

Introduction: The County of Humboldt Department of Public Works will remove three fish migration barriers, opening access to over 9,400 feet of spawning habitat in the Dinner Creek watershed. This will be accomplished by replacing three undersized culverts with fish friendly culverts.

This project is necessary because the existing culverts have been identified as fish migration barriers (Ross Taylor and Associates, 2005) and due to their size and corroded condition pose a potential risk of introducing sediment loads into critical fish habitat downstream during high winter storm events.

- The two barriers at Site 1 could be considered partial barriers for adult Coho and steelhead but complete barriers for juvenile Coho and steelhead.
- The culvert at Site 2 is considered a complete barrier to all Coho and steelhead. The culvert crossing at Briceland Thorne Road is perched approximately 5' above the stream channel.

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

Objectives: Objectives of this project include:

- Remove three fish passage barriers on Dinner Creek.
- Provide access to 1.8 miles of historical habitat for coho salmon.

Project Description:

Location: The project site is located on Dinner Creek at two locations where Briceland Thorne Road crosses the creek. Site 1 is located at Post Mile 3.74 and Site 2 is located at Post Mile 3.27. There is an additional culvert replacement site immediately upstream of Site 2 and will occur at a private property driveway crossing. Site 1 is located roughly 4,800 feet upstream of China Gulch confluence, 12,500 feet upstream of Redwood Creek confluence, and 8.5 miles upstream of the confluence with the South Fork Eel River. Site 2 is roughly 3,000 feet upstream of Site 1.

Site one is located at 40.09305280 north latitude: 123.93156670 west longitude.
Site two is located at 40.09149440 north latitude: 123.9376440 west longitude.

Project Set Up:

Humboldt County Environmental will oversee the project.

The time allocated for a County Design Engineer is to complete the bid package to the Board of Supervisors for project approval and answer questions during the project advertisement.

Construction Engineering includes preparation of survey staking data, a full time on-site inspector; two person survey crew for staking the design and staff for materials testing; and a Registered Engineer for construction oversight and contact administration.

Time is allocated for staff from the County Natural Resources Division, a qualified fish biologist, to assist with the fish exclusion fencing installation, fish relocation efforts, weekly oversight for permit compliance and post construction surveys.

Additionally, costs have been included to complete a post construction thalweg survey to complete a performance measure of the completed project. The survey would be completed the following summer allowing time for the sediment to naturally redistribute in the channel.

Prior to the beginning of earthwork activities at each site, a fish protection water bypass system will be installed. Fish exclusion fencing will be installed at both sites approximately 50 feet upstream and downstream of both sites. Fish exclusion fencing will most likely be installed by County fisheries biologist or other qualified biologist (Fisheries Consultant). Fish relocation efforts would be done by a qualified biologist (CDFW or Fisheries Consultant) using e-fishing methods following DFW and NMFS guidelines.

An additional subcontractor will install a vortex weir approximately 50' downstream of the new culvert at Site 2.

The estimated hours for the subcontractor costs for project implementation includes having a foreman, two heavy equipment operators, a truck driver and three laborers on site full time.

Materials: Project materials include:

Traffic Detour items and equipment used to protect the job site and public safety during construction. Construction area signs are placed in advanced warning of the construction site to encourage drivers to slow down and be aware of construction activities. The class 2 aggregate base will then be placed with either an excavator and/or 2 yard Loader to build up an approach road and act as a temporary abutment for the flat car bridge. The flat car bridge will be moved into place with a truck mounted crane and any further adjustments will be made with the excavator. The contractor will hand construct the wooden rails and place the Temporary Railing (Type K) at both sides of the bridge car to channelize traffic and protect the construction site from ongoing traffic. Traffic control signs will be placed as shown in the project plans. The skid steer will be used for the initial grading and maintenance of the gravel approaches.

- 89-ft Flat car bridge
- Construction Area Signs
- Temporary Railing (Type K)

- Class 2 Aggregate Base
- Excavator, 325
- Skid Steer
- Truck Mounted Crane
- 2 yard Loader
- Misc. wood and supplies for wheel guards and railing.

Simultaneously to installing the items for traffic control and public safety, the consultant shall implement the water bypass system and BMPs for the water Pollution Control Plan to protect construction sediments from entering Dinner Creek. This work will be completed by hand with hand-tools to minimize the impact on the channel. The location of the water bypass and details is shown on the project plans. The temporary silt fence will be installed at the excavation limits, prior to excavation. The remaining BMPs will be installed in prior to the prescribed construction activity and/or rainfall and include the following:

- Water Bypass System (Removes water from the work area to prevent sediment from entering the creek)
- 18" Gravity diversion pipe
- Fish exclusion fencing
- Filter fabric with reinforcement (wire mesh fencing or geogrid)
- Sand bags
- Splash Pad (3" to 6") Rock
- Generator
- Temporary Silt Fence (BMP for Water Pollution Control Plan)
- Temporary Concrete Wash out (BMP for Water Pollution Control Plan)
- Fiber Rolls (BMP for Water Pollution Control Plan)
- Broom (street sweeping)

Materials and Equipment used directly during the culvert installation at Site 1 include the following:

- 18-ft x 9-ft x 100-ft steel plate arch culvert
- Class A Concrete (foundation)
- Bar Reinforcing Steel (foundation)
- Class 2 Aggregate Base (structural backfill)
- Native Backfill (Embankment)
- Rock Slope Protection (1/2T to 2T) (to be placed on the reconstructed embankments at the ends of the new culverts)
- Imported River Gravel (bedding inside culvert)
- Truck mounted crane (placing culverts at grade)
- Excavator, 325 (excavation, reconstructing embankment)
- Skidsteer (placing river gravel inside culvert)
- Sheepsfoot Roller (structural backfill and embankment compaction)
- 2 yd. Loader (materials management)
- Lowboy trailer (transporting the excavator and other equipment)
- Small Motor Compactor (structural backfill)

- 10 yd, Dump Truck (hauling materials)

Materials and Equipment used directly during the culvert installation at Site 2 include the following:

- (2) 10-ft diameter Structural Steel plate Pipe culverts
- Class 2 Aggregate Base (structural backfill)
- Native Backfill (Embankment)
- Rock Slope Protection (1/2T to 2T) (to be placed on the reconstructed embankments at the ends of the new culverts)
- Imported River Gravel (bedding inside culvert)
- Vortex Weir Rock (1/2T to 2T)
- Vortex Weir River Gravel (3/4" to 4")
- Truck mounted crane (placing culverts at grade)
- Excavator, 325 (excavation, reconstructing embankment)
- Skidsteer (placing river gravel inside culvert)
- Sheepsfoot Roller (structural backfill and embankment compaction)
- 2 yd. Loader (materials management)
- Lowboy trailer (transporting the excavator and other equipment)
- Small Motor Compactor (structural backfill)
- 10 yd, Dump Truck (hauling materials)

Upon the completion of culvert installation, reconstructing the embankment and installing the Rock Slope Protection (RSP) at the culvert inlets/outlets, the fiber rolls (biodegradable) and hydroseed (native seed mix) will then be applied to the remaining disturbed soil areas and will utilize the following:

- Fiber Rolls
- Misc. Hand Tools
- Hydroseed
- Hydroseed mixer and sprayer truck

Simultaneously, the roadway will be restored to the pre-project conditions and an 18" overside drain will be installed at Site 1 to manage roadway runoff. This will include the following:

- Class 2 Aggregate Base (roadway section)
- Hot Mix Asphalt (roadway paving)
- 18" Corrugated Steel Pipe Downdrain (roadway drainage feature for runoff)
- 18" Entrance Taper (roadway drainage feature for runoff)
- 18" Anchor Assembly (roadway drainage feature for runoff)
- Smooth Drum Roller (compaction)
- Grader (surface preparation for paving)
- 2 yard Loader (surface preparation for paving)
- Skidsteer (surface preparation for paving)
- Paver (roadway paving)
- Broom (surface preparation for paving)

Tasks:

Task 1 –

Replace the culvert at Site 1 (PM 3.74) with an 18' x 9' x 100' steel plate arch culvert and remove the existing concrete weir. Replace both culverts at Site 2 (PM 3.27 and associated private driveway approximately 150 ft. upstream) with 10' (120") Structural Steel Pipe Culverts.

