

Decision Memo

West Weaver Creek Salmonid Habitat Rehabilitation Project

*USDA Forest Service
Shasta-Trinity National Forest
Weaverville Ranger District Trinity River Management Unit
T33N, R10W, Section 2 and 11 MDM
Trinity County, California*

Background

In cooperation with the USDA Forest Service, Shasta-Trinity National Forest (USFS) and private landowners, the Trinity County Resource Conservation District (TCRCD) has proposed the West Weaver Creek Salmonid Habitat Rehabilitation Project (Project), which includes channel and floodplain rehabilitation on a degraded reach of West Weaver Creek, near the town of Weaverville, in Trinity County, California. West Weaver Creek is a tributary to Weaver Creek, which in turn is a tributary to the Trinity River that currently supports Southern Oregon and Northern California Coast (SONCC) coho salmon evolutionarily significant unit (ESU) (*Oncorhynchus kisutch*) and steelhead (*Oncorhynchus mykiss*). The goals of the project are to improve fish passage through the project reach, improve instream conditions for spawning and summer/winter rearing for coho salmon and steelhead within the project reach, and promote fine sediment deposition in the overbank areas, thus improving conditions for the establishment of riparian species and reducing downstream sediment input to the Trinity River.

The West Weaver Creek watershed lies just west of the town of Weaverville, in township 33N, range 10W, sections 2 and 11, MDM. The project area includes approximately 2.39 acres of land (see Figure 1, Project Location and Figure 2, Project Site in Appendix C). Lands in the northern portion of the project area are managed by the USFS and comprise approximately 0.74 acre; the remaining 1.65 acres are privately owned. This decision does not authorize actions on lands not administered by the USFS.

USFS lands are managed in accordance with the Shasta-Trinity National Forest Land and Resource Management Plan (LRMP)¹. The project area is located within the Weaverville/Lewiston Management Area (Management Area #7) of the LRMP².

The project area is within an Adaptive Management Area (AMA) Management Prescription. Objectives for AMA lands are to learn how to manage on an ecosystem basis, in terms of both technical and social challenges, and in a manner consistent with applicable laws³.

¹ Shasta-Trinity National Forest, 1999.

² LRMP, pgs. 4-107 to 4-109.

³ LRMP, pgs. 4-69 to 4-71.

The project area is within the Riparian Management land allocation. Management Prescription IX, Riparian Management says “to maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management”⁴. Areas managed under Prescription IX are also termed “Riparian Reserves” and are required to meet Aquatic Conservation Strategy Objectives⁵.

Desired Future Conditions and Exiting Conditions

Desired conditions for the project reach are based on the land management designations within the area. They include the Forest Standard and Guideline to identify and treat riparian areas that are in a degraded condition⁶ and to design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains Aquatic Conservation Strategy and objectives⁷.

The project reach lies within an area that has been severely impacted by historic hydraulic mining and recent wildfires⁸. Currently there is poor salmonid habitat, and the reach supplies fine sediment downstream to the Trinity River (the Trinity River is a Section 303(d) listed river for sediment⁹). The existing stream in the project reach is incised with predominantly exposed bedrock and tall banks of coarse substrate. The altered setting does not have the hillslopes to supply colluvium needed to maintain a natural stream bed. This has led to several elements of impaired fish habitat: reduced fish passage, lack of alluvium needed for spawning and macroinvertebrate production, and a lack of summer rearing habitat. Areas adjacent to the stream lack the conditions, soil and available water, for riparian and upland species to establish.

The proposed actions described in the Decision section below would provide benefits including increased in-channel and floodplain sediment sorting and retention, decreased fine sediment yield into the Trinity River, improved passage to upstream habitat, increased spawning and rearing habitat, increased colonization surfaces for macroinvertebrates, and increased high-flow refugia.

Why I am Making this Decision

The purpose and need for the project is to provide fish passage to intact upstream reaches and improve conditions for spawning and summer/winter rearing for coho salmon and steelhead within the project reach and; promote fine sediment deposition in the overbank areas, thus improving

⁴ LRMP, pg. 4-59.

⁵ LRMP, pg. 4-53.

⁶ LRMP, pg. 4-25.

⁷ LRMP, pg. 4-59.

⁸ The 2001 Oregon Fire and the 2006 Junction Fire.

⁹ Clean Water Act Section 303(d) requires states to identify waters that do not meet, or are not expected to meet by the next listing cycle, applicable water quality standards after the application of certain technology-based controls and schedule such waters for development of Total Maximum Daily Loads (TMDLs) [40 Code of Federal Regulations (CFR) 130.7(c) and (d)].

conditions for the establishment of riparian species and reducing downstream sediment input to the Trinity River.

Decision

Restoration Design

See Appendix C for figures of project design.

Channel Bed Construction

The project will construct alternating segments of riffle pool, step pool, and boulder cascade geomorphic features, totaling approximately 490 linear feet of reconstructed channel bed. The geomorphic features will be designed to provide improved fish passage and provide opportunities for coho salmon and steelhead spawning and rearing within the project reach. Additionally, these enhancements will improve opportunity for macroinvertebrate productivity and improve connectivity to the adjacent bench resulting in increased off-channel rearing habitat and fine sediment retention.

In-Channel Structures

In-channel structures are project components which occur within the active creek channel and are designed to stabilize the channel, develop geomorphic complexity, and/or to provide aquatic species habitat. In-channel structures and activities would include boulder cascades, step-pools and crests, secondary channel streambed and crests, riffle-gravel crests, boulder sills, placement of engineered streambed material, boulder clusters, and large wood structures (riffle pool and secondary). Construction of in-channel structures typically includes the following sequence of actions:

- Dewatering of channel: in order to protect creek resources (i.e., reduce turbidity and nuisance sediment transport) and to protect aquatic organisms, up to approximately 605 linear feet of the stream channel may be dewatered. A qualified fisheries biologist will supervise fish rescue and translocation prior to dewatering, and will be present onsite during dewatering and subsequent fish rescue prior to any in-stream work being completed. No federally- or state-listed salmonid species are expected within West Weaver Creek under current conditions.
- Excavation of subgrade: Layout of excavation depths and horizontal limits by grade setter; excavation of earthen materials by excavator; relocation of excavated material by either a wheeled loader, tracked dump truck, or compact tracked loader; and miscellaneous support by laborers and the foreman.
- Placement of bedding materials: shuttling of bedding with a tracked loader; placement of the materials with a tracked loader or excavator; and grade checking/confirmation.
- Placement of boulders: shuttling of materials with either a wheeled loader or compact tracked loader; placement of boulders by an excavator; and grade checking/confirmation.
- Backfill with native materials: finish grading with an excavator or tracked loader, and miscellaneous clean-up and hand grading by laborers.

Excavation will occur primarily in the areas of the proposed secondary channels. Excavation depths range from 0.2 feet to 4.4 feet. A mix of gravel, cobbles, and boulders (rock materials) will be required for use in secondary channels and in-channel structures. The rock materials would be used for restoration features including: secondary channels, riffle-pools, step-pools, and boulder cascades. Earthwork on the project is

anticipated to balance with respect to cut and fill. Specifically, materials excavated to create the secondary channels and floodplain elements will be placed on site in designated areas. In order to avoid impacts on aquatic species, in-channel construction activities shall be restricted to the dry season, when stream flows have subsided. The dry season is anticipated to occur between June 15th and October 15th.

Spawning Gravel Augmentation

Appropriately sized spawning gravels, in the form of Engineered Streambed Material (ESM), will be added to the riffle-pool segments within the project reach to provide suitable substrate for spawning coho salmon and steelhead. Note that ESM contains a range of sediment sizes including spawning sized gravels. Large wood flow forcing structures will be used in the channel to facilitate pool formation to maintain the riffle pool reach, and provide cover during summer rearing.

Floodplain Connectivity and Riparian Planting

The reconstructed bed will raise water surface elevations and improve connectivity to an existing floodplain. Additionally, two secondary channels and a lower floodplain terrace will be graded to improve off-channel connectivity. The increased floodplain connectivity will provide high flow refugia for coho salmon and steelhead. The secondary channels will provide additional coho and steelhead winter rearing habitat. Large wood habitat structures will be placed at select locations in the secondary channel to provide velocity breaks and cover. Willow baffles will be placed on the lowered floodplain terrace to help reduce flow velocities, retain fine sediment, and promote expansion of the riparian zone. Soils generated by the excavation of the secondary channels and floodplain terrace will be placed on site within a designated area in the project grading footprint.

Post-Construction Erosion Control and Restoration Measures

Following construction activities, erosion control BMPs will be employed to limit on site erosion. All fill placement, access, and staging areas would be treated with sediment control measures after project completion. Erosion control measures may include, but are not limited to, select placement of erosion control fabric on upland slopes or ground areas (outside of the active channel) disturbed by equipment travel, coir logs for trapping of fine sediment on fill slopes, and hand placed or blown mulch over other disturbed ground surfaces.

After construction activities have been completed, portions of the disturbed areas will be revegetated with native riparian vegetation and/or a native seed mix. Planting would occur in late fall or early winter, before the winter storm season, in order to take advantage of seasonal precipitation and maximize survival rates. See Appendix B; West Weaver Creek Salmonid Habitat Rehabilitation Project Revegetation Plan.

Construction Methods

Construction of the West Weaver Creek Salmonid Habitat Rehabilitation Project will employ currently accepted typical construction methods. Prior to grading the side channels and floodplain bench will be cleared and grubbed to a depth of 0.5 feet (6 inches). Woody vegetation removed during clearing and grubbing will be used for wood structures and baffles, and may be shredded/chipped for re-use on site for mulch. Materials (e.g., soils, rocks, gravels, etc.) will be transported on site with a wheeled dump truck, tracked dump truck,

front end loader, and/or tracked skid-steer loader. In-channel work will likely utilize either a small scale excavator, or a wheeled backhoe.

Access and Staging

The primary access route to the project site is on the west side of the creek via a private road that connects to Oregon Street, which intersects with California Highway 299 in the town of Weaverville. The secondary alternative access route is from the intersection of California Highway 299 and McCoy Lane with access to the work area is via an existing dirt access road along the east side of the creek. Limited grading will occur associated with establishment of the access route to remove topographic features (less than one foot tall), and to generally smooth the surface of the staging area. The primary access route requires construction of a temporary creek crossing consisting of two (2) 18-inch diameter culverts and gravels. The existing grade will be demarcated with a material which will facilitate re-construction of original grade following removal of the culverts (e.g., filter fabric or a layer of mulch). Gravels associated with the access route will be removed from the channel following completion of the project. The gravels will be disposed of on-site; likely as non-engineered road surfacing on the landowner's private road. Ramps into and out of the creek will be graded to create drivable slopes for construction equipment. The estimated amount of grading is approximately 0.1 acre. The exact quantity may vary based upon conditions encountered during construction of the access route.

During construction, the contractor will require storage space for equipment and materials in addition to parking spaces for worker vehicles (i.e., "staging areas"). There are two staging areas proposed (see Figure 5). The larger of the two is located on the east bank generally in the middle of the work area. The second, smaller staging area is located adjacent to the creek crossing at the primary access route. Approximately 0.18 acre will be utilized for staging areas. Best management practices (BMPs) will be utilized to address impacts related to use of the access and staging areas.

The access routes and staging areas will not require surfacing with gravel; as noted above, as a result of historic land use practices the ground surface is largely gravels and cobbles (i.e., soils have been washed away). At the completion of the project the staging and access routes will be seeded with a mixture of native grasses and forbs.

Clearing and Grubbing

Vegetation that requires removal to facilitate construction activities will be removed by hand or machine. Trees larger than 12 inches diameter at breast height (DBH) will be stored on site for use. The top six inches of topsoil will be excavated and stockpiled. The topsoil will either be buried or re-applied, as per guidance from the project revegetation specialist. Woody vegetation removed during clearing and grubbing will be used for wood structures and baffles, and may be shredded/chipped for re-use on site for mulch.

General Grading

Grading activities excavate and place earthen materials on the site. The objective of the grading operations is to construct "design grade" elevations as shown in the grading plan. Grading will occur within the cleared and grubbed area.

