recruitment sites.

The project is necessary because a 1996 CDFW stream inventory report for McKee Creek recommended adding instream wood. This work has not yet been implemented. Adding instream wood will improve channel structure, channel function, habitat complexity, and habitat diversity for salmonids.

The Grantee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement will follow techniques in the California Salmonid Stream Habitat Restoration Manual Parts VII and XI (Flosi et al 1998 and 2002).

Objective(s):

The goals of this project are to increase pool depth and area within McKee Creek, which will also provide greater resilience to drought. The project will also increase channel connectivity to inset floodplains, improving winter habitat for juvenile salmonids. The project will increase instream habitat complexity and shelter values by providing increased cover and shade habitat in existing pools. These goals will be achieved by strategic placement of instream wood.

Project Description:

Location: The Grantee will conduct work along a section of McKee Creek. The locations of the project boundaries are approximately 40.06116700 ° north latitude, 123.96286100 ° west longitude at the downstream end; and 40.06627800 ° north latitude, 123.96069400 ° west longitude at the upstream end.

Project Set Up: Sanctuary Forest is the project lead. The Mattole Salmon group will be the main subcontractor for project implementation and will also provide design input. Other subcontractors who will contribute engineering and surveying expertise include Conor Shea, USFWS and Keith Barnard, Greenway Partners.

Sanctuary Forest: Sanctuary Forest (SFI) will oversee and coordinate the project, manage all grants and cost share, purchase all materials and provide monitoring. All monitoring will be paid by cost share funds and Sanctuary Forest volunteer in-kind services.

SFI Project Manager: The SFI project manager will manage the overall project including subcontracts, grant agreements, permits, and supervision of SFI supporting staff.

SFI Project Assistant Manager and Field Staff: The SFI project assistant manager and field staff will be responsible for project coordination with the subcontractors, materials purchase and delivery, invoicing and grant reporting; pre and post project monitoring and will also assist the project manager as needed.

SFI volunteers will assist with hand labor tasks.

SFI Bookkeeper and Grants Manager: The SFI bookkeeper and grants manager will manage the grant and subcontract budgets and perform all invoicing and payments.

Mattole Salmon Group: The Mattole Salmon Group (MSG) will be the implementation subcontractor of the project. MSG will be contribute to site assessment and project design and be responsible for implementation including heavy equipment installation of LWD features and supervision of the construction crews to assure the project is implemented as designed.

MSG Project Manager and Construction Supervisor: Responsibilities include management tasks such as subcontracts and budgets, as well as implementation and field supervision. Additional responsibilities include participation in project design and input on final plans; material specifications; and reporting documents including as built drawings.

MSG Bookkeeper: The MSG bookkeeper will create invoicing and track budgets.

MSG Equipment Operator: The MSG equipment operator will operate all heavy equipment as needed for placement and installation of logs and boulders, including excavator, bulldozer, log skidder, dump truck and trailer, and crane truck and trailer.

MSG Laborer (specialist construction): The MSG laborer specialist will perform all skilled implementation tasks including anchoring of logs and boulders to each other and to the trees selected for anchoring.

MSG Labor: The MSG laborer will perform all general labor including debarking of logs and erosion control work as well as assist the laborer specialist with all skilled implementation tasks.

Conor Shea Ph.D., P.E. (Civil Engineer/Fluvial Geomorphologist), USFWS will provide engineering design services on this project. His tasks will include developing HEC-RAS modeling of the entire project reach, two dimensional

hydraulic modeling of structures, preparing stability and buoyancy analyses for wood structures, 14 and preparing engineering analyses needed to ensure structures are in compliance with CDFW/NOAA fish passage requirements. Conor will prepare final design plans and work with the MSG construction supervisor to ensure that the structures are built in accordance with specifications.

Keith Barnard, Surveyor, Greenway Partners: Keith Barnard prepared the pre-project longitudinal profile survey and AutoCAD mapping for the project. Keith will survey and prepare the post-project longitudinal profile and assist with the surveying of cross-sections at all weir locations and pre- and post-project pool depth and area.

Materials: Materials that will be in this project include safety items, fuel, construction anchoring materials, logs, boulders, small rock and cobble, and miscellaneous tools and supplies.

Tasks:

1. Grant Oversight Manage grant agreements, invoicing and payments, reporting and cost share pursuant to grant and regulatory guidelines. Upon final execution of the Grant and prior to receiving a Final Notice to Proceed, deliver the landowner access agreements, subcontracts, and assure all permits are finalized.
2. Permitting Acquire all necessary permits from regulatory agencies to proceed with project design and implementation.
3. Pre-Project Monitoring Conduct on-site monitoring prior to project implementation. Monitoring and evaluation guidelines from the California Salmonid Stream Habitat Restoration Manual will be followed and the Stream Habitat Enhancement Project Evaluation Individual Structure or Site Form will be used. Additionally streamflow monitoring will be conducted. All monitoring to be paid with cost share funds and volunteer in kind services.
4. Pre – Project Photo Documentation Conduct photo documentation of all sites, including representative points.
5. Final Project Planning and Design Work and consult with all project partners and funders to finalize project design. Surveyor will perform surveys of channel cross-sections at the 4 log weir and 3 boulder weir sites as well as mapping of pre-project pool depth and area. Licensed engineer will perform engineering analysis to ensure fish passage and structural stability, as well as prepare construction drawings. Obtain final design approval from landowners, partners and CDFW Project Manager.
6. Project Implementation Purchase materials and coordinate delivery. Install a total of 18 instream structures at 13 sites along a 2,100 foot reach of McKee Creek: 8 pool habitat and scour structures, 4 log weir structures, 3 boulder weir structures and 3 unanchored structures. Install all structures utilizing approved placing and anchoring methods in accordance with the CDFW restoration manual. Anchored structures will utilize standard cabling and