1. County Design engineering staff will take the completed design plans and specifications and complete the bid package, which will be sent to the Board of Supervisors for project approval.
 2. Upon project approval, the project will be advertised for 5 weeks prior to the bid opening. The bid proposals will be reviewed by the County Construction Engineer and the lowest responsive bidder will be awarded the contract.
 3. County Construction Engineer will prepare a separate scope of work for the Vortex Weir construction at Site 2. The scope of work will be included into an informal bid packet and a minimum of three specialty contractors will be contacted to provide a proposal to complete the work. The selection of the specialty contractor will be based on past instream project experience and availability, not cost.
 4. Once the contract is awarded and an agreement is executed and approved by the Board of Supervisors, the County Construction Engineer will assign an on-site construction inspector, prepare the construction staking and schedule a pre-construction meeting.
 5. Prior to commencing any earthwork, the contractor will prepare a Water Pollution Control Plan (WPCP) outlining the appropriate Best Management Practices (BMPs) to prevent storm water discharges and non-storm water discharges from leaving the work area. BMPs may include temporary silt fence, fiber rolls and a temporary concrete washout (Bid Items).
 6. Fish exclusion fencing will be installed by County Environmental staff. Fish relocation activities will be conducted by CDFW staff or a fisheries consultant hired by the County. County fisheries biologist will assist in relocation efforts if needed. Fish exclusion and relocation efforts will take place at one site at a time since there is an extended time between project work at both sites.
 7. Water bypass system will be installed by the contractor once all the fish have been relocated.
 8. Contractor will install temporary construction signs that provide motorists advanced warning of the construction zone.
 9. Install a 90' flat car bridge during the duration of the earthwork at each site. The county bridge crew will move the flat car bridge on/off site and will move the flat car bridge from Site 1 to Site 2. The contractor will construct the wheel guard and the railing required for the flat car bridge, install the construction area signs and temporary railing (Type K) required for the traffic detour.
- **Tasks 6-9 will occur at Site 2 after work has been completed at Site 1.
10. Begin structure excavation to install culvert at Site 1. The existing roadway surface (asphalt concrete) and existing culvert and overside drain shall be removed and hauled off prior to structure excavation. Excavate the

- remaining material to be stockpiled and tested to determine if the material meets material standards for embankment construction.
11. Remove Concrete weir, approximately 20 feet downstream of new culvert.
 12. Construct footing forms and install reinforcing rebar for pouring the concrete (Class A concrete) for the 18' x 9' x 100' steel plate arch culvert. Assemble and install the culvert; and place approximately 3.5 ft of natural stream gravel.
 13. Place and compact the structural backfill and embankment at Site 1. Compaction efforts will be observed by the on-site inspector and tested to meet CalTrans standards for construction. Place Rock Slope Protection (1/2 Ton to 2 Ton)
 14. Establish temporary driveway access for landowners to access property during the installation of the culverts at Site 2.
 15. Begin structure excavation to install culvert at Site 2. The existing roadway surface (asphalt concrete) and existing culverts shall be removed and hauled off prior to structure excavation. Excavate the remaining material to be stockpiled and tested to determine if the material meets material standards for embankment construction.
 16. Excavate and remove the existing culverts and install 2-10' structural steel pipe culverts (L=70' and L=30') embedded approximately 2 ft. with natural river gravel. Excavate the stream channel between the two culverts creating an 8 ft. wide channel.
 17. Anchor the vortex weir into the bank at the bank full elevation with 1/2T-2T sized rocks with smaller diameter river gravel placed to fill the voids between the larger rocks. Approximately, 20 tons total of 1/2T to 2T and approximately 20 CY total of 3/4"-4" diameter river gravel will be required.
 18. Place and compact the structural backfill and embankment at Site 2. Compaction efforts will be observed by the on-site inspector and tested to meet CalTrans standards for construction. Place Rock Slope Protection (1/2 Ton to 2 Ton).
 19. Upon completion of the earthwork and removal of the flat car bridge, restore temporary driveway access to previous conditions. Hydroseed all disturbed soil areas with native grasses and place fiber rolls in locations unprotected by Rock Slope Protection.
 20. Install Class 2 Aggregate Base (0.67' section) and finish the roadway grading at both sites with controlled one way traffic. Install three 18-inch diameter overside drains on Briceland Thorne Road to direct storm water to the installed rock slope protection. Pave the roadway with Hot Mix Asphalt.
 21. The County qualified fish biologist will assist with monitoring surveys and perform County specific surveys for presence/absence post construction
 22. County Survey will perform post construction Thalweg profile and cross sections as a separate performance measure.

Deliverables:

Task 1- Bid Package with Board of Supervisors Approval

Tasks 2-4

- Bid Opening Results
- Executed Agreement approved by the Board of Supervisors
- Informal bid proposals for Vortex Weir Item; Agreement approved by the Director of Public Works (Contract less than \$50,000)

Tasks 5-20

- The removal of two known fish migration barriers and the installation of three fish-friendly culverts.
- Additional 1.8 miles of salmonid spawning and rearing habitat
- Elimination of sediment producing culverts and the potential for catastrophic sediment delivery (>1600 CY) into salmonid critical habitat (>1600 CY) into salmonid critical habitat via potential road failure at the road crossings.
- Periodic Status reports throughout the duration of construction as determined by grant manager.

Task 21

- Post Construction monitoring surveys documenting the presence/absence
- Spawning Surveys
- Periodic Status Reports

Task 22

- Post Construction Thalweg Channel Survey.

Tasks 1-22

- Annual Reports
- Final Report

Timelines:

Task 1 – Complete 6/1/2017

Task 2-4 - Complete 6/1/2017

Task 5-20 – 6/15/2017 to 10/15/2017

Task 21 – 10/2017 to 2/2019

Task 22 – 10/2017 to 2/2019

Final Report – Complete February 28, 2019

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.



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad (Bear Harbor (3912388) OR Briceland (4012318) OR Ettersburg (4012328) OR Garberville (4012317) OR Honeydew (4012421) OR Miranda (4012327) OR Piercy (3912387) OR Shelter Cove (4012411))

Possible species within the Briceland Quad and surrounding quads for 725149 Dinner Creek Fish Passage Barrier Removal Project, T04S R02E S23, Humboldt County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
American peregrine falcon <i>Falco peregrinus anatum</i>	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0	None	None	G4G5	S3	2B.2
coho salmon - southern Oregon / northern California ESU <i>Oncorhynchus kisutch</i>	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040	None	None	G5	S4	WL
fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SSC
foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050	None	None	G3	S3	SSC
giant fawn lily <i>Erythronium oregonum</i>	PMLIL0U0C0	None	None	G4G5	S2	2B.2
golden eagle <i>Aquila chrysaetos</i>	ABNKC22010	None	None	G5	S3	FP
Howell's montia <i>Montia howellii</i>	PDPOR05070	None	None	G3G4	S2	2B.2
Humboldt milk-vetch <i>Astragalus agnicidus</i>	PDFAB0F080	None	Endangered	G2	S2	1B.1
leafy reed grass <i>Calamagrostis foliosa</i>	PMPOA170C0	None	Rare	G3	S3	4.2
leafy-stemmed mitrewort <i>Mitellastrum caulescens</i>	PDSAX0N020	None	None	G5	S4	4.2
little willow flycatcher <i>Empidonax traillii brewsteri</i>	ABPAE33041	None	Endangered	G5T3T4	S1S2	
maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0	None	None	G3	S3	4.2
marsh pea <i>Lathyrus palustris</i>	PDFAB250P0	None	None	G5	S2	2B.2
Mendocino Coast paintbrush <i>Castilleja mendocinensis</i>	PDSCR0D3N0	None	None	G2	S2	1B.2
Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420	None	None	G4	S4	4.2
mountain shoulderband <i>Helminthoglypta arrosa monticola</i>	IMGASC2035	None	None	G2G3T1	S1	