Restoration Activities

Restoration activities, broadly, are actions taken after earthwork and in-channel structure placement. These activities stabilize post-construction soils, reduce impacts of localized erosive forces, and facilitate differential deposition of sediments. Restoration activities include: revegetation, live pole planting, multi-layer fabric installation, and flow baffles.

Revegetation efforts at the site will be undertaken by the TCRCO. Revegetation will consist of limited planting of live poles, container stock and seeding of select species found within the watershed. This effort will be in support of and in addition to seeding for erosion control and site stabilization. Revegetation will occur in the late fall or early winter to take advantage of seasonal precipitation; the TCRCO will monitor the site and depending on spring rainfall may selectively hand irrigate container stock to facilitate plant establishment.

Post-Construction Erosion Control and Restoration Measures

Following construction activities, erosion control Best Management Practices (BMPs) will be employed to limit on site erosion. All fill placement, access, and staging areas would be treated with sediment control measures after project completion. Erosion control measures may include, but are not limited to, select placement of erosion control fabric on upland slopes or ground areas (outside of the active channel) disturbed by equipment travel, coir logs for trapping of fine sediment on fill slopes, and hand placed or blown mulch over other disturbed ground surfaces.

After construction activities have been completed, portions of the disturbed areas will be revegetated with native riparian vegetation and/or a native seed mix. Planting would occur before the winter storm season in order to maximize survival rates.

Post Project Monitoring

A site specific monitoring plan has been developed collaboratively by the USFS Pacific Southwest Research Station and the TCRCO to monitor changes in physical and biological factors within the Project area. Sensors maybe placed in the creek to help evaluate physical changes in temperature, flow, turbidity, etc. The monitoring will continue for up to 5 years post implementation.

Resource Protection Measures

As part of the Decision, the interdisciplinary team of resource specialists developed site-specific resource protection measures (RPM) and Best Management Practices (BMP) in order to reduce or eliminate potential negative impacts to resource. See Appendix A for a complete description of all RPMs and BMPs.

Rational for a Categorical Exclusion

I have determined that this action fits into a category of actions that are excluded from documentation in an Environmental Assessment or an Environmental Impact Statement. The category is described in the code of Federal Regulations as 36 CFR 220.6(e)(6). Timber stand and/or wildlife habitat

improvement activities that do not include the use of herbicides or do not require more than 1 mile of low standard road construction.

I have reviewed the resource conditions pertaining to extraordinary circumstances (see below) and have determined that no extraordinary circumstances exist that would preclude use of a categorical exclusion in accordance with Council on Environmental Quality regulations at 40 CFR 1508.4. The interdisciplinary effects analysis available in the project record shows that the project, as designed, will have no significant environmental effects. My conclusion is based on a review of the project record that shows a thorough analysis using the best available science. Resource conditions that were considered in determining whether extraordinary circumstances exist related to the proposed action are as follows:

1) Federally listed threatened or endangered species or designated critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species:

Wildlife Species:

(West Weaver Creek Salmonid Habitat Rehabilitation Project Wildlife Biological Assessment; Joshua Boldt and Tom Quinn; June 2017. West Weaver Creek Salmonid Habitat Rehabilitation Project Wildlife Biological Evaluation; Joshua Boldt and Tom Quinn; June 2017)

Threatened, Endangered or Proposed Species

The following Federally listed species were considered for affects from this proposal:

Endangered

- Grey wolf (*Canis lupus*)
- Conservancy fairy shrimp (*Branchinecta conservatio*)

Threatened

- Northern spotted owl (*Strix occidentalis caurina*)
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
- Vernal pool tadpole shrimp (*Lepidurus packardi*)
- Vernal pool fairy shrimp (*Brachyramphus lynchi*)

Proposed

- none

Gray Wolf

This project would have no effect on the gray wolf or its habitat because:

- The project area lies well outside the current range of this species and does not support suitable habitat for this species.

Conservancy Fairy Shrimp

This project would have no effect on the Conservancy Fairy Shrimp or its habitat because:

- The project area lies well outside the expected range of this species and does not support suitable habitat for this species.

Northern Spotted Owl (NSO)

This project would have no effect on the northern spotted owl or its habitat because:

- There is no suitable NSO nesting, roosting or foraging habitat in the project area, and project activities would have no effect on habitat suitability for NSO. Potential functionality as connectivity habitat would not be adversely affected by project activities.
- There is no designated NSO Critical Habitat within the project area, so the project would have no effect on NSO Critical Habitat.

Western Yellow-billed Cuckoo

This project would have no effect on the western yellow-billed cuckoo or its habitat because:

- The project area lies well outside the expected range of this species and does not support suitable habitat for this species.

Vernal Pool Tadpole Shrimp

This project would have no effect on the vernal pool tadpole shrimp or its habitat because:

- The project area lies well outside the expected range of this species and does not support suitable habitat for this species.

Vernal Pool Fairy Shrimp

This project would have no effect on the vernal pool fairy shrimp or its habitat because:

- The project area lies well outside the expected range of this species and does not support suitable habitat for this species.

Forest Sensitive Species

Mammals

fisher (*Pekania pennanti*)
Pacific marten (*Martes americana*)
North American wolverine (*Gulo gulo luteus*)
pallid bat (*Antrozous pallidus*)
Townsend's big-eared bat (*Corynorhinus townsendii*)
fringed myotis bat (*Myotis thysanodes*)

Birds

bald eagle (*Haliaeetus leucocephalus*)
northern goshawk (*Accipiter gentilis*)
willow flycatcher (*Empidonax traillii*)
yellow rail (*Coturnicops noveboracensis*)

Reptiles

western pond turtle (*Emys marmorata*)

Amphibians

northern red-legged frog (*Rana aurora aurora*)
foothill yellow-legged frog (*Rana boylei*)
Cascade frog (*Rana cascadae*)
southern torrent salamander (*Rhyacotriton variegatus*)
Shasta salamander (*Hydromantes shastae*)

Invertebrates

western bumble bee (*Bombus occidentalis*)
California floater (*Anodonta californiensis*)
black juga (*Juga nigrina*)
kneecap lanx (*Lanx patelloides*)
scalloped juga (*Juga [Calibasis] occata*)
montane peaclam (*Pisidium [Cyclocalyx] ultramontanum*)
Shasta sideband snail (*Monadenia troglodytes troglodytes*)

Wintu sideband snail (*Monadenia troglodytes wintu*)

Shasta chaparral snail (*Trilobopsis roperi*)

Tehama chaparral snail (*Trilobopsis tehamana*)

Pressley hesperian snail (*Vespericola pressleyi*)

Shasta hesperian snail (*Vespericola Shasta*)

nugget pebble snail (*Fluminicola seminalis*)

The proposed action will have no effect on North American wolverine, fisher, Pacific marten, or northern goshawk, yellow rail, willow flycatcher, bald eagle, or Shasta salamander, northern red-legged frog, Cascade frog, southern torrent salamander, or California floater, black juga, kneecap lanx, scalloped juga, montane peaclam, Shasta sideband snail, Wintu sideband snail, Shasta chaparral snail, Tehama chaparral snail, Pressley hesperian snail, Shasta hesperian snail, or nugget pebble snail because:

- There is not suitable habitat within the project area, and/or;
- The project area is outside of the known range of the species

This project may impact individuals of pallid bat, Townsend's big-eared bat, fringed myotis, western pond turtle, foothill yellow-legged frog, and western bumblebee but would not likely lead to a trend toward federal listing or affect the viability of the species for the reasons discussed below:

- There are no recorded observations of pallid bat, Townsend's big-eared bat, fringed myotis, western pond turtle, or foothill yellow-legged frog in or near the project area, but habitat in the project area may potentially be suitable for these species.
- Direct impacts to western bumblebee could include removal of suitable foraging habitat through vegetation clearing, and disturbance of colonies in ground cavities through excavation and grading activities. However, this impact is expected to be minor due to the abundance of existing suitable habitat for this species in the project vicinity and region. Although some individual western bumble bees may be temporarily displaced due to implementation of the project, overall disturbance to western bumble bee is expected to be minor.
- Project activities are not expected to cause any decrease in habitat suitability for pallid bat, Townsend's big-eared bat, or fringed myotis. Caves, cliffs and rock crevices would not be affected, only very small trees would be removed, and snags would be retained. Any increase in noise disturbance above the ambient noise level would be very minor and short in duration.
- Resource protection measures (including pre-construction surveys for foothill yellow-legged frog and western pond turtle), and specific measures for instream construction, would reduce potential effects to foothill yellow-legged frog and western pond turtle. See Appendix B for a complete list of all Resource Protection Measures.

Aquatic Species:

(Fisheries Specialist Report Biological Assessment/Biological Evaluation and Essential Fish Habitat Report for the West Weaver Creek Salmonid Habitat Rehabilitation Project; Andy Hatch and Phil Fishella; June 2017)

Threatened, Endangered or Proposed Species

The following Federally listed species were considered for affects from this proposal:

Endangered

- Sacramento River winter-run Chinook salmon ESU (*Oncorhynchus tshawytscha*)

Threatened

- Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*)
- Central Valley steelhead DPS (*Oncorhynchus mykiss*)
- Northern California steelhead DPS (*Oncorhynchus mykiss*)
- California Coastal Chinook salmon ESU (*Oncorhynchus tshawytscha*)
- Central Valley spring-run Chinook salmon ESU (*Oncorhynchus tshawytscha*)

Proposed Species

- none

Sacramento River winter-run Chinook salmon ESU

This project would have no effect on the Sacramento River winter-run Chinook salmon or its habitat because:

- The action area lies well outside the expected range of this species and does not support suitable habitat for this species.

Central Valley steelhead DPS

This project would have no effect on the Central Valley steelhead or its habitat because:

- The action area lies well outside the expected range of this species and does not support suitable habitat for this species.

Northern California steelhead DPS

This project would have no effect on the Northern California steelhead or its habitat because:

- The action area lies outside the expected range of this species and does not support suitable habitat for this species.

California Coastal Chinook salmon ESU

This project would have no effect on the California Coastal Chinook salmon or its habitat because:

- California Coastal Chinook salmon are not expected to occur in West Weaver Creek due to limiting habitat conditions and life history requirements for the species.
- California Coastal Chinook salmon have not been observed in the project reach during monitoring conducted by the USFS from 2012 to 2106. So while West and East Weaver Creek could potentially be accessed by California Coastal Chinook salmon, it is unlikely that they occur in the action area.

Central Valley spring-run Chinook salmon ESU

This project would have no effect on the Central Valley spring-run Chinook salmon or its habitat because:

- The action area lies well outside the expected range of this species and does not support suitable habitat for this species.

Southern Oregon/Northern California Coast (SONCC) coho salmon

The proposed actions may affect, but are not likely to adversely affect, SONCC coho salmon ESU. Based upon the analysis of baseline habitat conditions, the effects of the proposed action on SONCC coho salmon ESU would be limited to potential downstream effects. It is unlikely coho salmon currently use the project reach due to low-quality habitat conditions from erosion and wildfire activity. Furthermore, coho salmon have not been observed in the project reach during monitoring conducted by the USFS from 2012 to 2016, and the species is not expected to occur within the project reach under current conditions.

The long-term effects of the proposed action would be beneficial for SONCC coho salmon ESU in the action area by providing additional suitable habitat within West Weaver Creek and preventing damage from sedimentation to currently suitable habitat downstream that may be influenced by current degraded conditions within the project reach. Furthermore, indirect construction effects (e.g., releases and exposure of sediments, construction-related contaminants) would be avoided and/or minimized with implementation of the resource protection measures described in Appendix A.

Consultation to Date

On December 19, 2016, the USFS requested that the U.S. Army Corps of Engineers (USACE) be designated as the lead federal agency for completing Section 7 consultation under the Endangered Species Act (ESA) for the project. The USACE agreed to take responsibility as lead federal agency for conducting ESA consultation (see project record). Coordination between the USACE and the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS) Arcata office, determined that the project may be eligible for Section 7 coverage under an existing USACE/NMFS Programmatic Biological Opinion (PBO) for salmonid habitat restoration projects. Following project applications to the USACE and NMFS/NOAA, and with the incorporation of certain construction-related avoidance and minimization measures, the project was deemed authorized pursuant to Section 7 of the ESA under the USACE/NMFS PBO (see project record).

