

**Introduction:**

The Smith River Alliance will implement the Elk Valley Road Fish Passage Design Project. The purpose of this project is to improve fish passage in Elk Creek at all life stages and restore natural conveyance of spawning gravels and woody debris.

The project is necessary because the Del Norte County Culvert Inventory and Fish Passage Evaluation report (Taylor 2001) identified these culverts as partial barriers to all life stages of salmonids and undersized for 100-year flows, thereby restricting hydrologic functions such as the conveyance of substrate and woody debris. Recent research and survey efforts indicate these crossings restrict salmonid passage to limited spawning habitat in Elk Creek Watershed. While Elk Creek has an abundance of good quality rearing habitat for juvenile salmonids, spawning habitat is rare and likely a limiting factor for coho salmon recovery targets of 80% occupancy of IP habitat in the Elk Creek watershed (NMFS 2014).

**Objective(s):**

The project will develop designs for three passage barriers in the Elk Creek watershed located on Elk Valley Road. Objectives include: 1) improve fish passage to spawning habitat; 2) improve downstream migration of juvenile salmonids at a greater range of flows; 3) improve conveyance and capacity for flood flows; and 4) restore hydrologic function and conveyance of sediment and debris.

**Project Description:****Location:**

The project site is in the Elk Creek watershed, a small urban coastal basin located on the southern end of Crescent City. The mainstem of Elk Creek flows in a Northeast to Southwest direction and has tributaries spreading out from the mainstem to the North and South. Elk Valley Road runs parallel to Elk Creek and bisects the southern portion of the watershed, crossing the tributaries of Elk Creek in five separate places. Streams in this part of the watershed are low gradient with gravel substrate, ideal spawning and rearing habitat for coho salmon.

Crossing 1 on Elk Valley Road, 1.78-miles from Hwy 101, intersects South Tributary 3 (ST3) approximately 0.76-miles upstream of the confluence with Elk Creek. There is approximately 0.96-miles of salmonid spawning and rearing habitat upstream of the crossing. Elk Valley Rancheria is currently upgrading a private road/stream crossing on ST3 located approximately 1700 feet upstream of Crossing #1.

Crossing 2 on Elk Valley Road, 2.35-miles from Hwy 101, intersects the southern branch of South Tributary 4. The road/stream crossing is 0.83-miles upstream of the confluence with Elk Creek. Upstream of Elk Valley Road this tributary branches four times and travels across privately owned land and the State Parks North Operation Center. There is approximately 1.6-miles of spawning and rearing habitat upstream of Elk Valley Road. Smith River Alliance is currently designing upgrades for three private stream/road crossings on this tributary upstream of Crossing 2.

Crossing 3 on Elk Valley Road, 2.42-miles from Hwy 101, intersects the north fork of South Tributary 4 (also known as Nunes Creek). The crossing is 0.82-miles upstream of the confluence with Elk Creek and is on the mainstem of South Tributary 4. Upstream of the crossing there is approximately 0.86-miles of spawning habitat. There are no private stream crossings from the headwaters in Jedidiah Smith State Park to the crossing with Elk Valley Road.

Project coordinates are: Crossing 1: 41.7662 North and -124.15719 West; Crossing 2: 41.77282 North and 124.15331 West; Crossing 3: 41.7739 North and -124.15289 West.

## **Project Set Up:**

The project will be completed by a team consisting of the Smith River Alliance (SRA), Stillwater Sciences (SWS), SHN Engineers and Geologists (SHN), and DZC Archaeology and Cultural Resource Management (DZC). SRA will provide ongoing landowner outreach and engagement, coordination with other stakeholders and regulatory agencies, grant management and reporting, guidance on fisheries biology, fish passage, habitat enhancement opportunities, and assistance with SWS survey efforts. SRA will lead the riparian surveys and prepare a planting plan to restore areas disturbed by project construction. SRA will secure permits for the development of shovel-ready designs. SWS will conduct the geological and geomorphic site characterizations, identification of geologic hazards and constraints, characterization of vegetation communities, botanical assessments for CEQA permitting, hydrologic and hydraulic analyses, and preparation of engineering plans and specifications. The Project Geologist will oversee all aspects of the project for SWS and lead the geologic and geomorphic assessments, participate in stakeholder meetings, develop conceptual restoration plans, and author sections of the project report. The Senior Engineer will lead in identification of alternatives and design development, oversee the hydrologic and hydraulic analyses, and author sections of the project report. The Senior Geologist will advise and provide technical oversight of the geologic and geomorphic assessments, and assist with development of restoration plans. The Project Engineer will work on hydraulic analyses, developing crossing designs, and conducting AutoCAD drafting. The Botanist will lead the wetland and rare plant assessments to support project permitting, will assist with development of restoration plans, and author sections of the project

report. The Botanical Assistant will support the Botanist with field and office tasks. The Staff Geologist will assist with survey processing and provide GIS services. The Spatial Analyst will provide additional GIS services. The GIS Technician will support the Spatial Analyst. The Engineer in Training (EIT) will assist with the topographic survey and figure production. SHN will lead the geotechnical investigation foundation design of the road-stream crossings including, characterizing soil conditions for the crossing foundations, providing recommendations on the site suitability and site preparations, and developing the drawings and specifications for the crossing foundation systems. SHN will serve as a subconsultant to SWS. DZC will conduct the necessary cultural and archaeological resource investigations to satisfy CEQA permitting requirements for project implementation. DZC will serve as a subconsultant to SWS.

## **Materials:**

Subcontractor Supplies include: RTK-GPS Robotic total station Hand auger Water level loggers Drill Rig Soil Sample Tubes. SRA will purchase equipment and a software license to support existing conditions surveys and mapping requirements including: GPS Unit (SRA purchase) ArcMap Non-Profit License (SRA fee). This equipment is not currently available because in the past this equipment has been available to the SRA from CDFW as part of collaborative efforts through the Coastal Salmonid Monitoring Program.