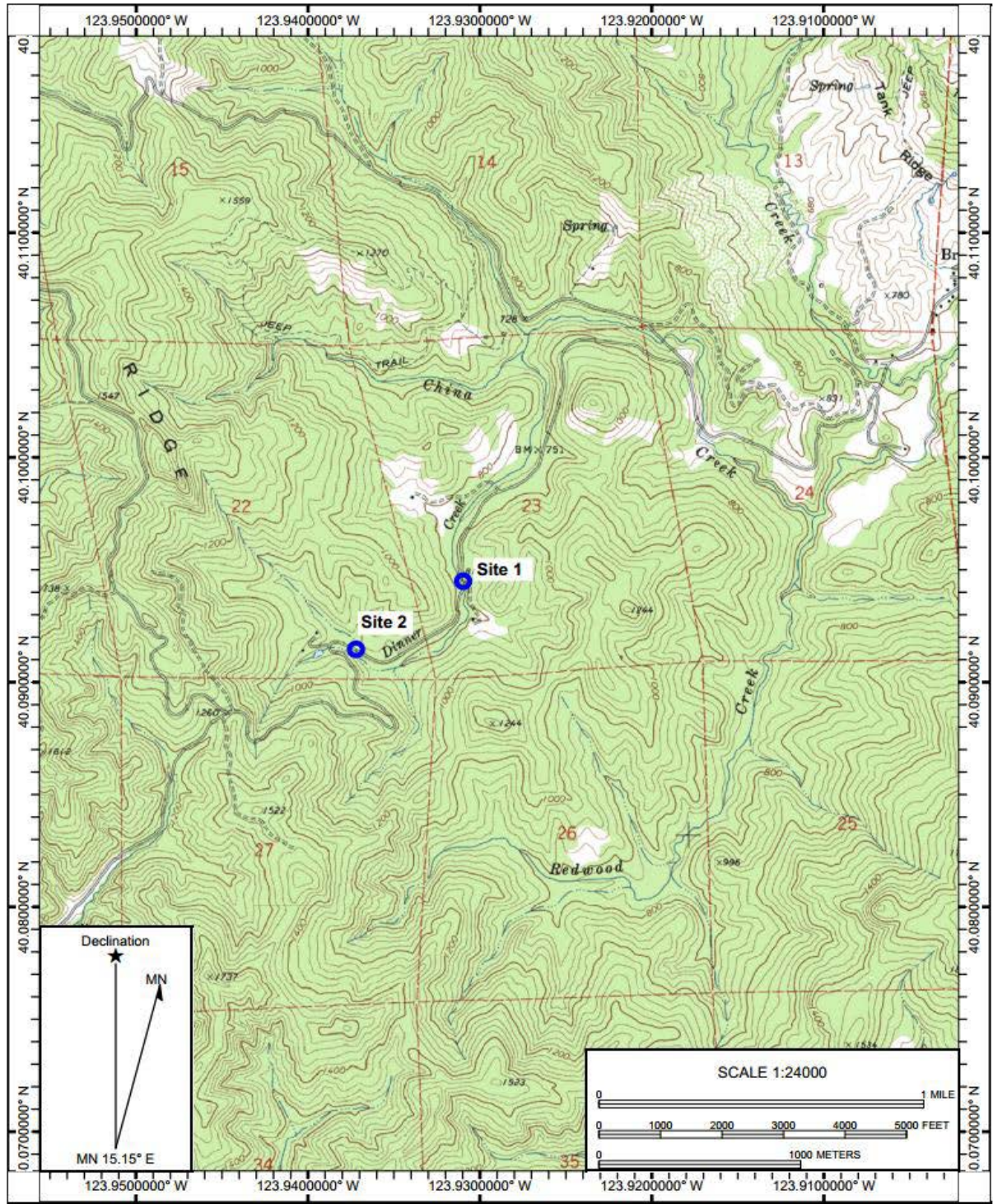
Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380	None	None	G4?	S1S2	
Oregon coast paintbrush <i>Castilleja litoralis</i>	PDSCR0D012	None	None	G3	S3	2B.2
Oregon goldthread <i>Coptis laciniata</i>	PDRAN0A020	None	None	G4	S3	4.2
osprey <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6	None	None	G5T3	S2	1B.2
Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010	None	None	G4	S3S4	SSC
pallid bat <i>Antrozous pallidus</i>	AMACC10010	None	None	G5	S3	SSC
perennial goldfields <i>Lasthenia californica ssp. macrantha</i>	PDAST5L0C5	None	None	G3T2	S2	1B.2
small groundcone <i>Kopsiopsis hookeri</i>	PDORO01010	None	None	G4?	S1S2	2B.3
Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030	None	None	G3	S3	SSC
southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020	None	None	G3G4	S2S3	SSC
summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B	None	None	G5T4Q	S2	SSC
Ten Mile shoulderband <i>Noyo intersessa</i>	IMGASC5070	None	None	G2	S2	
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
Upland Douglas Fir Forest <i>Upland Douglas Fir Forest</i>	CTT82420CA	None	None	G4	S3.1	
western bumble bee <i>Bombus occidentalis</i>	IIHYM24250	None	None	G2G3	S1	
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050	None	None	G3	S3	1B.2
Whitney's farewell-to-spring <i>Clarkia amoena ssp. whitneyi</i>	PDONA05025	None	None	G5T1	S1	1B.1
northern spotted owl <i>Strix occidentalis caurina</i>	ABNSB12011	Threatened	Candidate Threatened	G3T3	S2S3	SC

Record Count: 38

Dinner Creek Fish Passage Barrier Removal Project
Project Location Map
T04S R02E S23, Briceland Quad, Humboldt County



Introduction: The Hoopa Valley Tribe's Fisheries Habitat Division (HVTF) will improve ecological function and hydrologic connectivity in the historic floodplain of Supply Creek through levee/road removal and instream, off-channel, and riparian habitat creation and enhancement.

Due to the mountainous terrain, low-gradient floodplain reaches favored by coho salmon like Supply Creek are rare in tributaries to the Trinity River. This project is necessary because Supply Creek has high intrinsic potential for coho salmon, but the lower reach is constrained by a levee, which impairs the streams ability to provide over-summer and wintering habitat for coho and reduces the channel's ability to store gravel and large wood critical for all life stages. The paucity of off-channel habitat within the project area, combined with depensation, is likely having a significant population level effect within the creek and throughout the Trinity River Watershed, where coho from other natal streams redistribute from in search of improved habitat.

Permit Disclosure: 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, IX, XI, and XII (Flosi et al 1998 and 2002).

Objectives: The goal of this project is to remove levees and restore channel form and floodplain connectivity. The objectives of this project include:

- Breach a levee/remove a road contributing sediment, and construct off-channel ponds, seasonal wetlands, floodplains, and side channel areas that will provide immediate high quality winter and summer juvenile coho natal and non-natal rearing habitat (emphasizing winter rearing);
- Implement a process-based restoration approach that restores mainstem channel form, floodplain connectivity, habitat complexity, riparian function, and salmon habitat for all life stages by encouraging the channel to restore itself over time.
- Provide access to and restore high quality habitat blocked by the 1964 levee that is now Scale Shack Road (on the south side of Supply Creek between Highway 96 and Loop Road), allowing coho access to low gradient complex backwater and seasonal wetlands throughout the summer and winter rearing season not currently available.
- Add large wood to improve habitat by providing improved cover, gravel sorting, and increased channel complexity within the cold water perennial refuge Supply Creek provides.
- Implement riparian enhancements (floodplain lowering and plantings) to improve shading, food supply, and provide future large wood loading.
- Directly address the major limiting factor for this core population identified in the National Marine Fisheries Service Final Recovery Plan (2014) - a lack of off-channel rearing habitat- while improving conditions for all anadromous species and life-stages by breaching levees and restoring channel form and connectivity with the historic floodplain.

