

Initial Study and Draft Mitigated Negative Declaration

Smith River Alliance

Use Permit for the Lower Stotenburg Creek Fish Passage Project

October 2022



Prepared By
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Project Information Summary

- 1. Project Title:** Smith River Alliance
Use Permit for Lower Stotenburg Creek Fish Passage Project – UP2303C
- 2. Lead Agency Name and Address:** Del Norte County
Planning Commission
981 H Street, Suite 110
Crescent City, CA 95531
- 3. Contact Person and Phone Number:** Jacob Sedgley
(707) 464-7254
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- 4. Project Location and APN:** Near 2710 South Fred D. Haight Drive, Smith River, CA 95567
APN 105-020-005-000 & 105-020-068-000
- 5. Project Sponsor's Name and Address:** Monica Scholey
P.O. Box 2129
Crescent City, CA 95531
- 6. County Land Use:** General Commercial
- 7. County Zoning:** AE (Agricultural Exclusive), RCA-2(e) (Designated Resource Conservation Area, Estuary), RCA-2(r) (Designated Resource Conservation Area, Estuary, Riparian Vegetation)
- 8. Description of Project:**

Stotenburg Creek flows parallel to Fred Haight Drive and enters the mainstem Smith River approximately 0.8 miles upstream from the Del Norte County boat ramp and approximately 5.9 miles upstream of the mouth of the Smith River in Del Norte County, CA. Stotenburg Creek is the first tributary downstream of the Highway 101 bridge (Dr. Fine Bridge) over the Smith River. The project is located along 0.5 miles of Stotenburg Creek beginning at the mouth of the creek, where it meets the mainstem of the Smith River, and extends upstream to just northwest of Cedar Lodge Lane. Most of the project is located on APN: 105-020-050, a 114.2-acre parcel utilized for agricultural grazing. The downstream most crossing (Crossing #1) is located at the following coordinates: 41.888251, - 124.146447. The inlet and construction footprint of the upstream most crossing (Crossing #4) is located on APN: 105-020-068, a 2-acre parcel owned by Pacific Power.

The four undersized stream crossings in the project reach limit fish passage and interfere with the natural conveyance of water, sediment, and wood. Consequently, the channel lacks complexity and depth and increases gravel deposition at the confluence, causing a lack of connectivity between the creek and the river. The crossings also impede fish passage and cause fish strandings when the creek seasonally dries. Additionally, cattle have access to the stream, impacting water quality and riparian vegetation. The riparian vegetation includes sections of dense willow with no mature conifers or riparian trees and other areas devoid of riparian vegetation. Non-native invasive blackberry is dominant and invasive canary grass is present.

The project will restore habitat by: 1) Removing the four crossings, two of which will be replaced and upgraded; 2) installing an engineered log jam, 400' of willow baffles, 5 large wood structures, and 5 beaver dam analogs to increase channel complexity and connectivity; 3) recontouring the channel to enhance connection to the Smith

River and to establish floodplain connectivity; and, 4) controlling invasive and enhancing native riparian vegetation and installing cattle exclusion fencing throughout the 0.5-mile project area.

9. Surrounding Land Uses and Settings:

The project area is surrounded mainly by agricultural and natural resources zone districts, with some rural residential zoning nearby. Parcels immediately to the north include a large agricultural field zoned AE, and less than ten residences zoned Rural Residential Agricultural (RRA-1). Parcels to the east include some of the above mentioned residential uses and agricultural fields. Uses immediately south of the parcel include agricultural fields. Parcels directly west of the project area include an agricultural field and the Smith River.

10. Required Approvals: Adoption of a Negative Declaration (Del Norte County Planning Commission)

11. Other Approvals (Public Agencies): California Coastal Commission, California Department of Fish and Wildlife, Regional Water Quality Control Board, U.S. Army Corps of Engineers

12. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?

Native American tribes, traditionally and culturally affiliated with the project area have been notified of the project application completion and the beginning of the AB 52 consultation period pursuant to PRC §21080.3.1. Notification of the beginning of the AB 52 consultation period was provided September 19, 2022. No requests for consultation pursuant to PRC §21080.3.1 were received.

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" without mitigation as indicated by the checklist on the following pages. All mitigation measures are provided in the Mitigation Monitoring and Reporting Program.

<input type="checkbox"/>	Aesthetics	<input type="checkbox"/>	Agriculture and Forestry Resources	<input type="checkbox"/>	Air Quality
<input checked="" type="checkbox"/>	Biological Resources	<input checked="" type="checkbox"/>	Cultural Resources	<input type="checkbox"/>	Energy
<input type="checkbox"/>	Geology/Soils	<input type="checkbox"/>	Greenhouse Gas Emissions	<input type="checkbox"/>	Hazards & Hazardous Materials
<input type="checkbox"/>	Hydrology / Water Quality	<input type="checkbox"/>	Land Use / Planning	<input type="checkbox"/>	Mineral Resources
<input type="checkbox"/>	Noise	<input type="checkbox"/>	Population / Housing	<input type="checkbox"/>	Public Services
<input type="checkbox"/>	Recreation	<input type="checkbox"/>	Transportation	<input checked="" type="checkbox"/>	Tribal Cultural Resources
<input type="checkbox"/>	Utilities / Service Systems	<input type="checkbox"/>	Wildfire	<input type="checkbox"/>	Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

<input type="checkbox"/>	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
<input checked="" type="checkbox"/>	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
<input type="checkbox"/>	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
<input type="checkbox"/>	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
<input type="checkbox"/>	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Jacob Sedgley

Planner

Date

Environmental Checklist

1. Aesthetics

Except as provided in Public Resources Code Section 21099, would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In non-urbanized areas, substantially degrade the existing visual character or public views of the site and its surroundings? (Public views are those that are experienced from publically accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. The land surrounding Lower Stotenburg Creek is primarily utilized for agricultural production, and the project would not result in any long term adverse impact on scenic vistas. The impact would be short term and temporary while construction and restoration activities are on-going. A less than significant impact is expected.
- b. Based on the California Scenic Highway Mapping System, no designated state scenic highways are found adjacent to or within view of the project area¹. There is one officially designated State Scenic Highway section within Del Norte County along Highway 101 with scenic ocean views through Del Norte Redwoods state park, although Highway 101 for the majority of its length in Del Norte County has been identified by the State Scenic Highway Mapping System as eligible for State listing. The project area may be visible from the portions of the US 101 highway listed as eligible for State listing; however, the project will not damage any trees, rock outcroppings, and any visual impacts are expected to be minor and temporary. No significant impact is expected.
- c. The project is located in a rural agricultural area in close proximity to the Smith River. The restoration project may be visible from surrounding parcels, although it will be obscured by existing vegetation in the immediate area. Upon project completion, the typical view will not be significantly altered from current conditions and no impact is expected.
- d. The project will not create any lighting sources. In addition, temporary construction activities associated with the restoration project will be conducted during daylight hours and will avoid excessive light pollution from the site. No impact is expected.

1: Caltrans. (n.d.). California State Scenic Highway System Map. Retrieved October 18, 2022

2. Agriculture and Forest Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a. Maps prepared pursuant to California’s Farmland Mapping and Monitoring Program (FMMP) include Del Norte County as an “Area Not Mapped” and, therefore do not categorize the project area as having any type of Important Farmland (California Department of Conservation 2018). The project site and surrounding areas are under agricultural production, specifically cattle grazing. There are no parcels under Williamson Act contract within or adjacent to the project site. No Prime Farmland exists on-site.
- b. There are no parcels under Williamson Act contract within or adjacent to the project site. According to Del Norte County’s GIS Portal, areas adjacent to the project site are zoned for agricultural uses, although no timber production is present. The project parcels are mainly zoned Agriculture Exclusive (AE), surrounding the majority of the project area while most of the project site is zoned Designated Resource Conservation Area (RCA-2(e) & RCA-2(r)). The project proposal includes installation of approximately 1,600 feet (0.3 miles) of cattle exclusion fencing that would protect 3.67 acres of riparian area from livestock. The purpose of the fencing is to keep livestock in areas zoned for agriculture and prevent them from roaming into environmentally sensitive areas associated with the RCA-2 zone districts or other riparian vegetation located on the parcels. The fencing would work to prevent conflicts with existing zoning and, therefore, no significant impact is expected.
- c. No Timber Production Zones exist on-site or adjacent to the property.
- d. The project would not result in the loss of forestland.
- e. The project would not involve changes in the existing environment which would result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use, although livestock movement within riparian areas would be significantly reduced or eliminated. No forest land or timberland exists at the

project site or adjacent parcels and the project would not result in the loss or conversion of forest land. Therefore, a less than significant impact would occur.

3. Air Quality

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in other emissions (such as those leading to odors or dust) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a. The project is expected to create additional vehicle trips by construction workers and delivery vehicles. It is unlikely construction trips will create a substantial increase in fugitive dust. Earth moving and other ground disturbing activity may generate fugitive dust. In an effort to minimize the amount of fugitive dust from construction activities at the site, the contractor will employ best management practices including covering spoils and watering active construction areas as necessary. This impact will be limited to the construction phase of the project.

Equipment used for the project may include, but is not limited to, both track and tire equipment including dump trucks, front-end loaders, excavators, skid-steer loaders, backhoes, water tenders, and compactors. Emissions from the project will be limited to the construction phase. Maintaining equipment in good working order, implementing applicable BMPs and complying with state regulations for exhaust systems will result in no conflict with existing air quality plans and a less than significant impact.

- b. Del Norte County is in attainment for all Federal and State criteria air pollutants. The attainment status for each criteria air pollutant is based on measurements collected at monitoring stations throughout the county. Monitoring results have shown that the principal pollutant in the North Coast Air Basin is PM₁₀. As noted above under Section (a), the project will create a temporary increase of PM₁₀ emissions from earth moving work and vehicle exhaust. Increase in criteria pollutants, including PM₁₀, generated by the project will be limited and temporary. As such, there will be a less than significant impact.
- c. The project area is not known to be located in close proximity to any sensitive receptors or any significant population centers. Any air quality emissions will be limited and temporary and there are no project activities that are anticipated to create a substantial amount of odor. As such, there will be a less than significant impact related to sensitive receptors or other emissions such as odors.

4. Biological Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. No biological resources are expected to be adversely affected by the project because the project is designed to prevent impacts to any state or federally listed species. Fish, frogs, and other aquatic life are not expected to be adversely affected due to the timing of construction. The project will address limiting factors for Coho salmon reproduction and migration (NMFS 2014). The project is designed to restore natural stream flow conditions and facilitate fish passage. More detail on botanical and wildlife species encountered within the project area is listed below.

Botanical Species

Vegetation communities in the survey area were formed by various coastal riparian vegetation assemblages. Most prevalent was the *Salix hookeriana* - *Salix sitchensis* - *Spiraea douglasii* Shrubland Alliance, a sensitive natural community (S3). This alliance was further classified and mapped into the *Salix hookeriana* and *Salix sitchensis* associations. These vegetation associations formed dense mid-canopy cover along Lower Stotenburg Creek with riparian canopy breaks that occurred along the left bank and along road crossings. Invasive weed *Rubus armeniacus* (Himalayan blackberry) had moderate to high understory cover throughout the left bank and sparse to moderate cover along the right bank. The project design includes enhancement of *Salix sitchensis* and *Salix hookeriana* associations with understory invasive weed management activities and subsequent

interplanting. Near Lower Stotenburg Creek confluence, the new channel alignment activities may disturb some *Salix sitchensis* (Sitka willow) however any canopy cover loss will be temporary based on this species recovery after disturbance (willow species have shown rapid regrowth from intact root balls, trunks, branches). The design also includes revegetation in the riparian canopy gaps observed along the left bank of the *Salix hookeriana* Association in the project footprint. The planting palette at these locations include overstory and mid-story species observed in the riparian upper bank locations of the adjacent Smith River. These revegetation areas will enhance the currently monotypic mid-story riparian corridor by adding species known to commonly occur in this vegetation alliance and provide some additional overstory thereby increasing structure complexity and shade.

The upper bank riparian of Smith River adjacent to the project contained primarily *Alnus rubra* Forest Alliance (red alder forest). In this alliance, cover by mature *Populus trichocarpa* (black cottonwood), *Salix lasiandra* (Pacific willow), *Fraxinus latifolia* (Oregon ash), and *Umbellularia californica* (California bay) were prevalent. In the project footprint near Crossing One, this alliance formed a dense overstory with moderate mid-story canopy cover and an understory primarily composed of Himalayan blackberry. The small mature patch that occurred further upstream of Lower Stotenburg Creek was typical of the historical species assemblage along the creek. At this location, the canopy formed an intermittent overstory and nonnative Himalayan blackberry was prevalent within the understory along the unvegetated riparian right bank. The project design revegetation will infill this canopy gap and nonnative vegetation management activities are planned. In general, mature overstory tree species will be avoided by the project where this alliance overlaps with project design features except at Crossing One where around eight red alders will be removed for construction of the road crossing. Riparian enhancement by interplanting with mixed hardwoods and some evergreen conifers where invasive weed management activities are planned in this alliance.

Openings along the Lower Stotenburg riparian corridor contained stands of Himalayan blackberry (*Rubus armeniacus* Semi-Natural Shrubland Association). Revegetation at these locations will first involve the mechanical removal and disposal of this invasive weed species followed by infill planting using a diverse overstory and mid-story riparian planting palette. These project activities will expand the narrowed riparian corridor at these locations and transition these nonnative stand types to native species assemblages. A small portion of the survey area near the Smith River backwater ponded feature (typed as open water) had an open canopy with sparse to moderate cover by *Phalaris arundinacea* (reed canary grass) and was mapped as the *Phalaris arundinacea* Semi-Natural Herbaceous Association. Reed canary grass extended upstream into the *Salix sitchensis* Association that was mapped along the lower extent of Lower Stotenburg Creek. This weedy species had moderate cover along the riparian canopy edge and lower cover underneath the closed mid-story canopy. Reed canary grass removal and disposal will occur where design activities are planned. In addition, best management practices will be employed during construction activities to reduce the spread of seed and plant material throughout the site. One special-status species, *Carex lyngbyei* (Lyngbye's sedge) was noted in this vegetation community. Mid-bank riparian vegetation along the Smith River riverbank was characterized by the *Salix exigua* - *Salix melanopsis* Association, where moderate cover by *Salix melanopsis* was observed. This species colonizes and stabilizes mid-bank areas and although only a small portion is mapped within the survey area, it has a wider occurrence along the Smith River riverbank. This vegetation community is naturally disturbed by fluctuating river water levels and scour. It is outside of the project footprint and will not be impacted by project activities.

One special-status species was observed in survey area: *Carex lyngbyei* (Lyngbye's sedge). During project implementation, the small patch identified in the project will be flagged for avoidance by a qualified biological monitor. The following minimization measures are indicated to be employed to reduce impacts to the population by project activities:

- The Project disturbance footprint will be minimized to the extent possible.

- Ground disturbance and vegetation clearing and/or trimming will be confined to the minimum amount necessary to facilitate Project implementation.
- Heavy equipment and vehicles will use existing access roads to the extent possible.
- Construction materials will be stored in designated staging areas.
- Measures to prevent the spread of invasive weeds will be taken, including, where appropriate, inspecting equipment for soil, seeds, and vegetative matter, cleaning equipment, utilizing weed-free materials and native seed mixes for revegetation, and proper disposal of soil and vegetation. Prior to entering and leaving the work site, workers will remove all seeds, plant parts, leaves, and woody debris (e.g., branches, chips, bark) from clothing, shoes, vehicles, and equipment.

Mitigation Measure BIO-2 is added in order to further protect special-status species. If special-status plant species occur within the project work limits, then a qualified biologist will establish an adequate buffer area for each plant population to exclude activities that directly remove or alter the habitat of, or result in indirect adverse impacts on, the special-status plant species. Temporary fencing will be used to prevent accidental disturbance of the special status plants during construction. If direct impacts cannot be avoided, the project proponent shall prepare a plan for minimizing the impacts by one or more of the following methods: 1) salvage and replant plants at the same location following construction; 2) collect seeds or other propagules for reintroduction to the site at a ratio of 3 plants installed for each 1 special species individual disturbed. Responsible agency staff will be consulted on the minimization plan prior to construction. The success criterion for any seeded, planted, and/or relocated plants shall be full replacement at a 1:1 ratio after five years. Monitoring surveys of the seeded, planted, or transplanted individuals shall be conducted and reported on annually for a minimum of five years, to ensure that the success criterion can be achieved at year 5. If it appears the success criterion would not be met after five years, contingency measures may be applied. Such measures shall include, but not be limited to: additional seeding and planting; altering or implementing weed management activities; or, introducing or altering other management activities.

Wetlands

Wetlands delineated within the survey area occurred along the immediate riparian corridor adjacent to the delineated waters of Smith River and lower Stotenburg Creek. These palustrine wetlands were described by their dominant vegetation composition and classified as temporarily flooded broad-leaved deciduous forest, broad-leaved deciduous scrub/shrub wetlands, and persistent emergent wetlands.