## **Tasks:**

### **Task 1 Project Management**

SRA will provide technical and administrative services associated with performing and completing the work for this Project, including managing this Agreement, assuring all permits are finalized, coordination with landowners, stakeholders and members of the project design team, delivering the final landowner access agreement, administering subcontracts, invoicing and payments, drafting and finalizing progress reports and data management

### **Task 2 Technical Advisory Committee (TAC)**

SRA will convene a Technical Advisory Committee (TAC) composed of technical staff from the California Department of Fish and Wildlife (CDFW), NOAA Restoration Center (NOAA RC), SRA, SWS, Del Norte County Road Division, and other technical stakeholders to form consensus and guide technical review and decision criteria for each step of the design process. SRA will facilitate up to three TAC meetings to be held at key project milestones:

Stakeholder Meeting 1 - This will serve as a kick-off meeting with SRA, SWS, and Del Norte County to provide an opportunity to discuss conceptual crossing upgrade options, road-use and maintenance requirements, and potential future constraints.

TAC Meeting 1 - This site meeting will follow submittal of conceptual (30% level) design alternatives and supporting analyses and will provide opportunity to discuss project elements and identify a preferred alternative for 65% design development.

TAC Meeting 2 - This office-based meeting would be used to present the draft 65% design plan set and basis of design report.

TAC Meeting 3 - This office-based meeting would be used to receive comments on the 90% submittal.

Each meeting will provide opportunity for discussion, as well as verbal or written comment from TAC members. Additional input from TAC members may be sought via email and/or focused conference calls throughout the project. SRA will coordinate the TAC process, including selecting TAC members, scheduling, and facilitating meetings and preparing summary meeting notes. In addition to formal TAC meetings, SRA and SWS will facilitate individual coordination with landowners adjacent to the crossing sites to ensure consensus on project designs.

### **Task 3 Site Characterizations**

The site characterizations will include topographic surveys, vegetation assessments, and geologic and geomorphic assessments, and geotechnical investigation (described below under Task 4).

#### **Topographic Survey:**

Topographic surveys will be conducted with a robotic total station and/or RTK GPS to characterize channel bed and banks, road and crossing geometry, and floodplain topography. Survey control will be established by the licensed engineer with a minimum of two permanent benchmarks set within the project areas but outside the proposed work areas. Surveys will include general site topography and detailed channel geometry through the crossings extending several hundred feet in the up and downstream directions. Existing NOAA Coastal LiDAR data may be used to augment topographic surveys to create a DTM representing current conditions in the project areas. The existing conditions DTM will be used to create detailed basemaps (e.g., 1-foot contour or less) for field mapping, feasibility analyses, and project design.

#### **Vegetation Community Characterization:**

SRA will lead an assessment of existing vegetation communities at the project site and at a reference reach upstream of the project area. The vegetation characterization will define riparian forest alliances, invasive plants, disturbance, and overall health of the stand. The field assessment will follow the methods of the CDFW-CNPS Protocol for the Combined Vegetation Rapid Assessment and Relevé Method (CNPS and CDFW 2018) such that a representative location for each stand type will be sampled using the rapid assessment method. Results

from this assessment will inform invasive plant treatment actions and the plant selection for revegetation of disturbed areas.

## Geologic and Geomorphic Assessments:

A licensed professional geologist from SWS will lead the geomorphic assessment to evaluate risks and sustainability of project features, inform development of alternatives, and help guide selection of preferred project alternatives. The geomorphic assessment will initially consist of compilation of aerial and ground photos, maps, and other pertinent information regarding channel and floodplain morphology, fluvial processes, and the existing and anticipated sediment supply to the project reach. A historical aerial photo analysis will be conducted to map the evolution of channel and floodplain morphology and riparian vegetation in response to large flood events and anthropogenic disturbance. A field geomorphic assessment will then be conducted to describe existing channel morphology and bed material grain size distributions and identify hydraulic controls. The geologist will produce a geomorphic map of the project area using aerial photo and LiDAR analyses, field assessments, and the surveyed topographic basemap. The methods and results of the geomorphic assessment will be included in the Basis of Design report. Recommendations developed with these data will guide restoration planning and designs of crossing upgrades during Task 5.

## Fish Passage and Habitat Use:

SRA will lead a pre implementation assessment of fish passage and redd density upstream and downstream of the culverts. SRA and SWS will review the passage assessment from the 2001 Ross Taylor report and update as needed following guidelines in section IX of volume II California Salmonid Stream Habitat Restoration Manual (CDFW 2004). Updated passage criteria and information from the Ross Taylor report will inform project designs to ensure passage meets all CDFW and NOAA standards (Taylor 2001). SRA's pre-project assessment of adult salmonids following peak flows will provide a benchmark for measuring post implementation effectiveness. This assessment will build on habitat use and availability data from previous studies (Burgess 2005, Garwood 2019) and ongoing habitat use, and availability surveys conducted in 2019 and 2020 for the Elk Creek Restoration Feasibility Study (Contract Q1996003). While these studies provide sufficient data on pre-project use by juvenile salmonids, data on adult use and distribution is limited. Fish passage monitoring will be conducted in line with the guidelines in section IV-6 to IV-10 in the 4th edition California Salmonid Stream Habitat Restoration Manual (Flossi et al 1998) but the monitoring will be limited in scope (above and below the culverts on North Tributary 4) and frequency for replication before and after project Implementation.