Project Description:

Location: This project is located in the Hoopa Valley in the Trinity River Watershed along Supply Creek. This project will focus on the former floodplain on the south side of Supply Creek within the valley floor, where a road/levee (Scale Shack road, labeled Bair Road on some maps) confines the creek. This site is 0.1 miles upstream of the mouth at Trinity River mile 12.3. The south side of Supply Creek between Loop Road and Highway 96 is located at 41.05328 north latitude, 123.67718 west longitude (at the downstream end of Supply Creek).

Project Set Up: This project will be overseen by the HVTF, under the supervision of the Habitat Division Lead. The Habitat Division Lead will also oversee all fish protection aspects of the projects (e.g., removal of fish from the construction area prior to commencement -if deemed necessary and pre- and post-project biological monitoring) as well as the as-built survey post-project with the Engineering Subcontractor's assistance. All construction-related activities will be implemented by the Heavy Equipment Subcontractor under supervision of the Roads Director, with oversight by the Habitat Division Lead. During construction, the HVTF will contract with the Engineering Subcontractor for on-site construction support and inspection. The HVTF will also hire a Biological Subcontractor during large wood placement who will ensure all large wood habitat structures are optimally placed for salmonid habitat utilization. Riparian planting and three years of maintenance will be overseen by the Riparian Ecologist. Labor required for riparian planting and ongoing maintenance will be provided by the Heavy Equipment Subcontractor and Technician IIIs.

Materials: Materials necessary for this project include:

- Erosion control silt fencing
- Fir and pine large wood/logs (n=40) with root wads.
- River rock (round large boulder and cobbles)
- Stormwater Pollution Prevention Plan implementation supplies (straw, mulch, seed, etc.)
- Irrigation supplies needed for revegetation, and
- Construction signage, needed for construction noticing.

Tasks: Create 4 acres of high quality winter coho rearing floodplain and instream habitat and improve another 3 acres of upland habitat by removing Scale Shack road/levee (20 feet high and 1,300 feet in length) and constructing a more sinuous and longer mainstem channel, two oxbow ponds, two winter base flow side channels, extensive floodplain and riparian habitats, and at least 11 large wood structures to provide immediate habitat benefits and encourage pool development. Increase floodway width commensurate to upstream and downstream reaches with newly restored high quality aquatic and riparian habitat to support self-sustaining natural riverine processes and restore channel

complexity and riparian function over the long term. Remove Scale Shack road/levee on the south side of lower Supply Creek and construct features to create an accessible and topographically diverse floodplain, backwater features, and instream habitat that will provide coho rearing habitat across multiple flows. Excavate the levee/road on the south side of Supply Creek with a portion of spoils kept on site (for levee setback) but most hauled off-site. All earthwork will occur on dry surfaces. The mainstem, side channel and backwater features will be opened and wetted as a final step at the very end of construction.

Specific restoration elements include:

- **Mainstem and Floodplain Restoration.** Remove Scale Shack Road to create a restored mainstem channel, topographically diverse floodplain, winter side channels, and off-channel ponds. To facilitate channel realignment, construct one boulder and large wood habitat structure within the mainstem of Supply Creek. Construct the large wood habitat structure to direct 90% of streamflow up to a 1.25-year event into the new mainstem channel alignment, after which the upper bar surface will be overtopped. Construct approximately 4 acres of new floodplain adjacent to the new right bank mainstem channel. Mainstem channel large wood features will consist of Douglas fir and pine with root wads and branches intact. Large wood placements in bar features will be ballasted with large boulders (2 to 3 feet in diameter) and cobble. This bar feature is along the left bank of Supply Creek. Smaller wood will be added along the right bank woven into existing vegetation.
- **Secondary channels to be activated during winter/spring flows.** Narrow part of the existing mainstem channel to be used as a winter/spring side channel. Block off this 900-foot channel with a large constructed wood and boulder feature that will send most of the flow into the newly constructed channel. Another secondary channel will provide water to two oxbow off-channel ponds in the winter, creating large areas where limited overwintering habitat will be available and accommodating future channel migration and riparian recruitment over the long term. This will result in 1.2 acres of complex, off-channel instream habitats. Flow inundation targets initially will be winter base flow (20 cubic feet per second).
- **Large wood habitat elements.** Large wood habitat structures will be included in new channel, floodplain, side channel, and pond design features, as noted above. In sum, include at least 40 large wood pieces, including root wads, for a total of 11 large wood features. Source all large wood from the Hoopa Valley Indian Reservation, in coordination with Hoopa Forest Industries and the Hoopa Valley Tribal Forestry Department. Wedge large wood habitat elements into existing vegetation, partially incorporated into the bank during excavation, and/or ballast with other wood/boulders. Anchor pieces of wood shorter than 1.5 times the length of the bankfull width.

- **Riparian restoration and replanting.** Revegetation will consist of upland, riparian, and native grass planting. Douglas fir, Ponderosa Pine, oaks, and incense cedar will be planted over 3 acres. Plant riparian woody and herbaceous plant species including black cottonwood, willows, sedges and rushes 4 acres. Spread native grass seed and native grass straw mulch across the spoils and Heavy Equipment Subcontractor use areas. Irrigate and maintain the site for three years after construction. Grow plants at the adjacent Tsmeta Nursery.
- **As-built survey.** The HVTF will complete the post longitudinal profile for projects where channel grade is to be restored or otherwise modified by the project (as-built survey).

Implement the above project elements by completing the following tasks:

Task 1. Project Management. Project management and grant administration will be completed by HVTF and the Heavy Equipment Subcontractor. The Habitat Division Lead will track the project budget and develop and submit invoices to the Grantor's Project Manager on a regular basis. In addition, required annual report metrics will be generated and submitted to the Grantor's Project Manager by December 1st of every year during the Agreement term.

Task 2. Environmental Compliance and Permitting. The HVTF and Heavy Equipment Subcontractor will apply for and complete all necessary federal, state, and tribal permits and associated environmental compliance.

Task 3. Project Implementation. The construction aspects of the project will be implemented by the Heavy Equipment Subcontractor. This will include pre-project setup, excavation and the construction and placement of habitat and engineered features. Large wood with root wads will be sourced from Hoopa Valley Indian Reservation via the Roads and the Hoopa Valley Tribal Forestry Department activities. Construction will be overseen by the Engineering Subcontractor, Biological Subcontractor, and the Habitat Division Lead. Implement riparian planting and grass seeding under the supervision of the Riparian Ecologist and Habitat Division Lead using Tribal Technicians IIIs and possibly Tribal Civilian Conservation Corps (CCC) volunteers.

Task 4. Riparian Maintenance. Riparian maintenance will be performed by Tribal Technicians and possibly Tribal CCC under the supervision of the Riparian Ecologist and Habitat Division Lead.

Task 5. Monitoring. Post-project monitoring by HVTF will include physical monitoring of the project to ensure that the constructed channel is functioning using as-built criteria, longitudinal profile surveys, cross-sectional surveys, photo monitoring, and vegetation survival monitoring.

Pre-project baseline monitoring will be conducted prior to implementation and post-project effectiveness monitoring for the off channel features will be performed (done with funds outside this agreement). The HVTF will maintain and enhance its existing fisheries out-migrant monitoring and stream gauging stations on Supply Creek.

Deliverables:

Task 1. Progress reports and invoices, annual reports and final.

Task 2. Clean Water Act 401 Clean Water Certification consultation documents as necessary, and other permits as required.

Task 3. Project invoices, reports (progress, annual, and final) inclusive of quantified deliverables, construction subcontract. 100% stamped design.

Task 4. Project invoices and reports.

Task 5. As-built survey. Final project monitoring report.

Timelines:

Task 1. Project Management. June 1, 2017, or upon agreement execution, to February 28, 2021.