- pinning techniques. The 4 log weir structures will be sealed on the upstream side using a compacted wedge of gravel, clay and coir. The boulder weirs will closely follow CDFW restoration manual guidelines. Logs for the accelerated recruitment sites will be provided by falling approximately 8 standing trees into the creek at 3 locations where thinning is needed. A total of 71 logs, 103 boulders and 16 loads (160 tons) of small rock and cobble is estimated for all 18 structures. Heavy equipment will be used for trenching and placing the boulders, gravel and logs, with the exception of the accelerated recruitment sites. Boulders, cobble and gravel will be delivered to the site with dump trucks, and logs will be hauled to the site on logging trucks. Hand crews will perform anchoring and sealing tasks.
7. Post-Project Site Mulching and Planting Following implementation, mulch sites with native materials or rice straw where appropriate. Plant vegetation in areas that were opened up for equipment access and within the riparian corridor. Native tree seedlings and shrubs will likely include: Oregon Ash, Big Leaf Maple, Alder and Thimbleberry.
 8. Post – Project Surveys Surveyor will conduct survey of project to prepare post-implementation longitudinal profile and pool depth and area.
 9. Post-Project Monitoring Evaluate all structures in accordance with the Stream Habitat Enhancement Project Evaluation Individual Structure or Site Form. Additionally streamflow monitoring will be conducted. All monitoring to be paid with cost share funds and volunteer in kind services.
 10. Photo Documentation Conduct post-project photo documentation at all sites and in relation to pre-project photo documentation.
 11. Adaptive Management and Structure Modification Ensure weir function and habitat complexity through adaptive management and structure modification, to be informed by monitoring outcomes and consultations with partners and CDFW Project Manager. Anticipated structure modifications include adjustments to weirs to re-direct low or high flows, augment sealing of weirs, and installation of secondary structures to improve fish passage. Installation of a secondary structures will require 15 additional logs and 5 tons of small rock and cobble, and will be placed with heavy equipment. Most other adaptive management tasks can be performed with hand labor.
 12. Reporting Write and deliver progress reports for invoicing, Annual Progress Reports, and a Final Report to CDFW Project Manager. Include pre and post project longitudinal profile; pre and post project photos and monitoring results in the final report.

Deliverables:

1. Installation of 18 instream structures consisting of 65 logs with and without root wads.
2. Final Report, including pre and post project photo- documentation, as built drawings, preliminary monitoring results including a Stream Habitat Enhancement Project Evaluation Individual Structure or Site Form for all 18 structures, pre and post project longitudinal profiles and other required

reporting metrics. Adaptive management assessment and implementation outcomes will also be summarized in the report.

Timelines:

June 2016- June 2017: Complete pre project monitoring and surveys; complete project planning, final design and permitting

July - October 2017: Project implementation

September 2017 – October 2019: Post project monitoring and adaptive management

February 2020: Final Reporting

Additional Requirements:

The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee to the CDFW Grant Manager on a form provided by CDFW.

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*.

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

California Department of Fish and Game

Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Briceland Quad and the Surrounding Quads for: McKee Creek Instream Habitat Restoration.
T04S, R02E, S33, Briceland, Humboldt County

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 American peregrine falcon <i>Falco peregrinus anatum</i>	ABNKD06071	Delisted	unknown code...	G4T4	S3S4	
2 Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040			G5	S4	
3 Howell's montia <i>Montia howellii</i>	PDPOR05070			G3G4	S3	2B.2
4 Humboldt milk-vetch <i>Astragalus agnicidus</i>	PDFAB0F080		Endangered	G3	S3	1B.1
5 Mendocino Coast paintbrush <i>Castilleja mendocinensis</i>	PDSCR0D3N0			G2	S2	1B.2
6 Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420			G4	S4	4.2
7 Oregon coast paintbrush <i>Castilleja litoralis</i>	PDSCR0D012			G4G5T4	S3	2B.2
8 Oregon goldthread <i>Coptis laciniata</i>	PDRAN0A020			G4	S3	4.2
9 Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6			G5T3T4	S2	1B.2
10 Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010			G4	S3S4	SC
11 Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030			G3	S3	SC
12 Ten Mile shoulderband <i>Noyo intersessa</i>	IMGASC5070			G2	S2	
13 Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010		unknown code...	G3G4	S2	SC
14 Upland Douglas Fir Forest	CTT82420CA			G4	S3.1	
15 Whitney's farewell-to-spring <i>Clarkia amoena ssp. whitneyi</i>	PDONA05025			G5T1	S1	1B.1
16 coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0			G4	S3	2B.2
17 coho salmon - southern Oregon / northern California ESU <i>Oncorhynchus kisutch</i>	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
18 fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	unknown code...	G5T2T3Q	S2S3	SC
19 foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050			G3	S3	SC
20 golden eagle <i>Aquila chrysaetos</i>	ABNKC22010			G5	S3	
21 leafy reed grass <i>Calamagrostis foliosa</i>	PMPOA170C0		Rare	G3	S3	4.2
22 leafy-stemmed mitrewort <i>Mitellastra caulescens</i>	PDSAX0N020			G5	S4	4.2