## **Task 4 Hydrology and Hydraulics**

A hydrologic analysis will be performed for the project area including a review of nearby USGS gaging stations, FEMA Flood Insurance Rate Maps and Studies, and USGS Streamstats. Flood frequency flows (e.g., 100-year recurrence, 50-year recurrence, etc.) and exceedance probability flows will be calculated for each site using prorations from nearby gaged streams, regional flow regression equations and the Rational method. The assessment will develop a one dimensional (1-D) HEC-RAS model for each site from the digital terrain model (DTM) produced in Task 3 to evaluate water surface elevations, flow depths and velocities, and shear stresses in the creek channels under existing and future conditions. The hydraulic model will be used to identify design opportunities and constraints; evaluate the stability of proposed channel modifications, adequately size the crossing upgrade structures, and inform the design team about erosion and sedimentation patterns under existing and future conditions. Field observations of water surface elevations during winter high flows will aid in model calibration and verification. Pressure transducers installed at the project sites will provide continuous stage measurements throughout the winter/spring high flow season. Methods and results of the hydrology and hydraulics assessment will be included in the Basis of Design report.

## **Task 5 Conceptual Designs and Feasibility Analysis**

The project team will evaluate site opportunities and constraints and identify potential suitable options for upgrading the road-stream crossing structures to improve fish passage, flood flow conveyance, and natural stream function. Developing suitable design alternatives will be based on the assessments and analyses completed in Tasks 3 and 4.

The team will develop conceptual designs for the road-stream crossing structures, as well as riparian corridor improvements near the inlets/outlets of the new crossings. The crossing replacements will be developed using CDFW and NMFS stream simulation methodology. The preliminary crossing designs will be sized to convey the 100-year flood with adequate freeboard to pass sediment and large wood below the low cord of the crossing. The Smith River Alliance expects the crossing upgrades will replace the existing undersized culverts with an appropriately sized open bottom arch or box culvert backfilled with native streambed material. The crossing upgrades will be designed to provide unimpeded fish passage. The riparian assessment will consider strategic plantings of riparian species and conifers to inhibit invasive plant growth such as Himalayan blackberry.

Design alternatives will be developed to the 30% level, including schematic concept plan views, thalweg longitudinal profiles, and typical cross sections. The hydraulic modeling of existing and alternative conceptual designs will support the feasibility analysis. A planning-level cost estimate will be developed for each design and summarized in a draft Basis of Design report. These products will be



discussed at the first TAC meeting and review by the TAC will guide selection of a preferred alternative.

## **Task 6 Final Design Development**

This task will advance conceptual design plans through intermediate to final design submittals (i.e., 65%-100%). TAC members will be provided with interim submittals for review and comment.

### **Geotechnical Investigation and Crossing Foundation Design:**

SHN will conduct a focused geotechnical work scope that includes field investigation of the stream crossing sites, laboratory analysis of soil samples collected during the field investigation, and geotechnical analysis and reporting. The geotechnical investigation will focus on characterization of fill and native soils present in the existing crossings, and development of recommendations for construction of replacement crossings.

Because the stream crossings occur along a well-travelled County road, SHN proposes to complete the subsurface field investigation utilizing a truck-mounted drill rig with geotechnical drilling and testing capabilities. The Del Norte County Road Division will provide traffic control. SRA will secure a County Encroachment Permit for the Geotechnical investigation.

Field exploration will occur at the locations of proposed crossings, and adjacent to the channel. SHN anticipates six borings (two at each crossing site) on the order of 25 feet in depth. Laboratory testing defining the strength and textural character of the soil will be completed at SHN's accredited laboratory in Eureka. The results of the field investigation and laboratory testing will be analyzed by SHN's Senior Geotechnical Engineer and compiled in a geotechnical report, that will include conclusions regarding the suitability of the proposed project, and recommendations regarding site preparation, appropriate crossing subgrade design (e.g., culvert bedding), and specifications for engineered fill. SHN will include discussion of native soil properties to inform the design of the stream crossings.

SHN will prepare a detail design sheet showing the subgrade improvements and bedding for the crossings. The design will follow the guidelines provided in the geotechnical report. The details will include the following main elements: 1) excavation limits (plan and section views), 2) earthwork details such as benching, subgrade modifications, and backfilling, and 3) details related to installing the box culverts in accordance with the geotechnical report and the manufacturer's recommendations, such as bedding thickness and compaction requirements. SHN will prepare an earthwork specification addressing the materials to be installed as part of the design. SHN will provide cost estimation. SHN's products will be provided at the following stages: 65%, 90%, and 100%. The 100% submittal will be stamped/signed by a Professional Engineer licensed in the State of California.

## Design Development:

Based on the results of the feasibility analysis, geotechnical investigation, input from the TAC, and consultation with Del Norte County on the conceptual design alternatives, a preferred alternative will be selected and advanced to the 65% design level. Selection will be based on anticipated physical and biological outcomes (e.g., improved fish passage, improved habitat structure, increased riparian cover, bank stabilization, and fine sediment reduction), as well as constructability, implementation costs, and estimated longevity/sustainability of the proposed features.

65% Plans and a Basis of Design report will be developed for the preferred alternative. The design plans will include a plan view of all proposed features, grading plans, cross sections, profiles along construction alignments, typical construction detail drawings, preliminary revegetation plan, erosion, and sediment control plan, description of construction sequence, and technical notes. The Smith River Alliance will also develop an engineer's cost estimate for construction. The draft 65% Plans and Basis of Design report will be presented and discussed at the second TAC meeting. Comments will be incorporated into the final 65% Plans and Basis of Design report.

The 65% design will be advanced to the 90% and 100% levels with TAC review and adjustments to the design at each stage. Final 100% sealed plans will be produced for all three crossings.

## Revegetation Plan:

SRA will develop a revegetation plan with input from SWS. The revegetation design will include native woody plant species similar to those observed in the reference site location in addition to other well-adapted native species common to the region. A planting plan schematic will include recommended plant species form (e.g., shrub, tree), planting spacing and depth, and estimated number of plants. The revegetation plan will also include the following: location of the restoration sites, plant species selection and planting stock type, site preparation, procurement of materials, installation methods and schedule, maintenance, and estimated cost.