Forest Sensitive Species

- Pacific lamprey (*Entosphenos tridentatus*)
- Klamath Mountains Province (KMP) winter steelhead trout (*Onchorhynchus mykiss*)
- Upper Klamath-Trinity (UKT) Rivers Chinook salmon (*Oncorhynchus tshawytscha*)

The project will have no effect on Upper Klamath-Trinity (UKT) Rivers Chinook salmon because:

- The action area is outside of the known range of the species.
- The species has not been observed using West Weaver Creek.

The project may affect, but would not cause a trend toward listing for the Pacific lamprey and the Klamath Mountains Province (KMP) winter steelhead trout because:

- Resource protection measures will be implemented, including a diversion, dewatering, and fish rescue plan, to reduce the likelihood of direct effects or loss of individual fish during the dewatering process
- Due to the timing of the in-water work, no adult KMP winter steelhead trout are anticipated to be present during construction and no redds, eggs, or ammocoetes are likely to be present in the project reach during the work window due to lack of suitable spawning or larval habitat within the project reach.

- Construction timing is outside of the primary migratory time periods for fish moving both upstream and downstream so the likelihood of KMP winter steelhead trout and Pacific lamprey presence within the project reach is reduced.
- The long-term effects of the proposed action would be beneficial to salmonids and other fish species by improving fish passage and habitat quality including potential spawning habitat within the project reach, and improving habitat quality downstream of the project reach by decreasing sedimentation in the lower reaches of West and East Weaver Creeks due to the habitat degradation that currently exists in the project reach.

Botanical Species:

(West Weaver Creek Salmonid Habitat Rehabilitation Project Biological Assessment of Endangered, Threatened, and Proposed Plants Biological Evaluation of Potential Impacts on Sensitive Plants, Lichens, & Fungi; Joshua Boldt and Lusetta Sims; June 2017)

Threatened, Endangered or Proposed Species

There are no known threatened or endangered plant species within the project area.

Sensitive Species

- Brownie lady's slipper (*Cypripedium fasciculatum*)
- Mountain lady's slipper (*Cypripedium montanum*)
- Tracy's woolly-stars (*Eriastrum tracyi*)
- Canyon Creek stonecrop (*Sedum paradisum*)

The project will have no effect on Brownie lady's-slipper, Mountain lady's-slipper, Tracy's woolly-stars, or Canyon Creek stonecrop because:

- There were no known site records of sensitive botanical species previous to project level surveys.
- A focused botanical survey was conducted on June 2, 2015. While there is potential suitable (though lower quality) habitat in the project area, no Forest sensitive or other sensitive botanical species were found.

2) Flood plains, wetlands, or municipal watersheds:

(Hydrology Resource Report West Weaver Creek Salmonid Habitat Rehabilitation Project; Joshua Boldt and David Schmerge; June 2017)

Floodplains:

A floodplain exists in the project area adjacent to West Weaver Creek, in particular along the east (left) bank. The floodplain currently supports limited riparian habitat along its lower elevations, as well as disturbed hardwood-conifer woodland on its higher elevations. The floodplain is currently degraded due to the recent fire history and other disturbance as well as historical hydraulic mining.

The project is designed to promote fine sediment deposition in overbank areas and to retain sediment on the floodplain terrace, thus improving conditions for the establishment of riparian species and reducing downstream sediment input to the Trinity River. Project activities will raise water surface elevations and improve connectivity to the existing floodplain. The increased floodplain connectivity

will provide high flow refugia for coho salmon and steelhead. With the required BMPs and RPMs the potential effects on the resource condition will be negligible.

Wetlands:

A formal aquatic resources delineation was conducted for the project site in November 2014. No wetlands were identified.

Municipal Watershed:

Municipal watersheds are defined in FSM 2524.05 as "A watershed that serves a public water system as defined in the Safe Drinking Water Act of 1974, as amended (42 U.S.C. 300f et seq.): or as defined in the state safe drinking water statutes or regulations". Waters in the Weaver Creek Hydrologic Subarea support numerous beneficial uses including municipal and domestic supply. With proper adherence to the resource protection measures, proposed actions will improve water quality and aquatic/riparian habitats and will not result in adverse effects to water resources in the West Weaver Creek Watershed.

3) Congressionally designated areas, such as wilderness, wilderness study areas, or National Recreation Areas:

There are no congressionally designated areas, wilderness, wilderness study areas or National Recreation Areas within the project area or nearby that would be affected.

4) Inventoried roadless areas:

There are no inventoried roadless areas within the project area or nearby that would be affected.

5) Research Natural Areas:

There are no research natural areas within the project area or nearby that would be affected.

6) American Indian religious or cultural sites; and

7) Archaeological sites, or historic properties or areas:

(Cultural Resource Report West Weaver Creek Salmonid Habitat Rehabilitation Project; Heidi Koenig and Matthew Padilla; June 2017)

Based on the results of the records search, background research, and project surface survey conducted in November 2014, there are no historic properties in the area of potential effect¹⁰ (APE). No traditional cultural properties were identified within the area. There is a low potential to uncover significant buried archaeological resources during ground disturbing activities. Despite the low potential, the discovery of buried archaeological resources during project construction cannot be

¹⁰ The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist (36 CFR 800.16[b]).

entirely discounted. Therefore, resource protection measures (see Appendix A) are incorporated into the proposed actions that would reduce the impacts to any archaeological or cultural resources found during project activities.

Public Involvement

This action was originally listed as a proposal on the Shasta-Trinity National Forest Schedule of Proposed Actions and updated periodically during the analysis. Scoping to interested and affected parties during March of 2017 provided the public an opportunity to submit written comments regarding the proposed action. No comments were received.

Findings Required by Other Laws

This decision is consistent with the Shasta-Trinity National Forest LRMP as required by the 1982 regulations of the National Forest Management Act. The project was designed in conformance with LRMP goals for management direction for Riparian Reserves.

National Forest Management Act

My decision is consistent with the Forest Plan as required by the National Forest Management Act (NFMA). The project was designed in conformance with Forest Plan standards and incorporates the appropriate Forest Plan guidelines. The NFMA requires projects to be consistent with minimum specific management requirements as provided in the implementing regulations at 36 CFR 219.12 and described in the Forest Service Manual 1921.12a. I find the proposed action to be consistent with the provisions of the NFMA.

Executive Order 13112, Invasive Species

The project is consistent with EO 13112. See West Weaver Creek Salmonid Habitat Rehabilitation Project Revegetation Plan (Appendix B) for more information on invasive plant species and control.

Clean Water Act and State Water Quality Laws

The project complies with the Clean Water Act and State water quality laws including Best Management Practices and requirements for domestic water supply and state-defined municipal watersheds. The resource protection measures are designed to minimize the effects of the project on water and soil.

Other Laws and Requirements

The Endangered Species Act, National Historic Preservation Act, EO 11988 Floodplain Management, and EO 11990 Protection of Wetlands are summarized in the 'Rationale for a Categorical Exclusion' section above and discussed in more detail in the respected resource reports found in the project record.

Required Permits

The following permits, reviews, consultations, and approvals (see Table 1, below) would be required to be issued prior to the commencement of project construction.

**TABLE 1
PERMITS AND APPROVALS NEEDED**

Agency	Permit/Approval	Status
Federal		
National Marine Fisheries Service (NMFS)	Federal Endangered Species Act, Section 7 Consultation for Threatened and Endangered Species Biological Opinion	Project covered under Programmatic Biological Opinion with USACE.
United States Army Corps of Engineers (USACE)	Clean Water Act, Section 404 NWP 27 Permit for discharge of dredged or fill material in waters of the United States	Permit issued June 15, 2017.
State		
California Department of Fish and Wildlife (CDFW)	California Fish and Game Code Section 1600-1602 Streambed Alteration Agreement	Applied. Anticipated issuance of permit July 2017.
North Coast Regional Water Quality Control Board (NCRWQCB)	Clean Water Act, Section 401 Water Quality Certification	Certification issued May 15, 2017.
California State Water Resources Control Board (SWRCB)	<ul style="list-style-type: none"> • General Order for Dewatering and other Low Threat Discharge to Surface Waters Permit • National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit • General Waste Discharge Requirements for Dredge and Fill Discharges 	Not yet applied. Anticipated application date of June 2017.

Implementation

Implementation will begin in July 2017.

Administrative Review (Objection) Opportunities


This decision is not subject to administrative review (objection) pursuant to 36 CFR 218.1.

Contact

For additional information contact: Stephanie Riess (Environmental Coordinator), Trinity River Management Unit, 360 Main Street, Weaverville, CA. 530-623-1755.

Electronic copies of the Decision Memo and other information are available at:

<https://www.fs.usda.gov/project/?project=50935>.


Trinity River Management Unit,
Acting District Ranger, Jason McInteer


Date

Non-Discrimination Policy

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Persons with disabilities who wish to file a program complaint, please see information above on how to contact us by mail directly or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotope, etc.) please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

Appendix A

Resource Protection Measures

General Protection Measures

NOAA PBO

- Work shall not begin until (a) the Corps and/or NOAA RC has notified the applicant to the Program that the requirements of the Endangered Species Act (ESA) have been satisfied and that the activity is authorized and (b) all other necessary permits and authorizations are finalized.
- The general construction season shall be from June 15 to November 1. Restoration, construction, fish relocation, and dewatering within any wetted or flowing stream channel shall only occur within this period. Revegetation outside of the active channel may continue beyond November 1, if necessary.
- Prior to construction, any contractor shall be provided with the specific protective measures to be followed during implementation of the project. In addition, a qualified biologist shall provide the construction crew with information on the listed species and State Fully Protected Species in the project area, the protection afforded the species by the ESA, and guidance on those specific protection measures that must be implemented as part of the project.
- All activities that are likely to result in negative aquatic effects, including temporary effects, shall proceed through a sequencing of effect reduction: avoidance, reduction in magnitude of effect, and compensation (mitigation). Mitigation may be proposed to compensate for negative effects to waters of the United States. Mitigation shall generally be in kind, with no net loss of waters of the United States on a per project basis.
- Mitigation work shall proceed in advance or concurrently with project construction.
- Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter a live stream. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturers specifications.
- If the thalweg of the stream has been altered due to construction activities, efforts shall be undertaken to reestablish it to its original configuration.

North Coast Regional Water Quality Control Board 401 WQC

- The Regional Water Board shall be notified at least five working days (working days are Monday – Friday) prior to the commencement of construction.

Measures to Minimize Degradation of Water Quality

NOAA PBO

General erosion control during construction:

- When appropriate, isolate the construction area from flowing water until project materials are installed and erosion protection is in place.
- Effective erosion control measures shall be in place at all times during construction. Do not start construction until all temporary control devices (e.g., straw bales with sterile, weed free straw, silt fences) are in place down slope or downstream of project site within the riparian area. The devices shall be properly installed at all locations where the likelihood of sediment input exists. These devices shall be in place during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and detaining sediment-laden water on site. If continued erosion is likely to occur after construction is complete, then appropriate erosion prevention measures shall be implemented and maintained until erosion has subsided. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles (especially snakes) and amphibians.
- Sediment shall be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be sterile and weed free, staked and dug into the ground 12 cm. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.
- Sediment-laden water created by construction activity shall be filtered before it leaves the settling pond or enters the stream network or an aquatic resource area.
- The contractor/applicant to the Program is required to inspect, maintain or repair all erosion control devices prior to and after any storm event, at 24 hour intervals during extended storm events, and a minimum of every two weeks until all erosion control measures have been completed.

Guidelines for temporary stockpiling:

- Minimize temporary stockpiling of material. Stockpile excavated material in areas where it cannot enter the stream channel. Prior to start of construction, determine if such sites are available at or near the project location. If nearby sites are unavailable, determine a location where material will be deposited. Establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams supporting, or historically supporting populations of listed salmonids. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation. Use devices such as plastic sheeting held down with rocks or sandbags over stockpiles, silt fences, or berms of hay bales, to minimize movement of exposed or stockpiled soil.
- If feasible, conserve topsoil for reuse at project location or use in other areas. End haul spoils away from watercourses as soon as possible to minimize potential sediment delivery.