California Department of Fish and Game

Natural Diversity Database

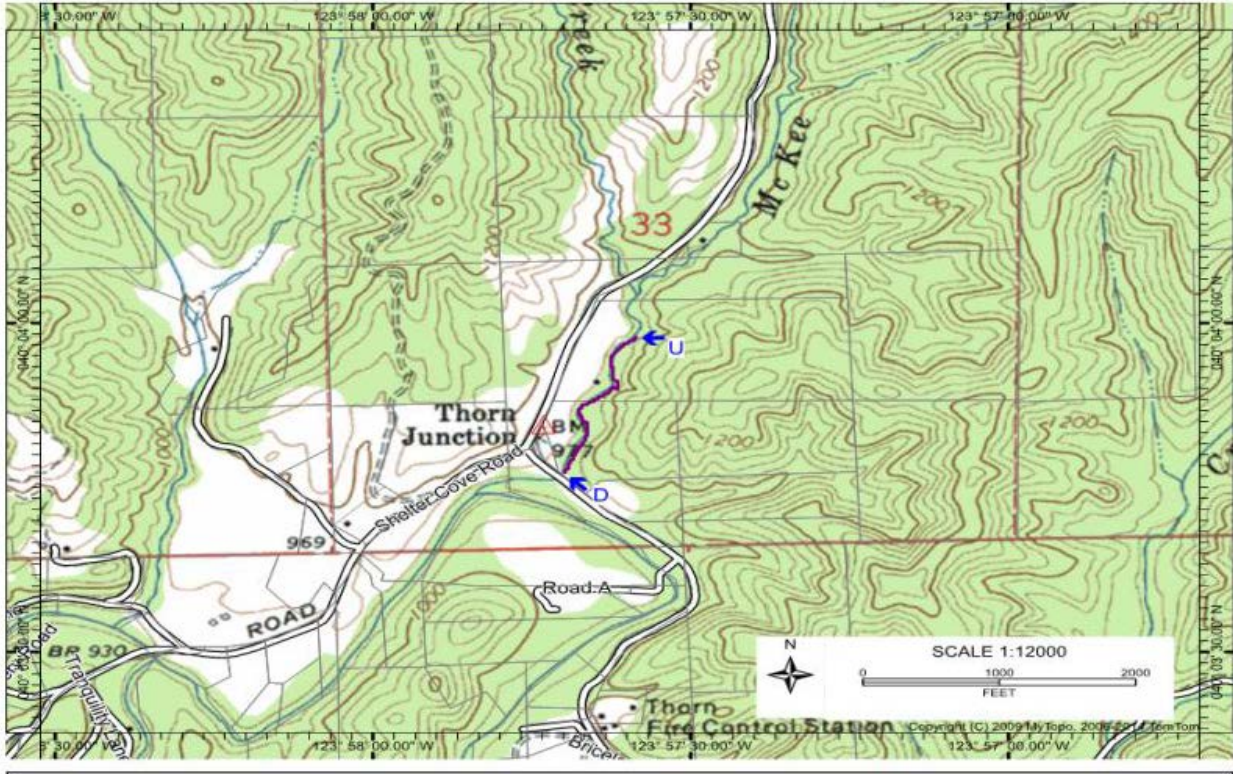
Selected Elements by Common Name - Portrait

Possible Species within the Briceland Quad and the Surrounding Quads for: McKee Creek Instream Habitat Restoration.

T04S, R02E, S33, Briceland, Humboldt County

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
23 little willow flycatcher <i>Empidonax traillii brewsteri</i>	ABPAE33041		Endangered	G5T3T4	S1S2	
24 maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0			G3	S3	4.2
25 marsh pea <i>Lathyrus palustris</i>	PDFAB250P0			G5	S2	2B.2
26 mountain shoulderband <i>Helminthoglypta arrosa monticola</i>	IMGASC2035			G2G3T1	S1	
27 northern spotted owl <i>Strix occidentalis caurina</i>	ABNSB12011	Threatened	unknown code...	G3T3	S2S3	SC
28 obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380			G4?	S1S2	
29 osprey <i>Pandion haliaetus</i>	ABNKC01010			G5	S4	
30 pallid bat <i>Antrozous pallidus</i>	AMACC10010			G5	S3	SC
31 small groundcone <i>Kopsiopsis hookeri</i>	PDORO01010			G4G5	S1S2	2B.3
32 southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020			G3G4	S2S3	SC
33 summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B			G5T4Q	S2	SC
34 western pond turtle <i>Emys marmorata</i>	ARAAD02030			G3G4	S3	SC
35 white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050			G3	S3	1B.2

McKee Creek Instream Habitat Restoration Project
Project Location Map
T04S, R02E, S33, Briceland Quad, Humboldt County



Introduction: The Pacific Coast Fish, Wildlife and Wetlands Restoration Association (PCFWWRA) will construct 11 large wood debris (LWD) features along approximately 0.5 miles of Morrison Gulch to enhance flatwater habitat types and shallow pools through increased logjam and woody debris complexity. Each feature will contain 3 to 5 key logs.

This project is necessary because Morrison Gulch supports coho salmon demonstrating resilience in spite of the fact that there have been a variety of land use impacts on fish habitat since the late 1800's. Deleterious activities included unrestricted logging and associated railroad, road and skid trail construction, stream clearing and residential development. This resulted in decreased pool frequency, depth and shelter values, significant stream bank erosion, locally dysfunctional or poorly functioning riparian habitat, high values of substrate embeddedness, and channel geomorphology simplification. This project will increase pool depth and cover providing shelter from predation. Bolstering the existing wood features and constructing new ones will also ensure continued geomorphic development and protection of the existing in-stream habitat, providing low velocity refuge for young of the year coho salmon during heavy runoff events, allowing for deeper summertime pools, increasing rearing potential and maintaining a complex geomorphic environment with increased edge habitat.

The Grantee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* Parts VII and XI (Flosi et al 1998 and 2002).

Objectives: By constructing 11 log structures along a 0.5 mile stretch of Morrison Gulch this project will create complex pool habitat and increase channel complexity. The project will be constructed with the following objectives:

- Place wood within the stream reach placed such that its function is consistent with the existing geomorphic environment.
- Provide several habitat elements which are currently lacking or could use improvement within Morrison Gulch.
- Enhance pool depth at existing pools by fluvial scour adjacent to LWD installation sites.
- Enhance cover in existing pools by adding complex wood structures to the margins of the existing channel.
- Provide refuge for coho salmon from high velocity flows during large storm events.
- Create enhanced spawning habitat by substrate sorting adjacent to LWD structures.
- Facilitate the creation and sustainability of a complex geomorphic channel environment where fish can "pick and choose" from a diverse suite of habitat elements within Morrison Gulch rather than compete for the limited suitable existing locations.

Project Description:

Location: The Morrison Gulch Watershed is located approximately 5 miles southeast of Arcata in the Jacoby Creek Watershed in Humboldt County. The downstream location of the project is at 40.81739600 north latitude: 124.04233230 west longitude. The upstream location of the project is at 40.82157310 north latitude: 124.03762850 west longitude.

Project Set Up: The project administration will be completed by the Project Manager who shall provide all agreement and subcontracting oversight and administration including but not limited to obtaining permits, securing agreements and subcontracts (grantors, subcontractors, and landowner), scheduling, implementation oversight, invoicing, reporting and agency and landowner communications. This task will occur throughout the life of the project. The Assistant Manager (AM) drafts subcontracts, invoices, permit applications and reports, and works closely with the Project Manager. The AM assists in tracking project's budgets and progress. They conduct some of the documentation in the field, communicate with partners, and reviews/verifies sub-invoicing. The AM spends the majority of time in the office, but does attend meetings with agencies and occasionally works in the field too.