## Task 7 Permitting

SRA will secure all necessary permits to streamline the planning phase with the County and produce shovel ready designs. SRA will coordinate with SWS, SHN and DCZ to complete all surveys necessary to acquire permits for the implementation phase (CEQA review, County, and coastal grading permits, 1602 LSA Agreement). Surveys will be scheduled to coincide with the development of conceptual designs and results will inform and modify final designs. SRA will consult with regulatory agencies during design development and will finalize permits by the 100% design submittal.



## Special-Status Plant and Sensitive Vegetation Survey:

SWS will query and review the CDFW California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS) List of Rare and Endangered Plants, and United States Fish and Wildlife Service (USFWS) species lists to form a list of special-status plants and vegetation communities that have the potential to be in the project area. SWS will conduct a one-day protocol-level special-status plant survey timed to coincide within with blooming periods of those species with potential to occur in the project (e.g., June-July). The survey will follow Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (California Department of Fish and Game 2009). The methods and results of the special-status plant and vegetation characterization surveys will be combined into a single report. The report will include copies of CNDDB forms and maps of documented special status plant populations, if applicable.

## Wetland Delineation:

SWS will conduct a pre-field desktop review of Natural Resources Conservation Service (NRCS) soils information (e.g., soils map, hydric soils list, report, and official descriptions), historical conditions, USFWS National Wetlands Inventory (NWI) maps and descriptions, and precipitation data to support the waters and wetlands delineation. SWS will conduct a one-day wetland delineation to map wetland boundaries within the project area in accordance with the 1987 U. S. Army Corps of Engineers (USACE) Wetlands Delineation Manual and the current Regional Supplement (Western Mountains, Valleys, and Coast Region). Data will be collected using the current regional supplement USACE data form. Wetland boundaries will be mapped in the field using a sub-meter GPS unit. SWS will prepare a wetland delineation report describing potential USACE- and state jurisdictional wetlands and waters identified in the project area. The report will include existing conditions gathered during the desktop review, detailed maps of delineated waters and/or wetlands in the project, and data forms used during the delineation.

## Cultural Resources:

DZC will provide the necessary cultural resources services to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969, Section 106 of the National Historic Preservation Act (NHPA) of 1966, and the California Environmental Quality Act (CEQA) of 1970 (all as amended), in support of the required environmental compliance and the necessary permit applications for the proposed project. The scope of work strategy will fulfill the requirements of both the CEQA and NEPA level review, in full compliance with Section 106 of the NHPA, and with the California State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation.

DZC will conduct a records search of the project area and a 0.5-mile radius around the Area of Potential Effects (APE) at the Northwest Information Center (NWIC). The records search will reveal the nature and extent of any cultural

resources work previously conducted within the project area. DZC will complete an intensive Phase I pedestrian survey of the Area of Potential Effects (APE). DZC will survey the known APE, plus a small buffer of 100 feet radius to allow for design variability, ingress, egress, and staging. Survey area is expected to remain under 5 acres. The location of all previously recorded sites, and any identified features, isolates, and cultural anomalies will also be recorded using sub-meter accuracy GPS units. No testing or excavation will be conducted, nor will any artifacts, samples, or specimens be collected during the survey. All site recordation will be completed on the relevant Department of Parks and Recreation 523 forms.

DZC will prepare a Cultural Resource Inventory Report (CRIR) for submission to the Lead Agency. The CRIR will conform to State Historic Preservation Office (SHPO) Archaeological Resource Management Report format which includes a project description, a list of field staff and report preparers, the methodology and results of the background review and archaeological survey, a map of potentially affected historic resources, literature cited, and relevant appendices.

## **Deliverables:**

### **Task 1:**

1. Quarterly invoices and progress reports
2. Annual Report
3. Copies of Executed Subcontracts
4. Draft Final Report
5. Final Report
6. Final Invoice

### **Task 2:**

1. Meeting agendas in PDF format
2. Draft and final meeting notes in PDF format

### **Task 3:**

1. Topographic base map, longitudinal profile, and typical cross sections of existing conditions in CAD and PDF formats
2. Geomorphic map (PDF format)
3. Vegetation Assessment
4. Maps and summary tabulation of salmonid distribution, habitat use and migration timing.

### **Task 4:**

1. Table of flood frequency and exceedance probability flows
2. Plots of recorded water levels for instream flow in NAVD88
3. Modeled existing and proposed conditions water surface elevations and channel inundation extents

### **Task 5:**

1. Preliminary design plans in 11x17 format (PDF)
2. Draft Basis of Design Report (PDF format)

**Task 6:**

1. SHN geotechnical report and crossing subgrade preparation designs (to be included in Planset) (PDF format)
2. 65% Planset (11"x17" PDF) and engineer's cost estimate
3. 90% Planset (11"x17" PDF) and engineer's cost estimate
4. Final Basis of Design Report (PDF format)
5. Revegetation Plan
6. Final (100%) signed Planset (11"x17" PDF and hardcopy)

**Task 7:**

1. Special Status Plant Survey Report
2. Copies of CNDDDB forms and maps of documented special status plant populations (if applicable)
3. Wetland Delineation Survey Report (PDF format)
4. Cultural Resources Final Site Report (PDF format)
5. Executed Permits and Permit Reports (LSAA Permits, County and Coastal Grading Permits)
6. Report from CEQA review