Construction activities associated with the lower Stotenburg Creek enhancement project have the potential to affect preliminary USACE-, State-, CC- and CDFW-jurisdictional features. Some permanent impacts to jurisdictional wetland riparian habitat by the road crossing improvements is anticipated. Bridge footings and the rock slope protection will displace 0.04 ac of adjacent wetlands composed of palustrine broadleaved deciduous scrub-shrub (PS-1) and forest (PF-1) wetlands. Road construction at the downstream road crossing location will remove approximately ten 12- to 18- inch diameter breast height hardwoods within the palustrine broadleaved deciduous forest wetlands (PF-1) in a 0.08 ac area. Overstory canopy is anticipated to remain high at this location by the retained adjacent riparian. Even so, the project includes 0.12 ac of enhancement activities in the existing jurisdictional riparian wetlands associated with nonnative, invasive weed management and revegetation with riparian plantings. Additionally, planned riparian plantings will expand into the existing grassland pasture creating 0.15 ac of riparian habitat.

The rock slope protection installed within the existing waterway footprint (0.01 ac) is not anticipated to impair waters and was considered a temporary impact on jurisdictional waters of lower Stotenburg Creek (W-4). The removal of the existing ford crossing surface and the recontouring of this feature is anticipated to enhance 0.04 ac and create/restore 0.04 ac of the lower Stotenburg Creek bed and bank features. Road construction associated with the new crossings is anticipated to impact some CC- and CDFW-jurisdictional one-parameter

riparian features (0.05 ac). This includes mostly willow scrub riparian habitat with no large diameter trees noted in the proposed road footprint. Enhancement of 0.06 ac of CC- and CDFW-jurisdictional one-parameter riparian features involving invasive weed removal and revegetation is planned. Furthermore, restoration activities, installation of willow baffles adjacent to the existing riparian corridor (0.04 ac) and the previously discussed riparian plantings (0.15 ac-acre), will provide riparian cover continuity in the existing canopy gaps along the stream corridor.

Type conversion is anticipated within the jurisdictional features in the project. Design actions of recontouring and widening the streambed will convert approximately 0.06 acres of existing adjacent wetland types to jurisdictional waters of lower Stotenburg Creek. Within the delineated OHWM of Smith River (W-1–W-3), design activities will convert approximately 0.10 acres of riparian scrub to riverine streambed, and 0.03 ac of riverine streambed to riparian wetland. This enhancement activity includes the conversion of some low-quality riparian scrub that contains high understory cover by nonnative, invasive Himalayan blackberry and reed canary grass, to restored riverine streambed.

The following measures will be implemented to minimize any potential negative impacts on these waters and avoid impacting waters outside of the Project footprint:

- The Project footprint will be minimized to the extent possible.
- Heavy equipment and vehicles will use existing and temporary access roads to the extent possible.
- Work will be conducted during the dry season to the extent possible.
- Construction materials will be stored in designated staging areas.
- The following erosion, sediment, material stockpile, and dust control best management practices will be employed on-site:
 - Locate temporary storage areas away from vehicular traffic;
 - Locate stockpiles a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets;
 - Protect all stockpiles from storm water run-off using a temporary perimeter sediment barrier such silt fences, compost socks, or sandbag barriers;
 - Keep stockpiles covered or protected with soil stabilization measures to avoid direct contact with precipitation and to minimize sediment discharge; and/or
 - Implement wind erosion control practices as appropriate on all stockpiled material.
- All construction equipment will be well maintained to prevent leaks of fuels, lubricants, or other fluids and extreme caution will be used when handling chemicals (fuel, hydraulic fluid, etc.). Service and refueling procedures will not be conducted where there is potential for fuel spills to seep or wash into wetlands or waters. Appropriate materials will be on-site to prevent and manage any spills.

Other Potential Resources

Project staging, project construction, vegetation removal (e.g., clearing and grubbing), vegetation management activities requiring removal of riparian vegetation, or tree trimming shall be performed outside of the bird nesting season (February 1st through August 31st) to avoid impacts to nesting birds; if these activities must be performed during the nesting bird season, a qualified biologist shall conduct a preconstruction survey in the project construction and staging areas for nesting birds and verify the presence or absence of nesting birds no more than 14 calendar days prior to construction activities or after any construction breaks of 14 calendar days or more. Surveys shall be performed for the project construction and staging areas and suitable habitat within 250 feet of the project construction and staging areas in order to locate any active passerine (perching bird) nests and within 500 feet of the project construction and staging areas to locate any active raptor (birds of prey) nest. Survey results shall be sent to County Planning staff and to the California Department of Fish and Wildlife (Habitat Conservation – Eureka Office) within three business days of completion. The survey should include a description of the area surveyed, time and date of surveys, ambient conditions, species observed, active nests

observed, evidence of breeding behaviors (e.g., courtship, carrying nesting material or food, etc.), and a description of any outstanding conditions that may have impacted survey results (e.g., weather conditions, excess noise, predators present, etc).

If active nests are located during the pre-construction bird nesting surveys, no-disturbance buffer zones shall be established around nests, with a buffer size established by the qualified biologist. Typically, these buffer distances are between 50 feet and 250 feet for passerines and between 300 feet and 500 feet for raptors. Buffered zones shall be avoided during construction-related activities until young have fledged or the nest is otherwise abandoned. Final buffer distances shall be made in consultation with the California Department of Fish and Wildlife (Habitat Conservation – Eureka Office) with notification provided to the County Planning Division. Surveys shall be repeated if there is a lapse in the project related work of seven days or longer. Mitigation Measure BIO-3 has been added to reflect this requirement in the event it is needed.

Mitigation Measure BIO-1

All workers performing construction activities shall receive training regarding the environmental sensitivity of the site and the need to minimize impacts. Training regarding sensitive habitats, special-status species, laws and regulations, permit conditions, elk encounters, BMPs, safety, and trash removal shall be covered.

Timing/Implementation: Prior to implementation of construction activities

Enforcement: County Community Development Department

Monitoring: N/A

Mitigation Measure BIO-2

If direct impacts can't be avoided, the applicant shall prepare a plan for minimizing the impacts by one or more of the following methods:

1. Salvage and replant plants at the same location following construction; and,
2. Collect seeds or other propagules for reintroduction to the site at a ratio of 3 plants installed for each 1 special species individual disturbed.

The success criterion for any seeded, planted, and/or relocated plants shall be full replacement at a 1:1 ratio after five years. Monitoring surveys of the seeded, planted, or transplanted individuals shall be conducted and reported on annually for a minimum of five years, to ensure that the success criterion can be achieved at year 5. If it appears the success criterion would not be met after five years, contingency measures may be applied. Such measures shall include, but not be limited to: additional seeding and planting, altering or implementing weed management activities, or introducing or altering other management activities. Approval of the Special Status Plants Mitigation Plan shall be made by the County in consultation with the California Department of Fish and Wildlife.

Timing/Implementation: Upon identification of Special Status Plants located within the project area that may be impacted by the project.

Enforcement: County Community Development Department, California Department of Fish and Wildlife

Monitoring: Annual monitoring surveys for a minimum of five years depending on success of mitigation per success criterion provided in the Special Status Plants Mitigation Plan. Contingency measures will be considered if success criterion not met within five years.

Mitigation Measure BIO-3

If vegetation removal can't be avoided during the nesting season (March 15- August 15 for most species), a qualified biologist shall conduct a preconstruction survey in the project construction and staging areas for nesting birds and verify

the presence or absence of nesting birds no more than 14 calendar days prior to construction activities or after any construction breaks of 14 calendar days or more. Surveys shall be performed for the project construction and staging areas and suitable habitat within 250 feet of the project construction and staging areas in order to locate any active passerine (perching bird) nests and within 500 feet of the project construction and staging areas to locate any active raptor (birds of prey) nest. Survey results shall be sent to County Planning staff and to the California Department of Fish and Wildlife (Habitat Conservation – Eureka Office) within three business days of completion. The survey should include a description of the area surveyed, time and date of surveys, ambient conditions, species observed, active nests observed, evidence of breeding behaviors (e.g., courtship, carrying nesting material or food, etc.), and a description of any outstanding conditions that may have impacted survey results (e.g., weather conditions, excess noise, predators present, etc).

If active nests are located during the pre-construction bird nesting surveys, no-disturbance buffer zones shall be established around nests, with a buffer size established by the qualified biologist. Typically, these buffer distances are between 50 feet and 250 feet for passerines and between 300 feet and 500 feet for raptors. Buffered zones shall be avoided during construction-related activities until young have fledged or the nest is otherwise abandoned. Final buffer distances shall be made in consultation with the California Department of Fish and Wildlife (Habitat Conservation – Eureka Office) with notification provided to the County Planning Division. Surveys shall be repeated if there is a lapse in the project related work of seven days or longer

Timing/Implementation: If any vegetation removal is planned outside of the nesting season (generally March 15 – August 15 for most species)

Enforcement: County Community Development, California Department of Fish and Wildlife

Monitoring: During the construction period

5. Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a-c. No cultural resources are known to exist on-site. The County records were searched for known cultural sites in the general project vicinity, and none were identified. Notice was provided to all tribes traditionally culturally affiliated with the project area and no comment was given with regard to cultural resources. Additionally, cultural staff from the Tolowa-Dee-ni' Nation is a voting member of the County Environmental Review Committee which reviews projects and makes CEQA recommendations. While resources are not known to exist on-site, the possibility of an inadvertent discovery is always possible during construction or other implementation activities associated with the project. In this case, mitigation measures included as CULT-1 assigned to the project will ensure that any resources located on-site will be properly treated as to not cause a significant impact.

Mitigation Measure CULT-1

An inadvertent discovery condition shall be added to the permit stating that in the event of archeological or cultural resources are encountered during construction, work shall be temporarily halted and a qualified archaeologist, local tribes, and the County shall be immediately contacted. Workers shall avoid altering the materials and their context until a qualified professional archaeologist, in collaboration with the local tribes has evaluated the situation and provided appropriate recommendations. Project personnel shall not collect any resources.

Timing/Implementation: Ongoing during the earthwork phase of development subject to the applicable permits

Enforcement: County Community Development Department

Monitoring: N/A

6. Energy

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a-b. Construction of the project will require some energy use including grading and construction along Lower Stotenburg Creek. However, as this is a restoration project with no long term energy use associated with it, it is not anticipated that construction will create a significant environmental impact due to wasteful consumption of energy resources. This project does not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Since the project will improve habitat along Lower Stotenburg Creek and result in expanded salmonid rearing habitat, the project will not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation, and will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, no impact on energy resources will occur.

7. Geology and Soils

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

a-c. The Northern California coast is located in the southern portion of the Cascadia Subduction Zone and is a seismically active area noted by numerous fault zones (Clarke and Carver 1992). The region as a whole is subject to potentially strong seismic ground shaking with earthquakes of 8.4 magnitude or greater (Clarke and Carver 1992). Multiple earthquake sources capable of generating moderate to strong earthquakes are in close proximity to the project site (as noted above) and strong seismic shaking is a regional hazard that could cause major damage to the project area. Due to the proximity to active seismic sources, localized areas in Del Norte County may be subject to secondary seismic effects, such as liquefaction, lateral spread, and seismically-induced land sliding. Liquefaction is the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event.

The Project will result in improved natural hydrologic, geologic, and sediment transport processes in Stotenburg Creek. All project designs have been reviewed and approved by CDFW engineers. Effective erosion control measures will be in place at all times during construction, worksites will be winterized each day when heavy rainfall is forecasted and an adequate supply of erosion control materials (e.g. gravel, straw bales and shovels) will be maintained onsite to facilitate a quick response to unanticipated storm events. Disturbed soils will be restored and revegetated at project completion to prevent erosion and ensure rapid establishment of native vegetation. The existing roads and stream crossings are within the 100-year flood zone of the Smith. The bridge structure will be bolted together during assembly to prevent risk of movement during a flood event. Additionally, in a flood scenario on the Smith River (e.g., a 100-year flood), it is possible the river could scour to near the proposed new Crossing 1 location, as it did in the 1964 flood. If the bridge was shifted or damaged during the flood event, re-installing the bridge post-flood would be substantially more cost-effective and logistically feasible than re-installing a large box culvert.

The project will use best management practices (BMPs) to prevent erosion and control sediment, as described in the current California Stormwater BMP handbook for construction. Upon the completion of the site grading, all disturbed surfaces shall be treated in order to prevent erosion. Erosion control measures will cover all disturbed and or graded surfaces, with the exception of river or stream bed.

All areas disturbed by grading shall be reseeded and mulched, only native seed and weed free straw will be used in sensitive habitats. A weed free pasture seed mix may be used on access roads outside of the riparian

zone. All necessary measures will be taken to minimize erosion of unfinished excavations, grading or work surfaces. Worksites will be winterized at the end of each day when significant rains are forecasted. All areas of bare soil outside the dry streambed, that are disturbed during construction will be mulched, seeded and planted with native plants after project implementation. The project will have an excess of 169 cubic yards of spoils. Fine sands and silts will be spread diffusely on pasture areas and mixed sand cobble and gravel will be stockpiled for re-use on road surfaces. All sediment control BMPs shall be maintained throughout the wet season until new vegetation is established.

- d. No impacts related to geology and/or soils, as a result of this project, are expected to occur. The site is not located on expansive soil as defined in Table 18-1-B.
- e. No septic or sewer systems are proposed as part of the project. As such, no impact will occur.
- f. No unique paleontological or geological resources are known to exist at the project site. As such, there will be no impact on unique paleontological or geological resources.

8. Greenhouse Gas Emissions

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. Global temperatures are affected by naturally occurring and anthropogenic-generated atmospheric gases such as water vapor, carbon dioxide, methane, and nitrous oxide. Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Emissions of GHGs from human activities such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere and are reported to have led to a trend of unnatural warming of the earth's climate, known as global warming or global climate change, and should be lessened and/or mitigated whenever possible.

In 2002, the California legislature declared that global climate change was a matter of increasing concern for the state's public health and environment, and enacted laws requiring the state Air Resources Board (ARB) to control GHG emissions from motor vehicles (Health & Safety Code §32018.5 et seq.). CEQA Guidelines define greenhouse gases to include carbon dioxide (CO₂), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The California Global Warming Solutions Act of 2006 (Assembly Bill 32) definitively established the state's climate change policy and set GHG reduction targets (Health & Safety Code §38500 et seq.). The State set its target at reducing greenhouse gases to 1990 levels by 2020. Executive Order B-30-15 and SB 32 extended the goals of AB 32 and set a 2030 goal of reducing emissions 40 percent from 2020 levels. This action keeps California on target to achieve the level of reductions scientists say is necessary to meet the Paris Agreement goals (CA Air Resources Board Climate Change Scoping Plan 2017).

In 2011, the CEQA Guidelines Section 15064.4 Appendix G was modified to include thresholds of significance for Greenhouse Gases. The project would have potential significant impacts if the project would: generate

greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Construction of the project would cause GHG emissions as a result of combustion of fossil fuels used in construction equipment, vehicles from workers commuting to and from the site, and the importing of construction material for the reservoir. The project would require the use of several pieces of heavy earthmoving and construction equipment in addition to other small engine-powered tools and equipment. The NCUAQMD has not adopted a threshold for construction-related GHG emissions against which to evaluate significance and has not established construction-generated criteria air pollutant screening levels above which quantitative air quality emissions would be required.

Excavated sediment and road fill will be maintained onsite to reduce impacts to traffic, greenhouse gas emissions, and air quality. An estimated 4,000 gallons of diesel and 50 gallons of gasoline will be consumed during project construction. The proposed project will restore and protect over 3.5 acres of native riparian vegetation. The riparian area will be enhanced by removing non-native plant species and installing over 131 native plants, including conifer trees. The riparian area will be protected with cattle exclusion fencing allowing for vegetation to mature and sequester carbon. This 3.5-acre protected riparian area will sequester 145.14 Mt CO₂-e over the first 5 years. Plant installation will take place on 0.35 acres. Native trees and shrubs will be planted in riparian areas currently lacking riparian cover, areas disturbed by project construction, and areas cleared of invasive plants. An additional 26.9 Mt CO₂-e will be sequestered over the first 5 years from this riparian planting. Impacts associated with the project are anticipated to be less than significant.

- b. The project is expected to result in a temporary and minimal increase in GHG emissions with an ultimate decrease in GHG emissions on project completion. It does not conflict with an applicable plan or policy and no impact will occur.

9. Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

in the project area?				
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a-b. The project will not create a significant hazard to the public or environment. All heavy equipment will be in good condition, inspected for leaks and washed prior to working within the action area and daily to prevent spills of hazardous materials. Spill containment, absorbent cleanup materials and emergency contact numbers will be onsite at all times during project construction and all contractors and responsible parties will be trained in the appropriate steps should a spill occur. All fueling will occur at least 100 feet from any waterway or stream to prevent impacts to water quality and contamination of hazardous materials. All pumps will be placed on absorbent mats. All machinery will be stored in designated staging areas at least 65' outside of riparian areas.