The implementation of the instream habitat structures will be completed by the Technical Oversight Subcontractor (TOS) and Heavy Equipment Subcontractor. The TOS will be on site to layout the proposed heavy equipment construction treatments in the project area. The TOS Senior Geologist (a professional geologist) will provide project and construction oversight and Quality Assurance /Quality Control of project products. The TOS Senior Geologist will manage project layout, construction oversight, monitoring, and reporting. The TOS Project Manager and TOS Physical Science Tech will conduct surveys, construction oversight, pre-, during, and post-construction monitoring, and data entry. The TOS Geographic Information Systems (GIS) Staff will provide field layout maps, digitize layout and as-built project data, and develop report maps. The TOS Clerical Staff will track and monitor hours and create invoices during the project. All TOS work elements will be supervised by a TOS Principal Geologist.

Revegetation will be conducted by a Revegetation Subcontractor.

The final reporting of the project will be done by the TOS Senior Geologist, TOS Project Manager, and reviewed by the TOS Principal Geologist most closely involved in the project.

Materials: Materials necessary for this project include logs and rootwads: Suitable live and down conifer trees, preferably with rootwad attached. Rebar, nuts and plates to anchor logs. Trees (planting): Native tree species will be used. Straw, tree mulch, and seed. Miscellaneous office supplies: Many small office

supplies will be used to complete the project including: photographic supplies, field maps, polyester film overlays for field maps, photo duplication for final reports, copying/binding for final reports, report maps, phone, fax, email and postage.

Tasks:

Task A: Project Administration. PCFWWRA personnel shall provide all agreement and subcontract oversight and administration including but not limited to obtaining permits, securing agreements and subcontracts (grantors, subcontractors, and landowner), scheduling, implementation oversight, invoicing, reporting and agency and landowner communications. This task will occur throughout the life of the project.

Task B: Implementation of the habitat enhancement structures. The TOS will be in charge of executing the implementation of the project. The TOS Clerical Staff will compile invoices and track budgets throughout the lifetime of the project.

Task B-1: Pre project layout and existing conditions characterization. The TOS will flag heavy equipment access routes and construction boundaries (layout), equipment exclusion areas for biologic or cultural resource protection and LWD staging areas. They will also document the existing conditions at the structure sites and setup photo point monitoring stations at the construction locations for final reporting.

Task B-2: Access opening and feature treatment. The TOS will work with the Heavy Equipment Subcontractor to open access points for equipment and construction of LWD features.

Task B-2-1: 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 a pilot car to move through the freeway system.

Task B-2-2: An excavator and bull dozer will be used to open access points.

Task B-2-3: The excavator and dump truck will be used to move LWD material to site specific locations. The excavator will be used to construct the LWD features. Laborers will be used to spread seed and straw. The Revegetation Subcontractor will plant trees at completed construction sites.

Task C: Reporting. The TOS will conduct post habitat enhancement surveys of the constructed LWD features and reoccupy photopoints to document pre and post conditions at the feature locations. The TOS will develop a report based on CDFW requirements that documents the work completed and the total costs to implement the project.

Deliverables:

Task A: Progress reports, invoices, and annual report(s).

Task B: Construction of 11 coho habitat enhancement LWD features.

Task C: Upon completion of the project submit a written completion report which contains (1) general grant information, (2) location of work, (3) project access, (4) participating landowner's 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 log numbers, (7) dates of work and the number of person hours expended, (8) labeled before and after photos of selected restoration activities and techniques, (9) grant dollars spent and contributed and/or in kind services used to complete the project, and (10) GIS generated maps and shapefiles of the project area.

Timelines:

Task A: Project management and coordination will begin once the grant agreement is finalized and continue through the life of the project – June 2016, or upon grant agreement approval, through February 2018.

Task B: We anticipate beginning the on-the-ground implementation (habitat enhancement) work during the summer of 2016 through 2018 contingent on the implementation of the Morrison Gulch Sediment Reduction Project. It is expected that the full project will take one work season to complete. All heavy equipment work will be completed during low-flow periods when impacts to water quality can be minimized or avoided.

Task C: A final completion report will be submitted by January 2018, or sooner.

Additional Requirements:

The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee to the CDFW Grant Manager on a form provided by CDFW.

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*.

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

California Department of Fish and Wildlife

Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Arcata South, Arcata North, Blue Lake, Korbel, Iaqua Buttes, McWhinney Creek, Fields Landing, Eureka, Tyee City Quads for: HI 174 Morrison Gulch Coho Habitat Improvement Project, T 05N, R 01E, S14, Arcata South, Humboldt County, United States

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 California clapper rail <i>Rallus longirostris obsoletus</i>	ABNME05016	Endangered	Endangered	G5T1	S1	
2 California globe mallow <i>Iliamna latibracteata</i>	PDMAL0K040			G2G3	S2	1B.2
3 Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040			G5	S4	
4 Del Norte salamander <i>Plethodon elongatus</i>	AAAAD12050			G4	S3	SC
5 Howell's montia <i>Montia howellii</i>	PDPOR05070			G3G4	S3	2B.2
6 Humboldt Bay owl's-clover <i>Castilleja ambigua var. humboldtensis</i>	PDSCR0D402			G4T2	S2	1B.2
7 Humboldt marten <i>Martes caurina humboldtensis</i>	AMAJF01012			G5T1	S1	SC
8 Kneeland Prairie penycress <i>Noccaea fendleri ssp. californica</i>	PDBRA2P041	Endangered		G5?T1	S1	1B.1
9 Lyngbye's sedge <i>Carex lyngbyei</i>	PMCYP037Y0			G5	S2	2B.2
10 Menzies' wallflower <i>Erysimum menziesii</i>	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
11 Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420			G4	S4	4.2
12 Northern Coastal Salt Marsh	CTT52110CA			G3	S3.2	
13 Northern Foredune Grassland	CTT21211CA			G1	S1.1	
14 Oregon coast paintbrush <i>Castilleja litoralis</i>	PDSCR0D012			G4G5T4	S3	2B.2
15 Oregon goldthread <i>Coptis laciniata</i>	PDRAN0A020			G4	S3	4.2
16 Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6			G5T3T4	S2	1B.2
17 Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010			G4	S3S4	SC
18 Point Reyes salty bird's-beak <i>Chloropyron maritimum ssp. palustre</i>	PDSCR0J0C3			G4?T2	S2	1B.2
19 Siskiyou checkerbloom <i>Sidalcea malviflora ssp. patula</i>	PDMAL110F9			G5T2	S2	1B.2
20 Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030			G3	S3	SC
21 Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010		Candidate Threatened	G3G4	S2	SC
22 Upland Douglas Fir Forest	CTT82420CA			G4	S3.1	
23 Wolf's evening-primrose <i>Oenothera wolfii</i>	PDONA0C1K0			G2	S1	1B.1

