

Introduction:

The California Conservation Corps will add 53 instream features, containing 157 (96 key) pieces of properly sized large wood (LW) throughout 1.07 miles (5,665 feet) of East Branch North Fork (EBNF) Big River to benefit and enhance salmonid habitat and stream function for the persistence and resilience of Coho Salmon and steelhead. According to the 2012 NOAA Fisheries Central California Coast Coho Recovery Plan, the number of existing key pieces in the project reach is considered “poor”, with only 1.5 key pieces per 100 meters. This project will bring the key piece count from a “poor” rating up to a “good” rating for quantity of wood in the project reach, as outlined in the NOAA Fisheries Final Recovery Plan for Central California Coast Coho Salmon Evolutionarily Significant Unit. This project will also address the need for habitat preservation and restoration efforts due to climate change impacts as stated in the 2009 California Climate Adaptation Strategy (California Natural Resources Agency).

The Project is necessary because the lack of large wood in the stream channel has negatively affected the quality and quantity of salmonid habitat within EBNF Big River by reducing the amount of large channel forming features and limiting complex cover for salmonids. Adding complex large wood features improves geomorphic function by capturing spawning gravels, improving winter and summer instream refugia, back flooding off-channel habitat and improving access to floodplains.

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

Objective(s):

The specific objective of this project is to improve the quality and quantity of spawning and rearing habitat for Coho Salmon and Steelhead by installing large wood in EBNF Big River. This project will result in a total of 53 large wood features consisting of 157 pieces of wood over 5,665 feet (1.07 miles) of stream, meeting the “very good” category for large wood and key-piece frequencies, as outlined in federal Coho Salmon recovery plans. The addition of appropriately sized wood to meet target criteria will provide complex cover and velocity refugia, promote sinuosity and increase floodplain connectivity, increase size and frequency of pools, sort gravel, and enhance overall stream function.

Project Description:

Location:

The project is located along a section of East Branch North Fork Big River, located in the county of Mendocino, State of California. The downstream end of the project reach is at Tributary #2 approximately 4,800 feet upstream of the confluence with North Fork Big River. The project reach extends 6,300 feet upstream and ends at tributary #5 as designated by CDFW's Stream Inventory Report. A 635-foot section of stream was excluded from the project reach to provide a buffer for a logging road crossing, making the treatment reach 5,665 feet in length. Mendocino Redwood Company (MRC) has an active logging road (75-EB) which parallels the project reach on the right bank. There is a significant stand of timber between the road and the stream, acting as a buffer for much of the project reach. The center point for the project reach is 39.32616° north latitude and -123.53718° west longitude; Township 17 North, Range 15 West, and Section 20 on the Comptche 7.5 Minute U.S. Geological Survey (USGS) Quadrangle map.

Project Set Up:

- Permittee laborers duties include: Task 5, implementation. Under the direct supervision of the crew supervisor (Conservationist 1), Permittee Corpsmembers will move LW into place utilizing wire rope rigging techniques, grip hoists, and other hand tools. Permittee Corpsmembers will also anchor and/or pin the features according to designs, conduct forest floor rehab, and install small wood as instructed.
- Permittee Fish Habitat Assistant (FHA): Tasks 1-7. The FHA will; submit permit applications, assist with reporting and invoices, track purchases and budgets, provide other administrative support services, and help to coordinate CEQA surveys; work with forester to identify trees, update site designs, assist Licenced Timber Operator (LTO), flag and prepare feature locations for construction, prepare/purchase tools and materials for implementation; ensure adherence to designs by providing technical support to Permittee's crews and crew supervisor at project site during implementation; prepare and conduct training for instream construction; train staff on water quality monitoring methods and techniques, and monitor water quality during implementation; provide logistical support; collect metrics data, create as-built drawings, conduct first winter observations, and collect any other information to meet reporting requirements.
- Permittee Conservationist I (CI) duties include: Task 5. The CI will be the direct crew supervisor and oversee crew operations during implementation.
- Mendocino Redwood Company (MRC) Forester duties include: Task 1c,3a. Approves selected trees to be felled for project sites. The forester also helps to coordinate spike camp and land access logistics.