Construction of the project would require the use and transport of hazardous materials including fuels, oils, and other chemicals used during construction activities. Improper use and transportation of hazardous materials could result in accidental releases or spills, potentially posing health risks to workers, the public, and the environment. These activities are controlled by County code provisions and state regulations (Health and Safety Code Division 20: Miscellaneous Health and Safety Provisions). Additionally, construction activities at the project site will incorporate current best management practices (BMPs) for construction, including site housekeeping practices, hazardous material storage, inspections, maintenance, worker training in pollution prevention measures, and secondary containment of releases to prevent pollutants from being carried off-site via runoff.

The proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving hazardous materials release into the environment. Therefore, a less than significant impact would occur.

- c-f. The project is located north of Redwood Elementary School within two miles of an existing school, but is not on a site designated as hazardous, or in an airport plan area or within two miles of an existing airport. The Del Norte County Regional Airport is located approximately nine miles south southwest of the project site. The restoration project is adjacent to existing access routes and will not block any existing roadways that may be used as evacuation routes. As the project will not store hazardous material onsite and is not located near airports and will not interfere with existing evacuation plans, no impact will occur.
- g. There is a small risk of an accidental spark igniting a fire and spills of fuels or other hazardous materials, but the potential for these impacts will be reduced to a less than significant level through implementation of mitigation measures outlined in a spill prevention and response plan (available upon request). Based on the low potential of wildfire, there will be less than significant impact.

10. Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
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Initial Study and Draft Mitigated Negative Declaration – Smith River Alliance – Use Permit for Lower Stotenburg Creek Fish Passage Project – UP2303C – October 2022

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on-or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional source of polluted runoff; or	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable ground water management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. The project does not involve any activities that would violate water quality standards or wastewater discharge requirements. Upon completion of the restoration project, water quality within Lower Stotenburg Creek will be enhanced. No impact is expected to occur.
- b. The project will have no impact on groundwater supplies or recharge. Because the project will improve channel connectivity and flow in Lower Stotenburg Creek, the ultimate effect will be positive on groundwater resources.
- c. The project is designed to improve the flow and connectivity of the restored portion of Lower Stotenburg Creek. Based on project design elements, any erosion or surface water runoff impacts will be less than significant.
- d. According to the Del Norte County GIS Portal, a portion of the project site is located within the Tsunami Evacuation Zone. Additionally, the project is located in the Zone AE flood zone associated with the Smith River; however, the enhancements are not expected to increase flooding. Project equipment will only be located in the area temporarily and will not introduce significant risk of release of pollutants due to inundation. As such, there will be less than significant impacts from potential pollution due to the project inundation.
- e. As noted previously, the project will have no impact on groundwater resources and will therefore have no impact related to a sustainable groundwater management plan. As such, there will be no conflict with existing water quality plans, and no impact will occur.

11. Land Use and Planning

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. The project involves restoration and habitat enhancement on Lower Stotenburg Creek. No project aspect would divide an existing community; therefore, no impact would occur.
- b. The General Plan Land Use designation for the project site is agricultural exclusive (AE) and resource conservation area (RCA). The project is consistent with the Del Norte County General Plan goals and policies for natural resources. The project will protect, restore and enhance habitats that support fish and wildlife species (Goal 1. E.) and support the continued viability of Del Norte County's agricultural economy (Goal 1.G.). The project will restore critical habitat protections for federally listed threatened and endangered species (Policy 1.E.2), maintain the continuation of existing agricultural uses of grazing within existing farmed wetlands (Policy 1.E.27 and 1.G.4.), and ensure that riparian vegetation be maintained along streams, creeks and other water courses for their qualities as wildlife habitat, stream buffer zones and bank stabilization (Policy 1.E.28.). The project will encourage the conservation of soils on agricultural lands and is compatible with the existing agricultural use of the area. As such, no impact would occur.

12. Mineral Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a-b. No mineral resources and no mineral resource extraction currently occurs within the project site. No mining is proposed. The project would not affect the availability of a known mineral resource that would be of value to the region, nor would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a specific, general plan or other land use plan. Therefore, no impact would occur.

13. Noise

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a-b. Increased noise levels will be temporarily present in the area during the project. Work will be conducted between the hours of 8:00 to 18:00 each day to minimize impacts to the surrounding residential housing. Additionally, the project will be conducted expeditiously to reduce the timeframe of elevated noise levels in the project area. The Project will not result in any change in noise levels after construction is completed. All operations will comply with OSHA regulations. Internal combustion engines will be equipped with a muffler of a type recommended by the manufacturer. Equipment used for restoration will utilize the best available noise control techniques (e.g. engine enclosures, acoustically attenuating shields or shrouds, ducts, etc.) whenever feasible and necessary. Since noise from construction activities will be limited to permitted hours, temporary in nature, and attenuated to within acceptable levels for the current rural residential land designation, effects from the project will be less than significant.
- c. The project is not located within any airport influence areas and does not fall within any noise contours that would indicate the exposure of employees to excessive noise level. As such, the project will not expose people residing or working in the project area to excessive airport-related noise levels, and no impact would occur.

14. Population and Housing

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. The project will not induce substantial population growth in the area. No impact would occur.

- b. The project would not displace any number of existing people or housing. No impact would occur.

15. Public Services

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. As discussed in the Population and Housing section, the project would not directly or indirectly induce population growth nor create new demand for services. Therefore, the project would have no impact on the service ratios, response times, or other performance objectives of schools, parks, and other public facilities and services that are based on population growth. No impact would occur

16. Recreation

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a-b. The project would not directly or indirectly induce substantial population growth nor would the project expand services. Therefore, the project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration would occur or be accelerated. The project would not include recreational facilities. Therefore, the project would not require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. No impact would occur.

17. Transportation

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision(b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. There will be an increase of traffic on the roadways from construction vehicles and other necessary equipment for staging, grading, and restoration activities. Increased traffic from oversized vehicles and equipment may have an impact on roadway accessibility for non-motorized users. However, this impact will be intermittent and temporary with no long term effects. Additionally, equipment will be staged away from main roadways when possible in order to better facilitate access by non-motorized users during construction of the reservoir. Impacts to traffic and safety along existing roadways and bike path networks will be minimal and temporary. The project does not propose any alterations to existing roads, trails, or other non-vehicle paths of travel.

Fred Haight Drive is a public county road and designated as a Major Collector. A county encroachment permit will be acquired prior to project construction. Traffic safety rules and regulations will be followed when hauling materials on or off-site. Project activities and staging areas will primarily be located on private property during construction to reduce impacts to traffic on Fred Haight Drive. As such, the project will not conflict with any policies regarding transportation in the area and a less than significant impact will occur.

- b. Restoration activities will create additional VMTs due to trips from construction workers and delivery of materials. It is unknown where construction workers would be traveling from and as such it is difficult to estimate the actual number of vehicle miles that will be generated. It is also unknown how many delivery trips will be required to bring all necessary construction materials to the site; however, these trips will only last for the duration of construction. After construction is completed, vehicle trips are expected to return to pre-project conditions. The project will generate some additional VMTs during project implementation, however these will be limited and temporary, with VMTs impacts less than significant.
- c-d. As the project does not propose any modifications to local roadways, it will also not create inadequate emergency access. During construction, access roads will be kept clear in the event of an emergency in order to facilitate adequate access. As such, there will be no impact from design features, incompatible uses, or inadequate emergency access.

18. Tribal Cultural Resources

Would the project:	Potentially Significant	Less Than Significant Impact	Less Than Significant	No Impact
--------------------	-------------------------	------------------------------	-----------------------	-----------

	Impact	with Mitigation Incorporated	Impact	
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a. No cultural resources are known to exist on-site. The County records were searched for known cultural sites in the general project vicinity, and none were identified. Notice was provided to the two tribes traditionally culturally affiliated with the project area and no comment was given with regard to cultural resources. Additionally, cultural staff from the Tolowa-Dee-ni' Nation is a voting member of the County Environmental Review Committee which reviews projects and makes CEQA recommendations. While resources are not known to exist on-site, the possibility of an inadvertent discovery is always possible during construction or other implementation activities associated with the project. In this case, mitigation measures included as CULT-1 assigned to the project will ensure that any resources located on-site will be properly treated as to not cause a significant impact.

19. Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the providers existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion of Impacts

- a. Utility service providers will be contacted prior to the Project to ensure excavation avoids all underground service lines. Overhead power lines near the project area will be avoided. In June 2019 an underground utility locator determined that the Crossing 4 fill contains a telephone and internet data cable, but no power lines. This finding was confirmed by the local foreman who was involved with constructing Crossing 4 in 2003/2004. The commercial business' phone/internet utilities are provided from another location outside the project area and we assume the residence relies on the utility lines buried in Crossing 4. Replacing Crossing 4 will require a short-term disruption of these services and a potential temporary replacement is being discussed with the residence landowner and utility companies. Power is provided to the affected properties via overhead lines outside the project area. Based on the existing infrastructure in place impacts will be less than significant.
- b. The project does not involve any increase in potable water demand. As such, there will be no impact.
- c. The project does not involve any development that would require additional wastewater capacity or construction of facilities that would increase demands from existing developments. As such, there will be no impact.
- d-e. The project will create a temporary increase in solid waste during construction. However, operations will not increase the amount of solid waste above existing levels. During construction of the project, construction workers must comply with all County and State solid waste diversion, reduction, and recycling mandates. As such, impacts will be less than significant.

20. Wildfire

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion of Impacts

- a. Wildland fire protection in California is the responsibility of either the State, local, or federal government. A State Responsibility Area (SRA) is a legal term defining the area where the State has financial responsibility for wildland fire protection. Incorporated cities and areas of federal ownership are not included. The prevention and suppression of fires in all areas that are not SRAs are primarily the responsibility of local or federal

agencies. There are more than 31 million acres in state responsibility area with an estimated 1.7 million people and 750,000 existing homes. Local Responsibility Areas (LRAs) include incorporated cities, cultivated agriculture lands, and portions of the desert. Local responsibility area fire protection is typically provided by: city fire departments, fire protection districts, counties, and by CAL FIRE under contract to local government. The project site is within both the Fort Dick Fire Protection District (FPD) and the Smith River FPD, and in the SRA. Both FPDs provide structural fire protection and emergency services to the Fort Dick and Smith River communities, respectively, and surrounding areas. Construction work at the project site would be temporary and roads would still be accessible so as to not impair an adopted emergency plan or emergency evacuation plan by ensuring access in the event of an emergency or evacuation. Therefore, there would be no impacts.

- b-d. The project does not include site-specific modifications that would expose project occupants to pollutants from a wildfire or other uncontrolled spread of wildfire. The project includes installation of an emergency water source, however, it would not exacerbate fire risk as there is an existing emergency water source or result in temporary or ongoing impacts to the environment, or expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire instability, or drainage change, As such, there would be no impacts.

21. Mandatory Findings of Significance

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a-c. Certain mandatory findings of significance must be made to comply with CEQA Guidelines §15065. The proposed project has been analyzed, and it has been determined that it would not:

- Substantially degrade environmental quality;
- Substantially reduce fish or wildlife habitat;
- Cause a fish or wildlife population to fall below self-sustaining levels;
- Threaten to eliminate a plant or animal community;
- Reduce the numbers or range of a rare, threatened, or endangered species;
- Eliminate important examples of the major periods of California history or pre-history;
- Achieve short term goals to the disadvantage of long-term goals;

- Have environmental effects that will directly or indirectly cause substantial adverse effects on human beings; or,
- Have possible environmental effects that are individually limited but cumulatively considerable when viewed in connection with past, current, and reasonably anticipated future projects.

The project has been evaluated in this initial study and determined to have no potentially significant unmitigated impacts. With implementation of the proposed mitigation measures all potentially significant impacts would be reduced to less than significant levels.

Due to the rural nature of the project site and surrounding resource conservation land uses the project as a whole does not have the potential to significantly degrade the quality of the environment, including air quality, fish or wildlife species or their habitat, plant or animal communities, important examples of the major periods of California history or prehistory, geologic resources, hazards, water resources, land use compatibility, noise, traffic movement, or other adverse effects, directly or indirectly, on human beings. The project as presented would restore fish and other wildlife habitat and contribute to water quality enhancement.

The project's individual impacts would not add appreciably to any existing or foreseeable future significant cumulative impact, such as visual quality, historic resources, traffic impacts, or air quality degradation. Incremental impacts, if any, would be small and undetectable. As reported throughout this document, any impacts to which this project would contribute would be mitigated to a less than significant level.

Mitigation Monitoring Plan

Biological Resources

Mitigation Measure BIO-1

All workers performing construction activities shall receive training regarding the environmental sensitivity of the site and the need to minimize impacts. Training regarding sensitive habitats, special-status species, laws and regulations, permit conditions, elk encounters, BMPs, safety, and trash removal shall be covered.

Timing/Implementation: Prior to implementation of construction activities

Enforcement: County Community Development Department

Monitoring: None

Mitigation Measure BIO-2

If direct impacts can't be avoided, the applicant shall prepare a plan for minimizing the impacts by one or more of the following methods:

1. Salvage and replant plants at the same location following construction; and,
2. Collect seeds or other propagules for reintroduction to the site at a ratio of 3 plants installed for each 1 special species individual disturbed.

The success criterion for any seeded, planted, and/or relocated plants shall be full replacement at a 1:1 ratio after five years. Monitoring surveys of the seeded, planted, or transplanted individuals shall be conducted and reported on annually for a minimum of five years, to ensure that the success criterion can be achieved at year 5. If it appears the success criterion would not be met after five years, contingency measures may be applied. Such measures shall include, but not be limited to: additional seeding and planting, altering or implementing weed management activities, or introducing or altering other management activities. Approval of the Special Status Plants Mitigation Plan shall be made by the County in consultation with the California Department of Fish and Wildlife.

Timing/Implementation: Upon identification of Special Status Plants located within the project area that may be impacted by the project.

Enforcement: County Community Development Department, California Department of Fish and Wildlife

Monitoring: Annual monitoring surveys for a minimum of five years depending on success of mitigation per success criterion provided in the Special Status Plans Mitigation Plan. Contingency measures will be considered if success criterion not met within five years.

Mitigation Measure BIO-3

If vegetation removal can't be avoided during the nesting season (March 15- August 15 for most species), a qualified biologist shall conduct a preconstruction survey in the project construction and staging areas for nesting birds and verify the presence or absence of nesting birds no more than 14 calendar days prior to construction activities or after any construction breaks of 14 calendar days or more. Surveys shall be performed for the project construction and staging areas and suitable habitat within 250 feet of the project construction and staging areas in order to locate any active passerine (perching bird) nests and within 500 feet of the project construction and staging areas to locate any active raptor (birds of prey) nest. Survey results shall be sent to County Planning staff and to the California Department of Fish and Wildlife (Habitat Conservation – Eureka Office) within three business days of completion. The survey should include a description of the area surveyed, time and date of surveys, ambient conditions, species observed, active nests observed, evidence of breeding behaviors (e.g., courtship, carrying nesting material or food, etc.), and a description of

any outstanding conditions that may have impacted survey results (e.g., weather conditions, excess noise, predators present, etc).

If active nests are located during the pre-construction bird nesting surveys, no-disturbance buffer zones shall be established around nests, with a buffer size established by the qualified biologist. Typically, these buffer distances are between 50 feet and 250 feet for passerines and between 300 feet and 500 feet for raptors. Buffered zones shall be avoided during construction-related activities until young have fledged or the nest is otherwise abandoned. Final buffer distances shall be made in consultation with the California Department of Fish and Wildlife (Habitat Conservation – Eureka Office) with notification provided to the County Planning Division. Surveys shall be repeated if there is a lapse in the project related work of seven days or longer

Timing/Implementation: If any vegetation removal is planned outside of the nesting season (generally March 15 – August 15 for most species)

Enforcement: County Community Development, California Department of Fish and Wildlife

Monitoring: During the construction period

Cultural Resources

Mitigation Measure CULT-1

An inadvertent discovery condition shall be added to the permit stating that in the event of archeological or cultural resources are encountered during construction, work shall be temporarily halted and a qualified archaeologist, local tribes, and the County shall be immediately contacted. Workers shall avoid altering the materials and their context until a qualified professional archaeologist, in collaboration with the local tribes has evaluated the situation and provided appropriate recommendations. Project personnel shall not collect any resources.

Timing/Implementation: Ongoing during the earthwork phase of the warehouse building subject to the Building Permit

Enforcement: County Community Development Department

Monitoring: N/A

LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT FINAL DESIGN

DEL NORTE COUNTY, CA

GENERAL NOTES, TERMS, & CONDITIONS:

1.