Task 2. Environmental Compliance and Permitting. June 1, 2017, or upon grant execution, to October 1, 2019.

Task 3. Project Implementation. June 30, 2017 to September 1, 2018. 100% Designs will be finalized before grant agreement execution.

Task 4. Riparian Maintenance November 30, 2017 to October 1, 2020.

Task 5. Monitoring June 1, 2017, or upon agreement execution, to December 31, 2020.

Additional Requirements:

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

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

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

standards detailed in the 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 CDFW Grant Manager a minimum of five working days before the project site is de-watered and the stream flow diverted. The notification will provide a reasonable time for CDFW personnel to oversee the implementation of the water diversion plan and the safe removal and relocation of salmonids and other native aquatic species from the project area. If the project requires dewatering of the site and the relocation of listed aquatic species, the Grantee will implement the following measures to minimize harm and mortality to listed species as well as other native aquatic species:

- Fish relocation and dewatering activities shall only occur between June 15 and October 31 of each year.
- 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, NMFS Biological Opinion, and project's Lake and Streambed Alteration Agreement (1600 permit).
- 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*.
- Only qualified fisheries biologist that are approved by USFWS and permitted by CDFW under a California Endangered Species Act (CESA) Memorandum of Understanding (MOU) shall handle and relocate CESA listed species.
- All electrofishing shall be performed by a qualified fisheries biologist under the supervision of CDFW and conducted according to the National Marine Fisheries Service, Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
- 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.

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

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

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

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

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

The landowner or responsible party must sign an access agreement stating they agree to maintain the erosion control project for a period of not less than 10

years. Maintenance will consist of repair to the road or stream crossing to a level that will effectively reduce sediment from entering the stream. In the event of an act of nature which results in partial or complete failure of the project, the landowner or applicant will not be held responsible for costs incurred after the act of nature. Acts of nature include, but are not limited to floods, earthquakes, volcanic eruptions, and wind storms.

Planting of tree seedlings will take place after December 1 or when sufficient rainfall has occurred to ensure the best chance of survival of the seedlings.



Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad IS (Fish Lake (4112336) OR French Camp Ridge (4112327) OR Hoopa (4112316) OR Hopkins Butte (4112325) OR Hupa Mountain (4112317) OR Johnsons (4112337) OR Orleans (4112335) OR Tish Tang Point (4112315) OR Weitchpec (4112326))

Possible species within Weitchpec Quad and surrounding quads for 725170 Supply Creek Restoration Project Phase II, T10N R04E S36, Humboldt County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
bald eagle <i>Haliaeetus leucocephalus</i>	ABNKC10010	Delisted	Endangered	G5	S3	FP
Bald Mountain milk-vetch <i>Astragalus umbraticus</i>	PDFAB0F990	None	None	G3	S2	2B.3
black swift <i>Cypseloides niger</i>	ABNUA01010	None	None	G4	S2	SSC
bunchberry <i>Cornus canadensis</i>	PDCOR01040	None	None	G5	S2	2B.2
California globe mallow <i>Iliamna latibracteata</i>	PDMAL0K040	None	None	G2G3	S2	1B.2
chinook salmon - upper Klamath and Trinity Rivers ESU. <i>Oncorhynchus tshawytscha</i>	AFCHA02056	None	None	G5	S1S2	SSC
coast checkerbloom <i>Sidalcea oregana ssp. eximia</i>	PDMAL110K9	None	None	G5T1	S1	1B.2
coast cutthroat trout <i>Oncorhynchus clarkii clarkii</i>	AFCHA0208A	None	None	G4T4	S3	SSC
coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Columbia yellow cress <i>Rorippa columbiae</i>	PDBRA27060	None	None	G3	S1	1B.2
Del Norte salamander <i>Plethodon elongatus</i>	AAAAD12050	None	None	G4	S3	WL
Dudley's rush <i>Juncus dudleyi</i>	PMJUN01390	None	None	G5	S1	2B.3
elongate copper moss <i>Mielichhoferia elongata</i>	NBMUS4Q022	None	None	G5	S4	4.3
fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SSC
foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050	None	None	G3	S3	SSC
giant fawn lily <i>Erythronium oregonum</i>	PMLIL0U0C0	None	None	G4G5	S2	2B.2
great blue heron <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
Heckner's lewisia <i>Lewisia cotyledon var. heckneri</i>	PDPOR04052	None	None	G4T3	S3	1B.2



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
hooded lancetooth <i>Ancotrema voyanum</i>	IMGAS36130	None	None	G1G2	S1S2	
Howell's montia <i>Montia howellii</i>	PDPOR05070	None	None	G3G4	S2	2B.2
Humboldt marten <i>Martes caurina humboldtensis</i>	AMAJF01012	None	Candidate Endangered	G5T1	S1	SSC
Karok hesperian <i>Vespericola karokorum</i>	IMGASA4040	None	None	G2	S2	
Klamath/North Coast Fall/Winter Run Chinook Salmon River <i>Klamath/North Coast Fall/Winter Run Chinook Salmon River</i>	CARB2332CA	None	None	GNR	SNR	
Klamath/North Coast Interior Headwater Fishless Stream <i>Klamath/North Coast Interior Headwater Fishless Stream</i>	CARB2220CA	None	None	GNR	SNR	
Klamath/North Coast Rainbow Trout Stream <i>Klamath/North Coast Rainbow Trout Stream</i>	CARB2312CA	None	None	GNR	SNR	
northern goshawk <i>Accipiter gentilis</i>	ABNKC12060	None	None	G5	S3	SSC
northern meadow sedge <i>Carex praticola</i>	PMCYP03B20	None	None	G5	S2	2B.2
northern red-legged frog <i>Rana aurora</i>	AAABH01021	None	None	G4	S3	SSC
Oregon goldthread <i>Coptis laciniata</i>	PDRAN0A020	None	None	G4	S3	4.2
Oregon shoulderband <i>Helminthoglypta hertleini</i>	IMGASC2280	None	None	G1	S1S2	
osprey <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
Pacific fuzzwort <i>Ptilidium californicum</i>	NBHEP2U010	None	None	G4G5	S3S4	4.3
Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6	None	None	G5T3	S2	1B.2
Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010	None	None	G4	S3S4	SSC
pale yellow stonecrop <i>Sedum laxum ssp. flavidum</i>	PDCRA0A0L2	None	None	G5T4Q	S4	4.3
robust false lupine <i>Thermopsis robusta</i>	PDFAB3Z0D0	None	None	G2	S2	1B.2
ruffed grouse <i>Bonasa umbellus</i>	ABNLC11010	None	None	G5	S3S4	WL
slender silver moss <i>Anomobryum julaceum</i>	NBMUS80010	None	None	G5?	S2	4.2



