Introduction:

The Eel River Watershed Improvement Group (ERWIG) will restore fish passage through the Buck Gulch road crossing by replacing the current culvert with a free-span bridge engineered to pass all life stages at all flows, and to convey 100 year flows. This project is necessary because the culvert is a complete juvenile salmonid barrier and a temporal barrier to adult 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 improvements will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Part IX and XII https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

The objective of the project is to replace a failing, partial barrier, culvert with a free-span bridge that will provide salmonids with uninhibited access to 0.52 miles of year-round habitat. The bridge will allow full passage to juvenile and adult salmonids and will convey 100-year flows.

Project Description:

Location:

The project is located on Buck Gulch, near the town of Briceland, in Humboldt County, CA. Buck Gulch is a tributary to Miller Creek, tributary to Redwood Creek, in the South Fork Eel River watershed. The project site is 0.13 miles upstream of the confluence with Miller Creek; located at 40.122538 north latitude and -123.914536 west longitude; Township 04 South, Range 03 East, and Section 12, of the Briceland 7.5 Minute U.S. Geological Survey (USGS) Quadrangle Map.

Project Set Up:

ERWIG Staff: ERWIG Executive Director: Task 1. Contract oversight, planning and reporting will be conducted by ERWIG Executive Director.
ERWIG Project Manager: Tasks 3, 5, 6 & 7. Will manage project setup and project implementation. Project manager will collect pre- and post- project metrics, take pre- and post- project photos and plant native trees & plants. Project manager will write annual and final reports.
Subcontractors:
Licensed Engineering Contractor (Wilcox Enterprises): Tasks 3 and 5. Will participate in project planning, will carry out equipment transportation, and will be responsible for all heavy equipment activities including culvert removal, bridge

installation, rock placement, log placement, and any digging necessary to complete the project. Wilcox will also be responsible for dewatering the creek.
Conservation Corps (CCC) Corpsmembers: Task 5. CCC will anchor the structures according to design and anchoring specifications. CCC will also install and water willow.
Stillwater Sciences: Tasks 3, 5, and 6. Will produce 100% design plans, will oversee culvert removal, bridge installaion, and the construction of large woody debris (LWD) structures and boulder weirs. Will complete the fish passage survey and write a fish passage assessment report.
Electrofisher (Ross Taylor & Associates): Task 4. Will remove aquatic life, primarily fish, from project site and place block nets.
SHN Engineers and Geologists (Special Inspections): Task 5. Will inspect bridge footings, soil compaction, welds, and any other special inspections required by the Humboldt County Building Permit.William Rich & Associates: Task 2. Will carry out archeological and botanical background and survey work. Will produce reports satifying CEQA requirements.Paleontology subcontractor: Task 2. Will conduct paleontology research and surveys and will prepare a report satisfying CEQA requirements.

Materials:

Materials to be purchased by the applicant include:

1. Anchoring materials: for large wood and boulder structures. Steel nuts are required to secure threaded rebar to LWD, live trees, and rock, increasing longevity of intended structural position. Steel washers will be used to lock the steel nut into place once fastened to the threaded rebar.?
2. Straw: to be placed on exposed soil prior to significant rainfall.
3. County Planning and Building Permits: required for the project.

Materials to be purchased by the subcontractor:

1. Boulders to be used to anchor large wood structures, construct gradient control structures, and to armor bank in select places.
3. Cobble & boulder rock armor to be used for bed and bank protection.
4. 3` base road rock for road surfacing.
5. Bridge

Materials to be donated by landowner:

1. Thirteen (13) pieces of large wood to construct five (5) instream structures to provide bank protection, pool scour, habitat complexity, and cover.
2. Willow cuttings to reinforce bank protection rock work and to reestablish riparian vegetation.
3. Lake and Streambed Alteration Agreement

Tasks:

Task 1 - Project Management and Administration -

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

1. Request to spend project funds in order to prepare for implementation (e.g., obtain permits, secure subcontracts, purchase supplies, apply for a Streambed Alteration Agreement, etc.). Requests shall be sent by email or telephone.
2. Subcontractor Agreements. A written copy of the sub agreement shall be submitted to the CDFW Grant Manager. The subcontract shall include specific language which establishes the rights of the auditors of the State to examine the records of the subcontractor relative to the services and materials provided under the grant.
3. CEQA survey interim reports for archaeological and botanical surveys. Interim reports shall be delivered prior to receiving notice to proceed, as part of the Notification of Lake or Streambed Alteration Application (LSAA) package. Final Archaeological, botanical and paleontological surveys shall be delivered prior to the End Term date.
4. Send Grantor LSAA with a check for the most current permit fee.