California Department of Fish and Wildlife

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Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24 alpine marsh violet <i>Viola palustris</i>	PDVIO041G0			G5	S1S2	2B.2
25 bald eagle <i>Haliaeetus leucocephalus</i>	ABNKC10010	Delisted	Endangered	G5	S2	
26 bank swallow <i>Riparia riparia</i>	ABPAU08010		Threatened	G5	S2	
27 beach layia <i>Layia carnosa</i>	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
28 black-crowned night heron <i>Nycticorax nycticorax</i>	ABNGA11010			G5	S4	
29 bristle-stalked sedge <i>Carex leptalea</i>	PMCYP037E0			G5	S1	2B.2
30 coast cutthroat trout <i>Oncorhynchus clarkii clarkii</i>	AFCHA0208A			G4T4	S3	SC
31 coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0			G4	S3	2B.2
32 coast sidalcea <i>Sidalcea oregana ssp. eximia</i>	PDMAL110K9			G5T1	S1	1B.2
33 coastal marsh milk-vetch <i>Astragalus pycnostachyus var. pycnostachyus</i>	PDFAB0F7B2			G2T2	S2	1B.2
34 coho salmon - southern Oregon / northern California ESU <i>Oncorhynchus kisutch</i>	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
35 cylindrical trichodon <i>Trichodon cylindricus</i>	NBMUS7N020			G4	S2	2B.2
36 dark-eyed gilia <i>Gilia millefoliata</i>	PDPLM04130			G2	S2	1B.2
37 double-crested cormorant <i>Phalacrocorax auritus</i>	ABNFD01020			G5	S4	
38 eulachon <i>Thaleichthys pacificus</i>	AFCHB04010	Threatened		G5	S3	
39 fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SC
40 foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050			G3	S3	SC
41 ghost-pipe <i>Monotropa uniflora</i>	PDMON03030			G5	S2	2B.2
42 giant fawn lily <i>Erythronium oregonum</i>	PMLIL0U0C0			G5	S2	2B.2
43 golden eagle <i>Aquila chrysaetos</i>	ABNKC22010			G5	S3	
44 great blue heron <i>Ardea herodias</i>	ABNGA04010			G5	S4	
45 great egret <i>Ardea alba</i>	ABNGA04040			G5	S4	

California Department of Fish and Wildlife

Natural Diversity Database

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Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
46 green sturgeon <i>Acipenser medirostris</i>	AFCAA01030	Threatened		G3	S1S2	SC
47 leafy-stemmed mitrewort <i>Mitellastrca caulescens</i>	PDSAX0N020			G5	S4	4.2
48 long-eared myotis <i>Myotis evotis</i>	AMACC01070			G5	S3	
49 longfin smelt <i>Spirinchus thaleichthys</i>	AFCHB03010	Candidate	Threatened	G5	S1	SC
50 maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0			G3	S3	4.2
51 marsh pea <i>Lathyrus palustris</i>	PDFAB250P0			G5	S2	2B.2
52 minute pocket moss <i>Fissidens pauperculus</i>	NBMUS2W0U0			G3?	S2	1B.2
53 northern clustered sedge <i>Carex arcta</i>	PMCYP030X0			G5	S2	2B.2
54 northern meadow sedge <i>Carex praticola</i>	PMCYP03B20			G5	S2	2B.2
55 northern red-legged frog <i>Rana aurora</i>	AAABH01021			G4	S2?	SC
56 obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380			G4?	S1S2	
57 osprey <i>Pandion haliaetus</i>	ABNKC01010			G5	S4	
58 pink sand-verbena <i>Abronia umbellata var. breviflora</i>	PDNYC010N4			G4G5T2	S1	1B.1
59 running-pine <i>Lycopodium clavatum</i>	PPLYC01080			G5	S3	4.1
60 sandy beach tiger beetle <i>Cicindela hirticollis gravida</i>	IICOL02101			G5T2	S1	
61 seacoast ragwort <i>Packera bolanderi var. bolanderi</i>	PDAST8H0H1			G4T4	S2S3	2B.2
62 seaside bittercress <i>Cardamine angulata</i>	PDBRA0K010			G5	S1	2B.1
63 seaside pea <i>Lathyrus japonicus</i>	PDFAB250C0			G5	S2	2B.1
64 sharp-shinned hawk <i>Accipiter striatus</i>	ABNKC12020			G5	S4	
65 short-leaved evax <i>Hesperovax sparsiflora var. brevifolia</i>	PDASTE5011			G4T3	S2	1B.2
66 snowy egret <i>Egretta thula</i>	ABNGA06030			G5	S4	
67 southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020			G3G4	S2S3	SC
68 summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B			G5T4Q	S2	SC