Minimizing potential for scour:

- When needed, utilize instream grade control structures to control channel scour, sediment routing, and headwall cutting.
- For relief culverts or structures, if a structure that empties into a stream is installed, an energy dissipater shall be installed to reduce bed and bank scour. This does not apply to culverts in fish bearing streams.
- The toe of rock slope protection used for streambank stabilization shall be placed below the bed scour depth to ensure stability.

Post-construction erosion control

- Immediately after project completion and before close of seasonal work window, stabilize all exposed soil with erosion control measures such as mulch, seeding, and/or placement of erosion control blankets. Remove all artificial erosion control devices after the project area has fully stabilized. All exposed soil present in and around the project site shall be stabilized after construction. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles (especially snakes) and amphibians.
- All bare and/or disturbed slopes (more than 100 square feet of bare mineral soil) will be treated with erosion control measures such as hay bales, netting, fiber rolls, and hydroseed as permanent erosion control measures.
- Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage shall be 95 percent with a minimum depth of two inches.
- When seeding is used as an erosion control measure, only seeds from native plant species will be used. Sterile (without seeds), weed-free straw, free of exotic weeds, is required when hay or hay bales are used as erosion control measures.

North Coast Regional Water Quality Control Board 401 WQC

- Only wildlife-friendly, 100 percent biodegradable erosion and sediment control products that will not entrap or harm wildlife shall be used. Erosion and sediment control products shall not contain synthetic (e.g., plastic or nylon) netting. Photodegradable synthetic products are not considered biodegradable. The applicant shall request approval from the Regional Water Board if an exception from this requirement is needed for a specific location.
- BMPs shall be implemented as proposed in the application materials. BMPs for erosion, sediment and turbidity control shall be implemented and in place at commencement of, during and after any ground clearing activities or any other project activities that could result in erosion or sediment discharges to surface water. Severe and unseasonal rain events are becoming more frequent due to the effects of climate change. Therefore, BMPs shall be immediately available for deployment at all times to prevent discharges to waters of the state.

- No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete washings, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature, other than that authorized by this certification, shall be allowed to enter into or be placed where it may be washed by rainfall into waters of the state. When operations are completed, any excess material or debris shall be removed from the work area.
- If, at any time, an unauthorized discharge to surface water (including wetlands, lakes, rivers or streams) occurs, or any water quality problem arises, the associated project activities shall cease immediately until adequate BMPs are implemented including stopping work. The Regional Water Board shall be notified promptly and in no case more than 24 hours after the unauthorized discharge or water quality problem arises.
- Fueling, lubrication, maintenance, storage, and staging of vehicles and equipment shall not result in a discharge or threatened discharge to any waters of the state including dry portions of the shoreline. At no time shall the applicant or its contractors allow use of any vehicle or equipment, which leaks any substance that may impact water quality.

USFS NEPA Resource Protection Measures

Prepare and Implement a SWPPP

Subject to requirements of Section 402 of the federal Clean Water Act, and the National Pollutant Discharge Elimination System (NPDES) permitting process, all construction projects that disturb more than one acre of land are required to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP is incorporated into all project plans and specifications. The restoration construction contractor(s) will be required to post a copy of the SWPPP at the project location, file a notice of intent to discharge stormwater with the NCRWQCB, and implement all measures required by the SWPPP. A component of the SWPPP is a dewatering plan for in-channel activities. A Qualified SWPPP Practitioner (QSP) will be responsible for construction monitoring to ensure that the provisions of the SWPPP are effectively enforced. In the event of noncompliance, the QSP will have the authority to shut down the construction site or fine the responsible party or parties.

The SWPPP will include the following information and Best Management Practices (BMPs).

A description of site characteristics, including runoff and drainage characteristics and soil erosion hazard.

A description of proposed construction procedures and construction-site housekeeping BMPs, including prohibitions on discharging or washing potentially harmful materials into roads, drainages, or the creek.

A description of BMPs that will be implemented for erosion and sediment control, including requirements to:

- Conduct major construction activities involving excavation and spoils haulage during the dry season, to the extent possible.
- Conduct all construction work in accordance with site-specific construction plans that minimize the potential for increased sediment inputs to \ surface waters.

- Grade and stabilize spoils sites to minimize erosion and sediment input to surface waters and generation of airborne particulate matter.
- Implement erosion control measures as appropriate to prevent sediment from entering surface waters to the extent feasible, including the use of silt fencing or fiber rolls to trap sediments.

A Spill Prevention and Response Plan that identifies any hazardous materials to be used during construction; describes measures to prevent, control, and minimize spillage of hazardous substances; describes transport, storage and disposal procedures for these substances; and outlines procedures to be followed in case of a spill of a hazardous material. The Spill Prevention and Response Plan will require that hazardous and potentially hazardous substances stored onsite be kept in securely closed containers located away from drainage courses and areas where stormwater is allowed to infiltrate. Spill prevention kits will be required to be kept in close proximity to construction areas and workers will be trained in their use. It will also stipulate procedures, such as the use of spill containment pans, to minimize hazard during onsite fueling and servicing of construction equipment. Finally, the Spill Prevention and Response Plan will require that all agencies listed in the Spill Prevention and Response Plan be notified immediately of any substantial spill or release.

A dewatering plan will be developed and designed so that any potential discharges to surface water will meet the water quality objectives provided in the *Water Quality Control Plan (Basin Plan) for the North Coast Region* (NCRWQCB, 2011). The Dewatering Plan will describe the procedures necessary to satisfy the requirements of the State of California's General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Storm Water Permit) and the RWQCB 401 water quality certification. The dewatering plan is required to include details on the proposed use of fish screens, intended to prevent entrainment or impingement of small fish (on the suction end of intake pipes), and measures to prevent erosion of sediments downstream.

Water Quality Measures for In-Channel Work

In-channel work, including all channel and bank modifications, will be restricted to the minimum necessary to support restoration success. In-channel work will be limited to the dry season (June 15th and October 15th).

The project will comply with Section 401 of the Clean Water Act and obtain certification for project-related activities to control sediment from entering West Weaver Creek during construction. To minimize risk from additional fine sediments, all trucks and equipment will be cleaned, and gravels will be processed away from flowing water.

Throughout the construction period, water quality (turbidity, settleable material, and/or visible construction pollutants) will be monitored as required by Section 401 NCRWQCB certification requirements to ensure that it stays within acceptable limits. Construction pace will be slowed and/or stopped if turbidity exceeds criteria established by the NCRWQCB.

Oil and grease used in equipment used in the channel of West Weaver Creek will be vegetable based.

All equipment working within the stream corridor will be inspected daily for fuel, lubrication, and coolant leaks; and for leak potentials (e.g., cracked hoses, loose filling caps, stripped drain plugs); and, all equipment must be free of fuel, lubrication, and coolant leaks.

Vehicles or equipment will be washed/cleaned only within staging areas or approved upland areas located at least 100 feet from the active stream channel. All equipment will be steam cleaned prior to working within the stream channel to remove contaminants that may enter the creek and adjacent lands. All

equipment will be fueled and lubricated in a designated staging area located outside the stream channel and banks.

Gravel will be appropriately screened prior to being placed in the creek to avoid introduction of fine material into West Weaver Creek. Gravels imported from a commercial source will be clean-washed and of appropriate size.

In-stream construction will proceed in a manner that minimizes sediment discharge.

During in-channel work, the contractor shall operate in a manner such that equipment operates from within the footprint of the in-channel feature

Spawning gravel or the existing substrate will be used to construct any required in-stream crossings.

Gravels and culvert structures associated with the temporary channel crossing of the primary access route will be removed from the channel following completion of the project.

Measures to Minimize Loss or Disturbance of Riparian Vegetation

NOAA PBO

Minimizing disturbance:

- Retain as many trees and as much understory brush as feasible, emphasizing shade-producing and bank stabilizing trees and brush.
- Prior to construction, determine locations and equipment access points that minimize riparian disturbance. Avoid entering unstable areas. Use project designs and access points that minimize riparian disturbance without affecting less stable areas, which may increase the risk of channel instability.
- Minimize soil compaction by using equipment with a greater reach or that exerts less pressure per square inch on the ground than other equipment, resulting in less overall area disturbed or less compaction of disturbed areas.
- If vegetation will be removed with chainsaws, consider using saws that operate with vegetable-based bar oil.
- Decompact disturbed soils at project completion as the heavy equipment exits the construction area.

Revegetation and success criteria:

- Any stream bank area left barren of vegetation as a result of the implementation or maintenance of the practices shall be restored to a natural state by seeding, planting, or other means with native trees, shrubs, or grasses prior to November 15 of the project year.
- Barren areas shall typically be planted with a combination of willow stakes, native shrubs and trees and/ or erosion control grass mixes.

- Native plant species shall be used for revegetation of disturbed and compacted areas. The species used shall be specific to the project vicinity or the region of the state where the project is located, and comprise a diverse community structure (plantings shall include both woody and herbaceous species).
- For projects where re-vegetation is implemented to compensate for riparian vegetation impacted by project construction, a re-vegetation monitoring report will be required after five years to document success. Success is defined as 70 percent survival of plantings or 70 percent ground cover for broadcast planting of seed after a period of three years. If revegetation efforts will be passive (i.e., natural regeneration), success will be defined as total cover of woody and herbaceous material equal to or greater than pre-project conditions. If at the end of five years, the vegetation has not successfully been reestablished, the project applicant to the Program will be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve the revegetation requirements. If success is not achieved within the first five years, the project applicant will need to prepare a follow-up report in an additional five years. This requirement will proceed in five year increments until success is achieved.
- All plastic exclusion netting placed around plantings will be removed after three years.

North Coast Regional Water Quality Control Board 401 WQC

- The applicant will adhere to the proposed riparian replanting plan as described in the submitted document *Revegetation Plan for West Weaver Creek Salmonid Habitat Rehabilitation Project*.
- Disturbance or removal of existing vegetation shall not exceed the minimum necessary to complete the project.

USFS NEPA Resource Protection Measures

- Revegetation efforts at the site will be undertaken by the TCRCD. Revegetation will consist of limited planting of live poles, container stock and seeding of select species found within or appropriate to the watershed. This effort will be in support of and in addition to seeding for erosion control and site stabilization. Revegetation will occur in the late fall or early winter, to take advantage of seasonal precipitation; the TCRCD will monitor the site and, depending on spring rainfall, may selectively hand-irrigate container stock to facilitate plant establishment. Please see the Revegetation Plan for details.

Measures to Minimize Disturbance from Instream Construction

NOAA PBO

- If the stream channel is seasonally dry between June 15 and November 1, construction will only occur during this dry period.
- Debris, soil, silt, excessive bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil or entering waters of the United States. Any of these materials, placed within or where they may enter a stream or lake, by the applicant

or any party working under contract, or with permission of the applicant, shall be removed immediately. During project activities, all trash that may attract potential salmonid predators will be properly contained, removed from the work site, and disposed of daily.

- Where feasible, construction shall occur from the bank, or on a temporary pad underlain with filter fabric.
- Use of heavy equipment shall be avoided in a channel bottom with rocky or cobbled substrate. If access to the work site requires crossing a rocky or cobbled substrate, a rubber tire loader/backhoe is the preferred vehicle. Only after this option has been determined infeasible will the use of tracked vehicles be considered. The amount of time this equipment is stationed, working, or traveling within the creek bed shall be minimized. When heavy equipment is used, woody debris and vegetation on banks and in the channel shall not be disturbed if outside of the project's scope.
- All mechanized equipment working in the stream channel or within 25 feet of a wetted channel shall have a double containment system for diesel and oil fluids. Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters. Vegetable based hydraulic fluids are preferred.
- The use or storage of petroleum-powered equipment shall be accomplished in a manner to prevent the potential release of petroleum materials into waters of the state (Fish and Game Code 5650).
- Areas for fuel storage, refueling, and servicing of construction equipment must be located upland.
- Prior to use, clean all equipment to remove external oil, grease, dirt, or mud. Wash sites must be located in upland locations so wash water does not flow into a stream channel or adjacent wetlands.
- All construction equipment must be in good working condition, showing no signs of fuel or oil leaks. Prior to construction, all mechanical equipment shall be thoroughly inspected and evaluated for the potential of fluid leakage. All mechanical equipment shall be inspected on a daily basis to ensure there are no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks shall be repaired in the equipment staging area or other suitable location prior to resumption of construction activity.
- Oil absorbent and spill containment materials shall be located on site when mechanical equipment is in operation within 100 feet of the proposed watercourse crossings. If a spill occurs, no additional work shall commence in-channel until (1) the mechanical equipment is inspected by the contractor, and the leak has been repaired, (2) the spill has been contained, and (3) CDFG and NOAA RC are contacted and have evaluated the impacts of the spill.