**Timelines:**

Task 1: 8/2/2021 to 9/30/2023

Task 2: 8/2/2021 to 2/1/2023

Task 3: 8/2/2021 to 6/1/2022

Task 4: 8/2/2021 to 6/1/2022

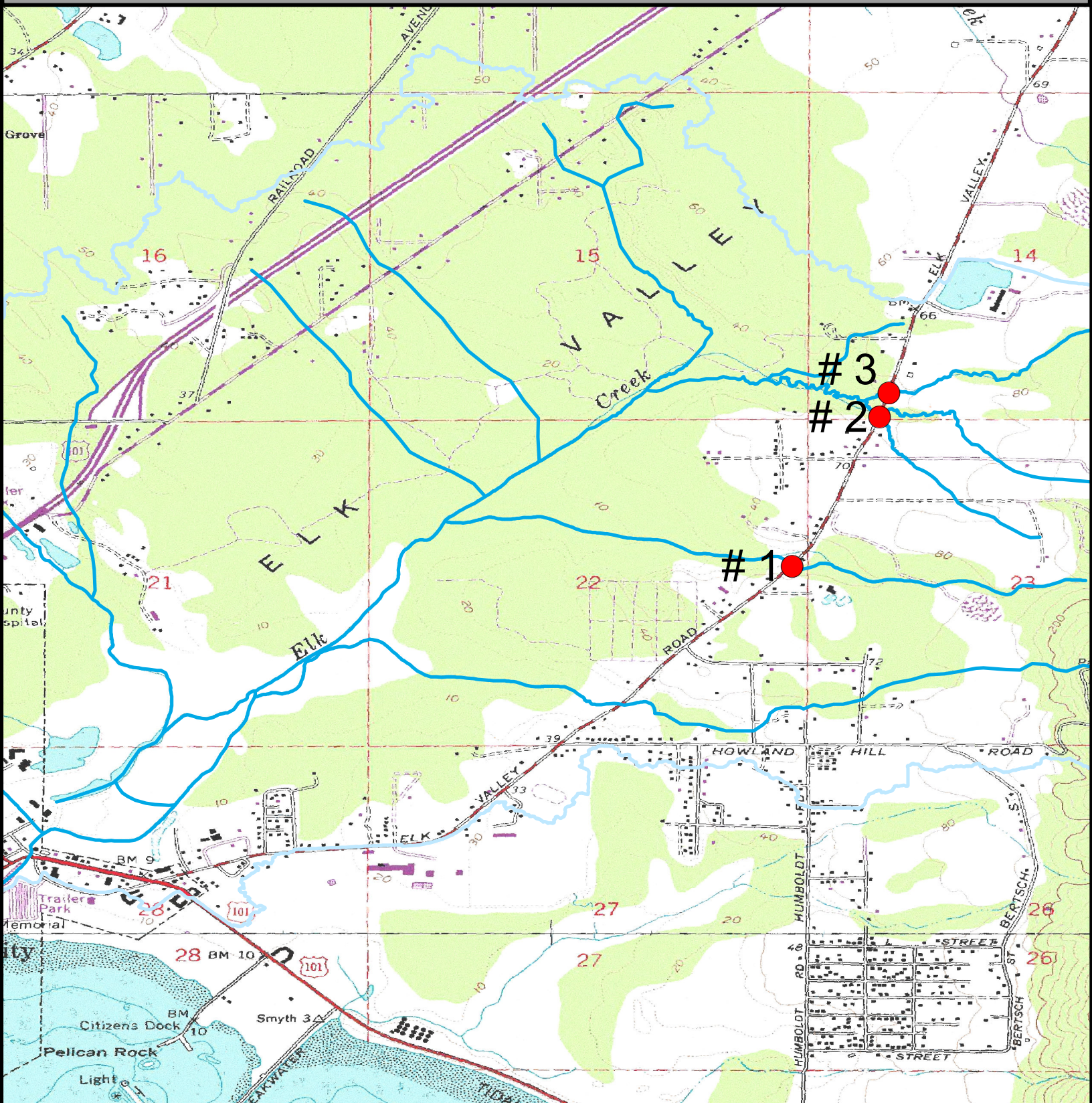
Task 5: 1/3/2022 to 6/1/2022

Task 6: 6/30/2022 to 3/1/2023

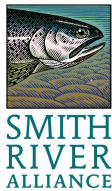
Task 7: 3/1/2022 to 3/1/2023



# ELK VALLEY ROAD FISH PASSAGE IMPROVEMENT PROJECT



## Project Topographic Map



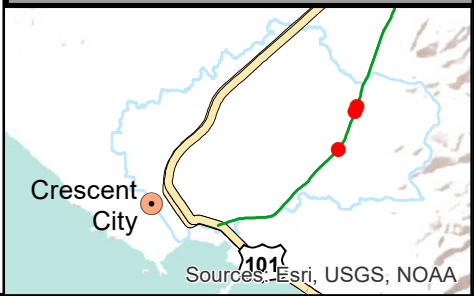
- Crossings
- Elk Streams
- Watershed Boundary