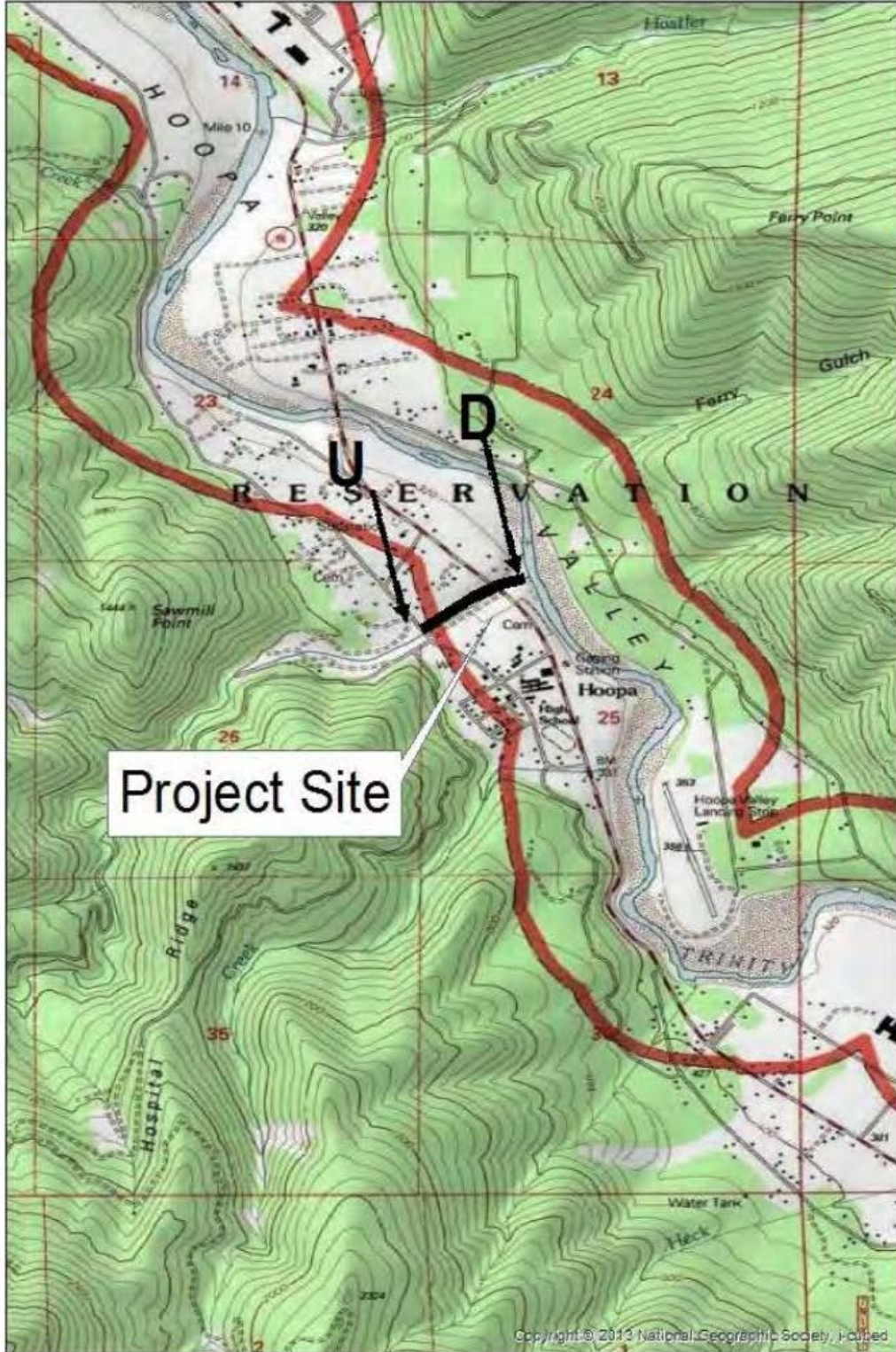
Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
small groundcone <i>Kopsiopsis hookeri</i>	PDORO01010	None	None	G4?	S1S2	2B.3
Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030	None	None	G3	S3	SSC
southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020	None	None	G3G4	S2S3	SSC
Suckley's cuckoo bumble bee <i>Bombus suckleyi</i>	IIHYM24350	None	None	GU	S1	
summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B	None	None	G5T4Q	S2	SSC
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
Tracy's sanicle <i>Sanicula tracyi</i>	PDAP11Z0K0	None	None	G4	S4	4.2
Trinity shoulderband <i>Helminthoglypta talmadgei</i>	IMGASC2630	None	None	G2	S2	
Upland Douglas Fir Forest <i>Upland Douglas Fir Forest</i>	CTT82420CA	None	None	G4	S3.1	
water bulrush <i>Schoenoplectus subterminalis</i>	PMCYP0Q1G0	None	None	G4G5	S3	2B.3
western bumble bee <i>Bombus occidentalis</i>	IIHYM24250	None	None	G2G3	S1	
western pearlshell <i>Margaritifera falcata</i>	IMBIV27020	None	None	G4G5	S1S2	
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050	None	None	G3	S3	1B.2
Wolf's evening-primrose <i>Oenothera wolffii</i>	PDONA0C1K0	None	None	G2	S1	1B.1
northern spotted owl <i>Strix occidentalis caurina</i>	ABNSB12011	Threatened	Candidate Threatened	G3T3	S2S3	SC
marbled murrelet <i>Brachyramphus marmoratus</i>	ABNNN06010	Threatened	Endangered	G3G4	S1	

Record Count: 55

Supply Creek Restoration Project Phase II
Project Location Map
T10N R04E S36, Hoopa Quad, Humboldt County



Miller Riparian Restoration Project

Introduction:

1. Overview/Need: The Eel River Watershed Improvement Group (ERWIG) will work with the landowner and the landowner's General Engineering Contractor to construct 19,980 feet of riparian protection fencing, treat 15 erosion livestock concentration erosion sites, place off-stream livestock watering stations at five locations, sanitize one 20,000 gallon water storage facility and two water troughs, lay 12,235 feet of High Density Polyethylene (HDPE) waterline, and plant 20 acres of native riparian seedlings. The project will create 191 acres of livestock-free riparian area, develops control fencing at two existing water trough sites and develops 5 additional water trough sites. The purpose of the project is to protect riparian areas of Oil and Maple creeks from livestock impacts and enhance them by treating livestock-related sediment sources and planting native seedlings. This project is the final riparian implementation needed to bring to conclusion the comprehensive landscape overhaul described in the ranch plan as part of the conservation easement. The work will address sediment and nutrient issues at current stream watering locations and improve riparian shading by minimizing cattle browsing of existing vegetation and planting riparian seedlings. This project is necessary to improve water quality and habitat conditions in Oil Creek, where rearing coho salmon have been observed. Reduction of sediment and nutrient contributions from Maple and Oil Creek will contribute to improvement in salmonid habitat conditions in the lower Eel River.

The Grantee shall not proceed with on the ground implementation until all necessary permits, and consultations are secured and/or a Notice to Proceed is issued.

All habitat improvement will follow techniques in the California Stream Habitat Restoration Manual (Parts VI, VII, and XI)

Objective(s):

The goal of this project is to eliminate livestock impacts to Oil and Maple creeks. The objectives for reaching this goal are to a) install fencing to keep livestock away from streams, creating 191 acres of riparian area protected from livestock impacts; b) provide off-stream watering stations, improving two existing and developing five additional watering sites; and c) planting 20 acres of riparian seedlings in heavily impacted areas where there is inadequate young tree growth. The fencing will eliminate browsing on riparian vegetation, reduce sediment and nutrient inputs, and improve bank stability by keeping livestock away from the streams and their riparian areas.

Project Description:

Location: The project is located within the Howe Creek Ranch on Oil Creek (tributary to the Eel River) and Maple Creek (tributary to Price Creek, thence, Eel River). The project boundaries are 40.48647000° north latitude, -124.19273000° west longitude for upstream end; and 40.49788000° north latitude, -124.18526000° west longitude for downstream end on Oil Creek. Boundary

coordinates for Maple Creek are 40.49757000° north latitude, -124.19287000° west longitude for upstream end; and 40.49898000° north latitude, -124.20185000° west longitude for downstream end.

Project Set Up: The Eel River Watershed Improvement Group (ERWIG) will subcontract the work to the landowner and the landowner's General Engineering Contractor (Agland Engineering, Inc.). ERWIG's Executive Director will coordinate with CDFW grant manager, administer the subcontract, provide technical assistance, and oversee all aspects of project for quality and timeliness, prepare grant invoices and project reports. The General Engineering Contractor and landowner will be responsible for site preparation, staking and flagging fence, tank and waterline locations, placing tanks and troughs, installing waterlines, plumbing tanks, pouring concrete footings and trough skirts, fence construction, applying rock at erosion control points, fence construction, installing culverts and boulders to address head cut at one site, seedling planting and browse protector installation, application of erosion control. The General Engineering Contractor will prepare as-built reports. Landowner, General Engineering Contractor, and Grantee Executive Director will prepare final report.