DESIGN INTENT. THESE DRAWINGS REPRESENT THE GENERAL DESIGN INTENT TO BE IMPLEMENTED AND CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE PROJECT MANAGER FOR ANY CLARIFICATIONS OR FURTHER DETAILS NECESSARY TO ACCOMMODATE ACTUAL SITE CONDITIONS. ANY DEVIATION FROM THESE PLANS WITHOUT THE ENGINEER'S APPROVAL ARE AT THE CONTRACTOR'S OWN RISK AND EXPENSE. NOTIFY PROJECT MANAGER IMMEDIATELY OF ANY UNEXPECTED OR CHANGED CONDITIONS, SAFETY HAZARDS, OR ENVIRONMENTAL PROBLEMS ENCOUNTERED.
2.

JOB SITE CONDITIONS AND CONTRACTOR RESPONSIBILITY. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, AND ALL ENVIRONMENTAL PROTECTION ELEMENTS, WHETHER SHOWN ON THESE DRAWINGS OR NOT. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CONSTRUCTION AND SAFETY REGULATIONS. THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND WILL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE ENGINEER (STILLWATER SCIENCES) HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.
3.

DAMAGE. CONTRACTOR SHALL EXERCISE CARE TO AVOID DAMAGE TO EXISTING PUBLIC AND PRIVATE PROPERTY, INCLUDING NATIVE TREES AND SHRUBS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, THEY SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION, AND SIZE. ANY SUCH COST MAY BE DEDUCTED FROM MONIES DUE CONTRACTOR UNDER THIS CONTRACT.
4.

LIMITS OF WORK, ACCESS, STAGING AND MOBILIZATION AREAS. THE APPROXIMATE LIMITS OF WORK ARE SHOWN ON THE DRAWINGS. EXACT LIMITS OF WORK, POINTS OF INGRESS-EGRESS, CREEK CHANNEL ACCESS, MOBILIZATION, STAGING, AND WORK AREAS WILL BE FLAGGED IN THE FIELD BY THE ENGINEER. EQUIPMENT MAINTENANCE AND FUELING MUST OCCUR OUTSIDE OF THE CHANNEL AREA AS DESCRIBED IN THE ENVIRONMENTAL PERMITS FOR THE PROJECT.
5.

WORK IN STREAM CHANNELS AND STREAM DIVERSIONS. ALL WORK INVOLVING USE OF HEAVY EQUIPMENT MUST BE COMPLETED FROM TOP OF BANK UNLESS A SPECIFIC POINT OF CREEK CHANNEL ACCESS HAS BEEN APPROVED AND IS SHOWN ON THE PLANS, AND THEN ONLY IN NON-LIVE WATER AS DEFINED BY CDFW. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE DEWATERING PLAN DEPICTED IN THIS PLAN SET.

5.1.

CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSING OF ALL WATER CONTROL STRUCTURES AND EQUIPMENT.

5.2.

THE CONTRACTOR SHALL FURNISH, INSTALL, AND OPERATE ALL OTHER NECESSARY MACHINERY, APPLIANCES, AND EQUIPMENT TO DIVERT FLOWING WATER AROUND WORK AREAS, AND TO KEEP EXCAVATIONS AND TRENCHES REASONABLY FREE FROM WATER DURING CONSTRUCTION. CONTRACTOR SHALL DISPOSE OF THE WATER SO AS NOT TO CAUSE INJURY TO PUBLIC OR PRIVATE PROPERTY, OR TO CAUSE A NUISANCE OR A MENACE TO THE PUBLIC, OR TO DEGRADE WATER QUALITY. THEY SHALL AT ALL TIMES HAVE ON HAND SUFFICIENT PUMPING EQUIPMENT AND MACHINERY IN GOOD WORKING CONDITION FOR ALL ORDINARY EMERGENCIES AND SHALL HAVE AVAILABLE AT ALL TIMES COMPETENT MECHANICS FOR THE OPERATION OF ALL PUMPING EQUIPMENT. IF THE CONTRACTOR CHOOSES TO USE A PUMPING SYSTEM FOR ANY PORTION OF THE WATER CONTROL WORK, THEY SHALL HAVE ADEQUATE BACK-UP EQUIPMENT TO ENSURE THE CONTINUOUS OPERATION OF THE EQUIPMENT.

5.3.

THE CONTRACTOR SHALL AT ALL TIMES PROVIDE FOR THE ADEQUATE RETURN FLOW OF DIVERSIONS BELOW THE PROJECT SITE. THE CONTRACTOR MAY TEMPORARILY DIVERT WATER DURING CONSTRUCTION, AS OUTLINED IN THE APPROVED STREAM DIVERSION AND WATER CONTROL PLAN. THIS MAY INCLUDE FOR INSTANCE, VISQUEEN AND STRAW BALE OR SAND BAG DIVERSION DIKES AND PIPING SYSTEMS. RETURN FLOW SHALL BE FILTERED THROUGH FILTER CLOTH, STRAW BALES AND/OR THROUGH A SERIES OF STILLING BASINS WHEN REQUIRED.

5.4.

TURBID DEWATERING FLOWS SHALL BE PUMPED INTO A HOLDING FACILITY OR SPRAYED OVER A LARGE AREA OUTSIDE THE STREAM CHANNEL TO ALLOW FOR NATURAL INFILTRATION OF SEDIMENTS. AT NO TIME SHALL TURBID WATER FROM THE HOLDING FACILITY BE ALLOWED BACK INTO THE STREAM CHANNEL UNTIL WATER IS CLEAR OF SILT.

5.5.

ALL HEAVY EQUIPMENT MUST HAVE A SUPPLY OF SORBENT PADS AVAILABLE TO CLEAN-UP GREASE, OIL, OR FUEL THAT DRIPS OR SPILLS INTO THE STREAM CHANNEL. USED PADS ARE TO BE DISPOSED OF PROPERLY AT CONTRACTOR'S EXPENSE.

6.

EARTHWORK QUANTITIES. CONTRACTOR IS RESPONSIBLE FOR ALL EARTHWORK, INCLUDING GRADING, PROVISION AND PLACEMENT OF ROCK MEETING SIZE LIMITS, AS SHOWN ON DRAWINGS, AND DISPOSAL OF ALL EXCESS SOIL AND RUBBLE. EARTHWORK QUANTITIES, INCLUDING GRADING, PLACED ROCK SLOPE PROTECTION AND OFF-HAUL QUANTITY ESTIMATES PROVIDED BY THE ENGINEER ARE ESTIMATES ONLY. THE ENGINEER DOES NOT, EXPRESSLY OR OTHERWISE BY IMPLICATION, EXTEND ANY WARRANTY TO EARTHWORK CALCULATIONS

7.

THE CONTRACTOR SHALL BE GIVEN COPIES OF ALL THE PERMITS, SHALL BECOME FAMILIAR WITH THE PERMIT REQUIREMENTS, AND SHALL BE RESPONSIBLE FOR ADHERENCE TO AND CONFORMANCE WITH ALL PERMIT CONDITIONS.

8.

AREAS TO BE GRADED SHALL BE CLEARED OF ALL VEGETATION INCLUDING ROOTS AND OTHER UNSUITABLE MATERIAL FOR A STRUCTURAL FILL, THEN SCARIFIED TO A DEPTH OF 6 INCHES PRIOR TO PLACING OF ANY FILL.

9.

AREAS WITH EXISTING SLOPES WHICH ARE TO RECEIVE FILL MATERIAL SHALL BE KEYED AND BENCHED.

10.

FILL MATERIAL SHALL BE SPREAD IN LIFTS NOT EXCEEDING 6 INCHES IN COMPACTED THICKNESS, MOISTENED OR DRIED AS NECESSARY TO NEAR OPTIMUM MOISTURE CONTENT AND COMPACTED BY AN APPROVED METHOD. FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY 1957 ASTM D - 1557 - 91 MODIFIED PROCTOR (AASHTO) TEST OR SIMILAR APPROVED METHODS.

11.

CUT SLOPES SHALL NOT EXCEED A GRADE OF 1.5 HORIZONTAL TO 1 VERTICAL. FILL AND COMBINATION FILL AND CUT SLOPES SHALL NOT EXCEED 2 HORIZONTAL TO 1 VERTICAL. SLOPES OVER THREE FEET IN VERTICAL HEIGHT SHALL BE PLANTED WITH APPROVED PERENNIAL OR TREATED WITH EQUALLY APPROVED EROSION CONTROL MEASURES PRIOR TO FINAL INSPECTION.

12.

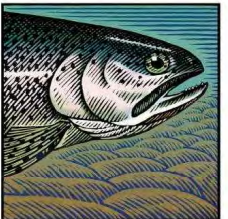
BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES: ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ONSITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM. TRASH AND CONSTRUCTION RELATED SOLID WASTE MUST BE DEPOSITED INTO A COVERED WASTE RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND. SEDIMENTS AND OTHER MATERIAL MAY NOT BE TRACKED FROM TO THE SITE BY VEHICLE TRAFFIC.
- VICINITY MAP
-
- PROJECT LOCATION MAP
-
- | Sheet List Table | |
|------------------|---|
| Sheet Number | Sheet Title |
| 1 | TITLE SHEET |
| 2 | PLAN OVERVIEW |
| 3 | STOTENBURG 1+00 TO 11+00 |
| 4 | STOTENBURG 1+00 TO 11+00 CROSS SECTIONS |
| 5 | STOTENBURG 11+00 TO 21+00 |
| 6 | STOTENBURG 21+00 TO END |
| 7 | DEWATERING PLAN |
| 8 | PLANTING PLAN |
| 9 | CULVERT AND BRIDGE DETAILS |
| 10 | ENGINEERED LOG JAM (ELJ) |
| 11 | DETAILS |
| 12 | DETAILS |
- EARTHWORK ESTIMATES:
- CUT: 888 CY
- IMPORT:
200 CY 0.5-2 TON RIPRAP ROCK
34 PIECES LARGE WOOD
- FILL:
719 CY ON-SITE
- NET: 169 CUBIC YARDS CUT
- ABBREVIATIONS AND SYMBOLS:
- <E> EXISTING
- <P> PROPOSED
- 3
8
DETAIL # ON SHEET
SHEET #
- LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT FINAL DESIGN
- DEL NORTE COUNTY, CA
- Stillwater Sciences
- 850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607
-
- SMITH RIVER ALLIANCE
-
- PROJECT NUMBER: 765.00
- SCALE: AS NOTED
- DATE: 10/7/2019
- DESIGN: DC/JM
- DRAWN: RT
- CHECKED: DC/JM
- APPROVED: JM
-
- TITLE SHEET
- SHEET 1 OF 12

LOWER STOTENBURG
CREEK COHO HABITAT
ENHANCEMENT FINAL
DESIGN

DEL NORTE COUNTY, CA

Stillwater Sciences

850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607



SMITH
RIVER
ALLIANCE



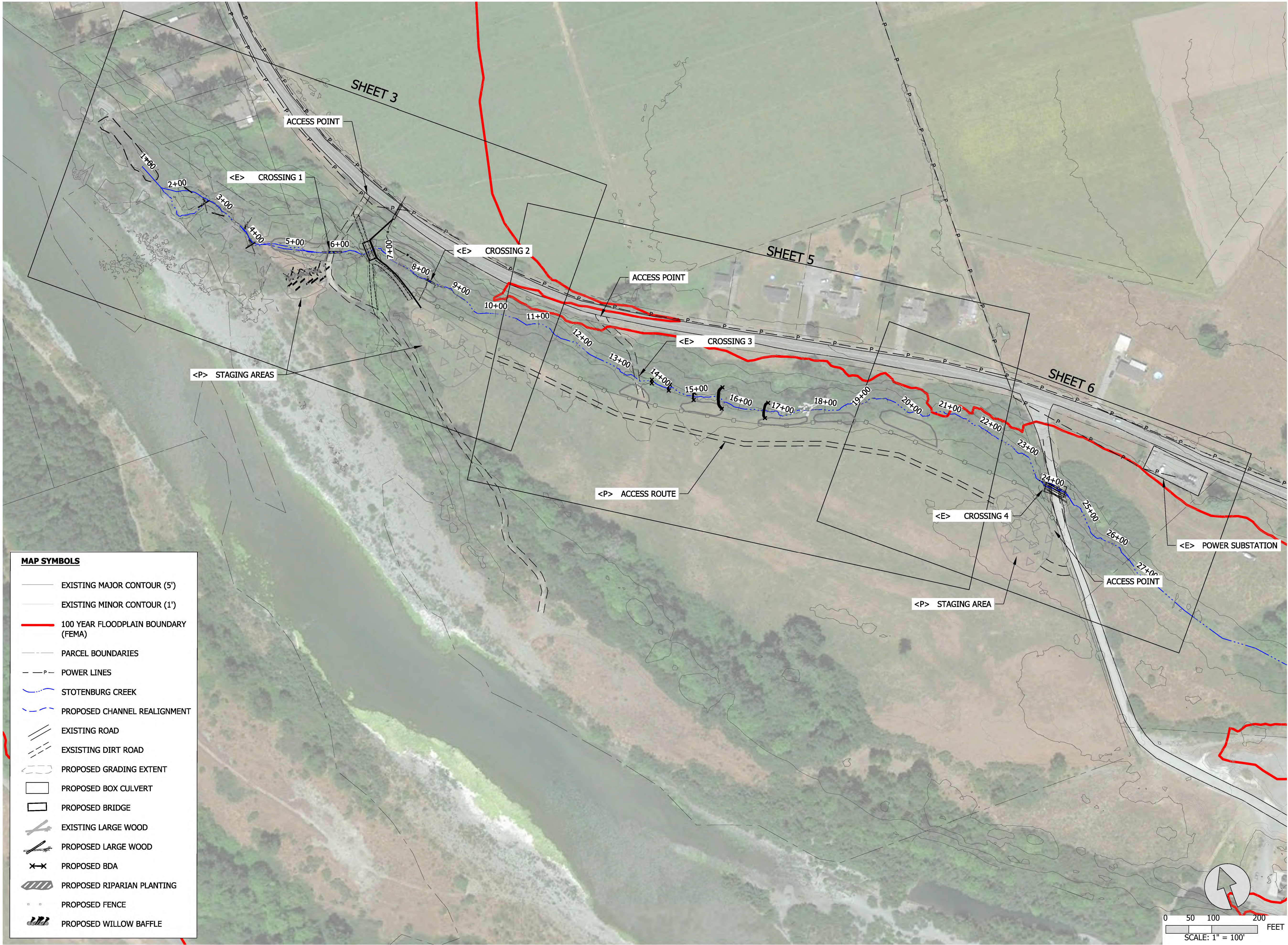
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SCALE: AS NOTED
DATE: 10/7/2019

DESIGN: DC/JM
DRAWN: RT
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APPROVED: JM



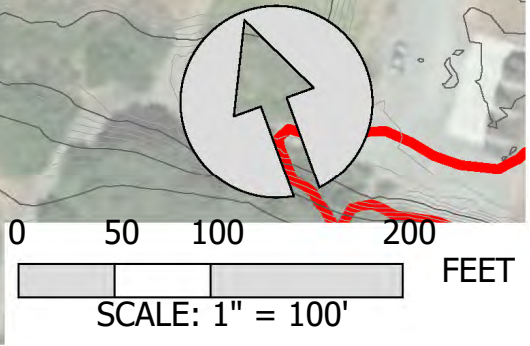
PLAN OVERVIEW

SHEET 2 OF 12



MAP SYMBOLS

- EXISTING MAJOR CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- 100 YEAR FLOODPLAIN BOUNDARY (FEMA)
- PARCEL BOUNDARIES
- POWER LINES
- STOTENBURG CREEK
- PROPOSED CHANNEL REALIGNMENT
- EXISTING ROAD
- EXISTING DIRT ROAD
- PROPOSED GRADING EXTENT
- PROPOSED BOX CULVERT
- PROPOSED BRIDGE
- EXISTING LARGE WOOD
- PROPOSED LARGE WOOD
- PROPOSED BDA
- PROPOSED RIPARIAN PLANTING
- PROPOSED FENCE
- PROPOSED WILLOW BAFFLE