The Grantee shall notify the CDFW Grant Manager a minimum of 10 business days prior to the beginning of project implementation.

Task 2 - CEQA Surveys - William Rich & Associates will conduct archeological and botanical surveys within the project reach to fulfill CEQA requirements. Interim survey reports will be delivered to CDFW Grant Manager prior to receiving a Notice to Proceed. Paleontological survey crew will conduct paleontological research, surveys and prepare reports.

Task 3 - Site Preparation - Stillwater Sciences will produce 100% design plans with guidance from CDFW and NOAA. Stillwater Engineer or ERWIG Project Manager will flag sites for material delivery and installation, clear brush for equipment as needed, and designate staging areas for equipment and wood. Excavator will be delivered by a lowboy to the staging area. Bridge will be delivered by truck. Boulders will be delivered by a dump truck along the project reach and/or staging areas. Pre-project photos and metrics will be collected. Project materials will be procured, including erosion control materials, anchoring materials, high strength epoxy, boulders and logs. To address concerns over invasive species, this project will follow the ERWIG Aquatic Invasive Species Decontamination Protocol which is in line with the CDFW Aquatic Invasive Species Decontamination Protocol.

Task 4 - Aquatic Species Relocation - Block nets will be set up and fish will be removed from the section of stream that is to be de-watered using an e-fisher,

operated by a qualified professional. Relocated fish will be placed in suitable habitat upstream and/or downstream of the project site. Amphibians will be caught with a dip net and relocated upstream and/or downstream of the section of stream to be de-watered.

Task 5.1 - Dewatering - Licensed equipment operator (Wilcox Enterprises) shall construct coffer dams upstream and downstream of the excavation site (within the fish exclusion zone) and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and may be sealed with sheet plastic. The suction end of the intake pipe shall be fitted with fish screens meeting CDFW and NOAA criteria to prevent entrainment or impingement of small fish. Any turbid water pumped from the work site itself to maintain it in a dewatered state shall be disposed of in an upland location where it will not drain directly into any stream channel. Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.

Task 5.2 - Site Construction - With guidance from Stillwater Engineer and ERWIG staff, Equipment Operator (Wilcox Enterprises) will remove the existing culvert. Removal of the existing culvert and fill prism will involve excavation of approximately 1,000 cubic yards of material which will be stored on the adjacent small driveway which will be converted into seasonal 4x4 access only. When fill material is placed for permanent storage, the receiving area will be ripped or decompacted first. The fill will then be placed in 1-foot lifts and shaped to blend with the surrounding topography with final surface grading designed to reduce runoff concentration as much as possible. Upon completion of the fill, woody debris will be scattered over the surface of the area as mulch.

Six new grade control structures will be installed within the new channel reach. Streambed material excavated from the upstream channel will be used to construct the channel between the grade control structures. Some additional imported cobble and boulders may be imported so that the streambed material matches specifications. Logs will be sourced locally and used by the equipment operator to build five (5) LWD structures. Re-enforced concrete abutments will be constructed and bridge will be placed and secured to abutments.

Task 5.3 - Anchoring - California Conservation Corps (CCC) corpsmembers under supervision of ERWIG staff will anchor the sites according to design and anchoring specifications. Site construction, wood placement, and anchoring will follow engineered design plans and will be in accordance with CDFG California Salmonid Stream Habitat Restoration Manual, Section VII (Flosi et al. 2010). Connections to boulders will involve threaded rebar connected via DYWIDAG eye nuts and half-inch alloy screw pin anchors. CCC corpsmembers will stake willow cuttings into rockwork to help guard against erosion, help stabilize the bank and provide riparian function.

Task 5.4 - Erosion Control - Erosion control wattles will be installed and mulching with rice straw and locally available native materials will take place as features are completed to avoid unforeseen erosion. Mulching will take place on all exposed soils which may deliver sediment to a stream. See Erosion Control (Section 11.2) in the Basis of Designs for more detail.

Task 5.5 - Watering and Riparian Planting - Willow stakes will be thoroughly watered by the CCC once per week until the first significant rainfall. In the winter following implementation, 40 native trees and plants will be planted in areas disturbed by the project. Species may include: *Sequoia sempervirens* (Redwood), *Pseudotsuga menziesii* (Douglas fir), *Vacinnium ovatum* (Evergreen huckleberry), *Heteromeles arbutifolia* (Toyon), *Gaultheria shallon* (Salal), *Ribes bracteosum* (stink currant), and *Rubus* sp. (thimbleberry, salmonberry, black-capped raspberry, etc).