California Department of Fish and Wildlife

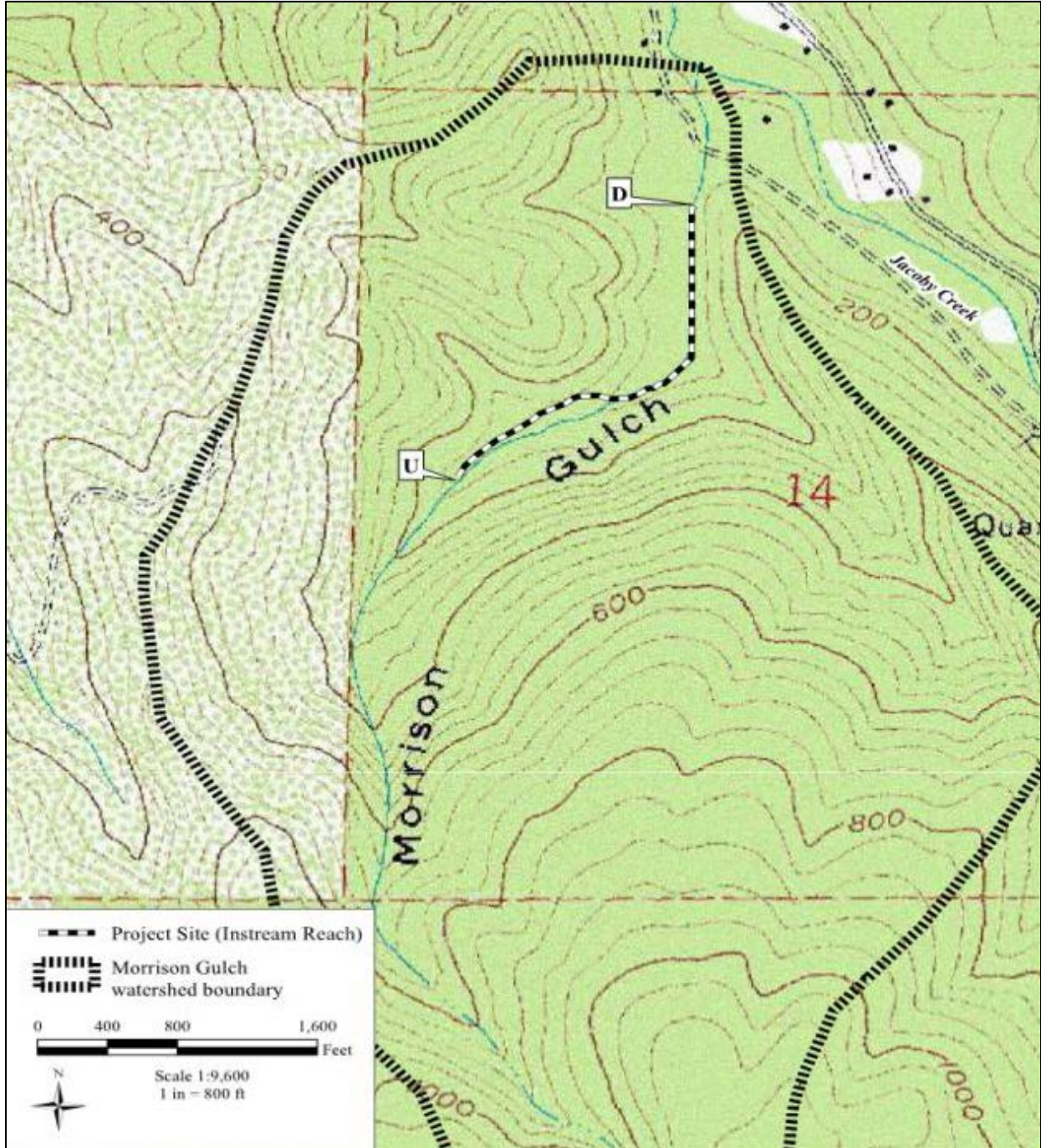
Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Arcata South, Arcata North, Blue Lake, Korbel, laqua Buttes, McWhinney Creek, Fields Landing, Eureka, Tye City Quads for: HI 174 Morrison Gulch Coho Habitat Improvement Project, T 05N, R 01E, S14, Arcata South, Humboldt County, United States

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
69 tidewater goby <i>Eucyclogobius newberryi</i>	AFCQN04010	Endangered		G3	S3	SC
70 twisted horsehair lichen <i>Bryoria spiralifera</i>	NLTEST5460			G3	S1S2	1B.1
71 western lily <i>Lilium occidentale</i>	PMLIL1A0G0	Endangered	Endangered	G1	S1	1B.1
72 western pond turtle <i>Emys marmorata</i>	ARAAD02030			G3G4	S3	SC
73 western sand-spurrey <i>Spergularia canadensis var. occidentalis</i>	PDCAR0W032			G5T4?	S1	2B.1
74 western snowy plover <i>Charadrius alexandrinus nivosus</i>	ABNNB03031	Threatened		G3T3	S2	SC
75 white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050			G3	S3	1B.2
76 white-footed vole <i>Arborimus albipes</i>	AMAFF23010			G3G4	S2S3	SC

Morrison Gulch Coho Habitat Improvement Project
Project Location Map
T05N R01E S14
Arcata South Quad, Humboldt County



Redwood Creek Instream Habitat Improvement Project - Jakubal

2016

Introduction:

The Grantee will complete the Redwood Creek Instream Habitat Improvement Project – Jakubal by installing 8 LWD and boulder features along a 1300 foot section of Redwood Creek to provide increased habitat complexity, enhance pools, and increase gravel sorting. This project is necessary because the 2010 CDFW stream habitat inventory report for Redwood Creek found an insufficient amount of woody cover in pools and flatwater habitat units. This project will provide rearing fry with protection from predation, rest from water velocity, and divide territorial units to reduce density dependent competition.

The Grantee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement will follow techniques in the California Salmonid Stream Habitat Restoration Manual, Part VII and Part XI.

Objective(s):

The specific objective of this project is to create a total of 8 instream features within 1300 feet of Redwood Creek, consisting of 47 logs and 14 tons of boulders. Additionally 50 native conifer seedlings will be planted along the riparian. The addition of these structures will enhance spawning and rearing habitats by providing cover, increasing pool complexity, increasing pool depth and frequency, sorting and collecting spawning gravels, increasing the quality and quantity of rearing habitat within the project reach, and by providing velocity refuge during peak winter flows for juvenile salmonids and migrating adult salmonids. Planting seedlings will promote riparian vegetation, provide additional shade for the stream, and establish wood for future recruitment

Project Description:

Location: The Grantee will conduct work along a section of Redwood Creek. The locations of the project boundaries are approximately 40.11036000 ° north latitude, 123.89569000 ° west longitude at the downstream end; and 40.10807000 ° north latitude, 123.89594000 ° west longitude at the upstream end.

Project Set Up: The Grantee Project manager will communicate and coordinate with landowner representatives to obtain entry permits, coordinate implementation schedules, obtain wood, and review project implementation details. Upon receipt of notice to proceed, project manager will obtain 1600 permit, hire subcontractors and provide management and direction to subcontractors throughout the duration of the project. All reporting and billing will be pursuant to contract and regulatory guidelines.