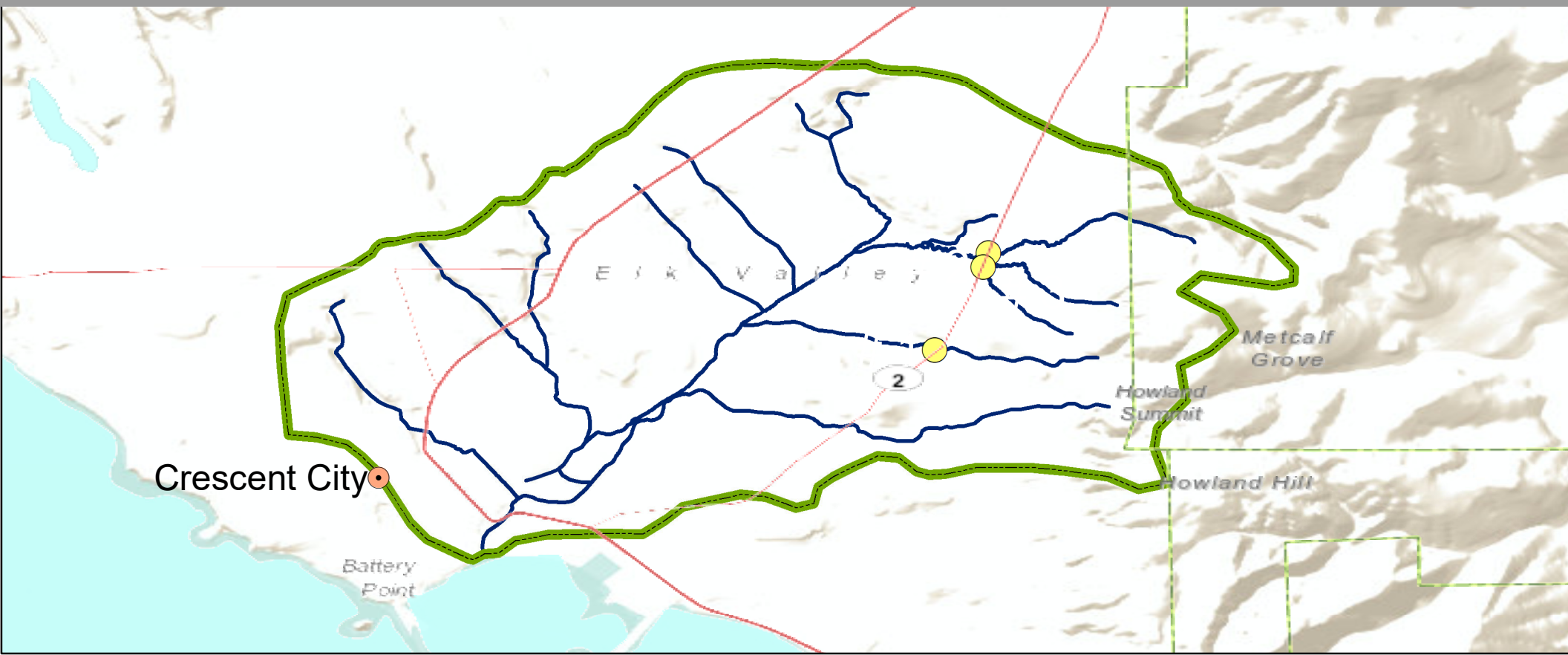
Map Sources:  
Imagery: USGS Quad Map  
Imagry, Roads, Cities  
ESRI World Mapping Service

0 0.2 0.4 0.8 Miles

## Map Location





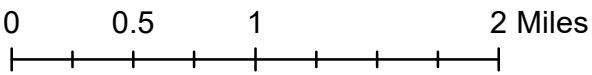


# Watershed Map

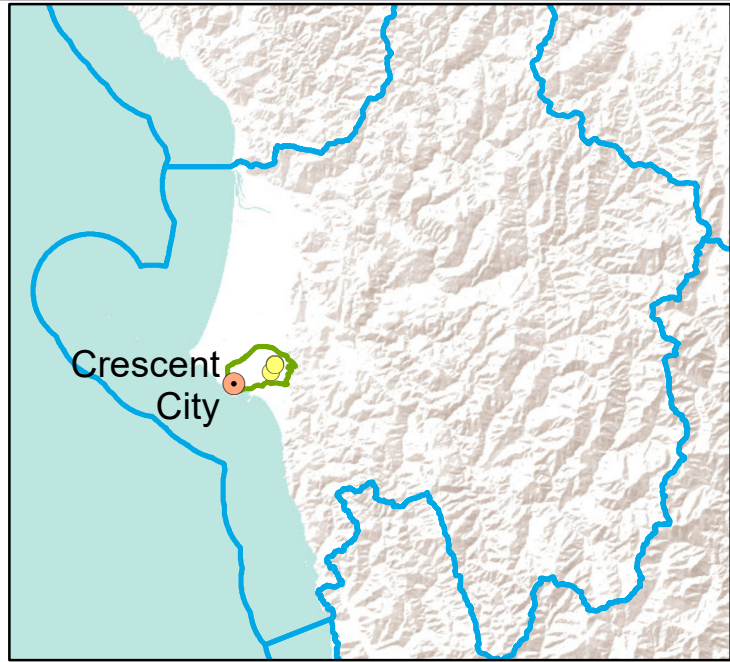


SMITH  
RIVER  
ALLIANCE

-  Crossings
-  Elk Creek Watershed
-  Smith River HUC 8
-  Elk Streams



Service Layer Credits:  
Sources: Esri, USGS,  
NOAA  
Sources: Esri, Garmin,





# Selected Elements by Scientific Name

## California Department of Fish and Wildlife

### California Natural Diversity Database



**Query Criteria:** Quad</span>(Crescent City (4112472)</span> OR </span>(Sister Rocks (4112462)</span> OR </span>(Smith River (4112482)</span> OR </span>(High Divide (4112481)</span> OR </span>(Hiouchi (4112471)</span> OR </span>(Childs Hill (4112461))

Possible species within the Crescent City and surrounding quads for 1723489 - Elk Valley Road Fish Passage Design Project, Del Norte County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b><i>Abronia umbellata</i> var. <i>breviflora</i></b> pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
<b><i>Anthoxanthum nitens</i> ssp. <i>nitens</i></b> vanilla-grass	PMPOA0F041	None	None	G5	S2	2B.3
<b><i>Arabis aculeolata</i></b> Waldo rockcress	PDBRA06010	None	None	G4	S2	2B.2
<b><i>Arabis mcdonaldiana</i></b> McDonald's rockcress	PDBRA06150	Endangered	Endangered	G3	S3	1B.1
<b><i>Arborimus pomo</i></b> Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
<b><i>Ardea alba</i></b> great egret	ABNGA04040	None	None	G5	S4	
<b><i>Ardea herodias</i></b> great blue heron	ABNGA04010	None	None	G5	S4	
<b><i>Ascaphus truei</i></b> Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
<b><i>Asplenium trichomanes</i> ssp. <i>trichomanes</i></b> maidenhair spleenwort	PPASP021K2	None	None	G5T5	S1	2B.1
<b><i>Atractelmis wawona</i></b> Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
<b><i>Boechera koehleri</i></b> Koehler's stipitate rockcress	PDBRA060Z0	None	None	G3G4	S3	1B.3
<b><i>Bombus caliginosus</i></b> obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
<b><i>Bombus occidentalis</i></b> western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
<b><i>Brachyramphus marmoratus</i></b> marbled murrelet	ABNNN06010	Threatened	Endangered	G3G4	S1	
<b><i>Branta hutchinsii leucopareia</i></b> cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T3	S3	WL
<b><i>Bryoria spiralifera</i></b> twisted horsehair lichen	NLTEST5460	None	None	G1G2	S1S2	1B.1
<b><i>Calamagrostis crassiglumis</i></b> Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
<b><i>Calicium adpersum</i></b> spiral-spored gilded-head pin lichen	NLT0005640	None	None	G3G4	S1	2B.2
<b><i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i></b> Butte County morning-glory	PDCON04012	None	None	G5T3	S3	4.2