Task 6 - Post Project Data and Photo Collection - Following implementation ERWIG and Stillwater Sciences will take post-project photos and quantitative implementation metrics will be collected which satisfy the Project Annual Progress Reports and Final Report. Fish passage surveys will be conducted at low and high flows to assess passage through the new culvert. A post-project, longitudinal profile survey will be conducted.

Task 7 - Reporting - ERWIG Staff will write and deliver Annual Progress Reports, and a Draft and Final Report to CDFW Grant Manager.

Deliverables:

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

Task 2 - CEQA Surveys - Finalized 100% Design Plans, Flagged Equipment Access Routes, Pre-project metrics and photos.

Task 3 - Site Preparation - Arch Culvert 54' by 18', five LWD structures (made of redwood (Sequoia sempervirens) or Douglas fir (Pseudotsuga menziesii) logs, three boulder grade control weirs, 20 native plants and trees.

Task 4 - Aquatic Species Relocation - Post-project metrics and photos, longitudinal profile, fish passage assessment.

Task 5.1 - Dewatering - De-watering data and summary report.

Task 5.2 - Site Construction - Steel bridge, 89’ long X 12' wide, five (5) LWD structures (made of redwood (*Sequoia sempervirens*) or Douglas fir (*Pseudotsuga menziesii*), logs, and eight (8) boulder grade control weirs.

Task 5.3 - Anchoring - Five (5) anchored LWD structures.

Task 5.4 - Erosion Control - Erosion control features.

Task 5.5 - Watering and Riparian Planting - A list of species planted at the project site and number of each species.

Task 6 - Post-Project Data and Photo Collection - Post-project metrics and photos, longitudinal profile, fish passage assessment.

Task 7 - Reporting - Annual reports, draft final report, final report.

Timelines:

Task 1 – Project Management and Administration – 4/1/2020 to 3/5/2022

Task 2 – CEQA Surveys – 4/1/2020 to 6/1/2020

Task 3 – Site Preparation – 6/1/2020 to 7/20/2020

Task 4 – Aquatic Species Relocation – 7/20/2020 to 7/31/2020

Task 5.1 – Dewatering – 7/31/2020 to 9/30/2020

Task 5.2 – Site Construction – 8/3/2020 to 9/30/2020

Task 5.3 – Anchoring – 8/10/2020 to 9/30/2020

Task 5.4 – Erosion Control – 8/3/2020 to 9/30/2020

Task 5.5 – Watering and Riparian Planting – 9/1/2020 to 2/26/2021

Task 6 – Post Project Data and Photo Collection – 11/2/2020 to 2/28/2022

Task 7 – Reporting – 11/1/2020 to 3/5/2022

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*.