Redwood Creek Instream Habitat Improvement Project - Jakubal

2016

Subcontracted California Conservation Corps (CCC) Conservationist I will supervise CCC Laborers in the implementation of the project and during the spike operation. Subcontracted CCC Laborers will provide the hand labor for the instream LWD structures.

A log truck subcontractor will be responsible for transport and delivery of the LWD to the project site. A dump truck subcontractor will be responsible for transport and delivery of the rock/boulders to the project site. An excavator operator will be responsible for unloading and placing LWD and rock/boulders at appropriate features within the project site.

Materials: Materials to complete this project consist of:

1. 10' by 1" threaded rod (rebar): will be used to anchor LWD to rock, live trees, and LWD. The purpose of using this material is to increase longevity of structure and increase resistance to transposition from high flow events.
2. Steel nuts: are required to secure threaded rebar to LWD, live trees, and rock, increasing longevity of intended structural position.
3. Steel washers will be used to lock the steel nut into place once fastened to the threaded rebar.
4. Conifers: will be used as riparian cover to reduce erosion, increase riparian complexity, and increase future instream wood recruitment.
5. Drill bits & extensions: Drill the holes through the logs and anchor trees for anchoring the structures according to the California Salmonid Stream Habitat Restoration Manual
6. Tool & Materials (chain, bar oil, portaband blades, shear pins, GFIs, misc gear.): (do not survive the project). These miscellaneous materials are required to drill and anchor all materials to appropriate anchor points.
7. Rental/Repair equipment: Working outdoors in a remote environment can be a less than ideal place for power tools and equipment. This allows for quick resolution for equipment that breaks down on the job site to keep the project on time and on budget.
8. Logs & rootwads: This is the LWD that will make up features to improve the instream conditions for anadromous salmonids.
9. Drop forged cable clamps: will be used to secure cable when used for rock to LWD connections.
10. Injectable mortar: Necessary for rock to cable adhesion when anchoring LWD to rock anchor points.
11. 5/8" cable: Necessary for rock to LWD connection in areas where live trees are insufficient in number and/or size to be used as anchor points.
12. Rock/boulders: used for anchoring the LWD in areas with insufficient live tree anchors and to provide scour as well as added cover.

Tasks:

Task 1. Contract oversight Contract oversight will be conducted by ERWIG Project Manager. The ERWIG Project Manager will communicate and coordinate with the landowner to obtain entry permits, coordinate implementation schedules, obtain wood donation and purchase, and go over project implementation details. Upon receipt of notice to proceed, project manager will obtain 1600 permit, hire subcontractors and provide management and direction to subcontractors throughout the duration of the project. All reporting and billing will be pursuant to contract and regulatory guidelines.

Task 2. Subcontractor Prep and Training ERWIG will ensure that all subcontractors are trained on landowner concerns and protocols before they enter the property to begin project work. The training will include security issues and road protocols. ERWIG will ensure that all subcontractors understand that ONLY those designated crew member for the project are allowed on the property. ERWIG will work closely with subcontractors to ensure that no actions result in the delivery of sediment to the stream channel when delivering, staging, and placing large wood in the stream ERWIG and its subcontractors will be aware of the status of various roads within the project area, and will not enter any decommissioned roads with heavy equipment, or do anything that might cause significant impacts on the hydrology of decommissioned road segments.

Task 3. Final Feature Design & Site Preparation ERWIG Project Manager and CCC Fish Habitat Assistant will prepare site specific designs based on channel 9 morphology, equipment access, and LWD availability. They will submit designs for landowner and CDFW Project Manager approval. ERWIG Project Manager along with CCC Fish Habitat Assistant will flag sites for wood delivery and installation, Clear brush for equipment as needed, designate staging areas for equipment and wood along project reaches. Excavator will be delivered by lowboy to staging area. Wood will be delivered by log trucks, dump trucks or self-loader and staged along project reach or staging areas.

Task 4. Project Implementation Under the direction of the Project Manager and CCC Fish Habitat Assistant, site construction on 8 LWD structures will begin with wood and rock placement by excavator. When necessary, CCC corpsmembers will move LWD into position using a grapple along. This method is also used for placing and securing rootwads to logs while anchoring is taking place. Site construction, wood placement, and anchoring will be in accordance with DFG California Salmonid Stream Habitat Restoration Manual, Section VII (Flossi et al.1998). The project will utilize living riparian trees as anchors by wedging the logs between them where feasible. When live anchor trees 6" in diameter or greater are absent in project area, boulders or a log deadman will be used as an anchor point. California Conservation Corps (CCC) corpsmembers under supervision of the Conservationist 1 will anchor features according to design and

anchoring specifications. Corpsmembers will use one inch threaded rebar to anchor logs to mature riparian trees, rock, and each other. Holes will be drilled through the logs and their anchor trees, using a hole hawg drill, timber bit, and drill bit extensions when necessary. One inch rebar will be strung through the log and secured with nuts and washers. When administering rock connections, corpsmembers will drill holes into placed rock or bedrock utilizing a hole hawg drill and rock bit, clean out the holes, fill the hole with mortar, insert the cable into the hole, then clamp the cable to the threaded bar that has been inserted through the log, and lastly fasten the nut with washer to the cable and the log. Corpsmembers will be supervised by a Conservationist 1 (C1), Fish Habitat Assistant, and the ERWIG Project Manager. Structures will be complex, consisting of logs fastened together along with rootwads and large rock boulders. Habitat quality and quantity will be significantly improved for coho and other salmonids along .25 miles of stream. Erosion control methods will be employed as required at each structure and along the equipment corridors to eliminate the possibility of sediment transport to the stream. To address concerns over invasive species, this project will follow the California Department of Fish and Wildlife Aquatic Invasive Species Decontamination Protocols and U.S. Department of the Interior-Bureau of Reclamation 2012 Inspection and Cleaning Manual for Equipment and Vehicles to prevent the spread of invasive species.