Requirements for Fish Relocation and Dewatering Activities

NOAA PBO

Guidelines for dewatering:

- In cases where it is deemed necessary to work in flowing water, the work area shall be isolated and all flowing water shall be temporarily diverted around the work site to maintain downstream flows during construction.
- Exclude fish from occupying the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. Mesh will be no greater than one eighth inch diameter. The bottom of a seine must be completely secured to the channel bed.
- Screens must be checked twice daily and cleaned of debris to permit free flow of water.
- Block nets shall be placed and maintained throughout the dewatering period at the upper and lower extent of the areas where fish will be removed. Block net mesh shall be sized to ensure salmonids upstream or downstream do not enter the areas proposed for dewatering between passes with the electrofisher or seine.
- Prior to dewatering, determine the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates (as described more fully below under General conditions for all fish capture and relocation activities).
- Coordinate project site dewatering with a qualified biologist to perform fish and amphibian relocation activities. The qualified biologist(s) must possess a valid state of California Scientific Collection Permit as issued by CDFG, must be familiar with the life history and identification of listed salmonids and listed amphibians within the action area, and must be experienced with fish capture and handling. Check with your local CDFG biologist for assistance.
- Prior to dewatering a construction site, qualified individuals will capture and relocate fish and amphibians to avoid direct mortality and minimize adverse effects. This is especially important if listed species are present within the project site.
- Minimize the length of the dewatered stream channel and duration of dewatering, to the extent practicable.
- Any temporary dam or other artificial obstruction constructed shall only be built from materials such as sandbags or clean gravel which will cause little or no siltation.
- Visqueen shall be placed over sandbags used for construction of cofferdams construction to minimize water seepage into the construction areas. Visqueen shall be firmly anchored to the streambed to minimize water seepage. Cofferdams and stream diversion systems shall remain in place and fully functional throughout the construction period.
- If coffer dams with bypass pipes are installed, debris racks will be placed at the bypass inlet. Bypass pipes will be monitored a minimum of twice per day, seven days per week. All accumulated debris shall be removed.
- Bypass pipes will be sized to accommodate, at a minimum, twice the summer baseflow.

- The work area may need to be periodically pumped dry of seepage. Place pumps in flat areas, well away from the stream channel. Secure pumps by tying off to a tree or stake in place to prevent movement by vibration. Refuel in an area well away from the stream channel and place fuel absorbent mats under pump while refueling. Pump intakes shall be covered with 1/8 inch mesh to prevent potential entrainment of fish or amphibians that failed to be removed. Check intake periodically for impingement of fish or amphibians.
- If pumping is necessary to dewater the work site, procedures for pumped water shall include requiring a temporary siltation basin for treatment of all water prior to entering any waterway and not allowing oil or other greasy substances originating from operations to enter or be placed where they could enter a wetted channel. Projects will adhere to *NMFS Southwest Region Fish Screening Criteria for Salmonids* (NMFS 1997a).
- Discharge sediment-laden water from construction area to an upland location or settling pond where it will not drain sediment-laden water back to the stream channel.
- When construction is complete, the diversion structure shall be removed as soon as possible in a manner that will allow flow to resume with the least disturbance to the substrate. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. This will minimize the probability of fish stranding as the area upstream becomes dewatered.

General conditions for all fish capture and relocation activities:

- Fish relocation and dewatering activities shall only occur between June 15 and November 1 of each year.
- All seining, electrofishing, and relocation activities shall be performed by a qualified fisheries biologist, who shall capture and relocate listed salmonids prior to construction of the water diversion structures (e.g., cofferdams). The biologist shall note the number of salmonids observed in the affected area, the number and species of salmonids relocated, where they were relocated to, and the date and time of collection and relocation. The biologist shall have a minimum of three years field experience in the identification and capture of salmonids, including juvenile salmonids, considered in this biological opinion. The biologist will adhere to the following requirements for capture and transport of salmonids:
 - Determine the most efficient means for capturing fish (i.e., seining, dip netting, trapping, electrofishing). Complex stream habitat generally requires the use of electrofishing equipment, whereas in outlet pools, fish may be concentrated by pumping-down the pool and then seining or dipnetting fish.
 - Notify NMFS one week prior to capture/relocation of salmonids to provide an opportunity to monitor.
 - Initial fish relocation efforts will be conducted several days prior to the start of construction. This provides the fisheries biologist an opportunity to return to the work

area and perform additional electrofishing passes immediately prior to construction. In many instances, additional fish will be captured that eluded the previous day's efforts.

- In streams with high water temperature, perform relocation activities during morning periods.
- Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s): (a) Similar water temperature as capture location; (b) Ample habitat for captured fish; (c) Low likelihood of fish reentering work site or becoming impinged on exclusion net or screen; (d) Fish must be released in a nearby location within the same HUC 8 watershed.
- Periodically measure air and water temperatures. Cease activities when water temperatures exceed 17.8 °C. Temperatures will be measured at the head of riffle tail of pool interface.
- Submit reports of fish relocation activities to CDFG and NOAA in a timely fashion

Electrofishing Guideline

- All electrofishing will be conducted by properly trained personnel, and according to NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act (NMFS 2000).
- The backpack electrofisher shall be set as follows when capturing fish:
 - Voltage setting on the electrofisher shall not exceed 300 volts.
 - Voltage: 100 Volts (initial), 300 Volt (max)
 - Duration: 500 microseconds (initial), 5 milliseconds (max)
 - Frequency: 30 Hertz (initial), 70 Hertz (max)
- A minimum of three passes with the electrofisher shall be conducted to ensure maximum capture probability of salmonids within the area proposed for dewatering.
- No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter ($\mu S/cm$) or when instream water temperatures exceed 17.8 C. Water temperatures shall be measured at the pool/riffle interface. Direct current (DC) used.
- A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and aquatic vertebrates.

Seining Guidelines:

- A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of salmonids within the area.
- All captured fish shall be processed and released prior to each subsequent pass with the seine.
- The seine mesh shall be adequately sized to ensure fish are not gilled during capture and relocation.

Guidelines for Relocation of Salmonids:

- Salmonid fish shall not be overcrowded into buckets; allowing approximately 6 cubic inches per young-of-the-year (0+) individual and more for larger fish.
- Every effort shall be made not to mix 0+ salmonids with larger salmonids, or other potential predators. Have at least two containers and segregate 0+ fish from larger age classes.
- Place larger amphibians, such as Pacific giant salamanders, in container with larger fish.
- Salmonid predators, such as sculpins (*Cottus* sp.) and Pacific-giant salamanders (*Dicamptodon ensatus*) collected shall be relocated so as to not concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of sculpins and Pacific-giant salamanders into the steelhead and coho salmon relocation pools. To minimize predation on salmonids, these species shall be distributed throughout the wetted portion of the stream so as not to concentrate them in one area.
- All captured salmonids shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured fish shall be placed into a pool, preferably with a depth of greater than two feet with available instream cover.
- All captured salmonids will be processed and released prior to conducting a subsequent pass.
- All native captured fish will be allowed to recover from electrofishing before being returned to the stream.
- Minimize handling of salmonids. When handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear DEET based insect repellents.
- Temporarily hold fish in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery powered external bubbler. Protect fish from jostling and noise and do not remove fish from this container until time of release.
- Place a thermometer in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds 18° C, fish shall be released and rescue operations ceased.
- Where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.

- Visually identify species and estimate year-classes of fishes at time of release. Record the number of fish captured. Avoid anesthetizing or measuring fish.
- If more than three percent of the steelhead, Chinook salmon, or coho salmon captured are killed or injured, the project lead shall contact NMFS PRD and CDFG. The purpose of the contact is to allow the agencies a courtesy review of activities resulting in take and to determine if additional protective measures are required. All steelhead, chinook salmon, and coho salmon mortalities must be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with date and time of collection, fork length, location of capture, and frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NMFS.

USFS NEPA Resource Protection Measures

Prepare a Dewatering Plan

A dewatering plan will be developed and designed so that any potential discharges to surface water will meet the water quality objectives provided in the *Water Quality Control Plan (Basin Plan) for the North Coast Region* (NCRWQCB, 2011). The Dewatering Plan will describe the procedures necessary to satisfy the requirements of the State of California's General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Storm Water Permit) and the RWQCB 401 water quality certification. The dewatering plan is required to include details on the proposed use of fish screens, intended to prevent entrainment or impingement of small fish (on the suction end of intake pipes), and measures to prevent erosion of sediments downstream.

Fish Rescue

The following work plan identifies step-by-step activities that will be followed under the direction of an on-site fisheries biologist during fish relocation and salvage at the project location.

1. Block nets with 1/8-inch mesh will be placed in suitable locations determined in the field approximately 100 feet above (i.e., upstream) and below (i.e., downstream) the designated construction area to isolate fish movement and prevent fish from entering the dewatered site. For this project, the construction area includes the portion of the West Weaver Creek where streambed rehabilitation would occur.
2. Once the stream reaches have been isolated, multiple passes utilizing a backpack electrofisher with an output of approximately 1.5 amps will be employed throughout the entire length of the reach to safely and effectively capture and remove fish. Electrofisher passes will continue until a diminishing return on fish captured per pass is reached (i.e., numbers of fish captured per pass are reduced to a level where effectiveness has substantially decreased). The on-site fisheries biologist will determine when a diminishing return on fish captured has been reached.
3. Once a substantially diminished return has been reached, the fisheries biologists will coordinate with the construction contractors to initiate a partial reduction in flows (through incremental diversion of flows) to slowly reduce the wetted channel area and condense any remaining fish. Additional electrofisher passes will be made as necessary until it has been reasonably determined by the on-site fisheries biologist that all fish have been removed from the site that practicably can be removed.

4. Captured fish from electrofishing (Steps 2 and 3) will be placed in 5-gallon buckets with fresh, clear water and transported to release sites identified during the site reconnaissance. Buckets containing fish will be moved to the release sites frequently, with no more than 50 fish in a bucket at one time and for no longer than 15 minutes. All fish species will be released in pools or slow moving currents (i.e., glides) and will be allowed to gently swim out of the buckets. Representative samples of the captured fish will be enumerated by species prior to release in suitable locations identified. Any potential fish mortalities will also be noted.
5. Once all fish have been captured, transported, and released, the on-site fisheries biologist will clear the site for complete dewatering. During the complete stream diversion and dewatering phase, the on-site fisheries biologists and contractor-provided assistants (number to be determined at the time of dewatering, up to three) will monitor the reach (with fish removal and transporting equipment) for any stranded fish that may have been missed during steps 3 and 4. The stream diversion will take place incrementally (i.e., diverting a portion of the total flow and allowing the water to recede slowly while minimizing erosion potential and turbidity). Any stranded fish will be immediately captured, transported, and released into suitable habitats as described above. Manual capture will also include removal of native fish that are hiding under rocks in the dewatered channel. To the extent practicable, once all stranded fish have been removed, transported, and released, the site will be thoroughly inspected for any potential stranded fish. If the site is deemed to be absent of fish to the extent practicable after inspection, the on-site fisheries biologist, in consultation with construction crews, will clear the site for continued construction operations.
6. The resource agencies will be notified at least two days prior to the expected date that the rescue and relocation will begin.
7. Following completion of fish rescue operations, a Fish Rescue Operation Report will be prepared and submitted to USACE, NMFS, USFWS, and CDFW within one month. The Fish Rescue Operation Report will document the fish rescue and salvage operation, including the estimated number of fish salvaged by species.