LOWER STOTENBURG
CREEK COHO HABITAT
ENHANCEMENT FINAL
DESIGN

DEL NORTE COUNTY, CA

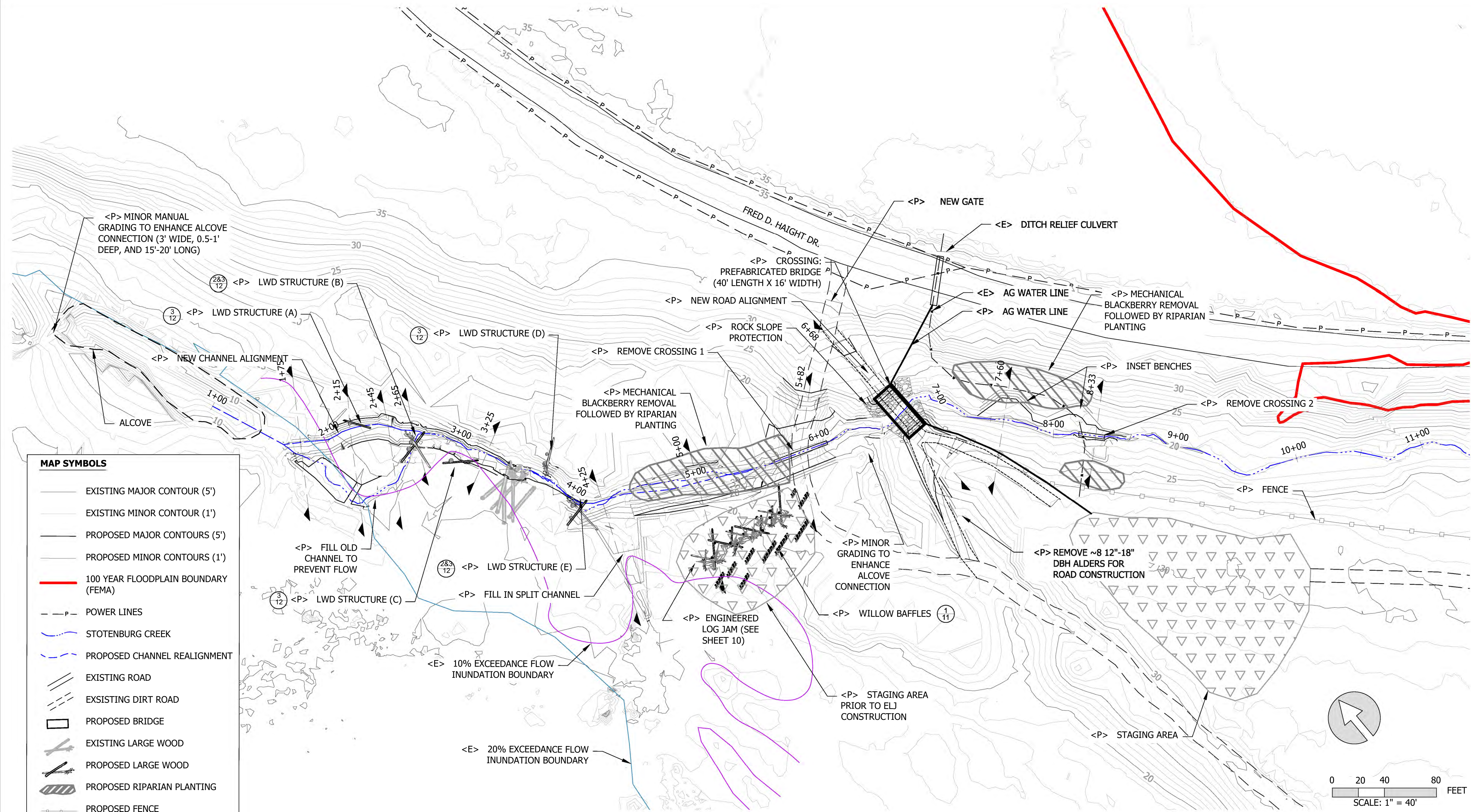
Stillwater Sciences

850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607

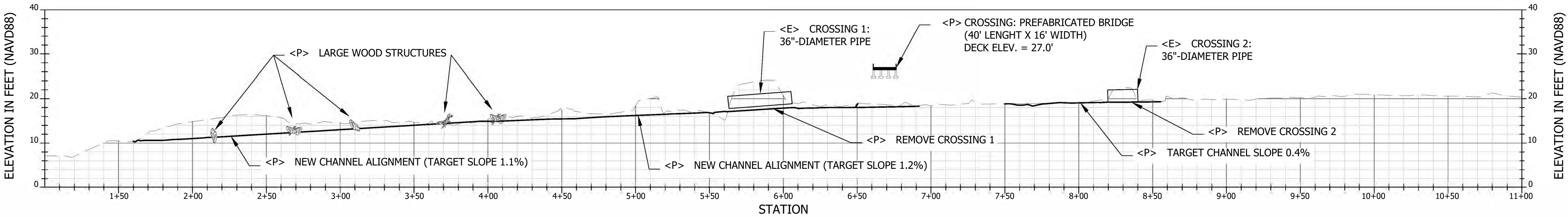


SMITH
RIVER
ALLIANCE

- MAP SYMBOLS**
- EXISTING MAJOR CONTOUR (5')
 - EXISTING MINOR CONTOUR (1')
 - PROPOSED MAJOR CONTOURS (5')
 - PROPOSED MINOR CONTOURS (1')
 - 100 YEAR FLOODPLAIN BOUNDARY (FEMA)
 - POWER LINES
 - STOTENBURG CREEK
 - PROPOSED CHANNEL REALIGNMENT
 - EXISTING ROAD
 - EXISTING DIRT ROAD
 - PROPOSED BRIDGE
 - EXISTING LARGE WOOD
 - PROPOSED LARGE WOOD
 - PROPOSED RIPARIAN PLANTING
 - PROPOSED FENCE
 - PROPOSED WILLOW BAFFLE



<P>STOTENBURG CREEK (STA. 1+00 TO 11+00)