# Selected Elements by Scientific 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
<b><i>Cardamine angulata</i></b> seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
<b><i>Cardamine nuttallii</i> var. <i>gemmata</i></b> yellow-tubered toothwort	PDBRA0K0R3	None	None	G5T3Q	S2	3.3
<b><i>Carex arcta</i></b> northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
<b><i>Carex lenticularis</i> var. <i>limnophila</i></b> lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
<b><i>Carex lyngbyei</i></b> Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
<b><i>Carex praticola</i></b> northern meadow sedge	PMCYP03B20	None	None	G5	S2	2B.2
<b><i>Carex serpenticola</i></b> serpentine sedge	PMCYP03KM0	None	None	G4	S3	2B.3
<b><i>Carex viridula</i> ssp. <i>viridula</i></b> green yellow sedge	PMCYP03EM5	None	None	G5T5	S2	2B.3
<b><i>Cascadia nuttallii</i></b> Nuttall's saxifrage	PDSAX0U160	None	None	G4?	S1	2B.1
<b><i>Castilleja elata</i></b> Siskiyou paintbrush	PDSCR0D213	None	None	G3	S2S3	2B.2
<b><i>Castilleja litoralis</i></b> Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
<b><i>Cerorhinca monocerata</i></b> rhinoceros auklet	ABNNN11010	None	None	G5	S3	WL
<b><i>Charadrius alexandrinus nivosus</i></b> western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
<b><i>Circus hudsonius</i></b> northern harrier	ABNKC11011	None	None	G5	S3	SSC
<b><i>Coastal and Valley Freshwater Marsh</i></b> Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
<b><i>Coastal Brackish Marsh</i></b> Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
<b><i>Cochlearia groenlandica</i></b> Greenland cochlearia	PDBRA0S020	None	None	G4	S1	2B.3
<b><i>Coenonympha tullia yontockett</i></b> Yontocket satyr	IILEPN6035	None	None	G5T1T2	S1	
<b><i>Coptis laciniata</i></b> Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
<b><i>Coturnicops noveboracensis</i></b> yellow rail	ABNME01010	None	None	G4	S1S2	SSC
<b><i>Cypseloides niger</i></b> black swift	ABNUA01010	None	None	G4	S2	SSC



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<b><i>Downingia willamettensis</i></b> Cascade downingia	PDCAM060E0	None	None	G4	S2	2B.2
<b><i>Egretta thula</i></b> snowy egret	ABNGA06030	None	None	G5	S4	
<b><i>Elanus leucurus</i></b> white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
<b><i>Empetrum nigrum</i></b> black crowberry	PDEMP03020	None	None	G5	S1?	2B.2
<b><i>Empidonax traillii brewsteri</i></b> little willow flycatcher	ABPAE33041	None	Endangered	G5T3T4	S1S2	
<b><i>Emys marmorata</i></b> western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
<b><i>Erethizon dorsatum</i></b> North American porcupine	AMAFJ01010	None	None	G5	S3	
<b><i>Eriogonum nudum var. paralinum</i></b> Del Norte buckwheat	PDPGN08498	None	None	G5T2	S1	2B.2
<b><i>Eriogonum pendulum</i></b> Waldo wild buckwheat	PDPGN084Q0	None	None	G4	S2S3	2B.2
<b><i>Erysimum concinnum</i></b> bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
<b><i>Erythronium hendersonii</i></b> Henderson's fawn lily	PMLIL0U070	None	None	G4	S2	2B.3
<b><i>Erythronium howellii</i></b> Howell's fawn lily	PMLIL0U080	None	None	G3G4	S2	1B.3
<b><i>Erythronium oregonum</i></b> giant fawn lily	PMLIL0U0C0	None	None	G4G5	S2	2B.2
<b><i>Erythronium revolutum</i></b> coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
<b><i>Eucyclogobius newberryi</i></b> tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
<b><i>Eumetopias jubatus</i></b> Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
<b><i>Fissidens pauperculus</i></b> minute pocket moss	NBMUS2W0U0	None	None	G3?	S2	1B.2
<b><i>Fratercula cirrhata</i></b> tufted puffin	ABNNN12010	None	None	G5	S1S2	SSC
<b><i>Gentiana setigera</i></b> Mendocino gentian	PDGEN060S0	None	None	G2	S2	1B.2
<b><i>Gilia capitata ssp. pacifica</i></b> Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
<b><i>Gilia millefoliata</i></b> dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2