- MRC Hydrologist duties include: Task 1c. Provides occasional assistance with access, general stream/project area information and informs of any other potential operations in the area.
- All in 1 Tree & Timber (LTO) duties include: Task 5a. Under direction from Permittee's fisheries staff (FHS and/or FHA), the LTO will fell flagged redwood and Douglas-fir trees at feature locations.
- William Rich and Associates duties include: Task 2. Pursuant to the California Environmental Quality Act (CEQA), the Principal Investigator, Research Associate (Archaeology), and Research Associate (Botany) will conduct archeological and botanical surveys/investigations throughout the project reach. Reports will be prepared to document potentially significant impacts on archaeological and botanical resources and describe subsequent avoidance/minimization measures.
- Pacific Watershed Associates duties include: Task 2. Pursuant to the California Environmental Quality Act (CEQA), The geologist and clerical staff will conduct a paleontological investigation of the project reach. A report will be prepared documenting any significant findings and subsequent avoidance/minimization measures.
- MRC Aquatic Biologist duties include: Task 2. This project will follow all guidelines for foothill yellow-legged frog (FYLF) mitigation outlined the 2020 FRGP CEQA Mitigated Negative Declaration, as well as any measures required by the CDFW's Lake and Streambed Alteration Agreement (LSAA) and will perform the initial survey and on-site monitoring tasks required for FYLF mitigation.

Materials:

All materials are to be purchased by permittee unless specified otherwise.

- Approximately 157 pieces of in-kind logs will be used for the 53 in-stream, large wood habitat enhancement features. Root-wads may also be used for in-stream habitat enhancement features.
- One inch diameter by 8-foot length threadbar: Used for anchoring in-stream structures. Threadbar is the structural component of the anchor used to fasten logs to each other and to live trees on the bank. Anchors are used to provide structural integrity, resist buoyancy, and hold structures in place, thereby increasing overall feature effectiveness.
- Steel Hex Nuts: Used for anchoring in-stream structures. Nuts get fastened on ends of Threadbar, over washers, to secure logs together, and/or to live trees on the bank.
- Plates (washers): Used for anchoring in-stream structures. Washers are placed on the ends of the threadbar before the nuts, allowing the nuts to lock into place.
- Wood Auger Bits: Used for drilling holes through logs/root-wads/trees for installation of threadbar during in-stream structure anchoring process.

- Rock Bits: Used for drilling holes for log to rock anchoring. This is a necessary material to complete quality anchoring, resist buoyancy, and increase feature effectiveness, and longevity.
- Epoxy: Used for securing cable to rock for log/rock anchoring. This is a necessary material to complete quality anchoring, secure features, resist buoyancy, and increase feature effectiveness and longevity.
- Decontamination chemicals: Used for decontamination of tools/gear as per contract requirements to prevent the spread of aquatic invasive species and sudden oak death.
- Hand Tools, Supplies, and associated expendable miscellaneous items (chain, bar oil, files, hacksaws, pipe wrenches, shearpins, GFI's, chokers, peaveys, hammers, chisels, etc.) (bulk) These hand tools are essential for setting logs and anchoring operations. The Permittee contributes half the cost of hand tools as cost share.

Tasks & Deliverables:

Task 1. Large Wood Acquisition:

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

Task 2. Implement Instream Habitat Features:

Permittee Corpmembers will install 53 large wood instream features consisting of 157 pieces of large wood within a 5,665-foot section of the East Branch North Fork Big River. Work will consist of the following:

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

Task 3. Install Small Woody Debris (SWD):

Available slash and SWD will be installed into features as applicable to provide immediate cover for salmonids present at time of construction. SWD will also be installed at specific features to capture additional floating debris, increasing the volume of wood in the channel and the associated geomorphic affects. SWD will consist of branches on tops of felled trees ranging from 3- to 11-inch diameter. To prevent erosion and introduction of fine sediment into the stream channel,

exposed dirt resulting from construction of features will be covered/mulched using on-site forest materials

Deliverables: A total of 53 instream features consisting of 157 pieces of large wood will be constructed within a 5,665-foot section East Branch North Fork Big River.