PROJECT NUMBER: 765.00
SCALE: AS NOTED
DATE: 10/7/2019

DESIGN: DC/JM
DRAWN: RT
CHECKED: DC/JM
APPROVED: JM



STOTENBURG 1+00 TO
11+00

SHEET 3 OF 12

LOWER STOTENBURG
CREEK COHO HABITAT
ENHANCEMENT FINAL
DESIGN

DEL NORTE COUNTY, CA

Stillwater Sciences

850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607



SMITH
RIVER
ALLIANCE



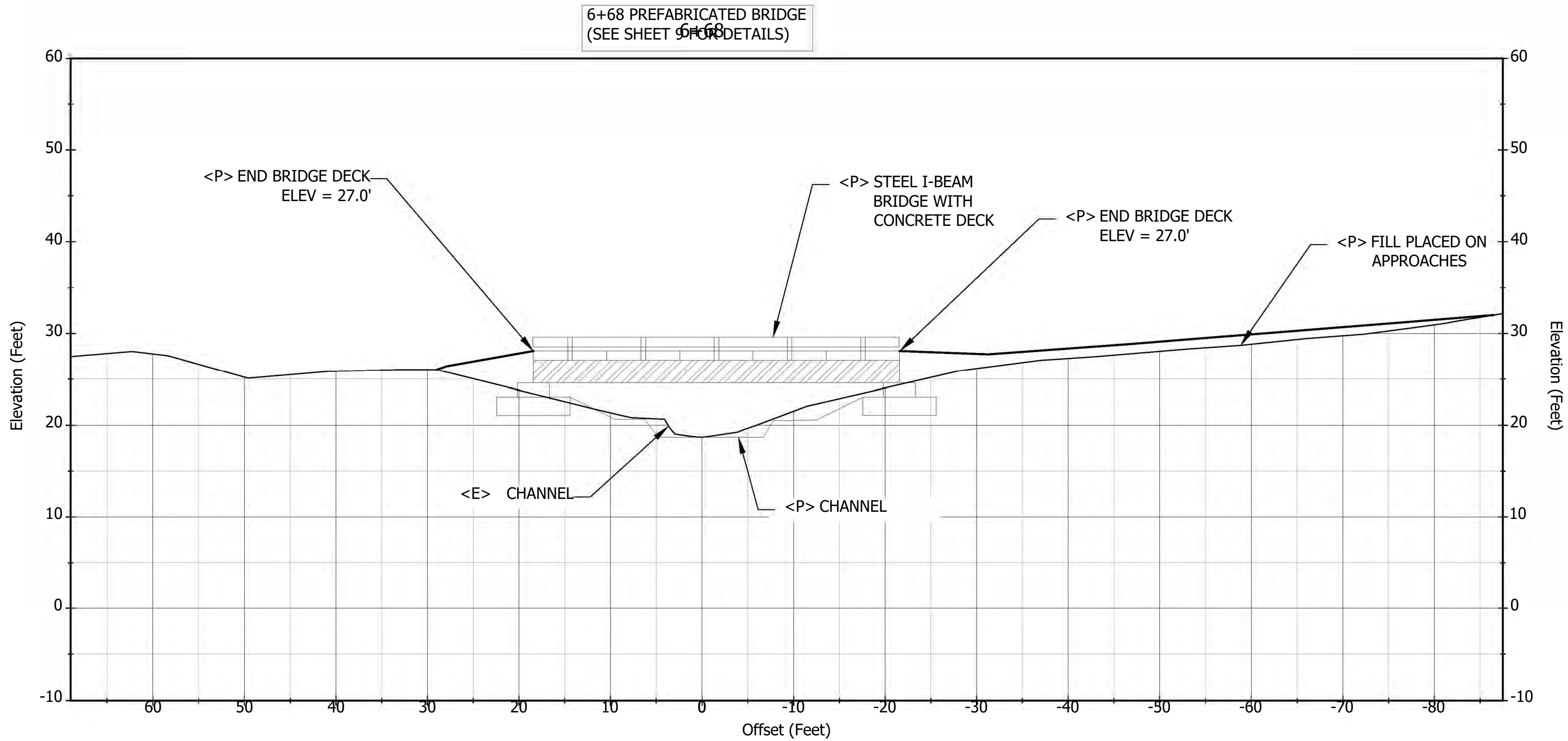
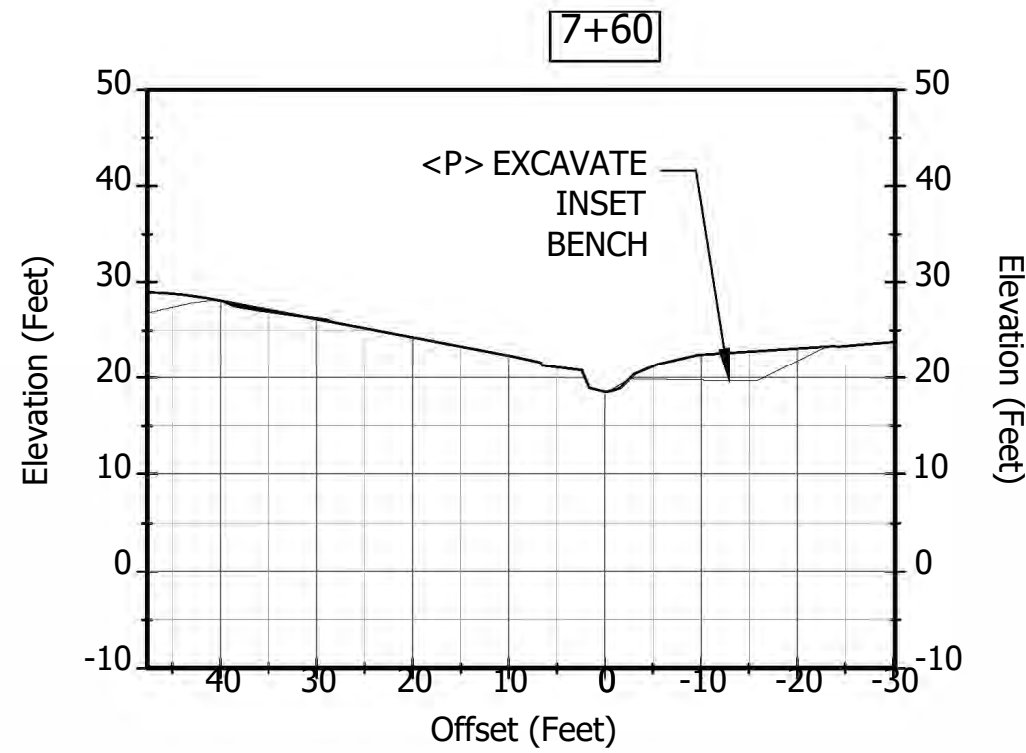
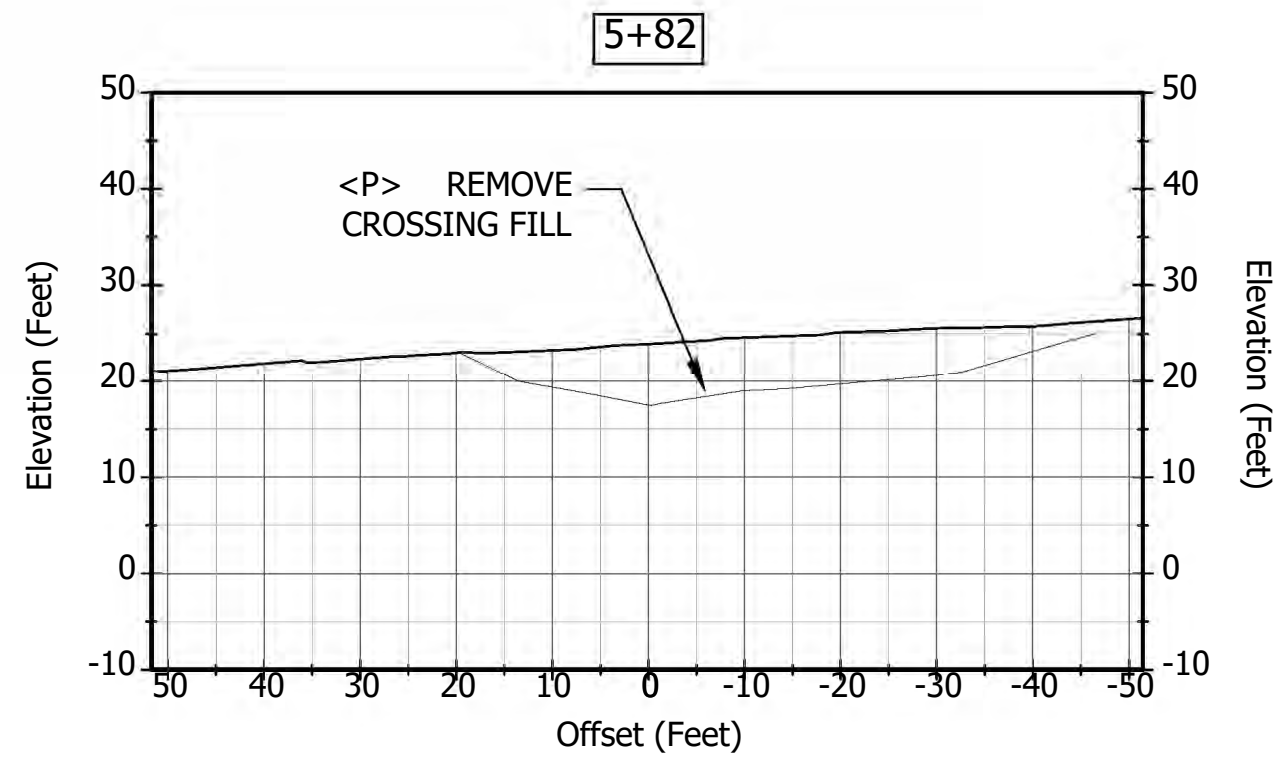
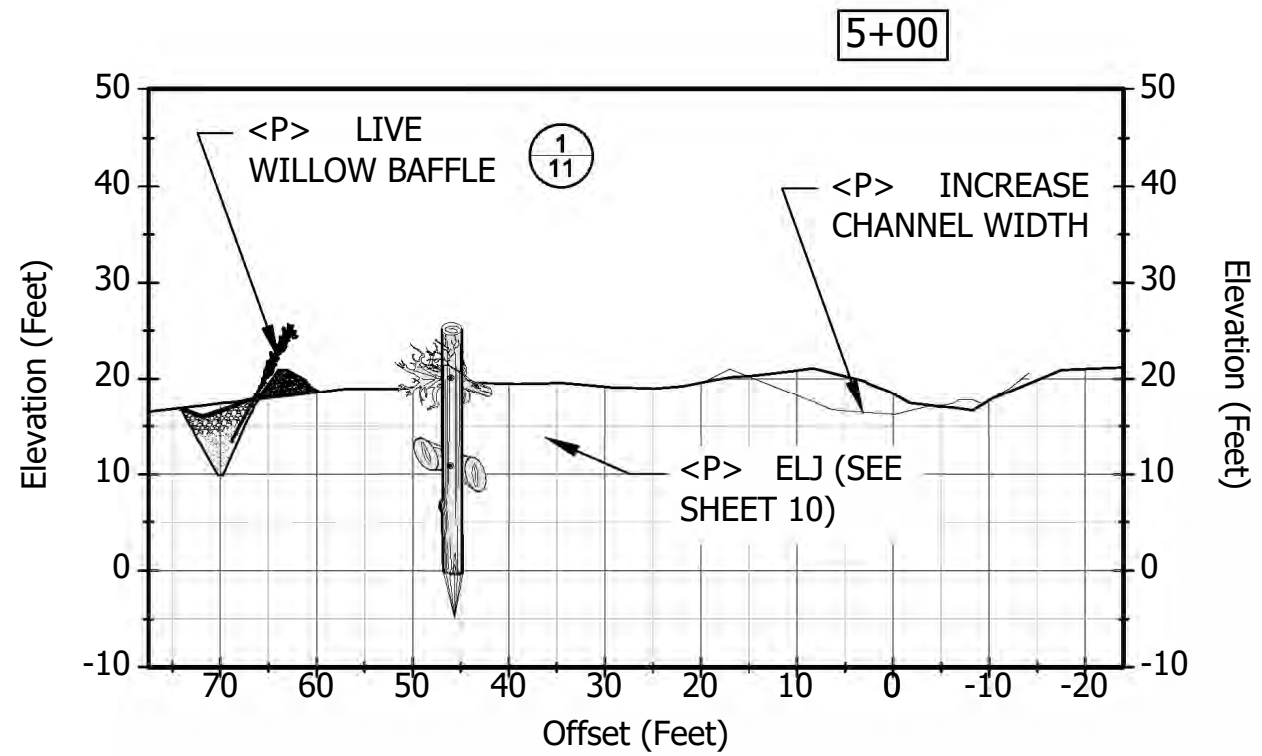
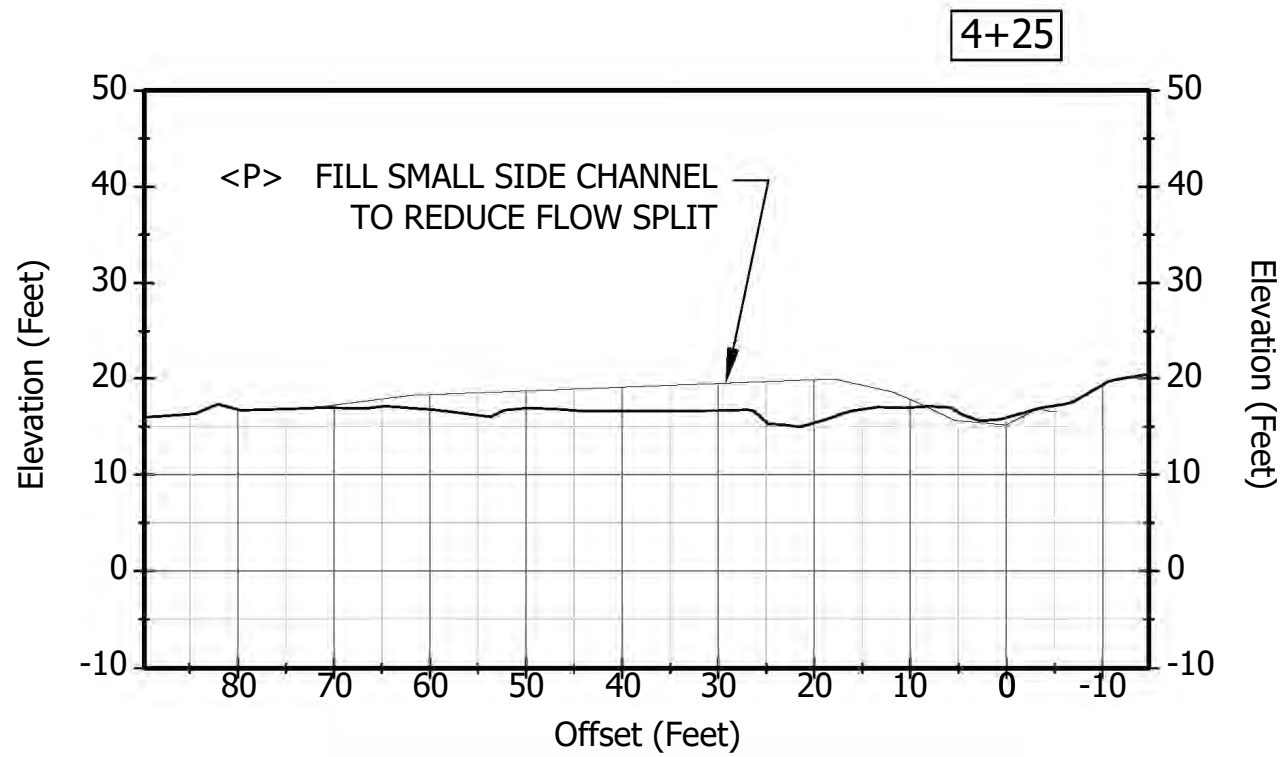
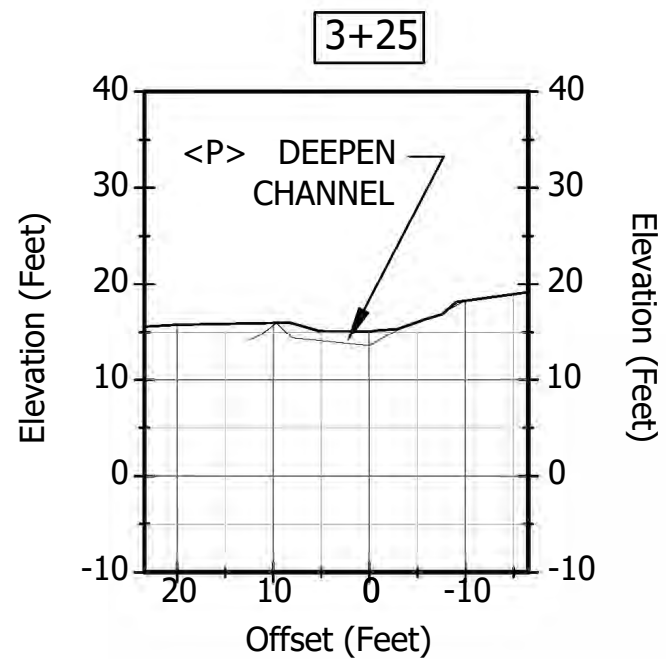
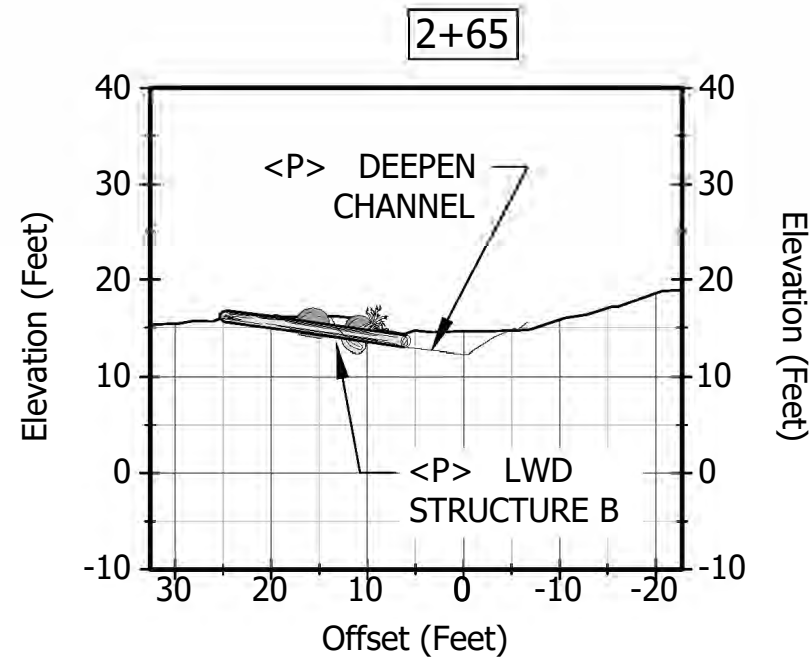
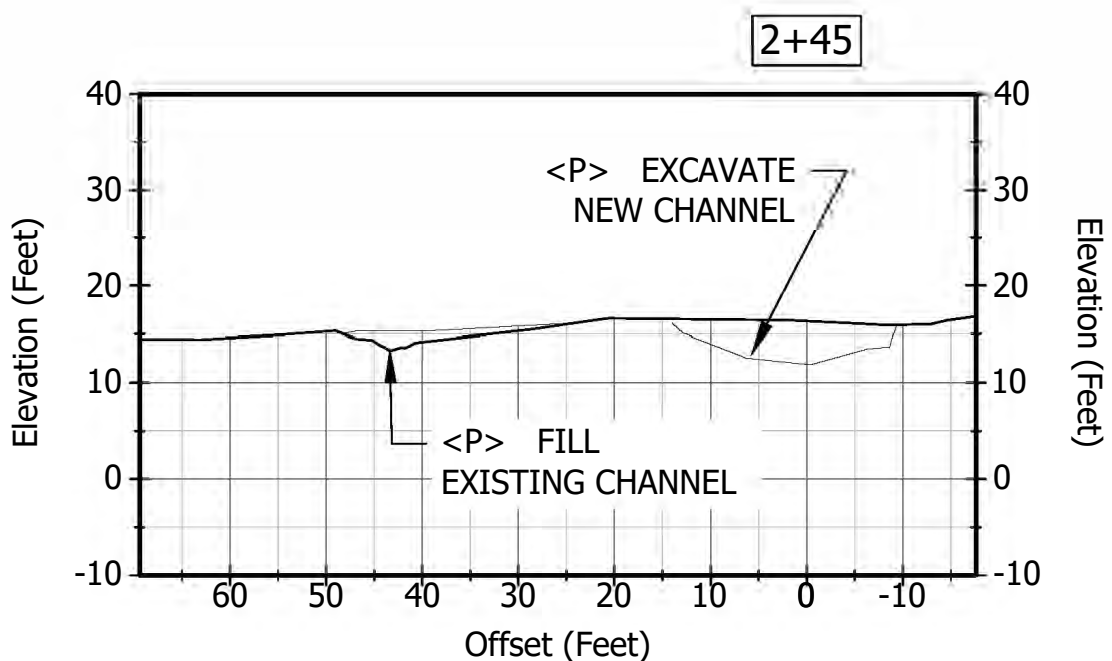
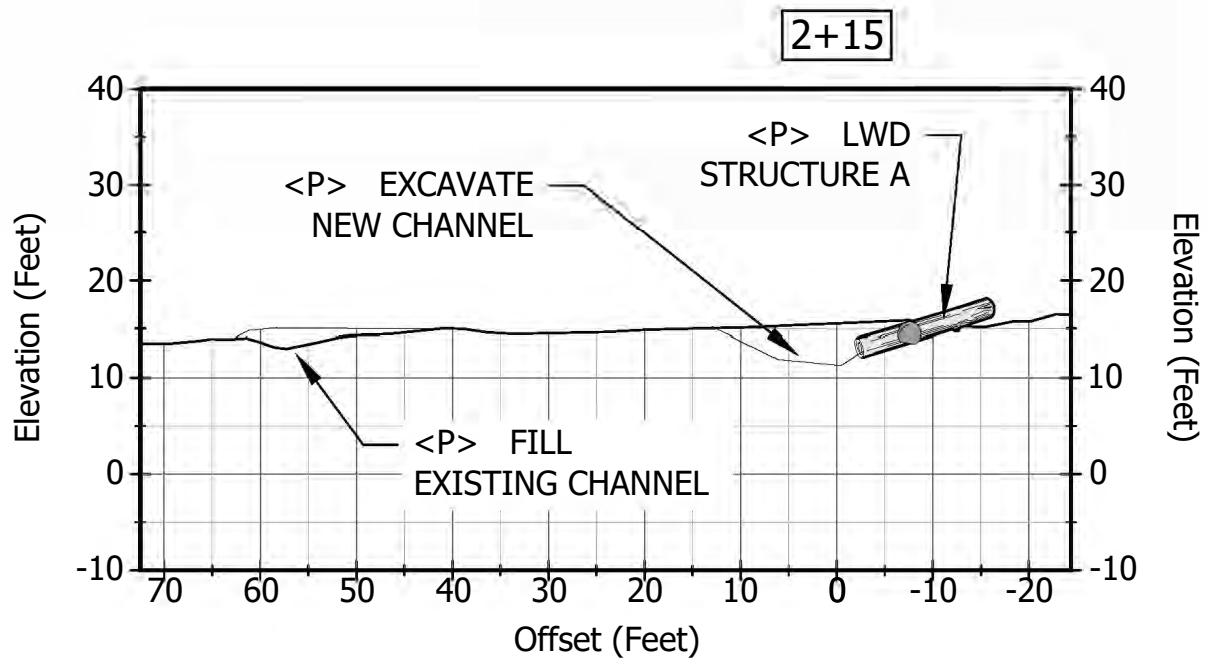
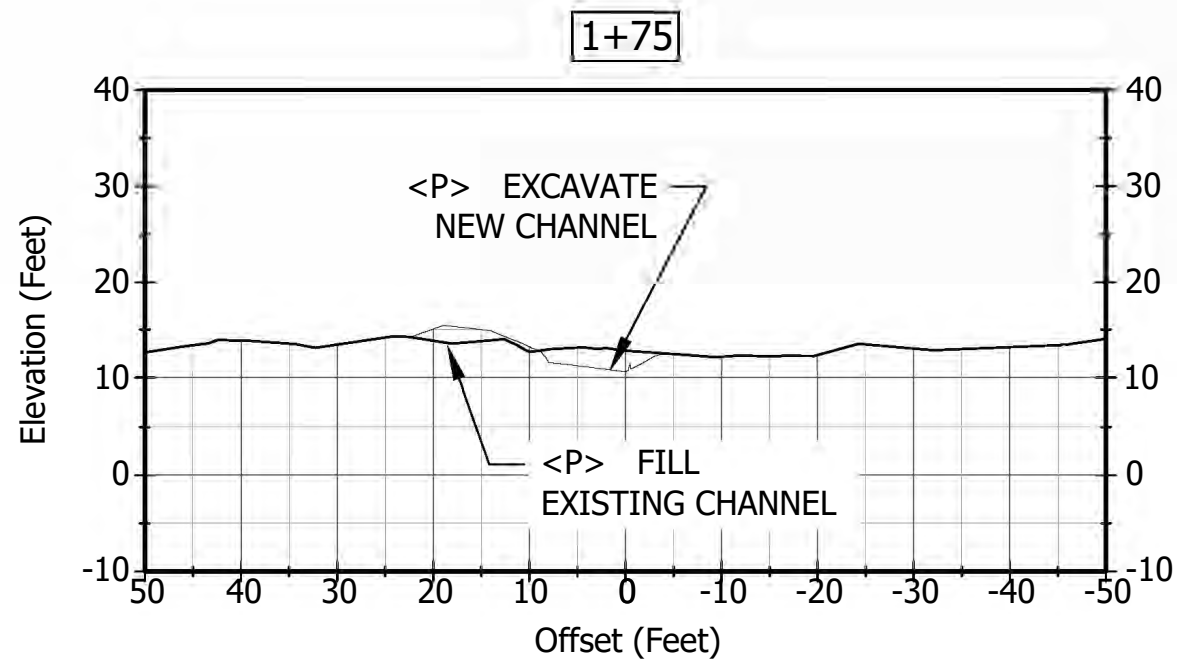
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SCALE: AS NOTED
DATE: 10/7/2019