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<b><i>Haliaeetus leucocephalus</i></b> bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
<b><i>Hesperovax sparsiflora var. brevifolia</i></b> short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
<b><i>Juga chacei</i></b> Chace juga	IMGASK4180	None	None	G1	S1	
<b><i>Kopsiopsis hookeri</i></b> small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3
<b><i>Lanx alta</i></b> highcap lanx	IMGASL7010	None	None	G2G3	S1S2	
<b><i>Lasionycteris noctivagans</i></b> silver-haired bat	AMACC02010	None	None	G5	S3S4	
<b><i>Lasthenia californica ssp. macrantha</i></b> perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
<b><i>Lathyrus japonicus</i></b> seaside pea	PDFAB250C0	None	None	G5	S2	2B.1
<b><i>Lathyrus palustris</i></b> marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
<b><i>Lewisia oppositifolia</i></b> opposite-leaved lewisia	PDPOR040B0	None	None	G3	S2	2B.2
<b><i>Lilium occidentale</i></b> western lily	PMLIL1A0G0	Endangered	Endangered	G1	S1	1B.1
<b><i>Limnephilus atercus</i></b> Fort Dick limnephilus caddisfly	IITRI15020	None	None	G3G4	S1	
<b><i>Lysimachia europaea</i></b> arctic starflower	PDPRI0A020	None	None	G5	S1	2B.2
<b><i>Margaritifera falcata</i></b> western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
<b><i>Martes caurina humboldtensis</i></b> Humboldt marten	AMAJF01012	Proposed Threatened	Endangered	G5T1	S1	SSC
<b><i>Mitellastra caulescens</i></b> leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
<b><i>Monadenia fidelis pronotis</i></b> rocky coast Pacific sideband	IMGASC7032	None	None	G4G5T1	S1	
<b><i>Moneses uniflora</i></b> woodnymph	PDPYR02010	None	None	G5	S2	2B.2
<b><i>Monotropa uniflora</i></b> ghost-pipe	PDMON03030	None	None	G5	S2	2B.2
<b><i>Myotis evotis</i></b> long-eared myotis	AMACC01070	None	None	G5	S3	
<b><i>Myotis thysanodes</i></b> fringed myotis	AMACC01090	None	None	G4	S3	



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<b><i>Myotis yumanensis</i></b> Yuma myotis	AMACC01020	None	None	G5	S4	
<b><i>Northern Coastal Salt Marsh</i></b> Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
<b><i>Nycticorax nycticorax</i></b> black-crowned night heron	ABNGA11010	None	None	G5	S4	
<b><i>Oceanodroma furcata</i></b> fork-tailed storm-petrel	ABNDC04010	None	None	G5	S1	SSC
<b><i>Oenothera wolffii</i></b> Wolf's evening-primrose	PDONA0C1K0	None	None	G2	S1	1B.1
<b><i>Oncorhynchus clarkii clarkii</i></b> coast cutthroat trout	AFCHA0208A	None	None	G4T4	S3	SSC
<b><i>Oncorhynchus mykiss irideus pop. 36</i></b> summer-run steelhead trout	AFCHA0213B	None	Candidate Endangered	G5T4Q	S2	SSC
<b><i>Packera bolanderi var. bolanderi</i></b> seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
<b><i>Pandion haliaetus</i></b> osprey	ABNKC01010	None	None	G5	S4	WL
<b><i>Pekania pennanti</i></b> fisher - West Coast DPS	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
<b><i>Phacelia argentea</i></b> sand dune phacelia	PDHYD0C070	None	None	G2	S1	1B.1
<b><i>Phalacrocorax auritus</i></b> double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
<b><i>Pinguicula macroceras</i></b> horned butterwort	PDLNT01040	None	None	G4	S2	2B.2
<b><i>Piperia candida</i></b> white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
<b><i>Plethodon elongatus</i></b> Del Norte salamander	AAAAD12050	None	None	G4	S3	WL
<b><i>Polemonium carneum</i></b> Oregon polemonium	PDPLM0E050	None	None	G3G4	S2	2B.2
<b><i>Polites mardon</i></b> mardon skipper	IILEP66030	None	None	G2G3	S1	
<b><i>Potamogeton foliosus ssp. fibrillosus</i></b> fibrous pondweed	PMPOT030B1	None	None	G5T2T4	S1S2	2B.3
<b><i>Pyrrocoma racemosa var. congesta</i></b> Del Norte pyrrocoma	PDASTDT0F4	None	None	G5T4	S2	2B.3
<b><i>Ramalina thrausta</i></b> angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
<b><i>Rana aurora</i></b> northern red-legged frog	AAABH01021	None	None	G4	S3	SSC



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<b><i>Rana boylei</i></b> foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
<b><i>Rhyacotriton variegatus</i></b> southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
<b><i>Riparia riparia</i></b> bank swallow	ABPAU08010	None	Threatened	G5	S2	
<b><i>Romanzoffia tracyi</i></b> Tracy's romanzoffia	PDHYD0E030	None	None	G4	S2	2B.3
<b><i>Sabulina howellii</i></b> Howell's sandwort	PDCAR0G0F0	None	None	G4	S3	1B.3
<b><i>Sagittaria sanfordii</i></b> Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
<b><i>Sanguisorba officinalis</i></b> great burnet	PDROS1L060	None	None	G5?	S2	2B.2
<b><i>Sidalcea malachroides</i></b> maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
<b><i>Sidalcea malviflora ssp. patula</i></b> Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
<b><i>Sidalcea oregana ssp. eximia</i></b> coast checkerbloom	PDMAL110K9	None	None	G5T1	S1	1B.2
<b><i>Silene scouleri ssp. scouleri</i></b> Scouler's catchfly	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
<b><i>Silene serpentinicola</i></b> serpentine catchfly	PDCAR0U2B0	None	None	G3	S3	1B.2
<b><i>Speyeria zerene hippolyta</i></b> Oregon silverspot butterfly	IILEPJ6087	Threatened	None	G5T1	S1	
<b><i>Streptanthus howellii</i></b> Howell's jewelflower	PDBRA2G0N0	None	None	G2G3	S2	1B.2
<b><i>Thaleichthys pacificus</i></b> eulachon	AFCHB04010	Threatened	None	G5	S3	
<b><i>Usnea longissima</i></b> Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
<b><i>Vaccinium scoparium</i></b> little-leaved huckleberry	PDERI180Y0	None	None	G5	S3	2B.2
<b><i>Viola langsdoeffii</i></b> Langsdorf's violet	PDVIO04100	None	None	G4	S1	2B.1
<b><i>Viola palustris</i></b> alpine marsh violet	PDVIO041G0	None	None	G5	S1S2	2B.2
<b><i>Viola primulifolia ssp. occidentalis</i></b> western white bog violet	PDVIO040Y2	None	None	G5T2	S2	1B.2

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