Timelines:

June 15 through October 31 of the years 2022, 2023, 2024, and 2025. Permittee staff will install large wood features together with SWD within the approved project reach. Erosion control measures will be installed as project features are completed

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual projects 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.

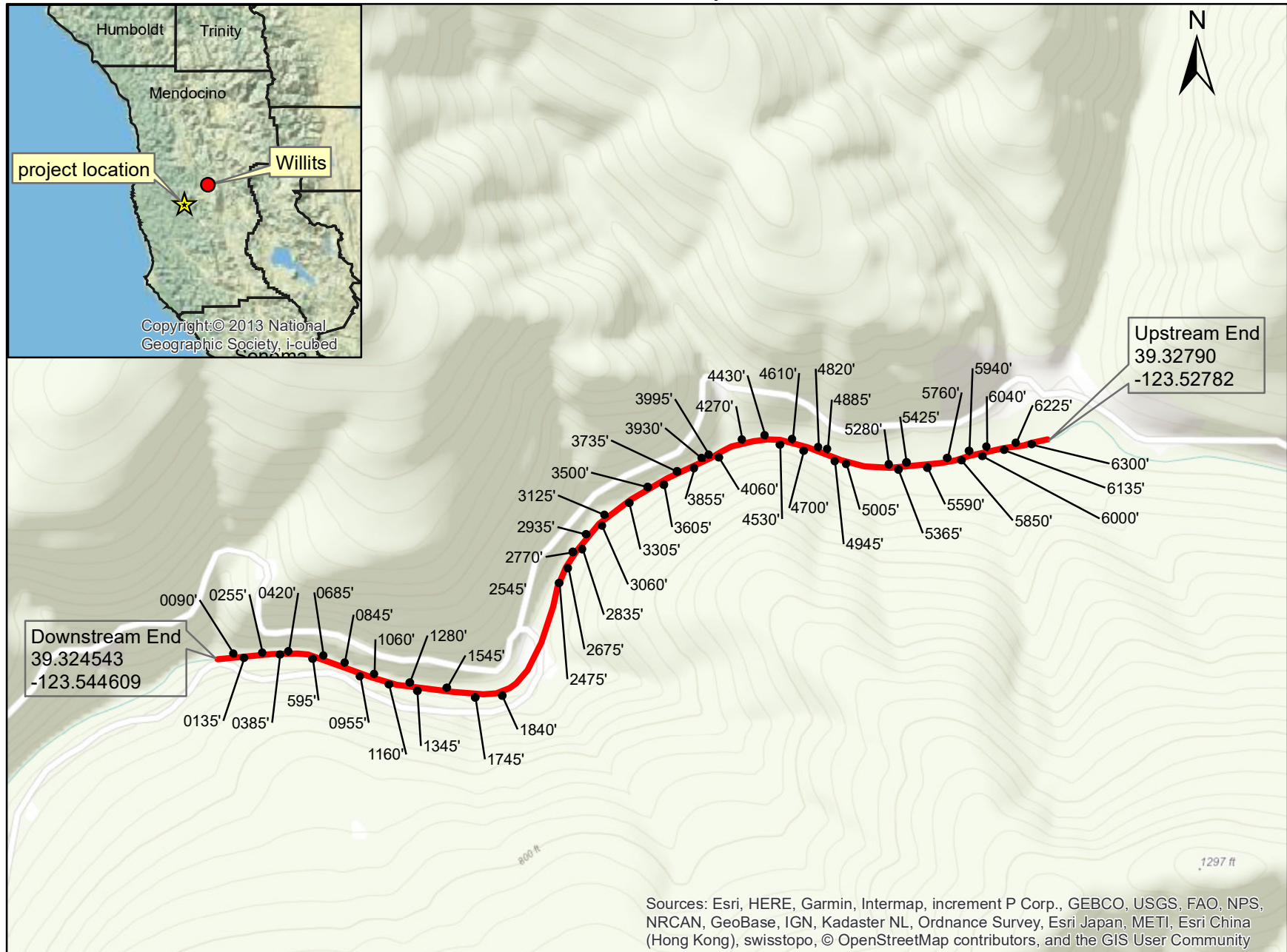
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). When transporting traps out of the area, each numbered trap will be bagged in its own bag to avoid cross contamination during transport in and out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