DESIGN: DC/JM
DRAWN: RT
CHECKED: DC/JM
APPROVED: JM



STOTENBURG 1+00 TO
11+00 CROSS SECTIONS

SHEET 4 OF 12



LOWER STOTENBURG
CREEK COHO HABITAT
ENHANCEMENT FINAL
DESIGN

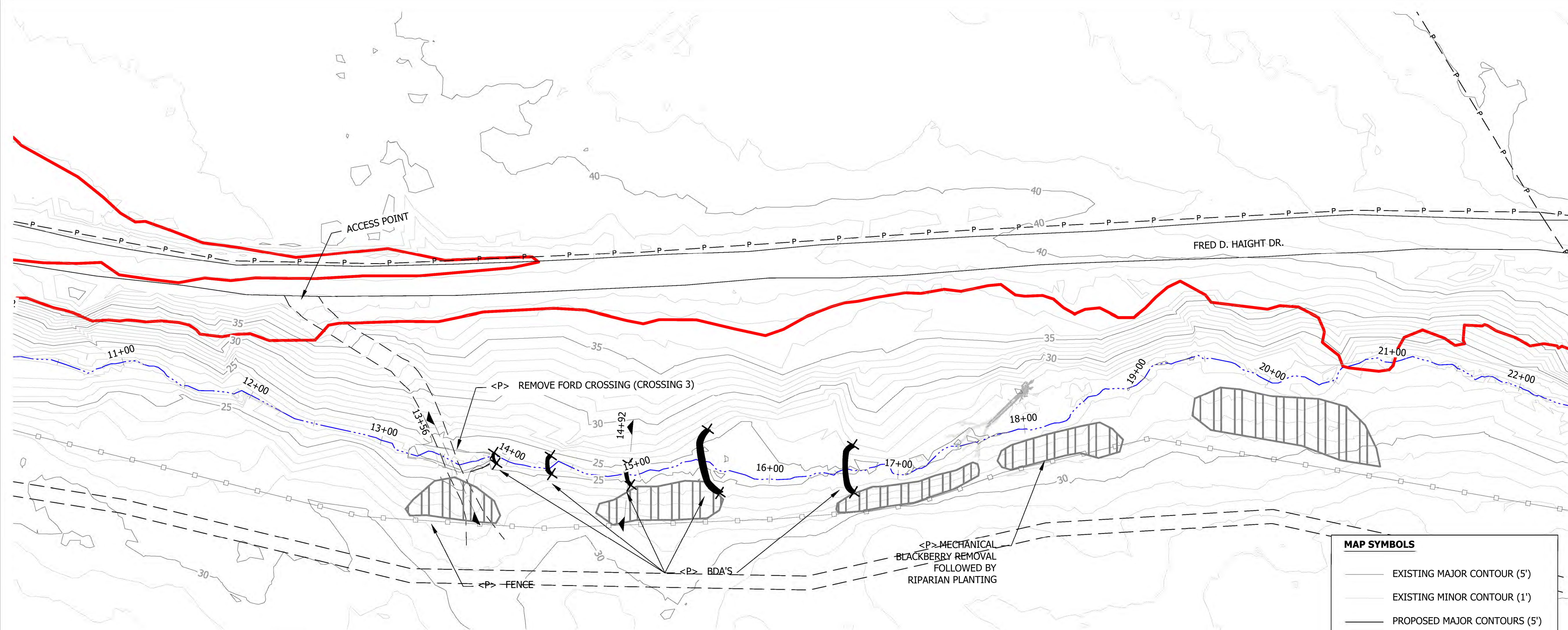
DEL NORTE COUNTY, CA

Stillwater Sciences

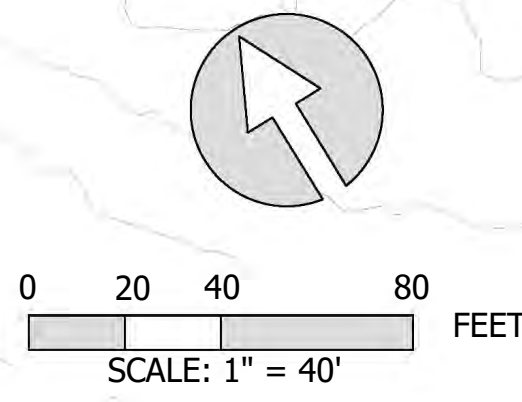
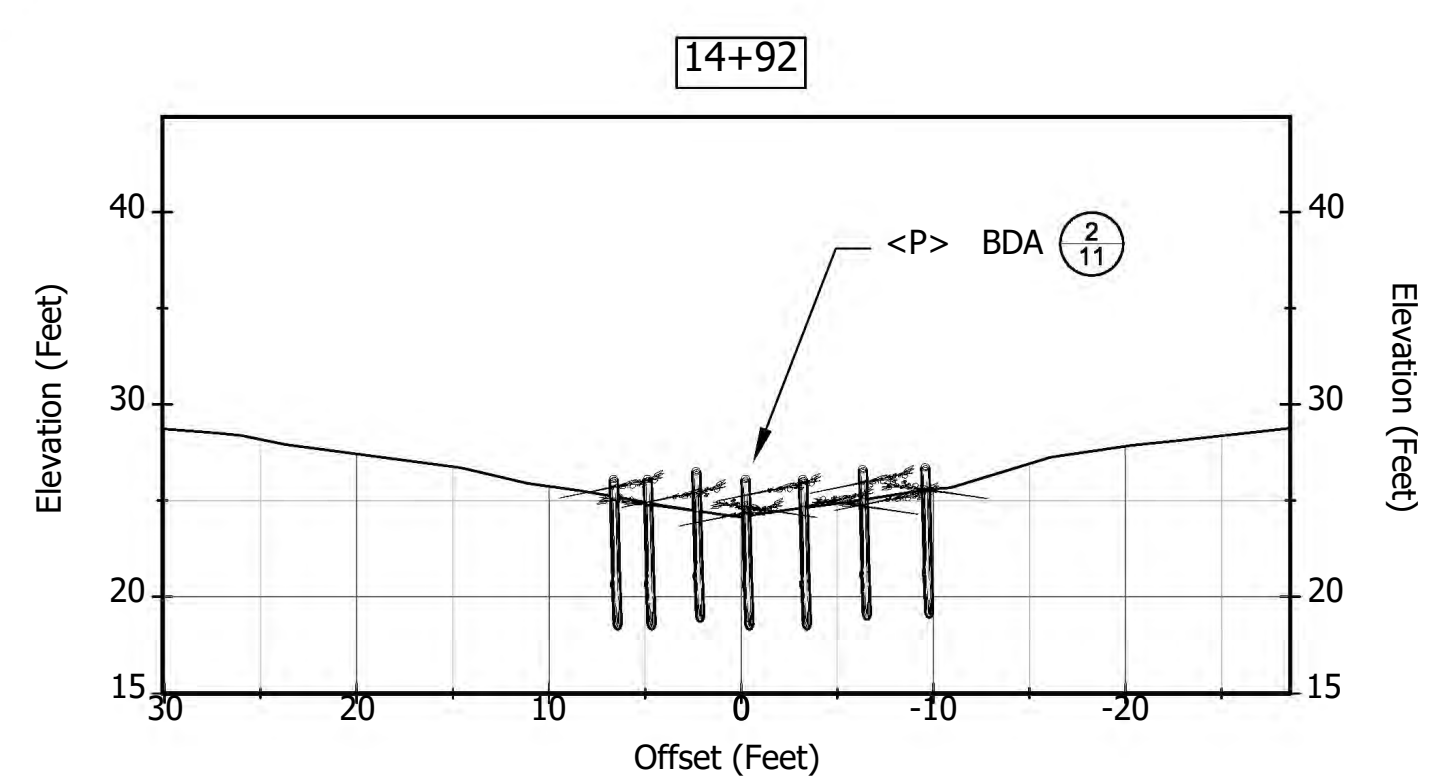
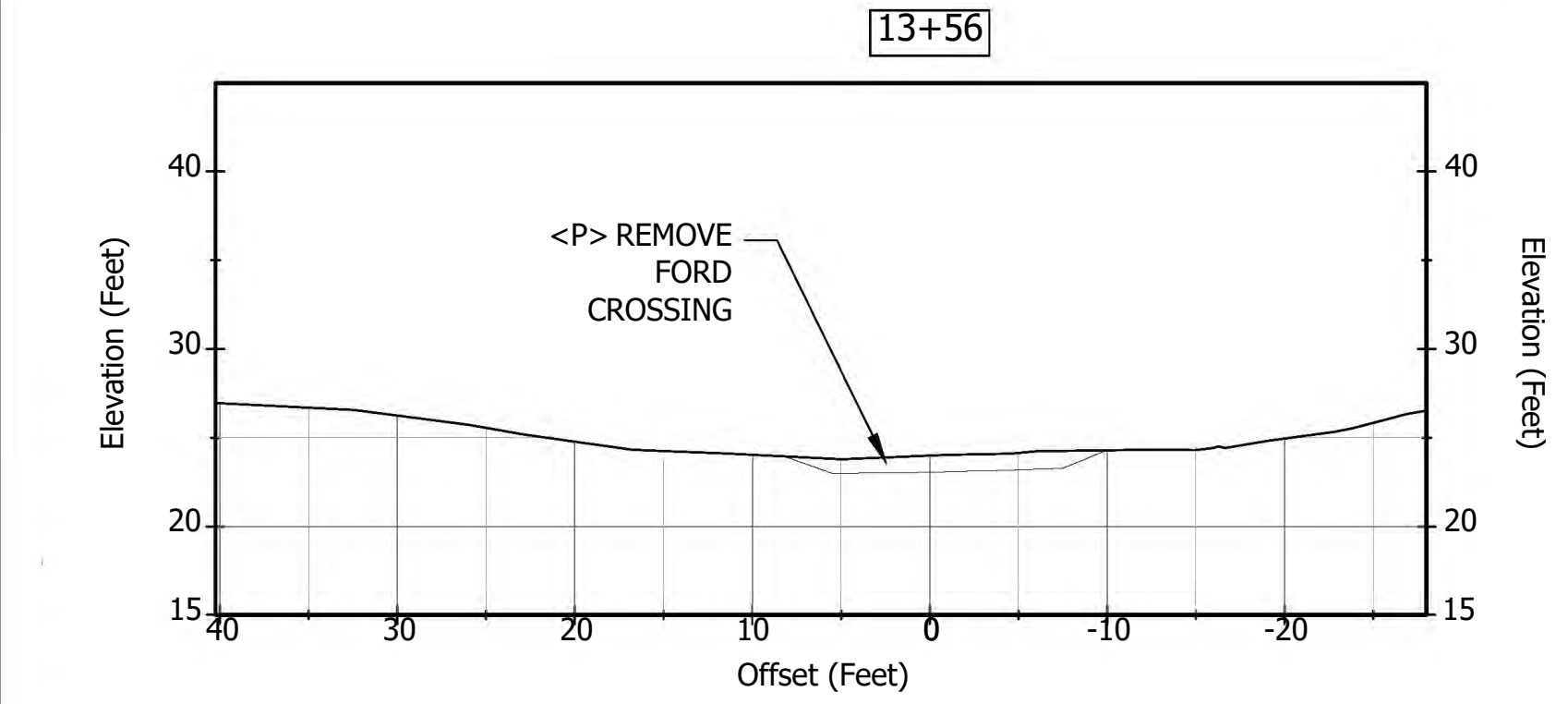
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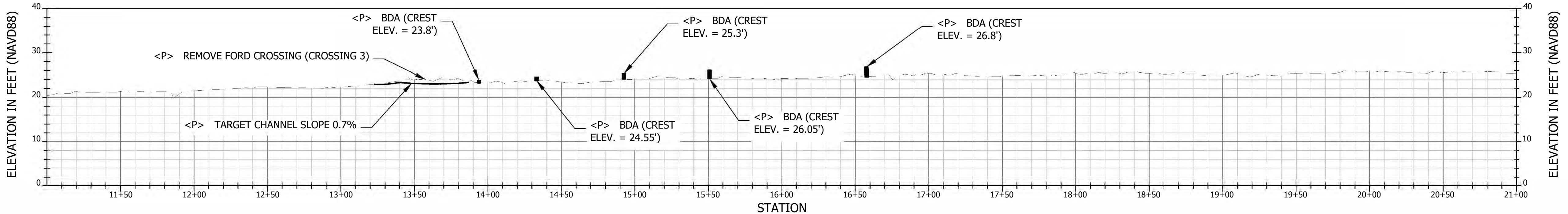
SMITH
RIVER
ALLIANCE



- MAP SYMBOLS**
- EXISTING MAJOR CONTOUR (5')
 - EXISTING MINOR CONTOUR (1')
 - PROPOSED MAJOR CONTOURS (5')
 - PROPOSED MINOR CONTOURS (1')
 - 100 YEAR FLOODPLAIN BOUNDARY (FEMA)
 - POWER LINES
 - STOTENBURG CREEK
 - PROPOSED CHANNEL REALIGNMENT
 - EXISTING ROAD
 - EXISTING DIRT ROAD
 - EXISTING LARGE WOOD
 - PROPOSED BDA
 - PROPOSED RIPARIAN PLANTING
 - PROPOSED FENCE



<P>STOTENBURG CREEK (STA. 11+00 TO 21+00)



PROJECT NUMBER: 765.00
SCALE: AS NOTED
DATE: 10/7/2019

DESIGN: DC/JM
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CHECKED: DC/JM
APPROVED: JM



STOTENBURG 11+00 TO
21+00

LOWER STOTENBURG
CREEK COHO HABITAT
ENHANCEMENT FINAL
DESIGN

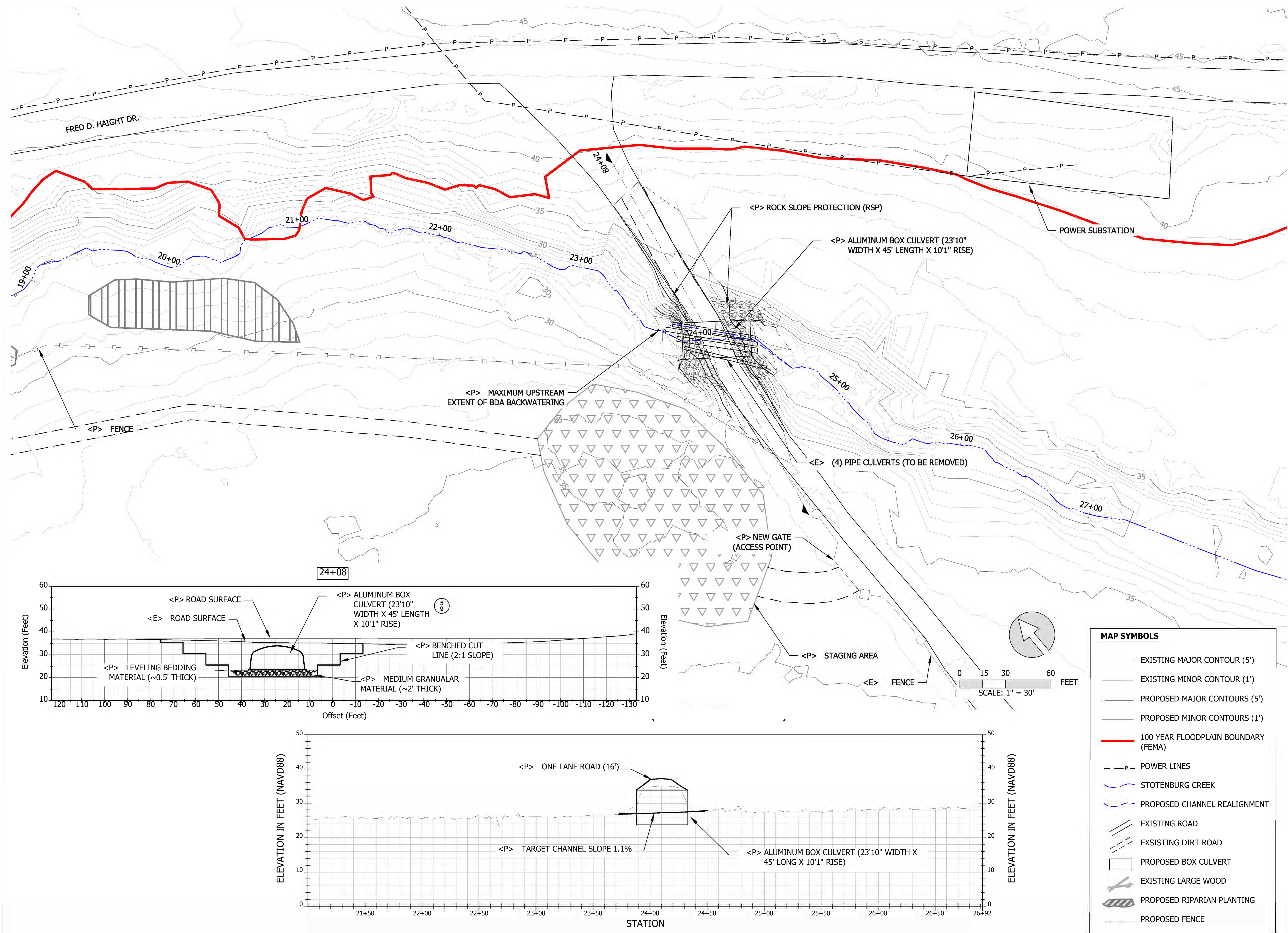
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SMITH
RIVER
ALLIANCE