Creation of Off-Channel or Side-Channel Habitat

NOAA PBO

- Any equipment work within a stream channel shall be performed in isolation from the flowing stream. If there is any flow when work is done, coffer dams shall be constructed upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. Cofferdams may be constructed from a variety of materials and methods, for example clean river gravel or sand bags, and may be sealed with sheet plastic. Foreign materials such as sand bags and any sheet plastic shall be removed from the stream upon project completion. In some cases, clean river gravel may be left in the stream, but the coffer dams must be breached to return stream flow to its natural channel.
- If it is necessary to divert flow around the work site, either by pump or by gravity flow, the suction end of the intake pipe shall be fitted with a fish screen that meets CDFG and NMFS (NMFS 1997a) criteria to prevent entrainment or impingement of small fish. Any turbid water pumped from the work site shall be disposed of in an upland location where it will not drain directly into any stream channel, or treated via settling pond to filter suspended materials before flowing back into the stream.

Installation of Fish Screens

NOAA PBO

- All flows will be diverted around work areas as described in the *Requirements for Fish Relocation and Dewatering Activities*.
- If fish removal is required, BMPs will be implemented as described in the *Requirements for Fish Relocation and Dewatering Activities*.
- Riparian disturbance will be minimized as described in the *Measures to Minimize Loss or Disturbance of Riparian Vegetation*.

Measures to Protect Salmonid Habitat

USFS NEPA Resource Protection Measures

The project seeks to comply with the National Oceanic and Atmospheric Administration Restoration Center (NOAA RC) Programmatic Biological Opinion (PBO) and Essential Fish Habitat determination for projects involving restoration of salmonid habitat; as such, it will implement all applicable avoidance and minimization measures as stipulated in the PBO. Furthermore, dewatering and the rescue and relocation of fish by a qualified biologist, as described in sections below, will be conducted in order to avoid and minimize potential impacts to fish including listed salmonids. Finally, the following measures will be used to reduce the likelihood of adverse impacts on salmonids that use West Weaver Creek:

- In-channel work, including all channel and bank modifications, will be restricted to the minimum necessary to support restoration success. In-channel work will be limited to the dry season (June 15th and October 15th).
- Sediment curtains will be placed around the construction zone to prevent sediment disturbed during ground disturbance activities from being transported and deposited outside of the construction zone.
- Silt fencing will be installed along the top of creek bank below upland areas where construction occurs within 100 feet of known or potential salmonid habitat. The contractor shall endeavor to prevent movement of sediment from grading areas into the creek channel.
- Spoil sites will be located so they do not drain directly into West Weaver Creek. Spoil sites will be graded to reduce the potential for erosion.
- Equipment will not operate in the active channel except as necessary to construct temporary stream crossings and in-stream habitat structures.
- All project personnel will be instructed on the protection of biological resources, and in particular the special-status species that might be encountered during project activities. They will be trained to stop work upon observation of a special-status species within the work area and to notify a project monitor for additional guidance.
- During the clear and grub phase and construction, as much understory brush and as many trees as possible will be retained. The emphasis will be on retaining shade-producing and bank-stabilizing vegetation.

Wildlife Species

USFS NEPA Resource Protection Measures

Perform Pre-Construction Surveys for Foothill Yellow-legged Frog

- Two weeks prior to any disturbance within suitable habitat for foothill yellow-legged frog, proposed disturbance areas shall be surveyed for adult frogs, tadpoles, or eggs by a qualified biologist. If the species is detected, the biologist shall contact CDFW to determine if moving any of the life stages is appropriate. In making this determination, CDFW would consider if an appropriate relocation site exists. If CDFW approves moving the animals, the biologist shall be allowed sufficient time to move the animals from the work site before work activities begin.

Perform Pre-Construction Surveys for Western Pond Turtle

- Prior to construction, a qualified biologist shall conduct a survey for western pond turtles within 24 hours of the start of construction activities within 500 feet of suitable habitat located within the construction area. If no individuals are identified, then no additional measures are required. If a turtle is found in a proposed construction area, the biologist would move the turtle from the area to suitable habitat downstream of the project site.

Invasive Weeds

USFS NEPA Resource Protection Measures

- The Contractor shall clean all equipment of dirt, mud and plant material prior to entering the work area to prevent the introduction and spread of invasive weed species.
- The project area will be monitored for 3 years subsequent to project implementation to ensure invasive weeds do not become established in the area affected by the project. Annual reporting will be submitted to the Shasta-Trinity National Forest to ensure compliance. If invasive weeds are found, the Shasta-Trinity National Forest will be notified immediately.

Cultural Resources

USFS NEPA Resource Protection Measures

- **Inadvertent Discovery of Cultural Resources.** If an inadvertent discovery of archaeological resources is made during the project, the USFS will require ground disturbing activities in the vicinity of the discovery to cease. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include refuse-filled privies or wells. After cessation of excavation the contractor shall immediately contact the USFS. The contractor shall not resume work until authorization is received from the USFS.

In the event of unanticipated discovery of archaeological materials during project implementation, the USFS shall retain the services of a Secretary of the Interior-qualified archaeologist (and a Native American representative if the site is prehistoric) to evaluate the significance of the find prior to resuming any activities that could impact the site.

In the case of an unanticipated archaeological discovery, if it is determined that the find is potentially eligible for listing in the California or National Register, and the site cannot be avoided, the USFS shall provide a research design and treatment plan, prepared by a qualified archaeologist, outlining data recovery to be performed on the resource, analysis, and reporting of the find. The research design and treatment plan shall be submitted to and approved by the USFS, the State Historic Preservation Officer, and appropriate Native American organizations prior to construction being resumed.

- **Inadvertent Discovery of Human Remains.** If potential human remains are encountered, ground disturbing activities in the vicinity of the discovery shall cease and the Trinity County Coroner shall be contacted in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the Coroner determines the remains are Native American, the Coroner will contact the Native American Heritage Commission (NAHC). As provided in Public Resources Code Section 5097.98, the NAHC will identify the person or persons believed to be most likely descended from the deceased Native American. The Most Likely Descendent will make recommendations for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.
- **Inadvertent Discovery of Paleontological Resources.** If paleontological resources, such as fossilized bone, teeth, shell, tracks, trails, casts, molds, or impressions are discovered during ground-disturbing activities, work shall stop in that area and within 100 feet of the find until a qualified paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the qualified paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. The qualified paleontologist may also propose modifications to the stop-work radius based on the nature of the find, site geology, and the activities occurring on the site. If treatment and salvage is required, recommendations shall be consistent with Society of Vertebrate Paleontology (SVP) 1995, and currently accepted scientific practice. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection [e.g., the University of California Museum of Paleontology (UCMP)], and may also include preparation of a report for publication describing the finds.

Appendix B

Revegetation Plan for West Weaver Creek Salmonid Habitat Rehabilitation Project

Site Preparation and Installation methods:

The project consists of two planting locations and three installation techniques. One planting location will be revegetated exclusively with willow pole-cuttings or transplanted willows, the other will be planted with both container stock and seed stock. Spacing between container and seed plantings will be 15-20ft. Spacing between transplanted willows or pole-cuttings will be 4-5ft. A native grass/forb seed mix will also be broadcast over the container/seed stock planting zone, at a rate of 40-60lbs/acre.

Container and seed stock will be planted in the fall after heavy-equipment construction completion. Pole cuttings and transplants will be installed in the summer during project implementation. Pole cuttings will be sourced from the willows removed from the channel as a consequence of stream contouring. Heavy equipment will be utilized to excavate pits or trenches to a depth of 8 feet, or to the depth of the water table. Willows will be placed in the pits immediately upon removal from their original location and will be buried to at least 2/3rds their length. Willows will be a minimum of 1.5" diameter at the basal end. If possible, the heavy equipment operator will include the root ball with the willow poles when removing vegetation from the riparian area to build the in-stream structures; in this scenario, some willows may be transplanted directly rather than installed from pole-cuttings.

Container stock will be installed using hand-tools. Planting holes will be excavated to a minimum of two times the width and two times the depth of the container. The rootball will be loosened after removal from the container and before planting to encourage root growth into the native soil. Plants will be checked for girdling roots before installation. Plants will be installed so the beginning of the root flare is flush with the ground. Small watering berms 3-4" high will be constructed at a 1 foot radius from the center of each planting hole to aid in watering. A soil amendment will not be incorporated into the planting holes. Container stock planting locations will receive a small amount of balanced slow release fertilizer. Pole cuttings and seed stock will not receive any fertilizer.

Seed stock will also be installed using hand-tools. Seeds will be planted to a depth equal to two times their width. Flagging will be used to indicate the location of seed plantings to aid in monitoring. The species that may be planted from seed are white oak (*Quercus garryana*) and Western redbud (*Cercis occidentalis*). White oak acorns mature in the fall do not require stratification. They will be collected at a location within five miles of the project site – and at the same elevation – to ensure genetic diversity of the plant material. The acorns will be collected in the same season they are to be planted. Each white oak planting hole will receive 2-3 acorns. Western redbud seed also matures in the fall and requires scarification before it will germinate – seed will be acquired from the TCRCO seed bank, which is sourced from plants at the same elevation as the project site. It will be scarified after removal from cold storage and then sown directly into the planting site – each hole will receive 4-6 seeds.

Materials

Plant material will be sourced from container stock, seed stock, and pole-cuttings. Container stock will be sourced from the Trinity County Resource Conservation District Native Plant Nursery or the closest available nursery. Seeds will be sourced from within five miles of the project from healthy, vigorous

donor plants. All requisite seed collection permits will be obtained. The native grass/forb broadcast seed mix will be sourced from a seed supplier such as Pacific Coast Seed.

Seed stock installations and pole-cuttings will not be fertilized – seeds sown directly into the soil will grow into more resilient plants without supplemental fertilizer. Both western redbud and Oregon white oak, the two species selected for seed installation, tolerate poor soils. Western redbud fixes nitrogen. Pole-cuttings generally do not require supplemental fertilization. Containerized plants will receive a small amount of balanced time release fertilizer such as Osmocote or Scotts Agriform Fertilizer Tablets. Fertilizer will be applied in accordance with the product label and instructions.

Vexar tree tubes will provide protection from herbivory. One tree tube will be secured to each seed and container planting with two 3' long bamboo stakes. Tree tubes will not be installed on pole-cuttings unless evidence of herbivory is observed after one growing season.

Irrigation is contingent upon funding. The size of the site is conducive to hand watering. Plants would receive supplemental irrigation in the summer following the initial planting. Each plant would receive 3-5 gallons of water on a bi-weekly schedule or dependent on weather conditions. Watering will be slow and deep to allow percolation through the soil and encourage deep root growth.

Plant List

Common name	Scientific name	Stock	Size	Quantity
Shrubs				
Western redbud*	<i>Cercis occidentalis</i>	seed	N/A	~50
Mountain Mahogany	<i>Cercocarpus betuloides</i>	container	D40	3
Upland Trees				
Oregon white oak*	<i>Quercus garryana</i>	seed	N/A	~50
Incense Cedar	<i>Calocedrus decurrens</i>	container	Tree pot	12
Ponderosa Pine	<i>Pinus ponderosa</i>	container	Tree pot	12
Riparian Trees				
Arroyo willow**	<i>Salix lasiolepis</i>	pole-cutting	2-3" caliper	~100
Oregon ash	<i>Fraxinus latifolia</i>	container	Tree pot	4
White alder	<i>Alnus rhombifolia</i>	container	Tree pot	5
Big leaf maple	<i>Acer macrophyllum</i>	container	Tree pot	4
Vines & Forbs				
California grape	<i>Vitis californica</i>	container	1 gallon	5
Mugwort	<i>Artemisia douglasiana</i>	container	1 gallon	3

Native Grass/Forb Seed Mix

Common name	Scientific name
California brome	<i>Bromus carinatus</i>
Blue wildrye	<i>Elymus glaucus</i>
Slender hairgrass	<i>Deschampsia elongata</i>
Idaho Fescue	<i>Festuca idahoensis</i>
Sky lupine	<i>Lupinus nanus</i>
Spanish clover	<i>Acmispon americanus</i>
Showy milkweed	<i>Asclepias speciosa</i>
Pine bluegrass	<i>Poa secunda</i>

**In the planting schematic shown below, there are 13 locations for white oak, with 2-3 acorns per hole, which would equal 26-39 acorns. Similarly, there are 3 locations for western redbud, with 4-6 seeds per hole, which would equal 12-18 seeds. Instead of these numbers in the plant list, the quantity is 50 for each to add an additional buffer for seed viability (both are easy to collect).*

***Arroyo willow are in the plant list but are not shown in the planting schematic. This is because the willow planting areas are in the secondary channels, separate from the main planting site represented in the schematic.*

Planting Schematic

See map on page 38 below.