Task 5. Riparian Planting To promote riparian vegetation, increase canopy cover above the creek, and to establish wood for future instream recruitment, CCC crews will return to the project site in the winter of 2017 to plant 50 conifer seedlings along the .25 miles of riparian zone, with a primary focus in areas of excavator ingress and egress.

Task 6. Post-Project Data and Photo Collection: Following implementation, post-implementation photos will be taken and metrics shall be collected which satisfy the Grant Agreement Annual Progress Report(s) and Final Report.

Task 7. Reporting Write and deliver progress reports for invoicing, Annual Progress report(s), and Final Report to CDFW Project Manager.

Deliverables: Eight complex LWD structures will be constructed and anchored using a total of 47 logs and rootwads and approximately 14 tons of boulders along 0.25 miles of Redwood Creek. These structures will enhance existing pools, increase gravel sorting, increase habitat complexity, and provide slow water refugia for salmonids. A final written report will be submitted after project completion. The report will include: (1) the grant agreement number, (2) location of work – project location will be shown using a USGS 7.5 minute topographical map, (3) specific project access using public and private roads and trails, with appropriate landowner contact information, (4) a description and analysis of the restoration and planning techniques used, (5) a description of project results (6)

Redwood Creek Instream Habitat Improvement Project - Jakubal

2016

dates of work and the number of person hours expended, (7) labeled photographs of all restoration activities and techniques pre and post project implementation, and (8) a financial overview of grant dollars spent and/or in kind services used to complete the project.

Timelines:

Task 1- Upon approval through December 31, 2017, oversee and coordinate project.

Task 2- Upon approval through December 31, 2017, oversee and ensure that subcontractors are trained and operate under landowner protocols.

Task 3 & 4- June 15, 2016 through October 31, 2016, June 15, 2017 through October 31, 2017, finalize design, label features, and install LWD features within the approved project reach. Erosion control will be installed as project features are completed.

Task 5- November 1, 2016 through February 28, 2017, November 1, 2017 through December 15, 2017, riparian plantings will occur.

Task 6 & 7- November 15, 2016, December 31, 2017, post-project description, photos and quantitative metrics will be delivered in an Annual Report, and a Final Report.

Additional Requirements: The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee to the CDFW Grant Manager on a form provided by CDFW.

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*.

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

California Department of Fish and Wildlife

Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Briceland, Shelter Cove, Ettersburg, Miranda, Garberville, and Piercy quads for: Redwood Creek Instream Habitat Improvement Project- Jakubal T04S, R03E, Section 18, Briceland Quad, Humboldt County, USA.

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 American peregrine falcon <i>Falco peregrinus anatum</i>	ABNKD06071	Delisted	Delisted	G4T4	S3S4	
2 Cone Peak bedstraw <i>Galium californicum ssp. lucicense</i>	PDRUB0N0E3			G5T3	S3	1B.3
3 Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040			G5	S4	
4 Davidson's bush-mallow <i>Malacothamnus davidsonii</i>	PDMALOQ040			G2	S2	1B.2
5 Hardham's evening-primrose <i>Camissoniopsis hardhamiae</i>	PDONA030N0			G2	S2	1B.2
6 Hickman's checkerbloom <i>Sidalcea hickmanii ssp. hickmanii</i>	PDMAL110A2			G3T2	S2	1B.3
7 Howell's montia <i>Montia howellii</i>	PDPOR05070			G3G4	S3	2B.2
8 Humboldt milk-vetch <i>Astragalus agnicidus</i>	PDFAB0F080		Endangered	G3	S3	1B.1
9 Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420			G4	S4	4.2
10 Oregon coast paintbrush <i>Castilleja litoralis</i>	PDSCR0D012			G4G5T4	S3	2B.2
11 Oregon goldthread <i>Coptis laciniata</i>	PDRAN0A020			G4	S3	4.2
12 Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6			G5T3T4	S2	1B.2
13 Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010			G4	S3S4	SC
14 San Antonio collinsia <i>Collinsia antonina</i>	PDSCR0H010			G1	S1	1B.2
15 Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030			G3	S3	SC
16 Ten Mile shoulderband <i>Noyo intersessa</i>	IMGASC5070			G2	S2	
17 Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010		Candidate Threatened	G3G4	S2	SC
18 Upland Douglas Fir Forest	CTT82420CA			G4	S3.1	
19 Valley Oak Woodland	CTT71130CA			G3	S2.1	
20 Whitney's farewell-to-spring <i>Clarkia amoena ssp. whitneyi</i>	PDONA05025			G5T1	S1	1B.1
21 arroyo toad <i>Anaxyrus californicus</i>	AAABB01230	Endangered		G2G3	S2S3	SC
22 coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0			G4	S3	2B.2
23 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	

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Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
<i>Oncorhynchus kisutch</i>						
24 dwarf calycadenia <i>Calycadenia villosa</i>	PDAST1P0B0			G3	S3	1B.1
25 fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SC
26 foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050			G3	S3	SC
27 golden eagle <i>Aquila chrysaetos</i>	ABNKC22010			G5	S3	
28 leafy reed grass <i>Calamagrostis foliosa</i>	PMPOA170C0		Rare	G3	S3	4.2
29 little willow flycatcher <i>Empidonax traillii brewsteri</i>	ABPAE33041		Endangered	G5T3T4	S1S2	
30 marsh pea <i>Lathyrus palustris</i>	PDFAB250P0			G5	S2	2B.2
31 mountain shoulderband <i>Helminthoglypta arrosa monticola</i>	IMGASC2035			G2G3T1	S1	
32 obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380			G4?	S1S2	
33 osprey <i>Pandion haliaetus</i>	ABNKC01010			G5	S4	
34 pale-yellow layia <i>Layia heterotricha</i>	PDAST5N070			G2	S2	1B.1
35 pallid bat <i>Antrozous pallidus</i>	AMACC10010			G5	S3	SC
36 small groundcone <i>Kopsiopsis hookeri</i>	PDORO01010			G4G5	S1S2	2B.3
37 summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B			G5T4Q	S2	SC
38 western pond turtle <i>Emys marmorata</i>	ARAAD02030			G3G4	S3	SC
39 white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050			G3	S3	1B.2

Redwood Creek Instream Habitat Improvement Project – Jakubal
Project Location Map
T04S, R03E, S18 Briceland Quad, Humboldt County