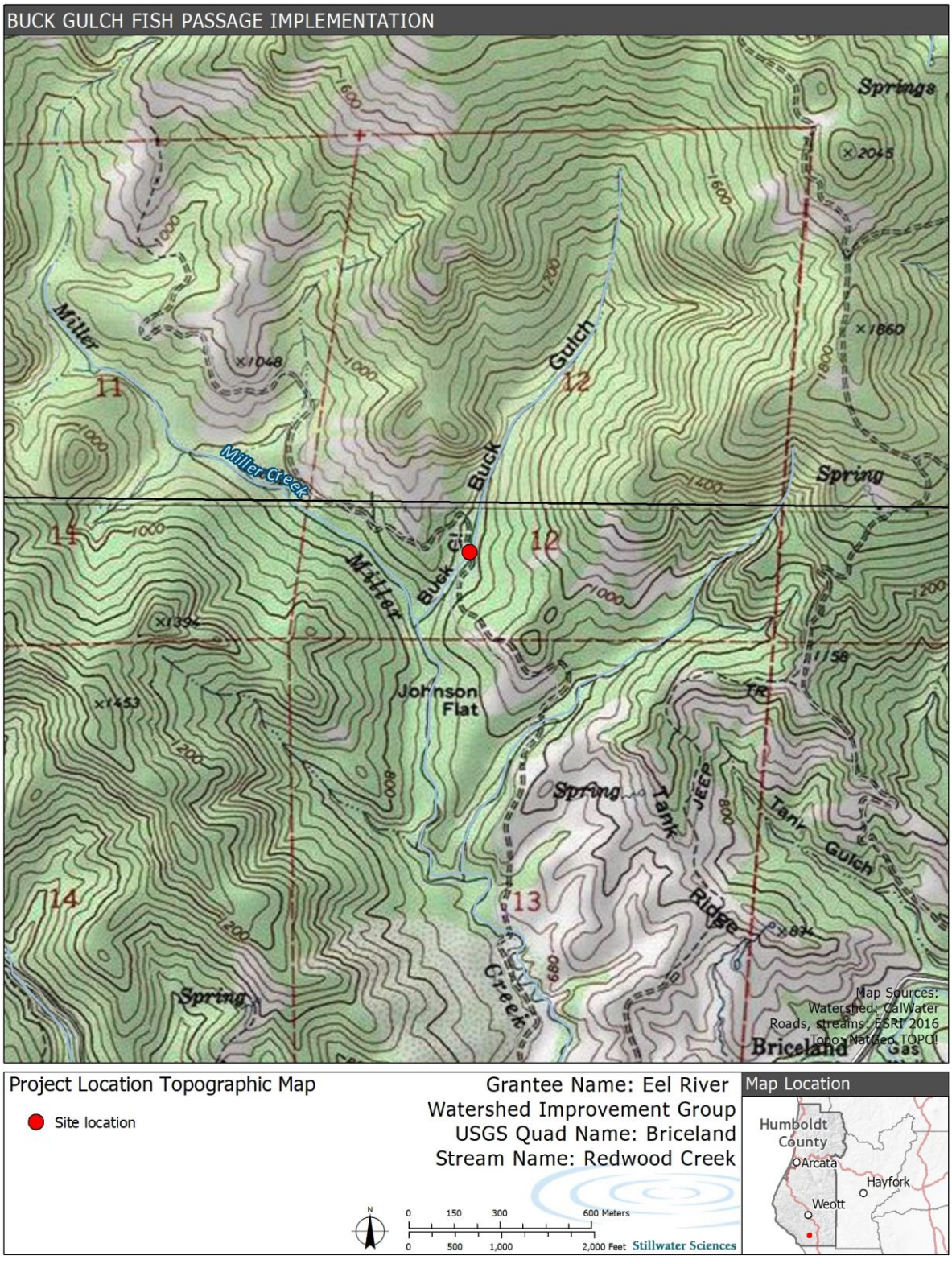
c. The Grantee shall minimize the amount of wetted stream channel dewatered at each individual project site to the fullest extent possible as approved by the CDFW Grant Manager and pursuant to conditions in the USACE Regional General Permit and NMFS Biological Opinion.

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 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.


BUCK GULCH FISH PASSAGE IMPLEMENTATION
Springs
Miller
Gulch
Buck
Miller Creek
Spring
Johnson Flat
Tank
Ridge
Creek
Briceland
Map Sources:
Watershed: CalWater
Roads, streams: ESRI 2016
Topo: NatGeo TOPO!
Project Location Topographic Map
Site location
Grantee Name: Eel River Watershed Improvement Group
USGS Quad Name: Briceland
Stream Name: Redwood Creek
0 150 300 600 Meters
0 500 1,000 2,000 Feet
Stillwater Sciences
Map Location
Humboldt County
Arcata
Hayfork
Weott

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

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

Possible species within the Briceland and surrounding quads for 3066 Bulk Gulch Barrier Removal, Humboldt County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus agnicidus Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Calamagrostis foliosa leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Castilleja mendocinensis Mendocino Coast paintbrush	PDSCR0D3N0	None	None	G2	S2	1B.2
Clarkia amoena ssp. whitneyi Whitney's farewell-to-spring	PDONA05025	None	None	G5T1	S1	1B.1
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Empidonax traillii brewsteri little willow flycatcher	ABPAE33041	None	Endangered	G5T3T4	S1S2	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erythronium oregonum giant fawn lily	PMLIL0U0C0	None	None	G4G5	S2	2B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Helminthoglypta arrosa monticola mountain shoulderband	IMGASC2035	None	None	G2G3T1	S1	
Kopsiopsis hookeri small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Montia howellii Howell's montia	PDPOR05070	None	None	G3G4	S2	2B.2
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Noyo intersessa Ten Mile shoulderband	IMGASC5070	None	None	G2	S2	
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
Oncorhynchus mykiss irideus pop. 36 summer-run steelhead trout	AFCHA0213B	None	None	G5T4Q	S2	SSC
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti fisher - West Coast DPS	AMAJF01021	None	Threatened	G5T2T3Q	S2S3	SSC
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Rana boylii foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Upland Douglas Fir Forest	CTT82420CA	None	None	G4	S3.1	
Upland Douglas Fir Forest						
Usnea longissima	NLLEC5P420	None	None	G4	S4	4.2
Methuselah's beard lichen						

Record Count: 42