Maintenance of plants

Future maintenance of the plants at this site depends on availability of funds. If the TCRCDD does not receive current requested funding, other sources will be sought.

Our proposed plan is as follows: Vegetation will be mulched after planting in the fall of 2017 by Reveg Coordinator and Conservation Tech I. Weed control fabric will be installed by Reveg Coordinator and Conservation Tech I in fall 2017.

Watering will begin in 2018, based on the last major rain fall and soil moisture. Reveg Coordinator will begin checking the site in May 2018 for soil moisture and any signs of stress in the vegetation. We estimate that watering will begin in late May or early June. Reveg Coordinator and one conservation tech 1, or two conservation techs 1, will fill the TCRCDD water tank at the TCRCDD office with tap water, haul the tank to the site and water the vegetation with hoses. The truck will be parked on a turn off next to the highway and techs will walk down to the vegetation. No water will be pumped from West Weaver Creek. Deep watering will take place every other week through the end of September. We are including up to 10 waterings per season in the budget to anticipate the possibility of a longer dry season.

Mulching will be applied again in May or June 2018, depending on the amount of mulch remaining in place from the previous fall.

Watering and mulching will continue in 2019, exactly as outlined for 2018.

Non-native, invasive weeds will be controlled through a suite of mechanical and cultural treatment methods, including weed whacking, application of weed fabric, and hand-pulling. The most appropriate method will be selected based on species, phenology, and site-specific factors such as slope and soil moisture. Treatments will be prioritized within the revegetation sites to maximize the benefit of reduced competition from invasive species. Because vegetation cover - and the associated invasive species load - will change as a result of the mechanical treatment of the floodplain during the WWCC project, the most appropriate treatment option and timing will be determined after completion of earth disturbing activities and first year rosettes have emerged.

Success criteria

If the following success criteria are not met, the TCRCDD will work independently with the North Coast Water Quality Control Board (NCWQCB) to reevaluate.

Species diversity: After 5 years, riparian species diversity representative of the site prior to project implementation. Of the original planting: At least 3 of the 4 riparian tree species must be present at the site, one of which must be willow; At least one of the two vines and forbs must be present at the site; at

least two of the three upland trees must be present at the site; and at least one of the two shrubs must be present at the site.

Species Density: For willow transplants and pole-cuttings – a minimum of 1 stem per square meter (determined through quadrat sampling). This metric will not be used as a success criteria for other species in the planting plan.

Structural diversity: Full over story development and canopy closure will not be possible in the project monitoring time-frame. This criteria will not be used to evaluate success of the project.

Plant vigor: At least 50% of the surviving plants must exhibit a plant vigor rating of “normal” or “high” as based on a qualitative assessment of plant health (see monitoring methods below). This criteria will not be used to evaluate the willow pole cutting/transplant component of the project.

Survivorship: At least 85% survivorship at the conclusion of the five year monitoring timeframe.

Monitoring methods

Monitoring methods will include photo points, quadrat sampling to determine willow species density, and plant mortality counts. Photo points will be established after project implementation. Three 1 x 1 meter quads will be randomly selected in the willow planting zones and marked with whisker flagging. The number of stems of each species will be counted and recorded. Once the data is recorded, species density will be determined using the following formula:

Average species density = [(density in plot 1) + (density in plot 2) + (density in plot X)] / total number of plots

Quadrat sampling will be conducted once yearly in the same month during the growing season. Photos will also be taken yearly in the same month during the growing season. Plant vigor assessments will be conducted at the same time as plant mortality counts and will follow the same schedule as the quadrat sampling. Plant vigor will be assessed using the following qualitative scale:

Vigor Rating	Description
Dead	Plant is dead.
Low	Plant is weak, growing slowly, and/or under stress. Foliage may be absent, diseased or showing nutrient deficiencies. Plant may have been browsed.
Normal	Plant has average vigor for its species and the site conditions.
High	Plant is growing well and appears to be free of significant health stress factors.

Data will be entered in excel or other appropriate program and saved on the TCRC server. Monitoring reports will include all relevant data captured in field monitoring efforts.

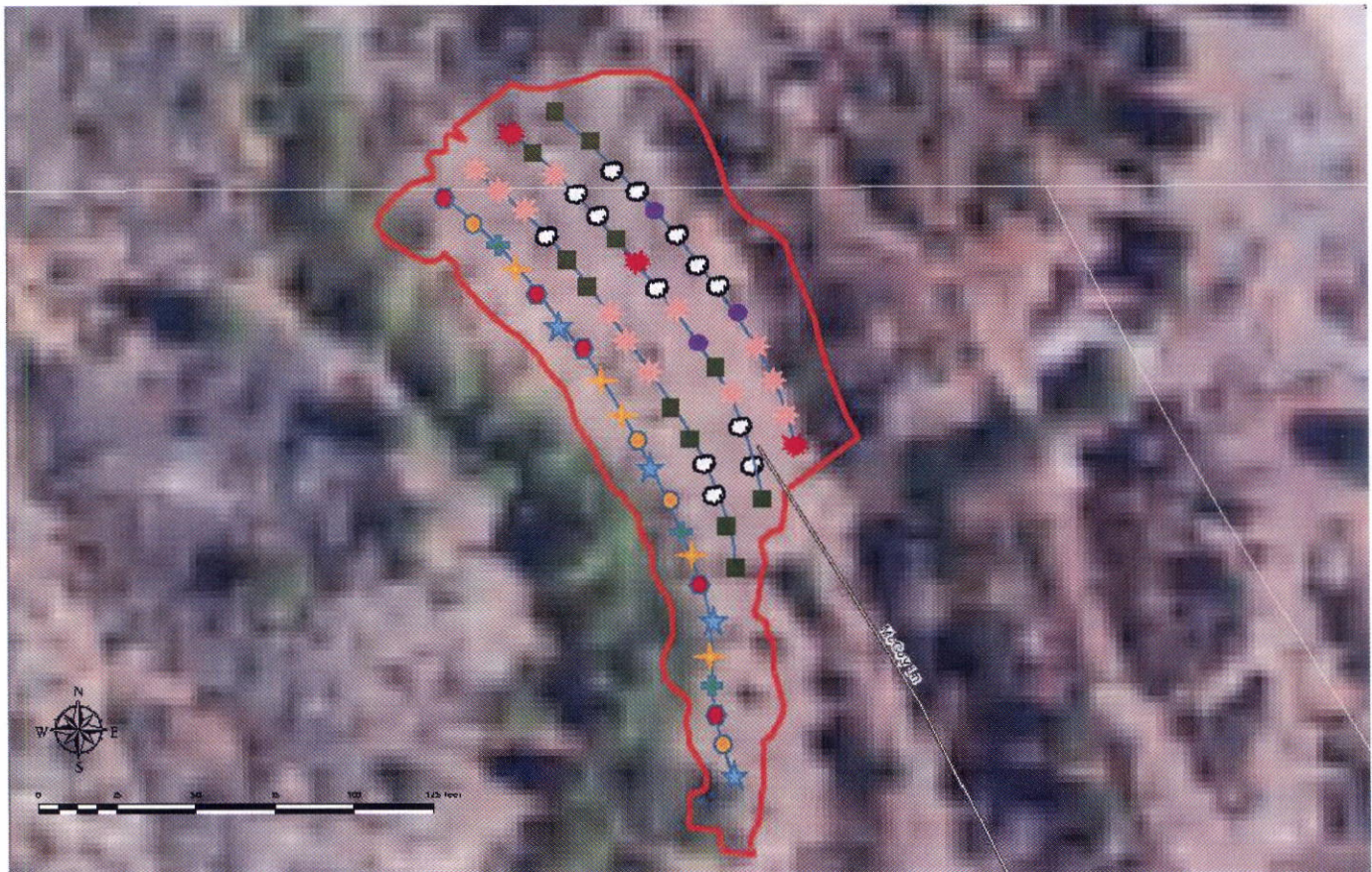
Monitoring reports will be created as follows:

- 1 post-project implementation report with photo points and a narrative of what was constructed/planted
- A 2018 monitoring report
- A 2020 monitoring report
- A 2022 monitoring report

Adaptive Management and Contingency Measures

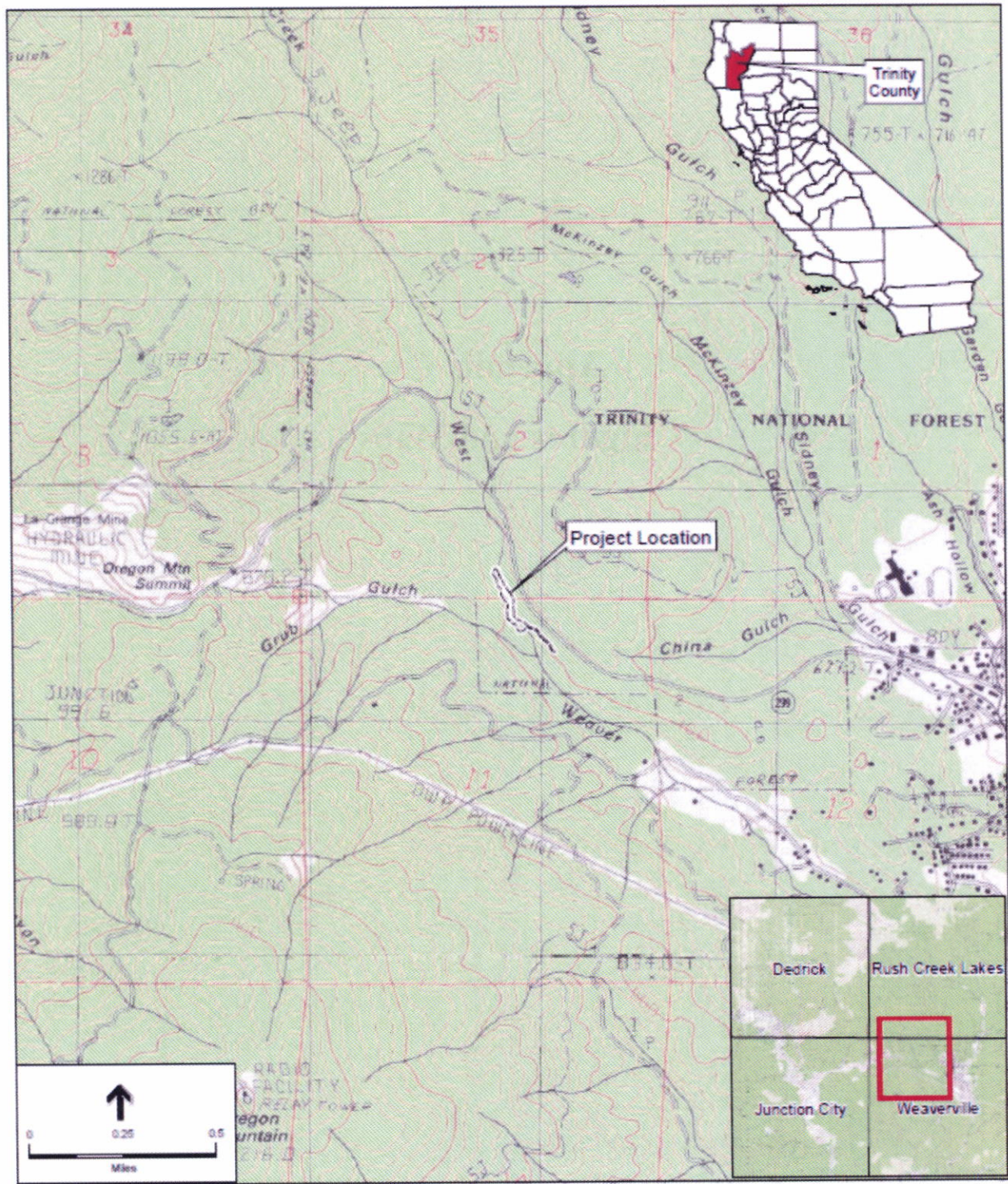
Adaptive management actions and strategies described in the Maintenance of Plants section above, are dependent upon the availability of funding. A funding source is not currently identified for this aspect of the project.