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

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

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

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

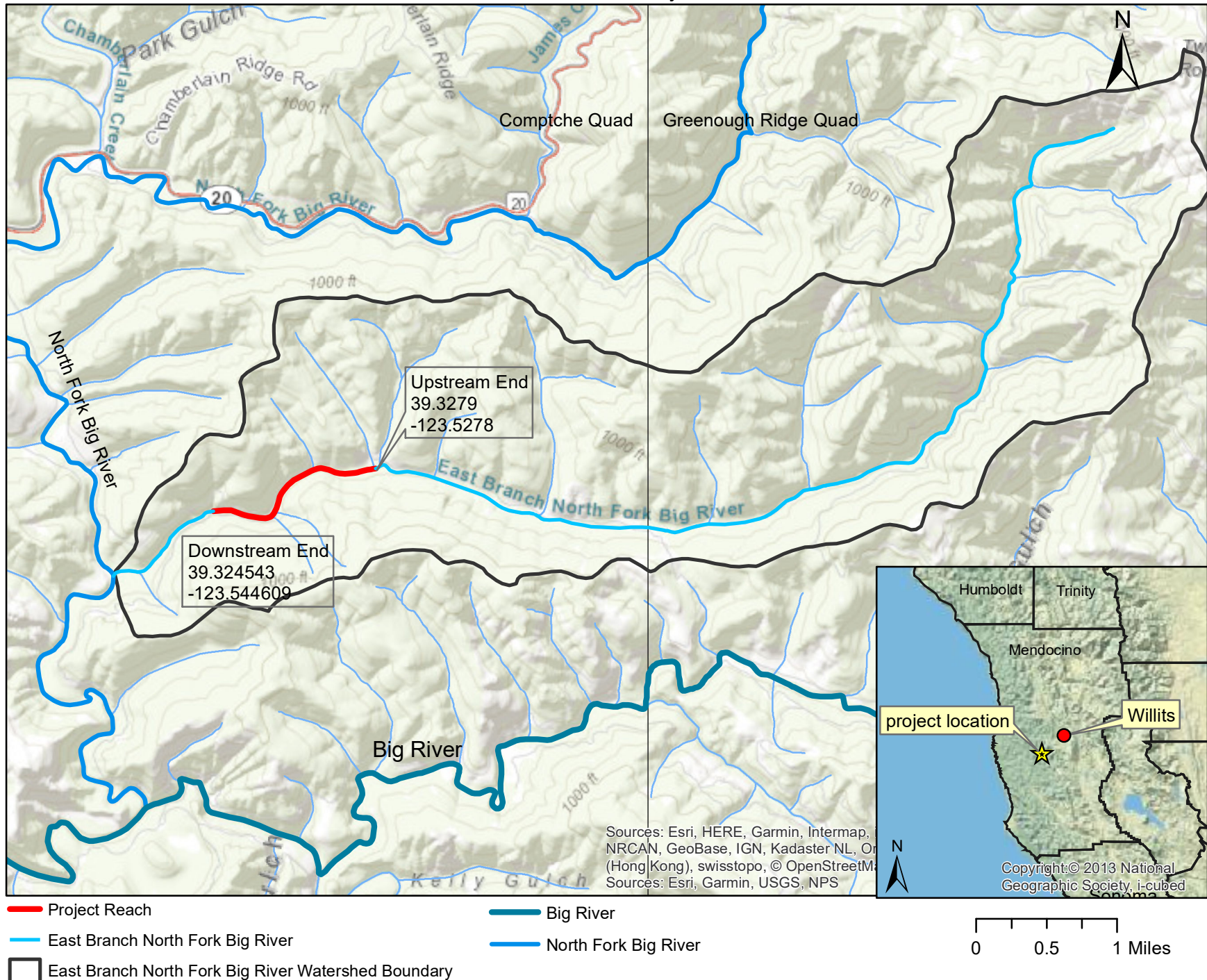


— Project Reach

0 0.25 0.5 Miles

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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





Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



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

Possible species within the Comptche and surrounding quads for 1725509 - East Branch North Fork Big River Coho Habitat Enhancement Project - Large Wood (Phase III), Mendocino County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Accipiter gentilis</i> northern goshawk	ABNKC12060	None	None	G5	S3	SSC
<i>Accipiter striatus</i> sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
<i>Agelaius tricolor</i> tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
<i>Agrostis blasdalei</i> Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
<i>Alisma gramineum</i> grass alisma	PMALI01010	None	None	G5	S3	2B.2
<i>Arboreus pomo</i> Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
<i>Arctostaphylos nummularia ssp. mendocinoensis</i> pygmy manzanita	PDERI04280	None	None	G3?T1	S1	1B.2
<i>Ascaphus truei</i> Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
<i>Astragalus agnicidus</i> Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
<i>Atractelmis wawona</i> Wawona riffle beetle	IICOL58010	None	None	G3	S1S2	
<i>Bombus caliginosus</i> obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
<i>Bombus occidentalis</i> western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
<i>Brasenia schreberi</i> watershield	PDCAB01010	None	None	G5	S3	2B.3
<i>Calileptoneta wapiti</i> Mendocino leptonetid spider	ILARAU6040	None	None	G1	S1	
<i>Campanula californica</i> swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
<i>Carex californica</i> California sedge	PMCYP032D0	None	None	G5	S2	2B.2
<i>Carex lenticularis var. limnophila</i> lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
<i>Carex lyngbyei</i> Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2
<i>Carex saliniformis</i> deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2



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



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<i>Lavinia symmetricus navarroensis</i> Navarro roach	AFCJB19023	None	None	G4T1T2	S2S3	SSC
<i>Lilium maritimum</i> coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
<i>Lycopodium clavatum</i> running-pine	PPLYC01080	None	None	G5	S3	4.1
<i>Mendocino Pygmy Cypress Forest</i> Mendocino Pygmy Cypress Forest	CTT83161CA	None	None	G2	S2.1	
<i>Mitellastra caulescens</i> leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
<i>Northern Coastal Salt Marsh</i> Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
<i>Oncorhynchus kisutch pop. 4</i> coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G5T2T3Q	S2	
<i>Oncorhynchus mykiss irideus pop. 16</i> steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
<i>Packera bolanderi var. bolanderi</i> seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
<i>Pandion haliaetus</i> osprey	ABNKC01010	None	None	G5	S4	WL
<i>Pekania pennanti</i> Fisher	AMAJF01020	None	None	G5	S2S3	SSC
<i>Pinus contorta ssp. bolanderi</i> Bolander's beach pine	PGPIN04081	None	None	G5T2	S2	1B.2
<i>Piperia candida</i> white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
<i>Pleuropogon hooverianus</i> North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
<i>Progne subis</i> purple martin	ABPAU01010	None	None	G5	S3	SSC
<i>Ramalina thrausta</i> angel's hair lichen	NLLEC3S340	None	None	G5?	S2S3	2B.1
<i>Rana aurora</i> northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
<i>Rana boylei</i> foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
<i>Rhyacotriton variegatus</i> southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
<i>Rhynchospora alba</i> white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
<i>Sanguisorba officinalis</i> great burnet	PDROS1L060	None	None	G5?	S2	2B.2



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California Natural Diversity Database



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<i>Sidalcea calycosa ssp. rhizomata</i> Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2	1B.2
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
<i>Sphagnum Bog</i> Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
<i>Taricha rivularis</i> red-bellied newt	AAAAF02020	None	None	G2	S2	SSC
<i>Trifolium buckwestiorum</i> Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
<i>Trifolium trichocalyx</i> Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
<i>Usnea longissima</i> Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2

Record Count: 68