Materials: The project will use 977 (approx. 89 loads) of quarry rock and woven geotextile fabric in 12.5 ft. by 432 ft. rolls for surface hardening at 15 erosion control points. Eight culverts for a total of 230 feet of 15" diameter culvert will be installed. Field fencing, barbed wires, T-posts, railroad tie relays (bracing), and pressure-treated round posts for 19,980 feet of fence are to be used. For upgrading existing watering systems and installing others: three head pressure break tanks and five concrete water troughs will be installed with stainless steel fittings; Redi-mix concrete and poured concrete footings and concrete skirts will be used around tanks and troughs; piping will be Polyvinyl chloride (PVC, above ground) and HDPE (below ground). Ten yards of ½ ton angular boulders will be placed to reduce head cutting at one culvert. Approximately 2,500 tree seedlings will be planted and caged with biodegradable Vexar mesh to avoid wildlife browsing. Erosion control materials (weed-free straw mulch and annual rye grass seed will be applied on bare soil

Tasks:

Task 1 – Contract Oversight

The ERWIG Executive Director will be responsible for contract oversight. Contract oversight will involve all project coordination and administrative tasks necessary to complete the project including and not limited to obtaining permits, securing subcontracts and agreements, scheduling, implementation oversight, invoicing, reporting and agency (including CDFW) and landowner communications.

Task 2 – Staking of worksites

The landowner and General Engineering Contractor will see that stakes are placed for water trough area to be leveled and trough center locations are flagged. Head break tank locations, based on elevations designed for head pressure and flow, and pipeline trenching routes will be staked as well as fenceline flagged.

Task 3 – Site Preparation for Fence, Pipeline and Tank Locations

General Engineering Contractor and landowner will carry out site-preparation for fence, pipeline, and tank locations including brush removal and some ground leveling will be done with bulldozer rake and light excavator. Some riparian planting area brush will also be mechanically removed during this stage of mechanical site area preparation (blackberry vines in Area 1 and coyote brush & poison oak in the south end of Area 3). This activity will be carried out in summer dry-soil season.

Task 4 – Installation of Off-stream Water System Components

General Engineering Contractor will install off-stream water system components including a) pouring concrete bases for head break tanks and skirts for water troughs, large tank saddles and footings for two storage tanks tank and trough placement; b) placement of 5 troughs, 1 valve box, and 3 head break tanks; and replacement of two steel storage tanks after they have been sanitized and concrete saddles and steel-reinforced footings have been constructed; c) Once all piperun beginning – ending tank locations are established, the pipelines can be laid, buried and plumbed. The pipeline runs will be trenched at a target 6” width and 16” depth with a dedicated all-terrain trencher. All pipe will be laid by hand labor, and trenches backfilled and compacted by hand labor where terrain demands, and mechanically where possible; d) Any trench location that has the potential to capture & accumulate water will be water-barred with appropriately spaced wooden blocks, placed across the trench and extending above the surrounding ground to divert captured flow away from the trench. Rock surfacing will be applied in heavy traffic areas around water troughs where there is easy access on established roads and deep-style troughs already in place. This work will be carried out in the summer dry-soil season.

Task 5 – Culvert Installation and Surface Hardening of Trails and Crossings

Landowner and General Engineering Contractor will use rock to surface harden trails and crossings where exclusion fencing concentrates livestock movement along the new fences. This includes 15 trail & road erosion prevention site locations. All culverts will be 15-inch diameter Dual Wall Polypropylene (DWPP), which can be installed with a small excavator. All sites will be hardened with quarry rock over geotextile fabric, spreading approximately 9” deep with a truck and shaping with a grader or 6-way blade bulldozer, then compacting with a 6x6 loaded water truck. Geotextile fabric will be placed with a 2 foot overlap on trough center areas. All exposed soil will be seeded and mulched with hay mulch, and temporarily fenced as necessary with portable fencing provided by the property’s

grazing lessee. This work must be completed during the dry-soil summer work season.

Task 6 – Exclusion Fence Construction

General Engineering Contractor and landowner will construct 19,980 feet of wildlife-friendly field fence. Wildlife gaps will be installed at strategic locations to allow all local species and age groups to pass, at a minimum of at least every 800 feet and at every water trough location. Eleven gates will be installed in the exclusion fencing. Gates will either have standard hinged galvanized livestock gate installed for frequent forestry management and road maintenance, or a tied hog panel for infrequent access. Line posts may be driven and field fence erected during wet soil conditions using an ATV or UTV for personnel access, so long as the materials are pre-staged.

Task 7 - Riparian Planting

General Engineering Contractor will plant native trees in streamside or upland riparian sites. All of the plantings will be containerized seedling stock, with the conifers and alder being pulled by the nursery and packed as bare-root to be planted by planting crews. Cottonwood and maple will come in individual containers to facilitate careful spacing. The spacing of cottonwood should not be closer to each other than 25 feet, and maple should be no closer to each other than 40 feet. All trees will be hoedad-planted and any tree location selected with competing vegetation within a 10" radius will be scalped before planting. Biodegradable 24" Vexar protectors will be installed on all trees immediately after planting to protect the trees for 2-3 years from deer browsing. The plants will be monitored and replanted (if necessary) for 3 years or more to achieve the specified standard for success.

Task 8 – Photo points and Reporting

Landowner and General Engineering Contractor will take pre- and post-project photos at monumented photo points established at all 15 treated Erosion Control Point sites and all six planting areas within the project area. General Engineering Contractor will provide as-built field reports on 15 ECP sites, 4 riparian exclusions, 5 new trough installations (all tank sites including pipelines), 2 trough center installations, 1 storage tank installation site, 3 head break tank installations, and 6 riparian planting sites. ERWIG and landowner will provide progress reports, invoicing for grant, annual reports, and final report.

Deliverables:

- 191 acres of riparian protected by livestock exclusion fencing with wildlife gaps every 800 feet
- 25,920 feet of stream length protected from livestock-related bank erosion, as well as nutrient and sediment loading
- 2,535 native trees planted and protected from wildlife browsing with Vexar netting

- An off-stream water delivery system including 5 low profile wildlife-friendly water troughs with concrete skirts; 3 concrete tank saddles and footings and 3 water head pressure reduction break tanks with associated HDPE waterline, and stainless steel fittings and bronze alloy valves
- Treatment of 15 erosion control points associated with livestock concentration that includes 8 new double-walled plastic culverts at stream crossings with 10 yards of ½ ton boulder placed at one culvert outlet; surface-hardening with quarry rock over geotextile fabric on 990 feet of livestock trail and for a total of 14,760 sq. ft. at three trough centers and one pond dike
- Pictures at monumented photo points associated with 15 treated erosion control points and 6 planting areas
- Annual Report indicating progress after each year of implementation and a Final Report including description and analysis of restoration treatments from As-Built field reports on erosion control points, tank locations and trough centers, fencelines, and planting areas; a description of the results of project including seedling count mortality by species, dates of work, the number of person-hours expended and before and after photos of planting areas, erosion control points, tank installations, and fencelines.

Timelines:

The project is proposed for June 1, 2017 through March 31, 2019.

ERWIG and Landowner:

- Environmental Compliance and Permitting (CEQA & NEPA): June 2017
- Planning: subcontract development & approval: June 2017
- Contract development with landowner, and review of landowner's general contract: June 2017

General Contractor (Agland Engineering):

- Materials purchase order development, materials delivery scheduling and operations scheduling: June 2017
- Preparation: pre-project photo assessment report component: July 2017
- Construction and preparation of staging sites, staging purchased materials: Aug. – Sept. 2017
- Pre-staking and flagging fence, tank and waterline locations: June – July 2017
- Site prep leveling for BT and trough placement and planting and fencing site preparation brush removal: July – Aug. 2017
- Place tanks (BTs and troughs): Aug 2017
- Remove (set aside) ST 69 storage tanks, pour concrete footings and saddles, replace tanks: Aug 2017
- Trench, lay and bury waterlines: September 2017
- Plumb tanks: October – November 2017; Aug 2017
- Place waterline trench waterbars: Aug 2017
- Pour trough skirts: June 2018

- Construct fence braces and stage fencing materials for wet weather: May – July 2018 (except where ECP construction will interfere with brace location)
- Construct elements at 15 fence-related Erosion Control Point (ECP) sites and complete fence braces, mulch and seed exposed soil: Aug.- Sept. 2018
- Erect field fencing: October – December 2018
- Plant seedlings and install protectors: Dec. 2018 – Jan 2019
- Draft and submit to Grantor annual reports: December 1, 2017 and 2018
- Final report compilation and final invoicing: Feb. 2019

Most tasks will be implemented during the dry season work window of June 15 – October 31. Except at erosion control points, fence post and brace installation may occur in May. Field fence erection (with minimal soil disturbance) is planned for October 1 – December 31. Seedling planting is planned for after December 1 through January 31.