Section V. Container/Seed Stock Planting Schematic



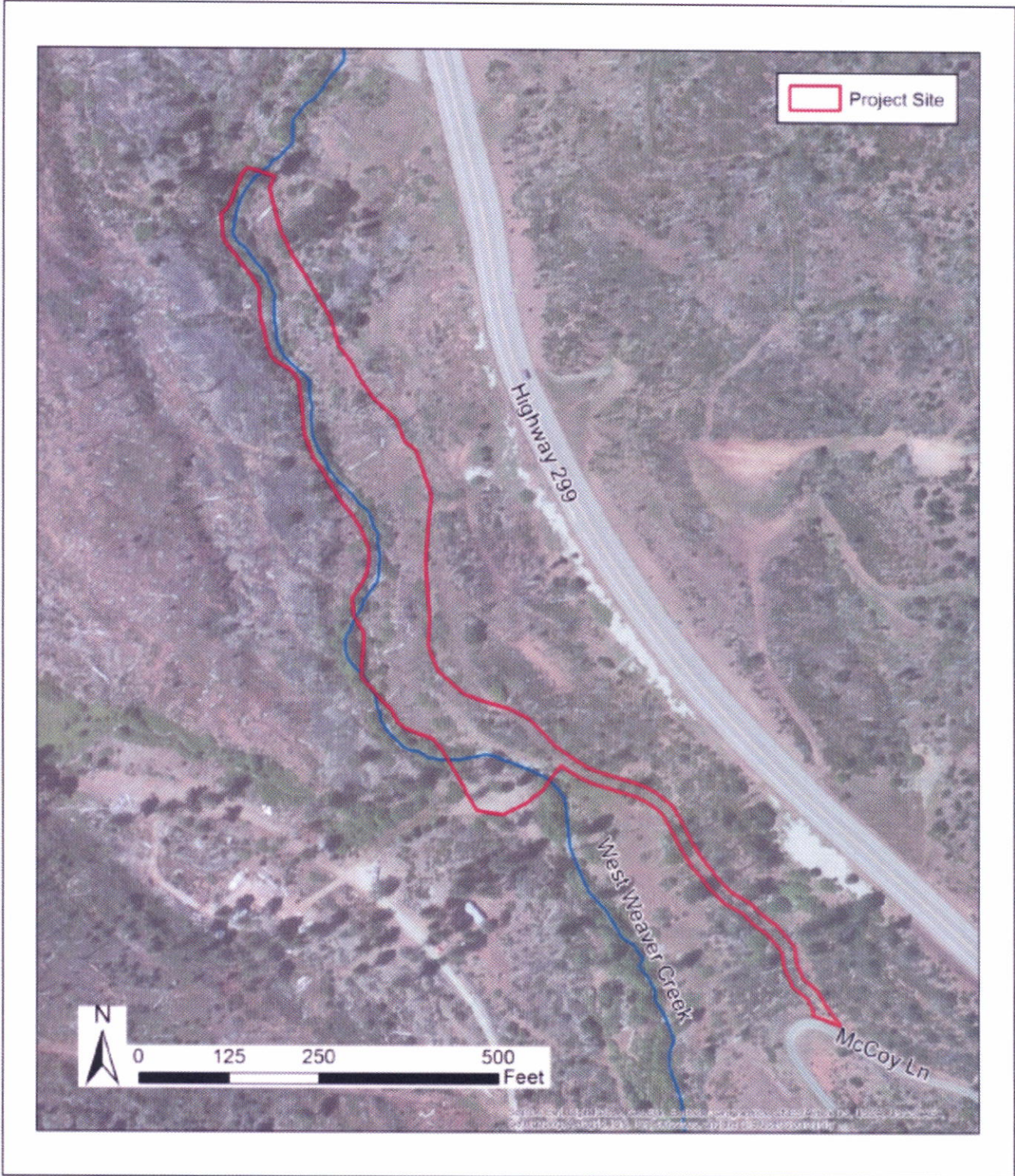
- | | | |
|----------------------------------|---------------------------------|-----------------------------------|
| ★ = <i>Acer macrophyllum</i> | ★ = <i>Cercis occidentalis</i> | ⊙ = <i>Quercus garryana</i> |
| ● = <i>Fraxinus latifolia</i> | ★ = <i>Vitis californica</i> | ● = <i>Cercocarpus betuloides</i> |
| ● = <i>Alnus rhombifolia</i> | ★ = <i>Pinus ponderosa</i> | |
| ⊕ = <i>Artemisia douglasiana</i> | ■ = <i>Calocedrus decurrens</i> | |

Appendix C
Figures and Maps



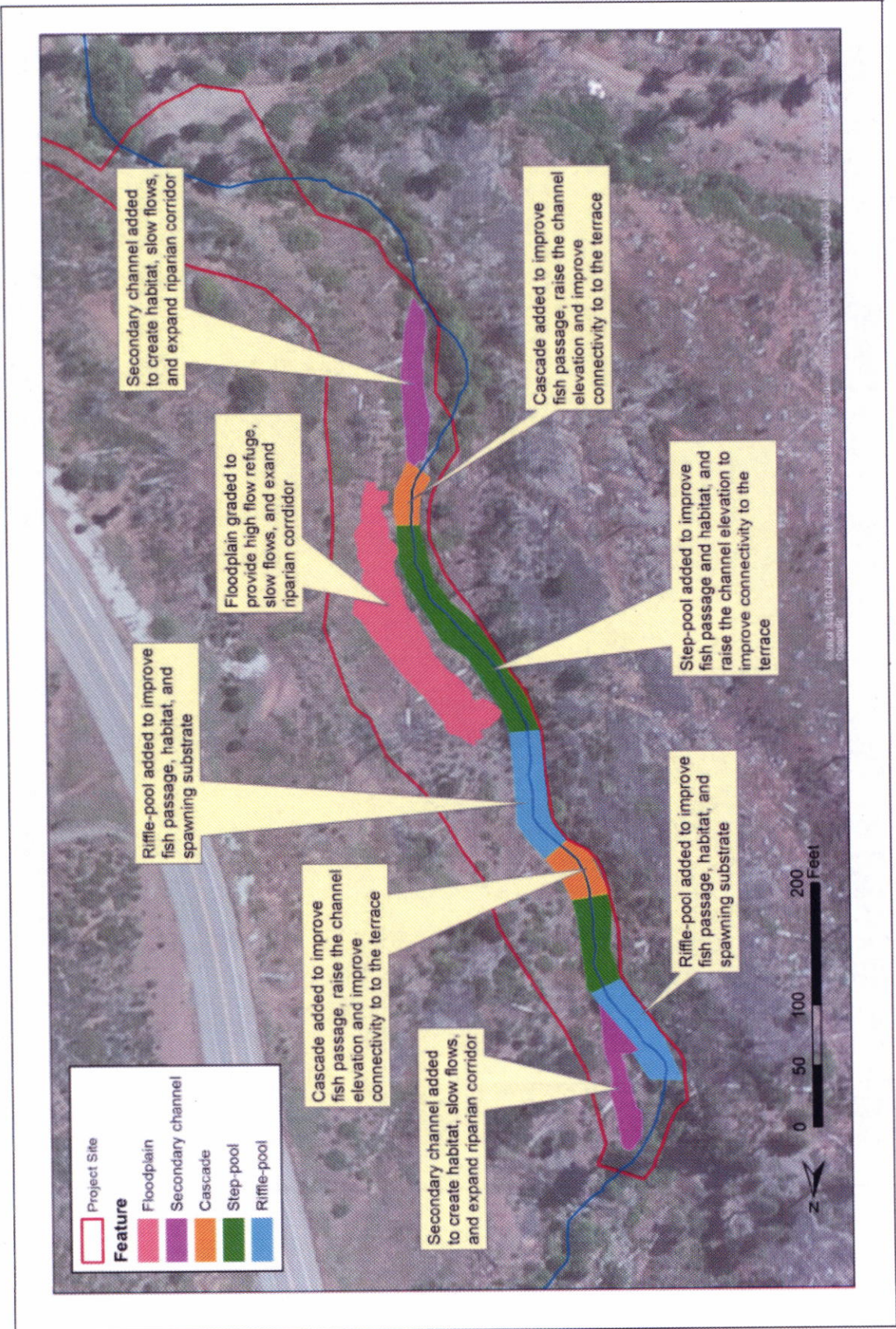
SOURCE: USGS Weaverville, Calif. 7.5-minute topographic quadrangle

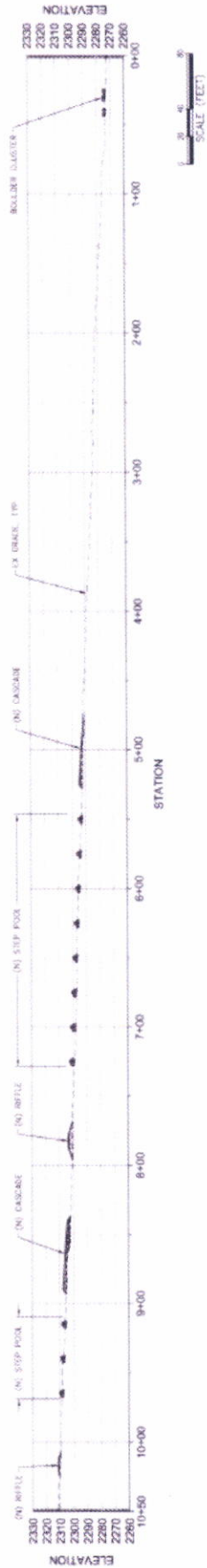
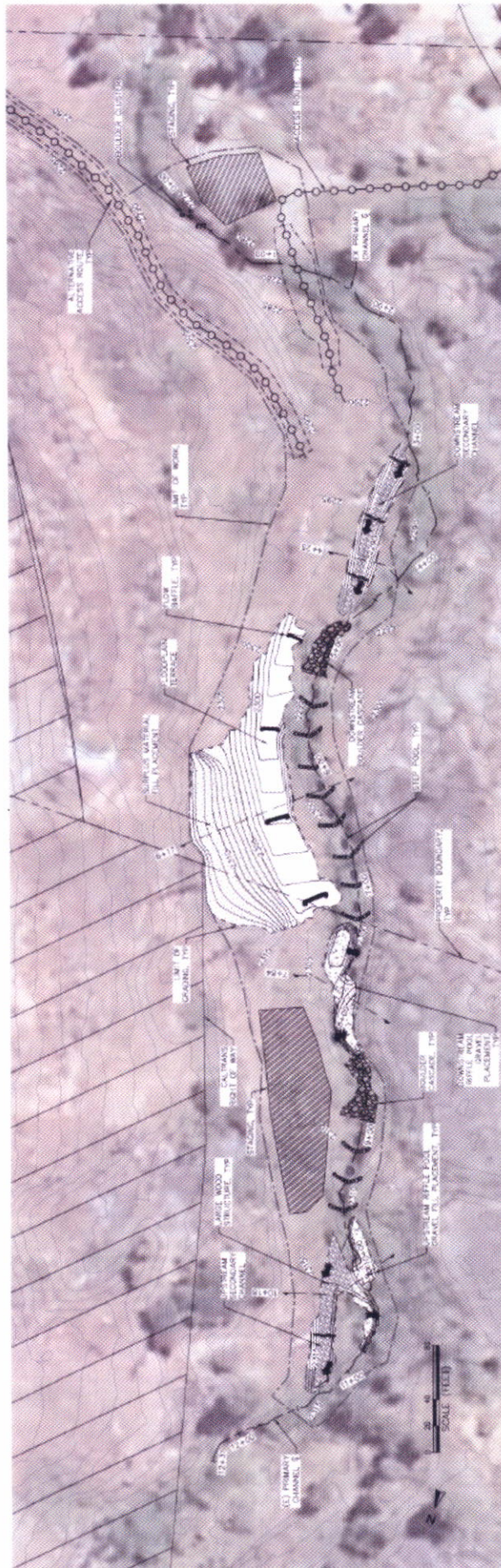
Figure 1
Project Location



SOURCES: ESRI (Aerial)

Figure 2
Project Site





NOTES:
 1. CROSS SECTIONS ARE SHOWN ON FIGURE 2-4. CROSS SECTIONS FOLLOW THE RIVER ALIGNMENT AND ARE ORIENTED LOOKING UPSTREAM.