Additional Requirements:

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

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

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

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

Seeding and mulching of all exposed soils shall be done for all slopes which may deliver sediment to a stream. Woody debris will be concentrated on finished slopes adjacent to stream crossings. The standard for success is 80% ground cover for broadcast planting of seed, after a period of three years. Mulching and seeding will take place as sites are

completed to avoid unforeseen erosion. Planting of tree seedlings will take place after December 1 or when sufficient rainfall has occurred to insure the best chance of survival of the seedlings.

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

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

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.

An agreement will be developed with the landowner that states the landowner or proponent will maintain the livestock exclusion fence(s) for a period of 10 years and totally exclude livestock from the riparian zone. Maintenance will include repair of fences to a level that will effectively exclude livestock from the livestock exclusion project area. Maintenance will not include damage that exceeds 50 percent of the fence due to natural disaster.



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad IS (Buckeye Mtn. (4012432) OR Bull Creek (4012431) OR Capetown (4012443) OR Ferndale (4012453) OR Fortuna (4012452) OR Hydesville (4012451) OR Petrolia (4012433) OR Scotia (4012441) OR Taylor Peak (4012442))

Possible species within the Taylor Peak Quad and surrounding quads for 725179 Miller Riparian Restoration Project, T01N R01W S9, Humboldt County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
bank swallow <i>Riparia riparia</i>	ABPAU08010	None	Threatened	G5	S2	
beach layia <i>Layia carnosa</i>	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
bluff wallflower <i>Erysimum concinnum</i>	PDBRA160E3	None	None	G3	S2	1B.2
coast cutthroat trout <i>Oncorhynchus clarkii clarkii</i>	AFCHA0208A	None	None	G4T4	S3	SSC
coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Coastal and Valley Freshwater Marsh <i>Coastal and Valley Freshwater Marsh</i>	CTT52410CA	None	None	G3	S2.1	
Coastal Douglas Fir Western Hemlock Forest <i>Coastal Douglas Fir Western Hemlock Forest</i>	CTT82410CA	None	None	G4	S2.1	
coastal marsh milk-vetch <i>Astragalus pycnostachyus var. pycnostachyus</i>	PDFAB0F7B2	None	None	G2T2	S2	1B.2
coho salmon - southern Oregon / northern California ESU <i>Oncorhynchus kisutch</i>	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040	None	None	G5	S4	WL
dark-eyed gilia <i>Gilia millefoliata</i>	PDPLM04130	None	None	G2	S2	1B.2
fisher - West Coast DPS <i>Pekania pennanti</i>	AMAJF01021	Proposed Threatened	Candidate Threatened	G5T2T3Q	S2S3	SSC
foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050	None	None	G3	S3	SSC
giant fawn lily <i>Erythronium oregonum</i>	PMLIL0U0C0	None	None	G4G5	S2	2B.2
golden eagle <i>Aquila chrysaetos</i>	ABNKC22010	None	None	G5	S3	FP
great blue heron <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
great egret <i>Ardea alba</i>	ABNGA04040	None	None	G5	S4	
Hitchcock's blue-eyed grass <i>Sisyrinchium hitchcockii</i>	PMIRI0D0S0	None	None	G2	S1	1B.1



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
hoary bat <i>Lasiurus cinereus</i>	AMACC05030	None	None	G5	S4	
Howell's montia <i>Montia howellii</i>	PDPOR05070	None	None	G3G4	S2	2B.2
Humboldt Bay owl's-clover <i>Castilleja ambigua</i> var. <i>humboldtiensis</i>	PDSCR0D402	None	None	G4T2	S2	1B.2
Humboldt marten <i>Martes caurina humboldtensis</i>	AMAJF01012	None	Candidate Endangered	G5T1	S1	SSC
leafy reed grass <i>Calamagrostis foliosa</i>	PMPOA170C0	None	Rare	G3	S3	4.2
longfin smelt <i>Spirinchus thaleichthys</i>	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Lyngbye's sedge <i>Carex lyngbyei</i>	PMCYP037Y0	None	None	G5	S3	2B.2
maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0	None	None	G3	S3	4.2
marbled murrelet <i>Brachyramphus marmoratus</i>	ABNNN06010	Threatened	Endangered	G3G4	S1	
Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420	None	None	G4	S4	4.2
minute pocket moss <i>Fissidens pauperculus</i>	NBMUS2W0U0	None	None	G3?	S2	1B.2
Northern Coastal Salt Marsh <i>Northern Coastal Salt Marsh</i>	CTT52110CA	None	None	G3	S3.2	
northern red-legged frog <i>Rana aurora</i>	AAABH01021	None	None	G4	S3	SSC
obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380	None	None	G4?	S1S2	
Oregon coast paintbrush <i>Castilleja littoralis</i>	PDSCR0D012	None	None	G3	S3	2B.2
Oregon polemonium <i>Polemonium carneum</i>	PDPLM0E050	None	None	G3G4	S2	2B.2
osprey <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
Pacific gilia <i>Gilia capitata</i> ssp. <i>pacifica</i>	PDPLM040B6	None	None	G5T3	S2	1B.2
Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010	None	None	G4	S3S4	SSC
pallid bat <i>Antrozous pallidus</i>	AMACC10010	None	None	G5	S3	SSC
running-pine <i>Lycopodium clavatum</i>	PPLYC01080	None	None	G5	S3	4.1



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
seacoast ragwort <i>Packera bolanderi</i> var. <i>bolanderi</i>	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
sharp-shinned hawk <i>Accipiter striatus</i>	ABNKC12020	None	None	G5	S4	WL
short-leaved evax <i>Hesperovax sparsiflora</i> var. <i>brevifolia</i>	PDASTE5011	None	None	G4T3	S2	1B.2
Siskiyou checkerbloom <i>Sidalcea malviflora</i> ssp. <i>patula</i>	PDMAL110F9	None	None	G5T2	S2	1B.2
slender silver moss <i>Anomobryum julaceum</i>	NBMUS80010	None	None	G5?	S2	4.2
Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030	None	None	G3	S3	SSC
southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020	None	None	G3G4	S2S3	SSC
summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B	None	None	G5T4Q	S2	SSC
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
tricolored blackbird <i>Agelaius tricolor</i>	ABPBXB0020	None	None	G2G3	S1S2	SSC
western bumble bee <i>Bombus occidentalis</i>	IIHYM24250	None	None	G2G3	S1	
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050	None	None	G3	S3	1B.2
Whitney's farewell-to-spring <i>Clarkia amoena</i> ssp. <i>whitneyi</i>	PDONA05025	None	None	G5T1	S1	1B.1
Wolf's evening-primrose <i>Oenothera wolfii</i>	PDONA0C1K0	None	None	G2	S1	1B.1
Yuma myotis <i>Myotis yumanensis</i>	AMACC01020	None	None	G5	S4	
northern spotted owl <i>Strix occidentalis caurina</i>	ABNSB12011	Threatened	Candidate Threatened	G3T3	S2S3	SC

Record Count: 57

Miller Riparian Restoration Project
Project Location Map
T01N R01W S9, Taylor Peak Quad, Humboldt County