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APPROVED: JM



STOTENBURG 21+00 TO
END

SHEET 6 OF 12

LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT FINAL DESIGN

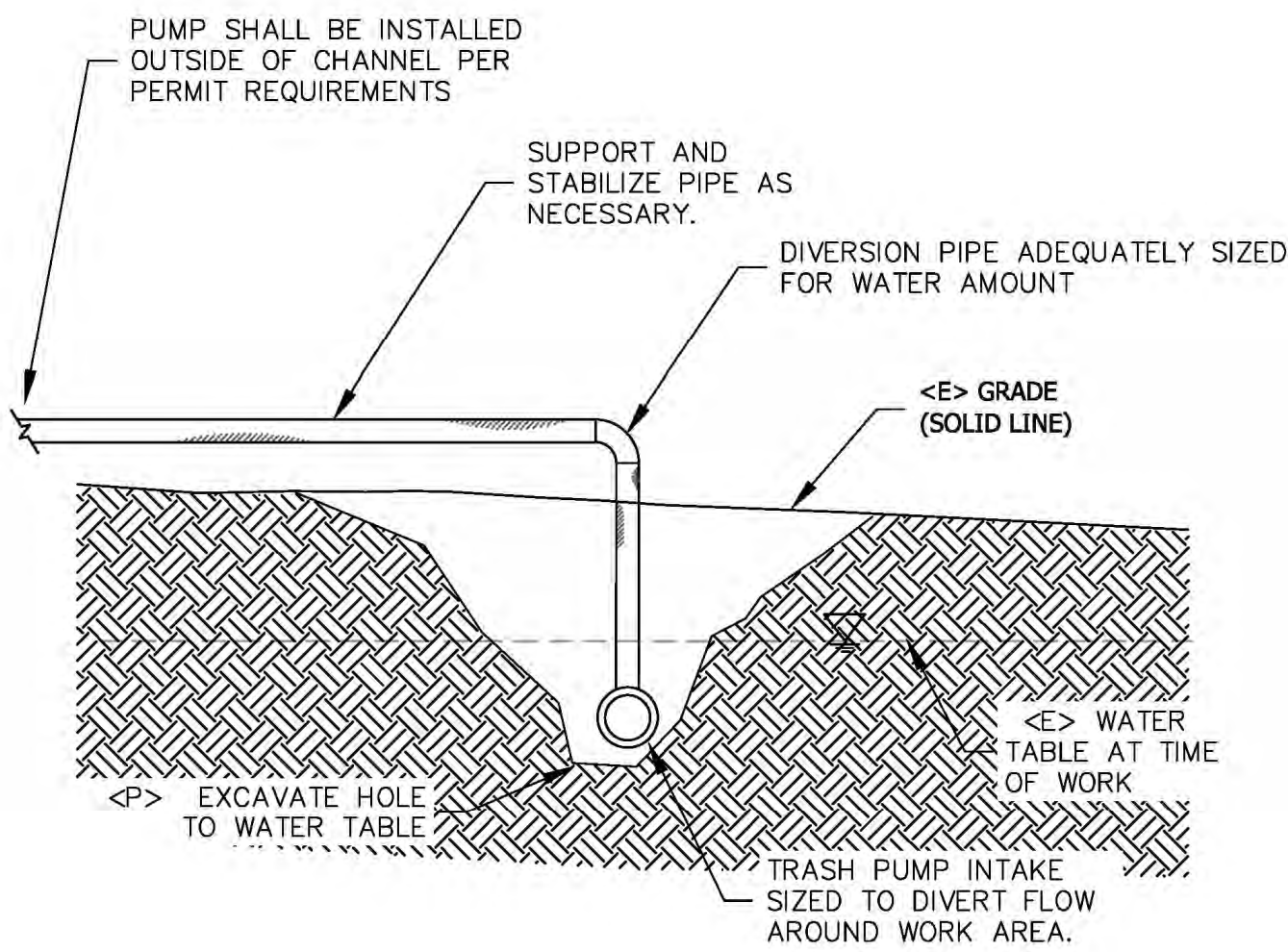
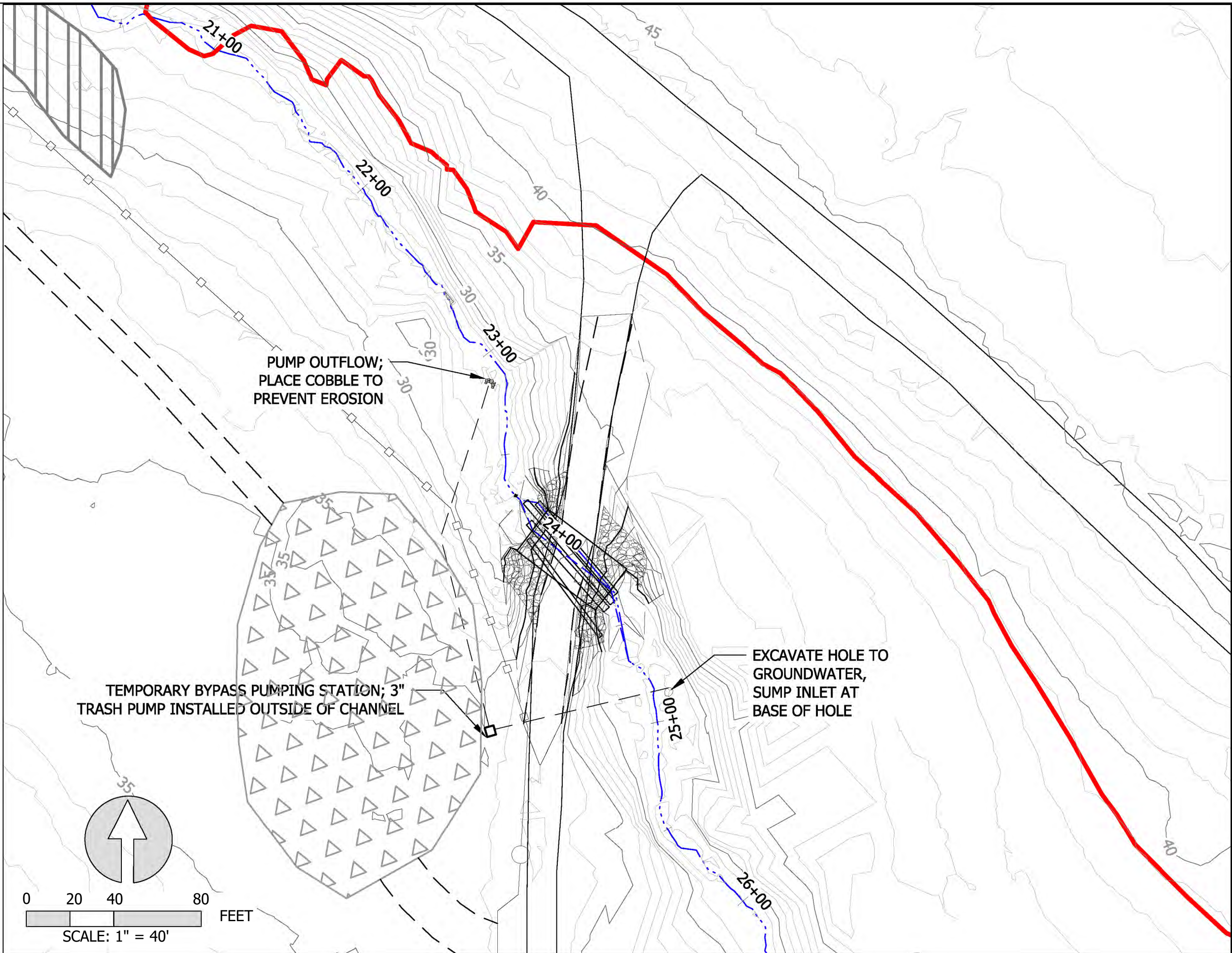
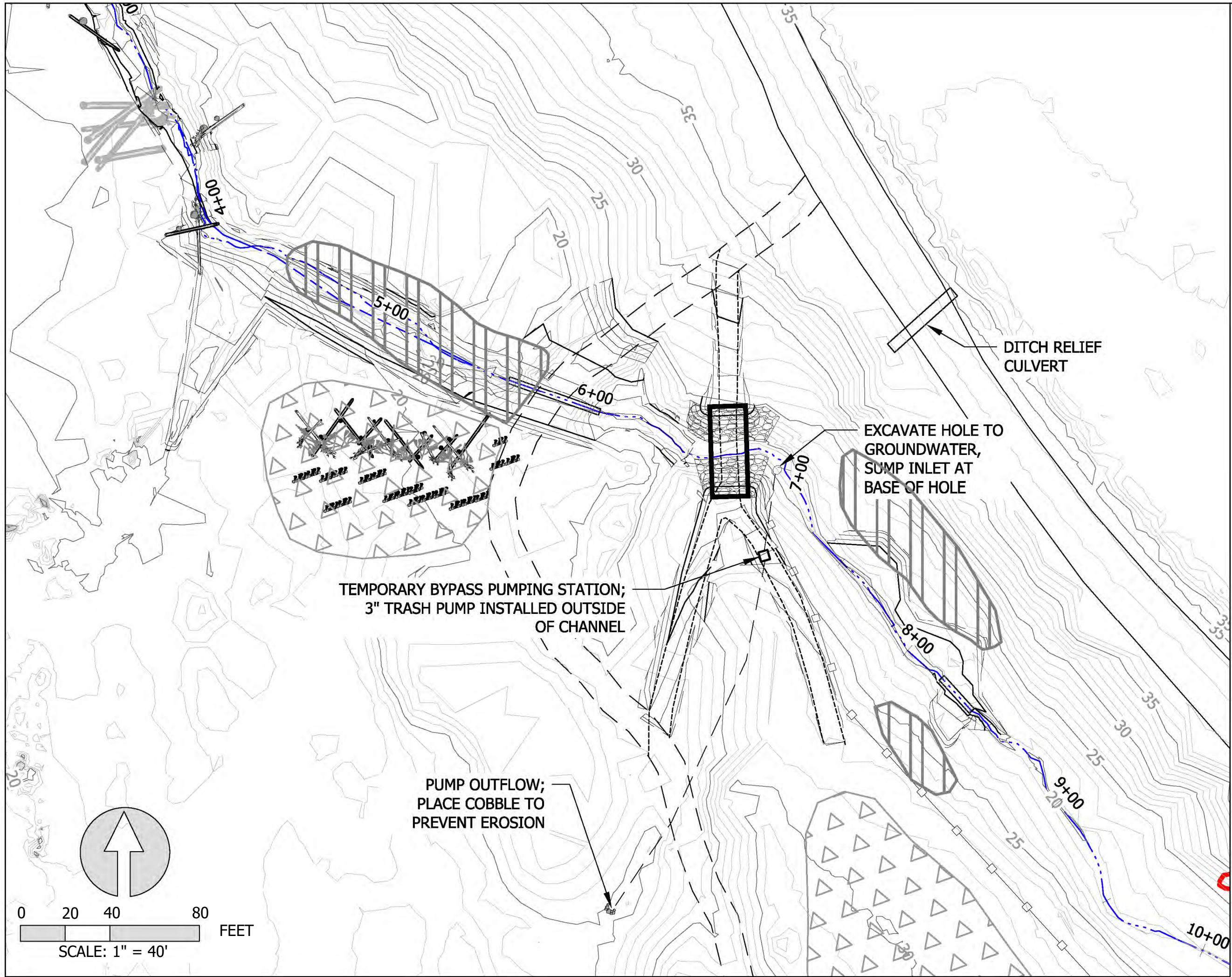
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SMITH RIVER ALLIANCE



1 DEWATERING SUMP

MAP SYMBOLS

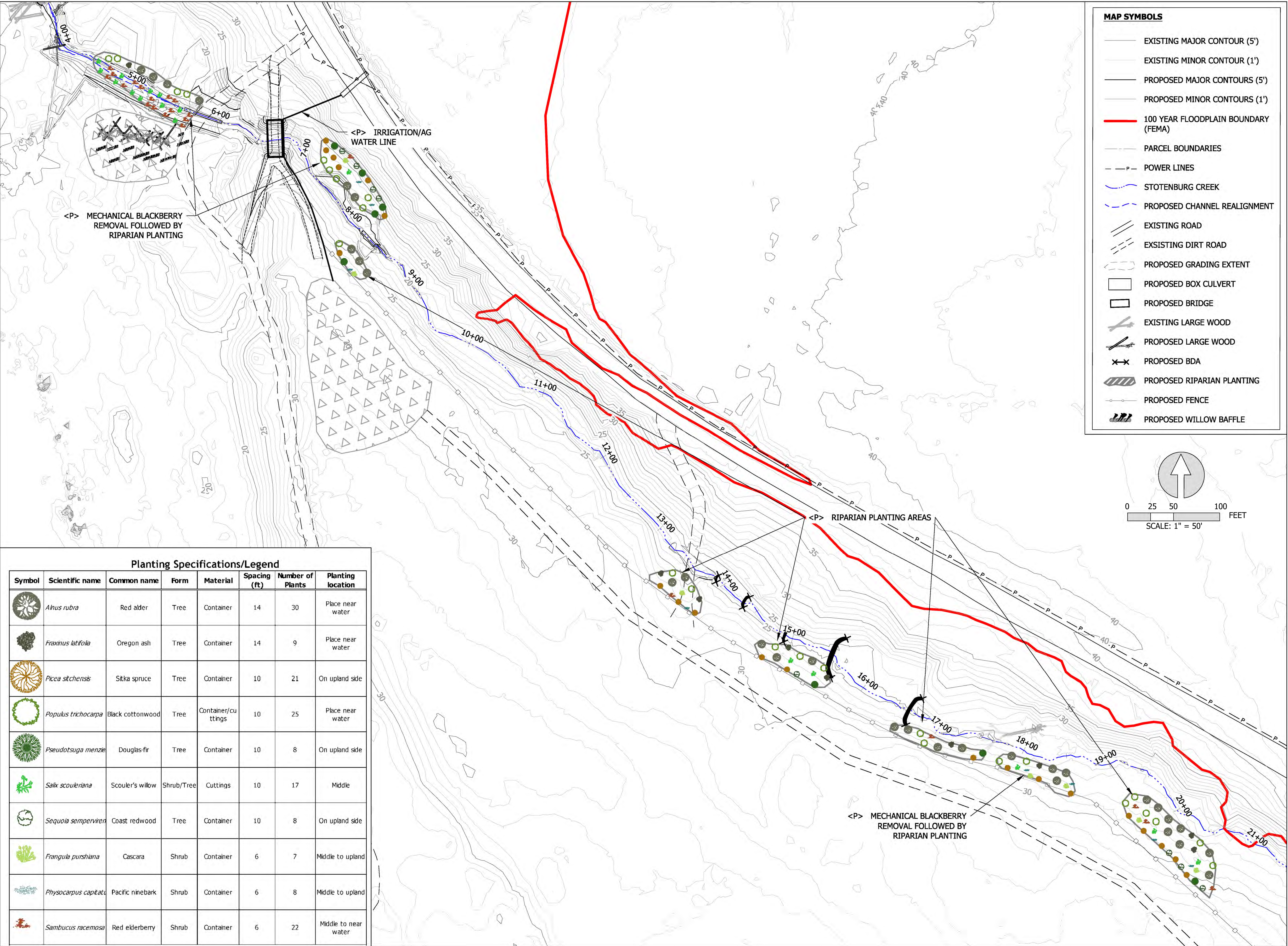
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- EXISTING MINOR CONTOUR (1')
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- PROPOSED MINOR CONTOURS (1')
- 100 YEAR FLOODPLAIN BOUNDARY (FEMA)
- PARCEL BOUNDARIES
- POWER LINES
- STOTENBURG CREEK
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- EXISTING ROAD
- EXISTING DIRT ROAD
- PROPOSED GRADING EXTENT
- PROPOSED BOX CULVERT
- PROPOSED BRIDGE
- EXISTING LARGE WOOD
- PROPOSED LARGE WOOD
- PROPOSED BDA
- PROPOSED RIPARIAN PLANTING
- PROPOSED FENCE
- PROPOSED WILLOW BAFFLE

PROJECT NUMBER: 765.00
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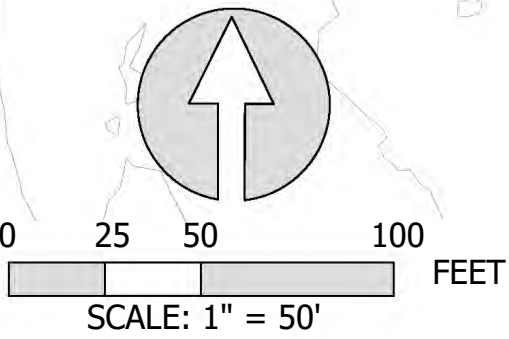
DEWATERING PLAN



Planting Specifications/Legend

Symbol	Scientific name	Common name	Form	Material	Spacing (ft)	Number of Plants	Planting location
	<i>Alnus rubra</i>	Red alder	Tree	Container	14	30	Place near water
	<i>Fraxinus latifolia</i>	Oregon ash	Tree	Container	14	9	Place near water
	<i>Picea sitchensis</i>	Sitka spruce	Tree	Container	10	21	On upland side
	<i>Populus trichocarpa</i>	Black cottonwood	Tree	Container/cuttings	10	25	Place near water
	<i>Pseudotsuga menziesii</i>	Douglas-fir	Tree	Container	10	8	On upland side
	<i>Salix scouleriana</i>	Scouler's willow	Shrub/Tree	Cuttings	10	17	Middle
	<i>Sequoia sempervirens</i>	Coast redwood	Tree	Container	10	8	On upland side
	<i>Frangula purshiana</i>	Cascara	Shrub	Container	6	7	Middle to upland
	<i>Physocarpus capitatus</i>	Pacific ninebark	Shrub	Container	6	8	Middle to upland
	<i>Sambucus racemosa</i>	Red elderberry	Shrub	Container	6	22	Middle to near water

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LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT FINAL DESIGN

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PLANTING PLAN

LOWER STOTENBURG
CREEK COHO HABITAT
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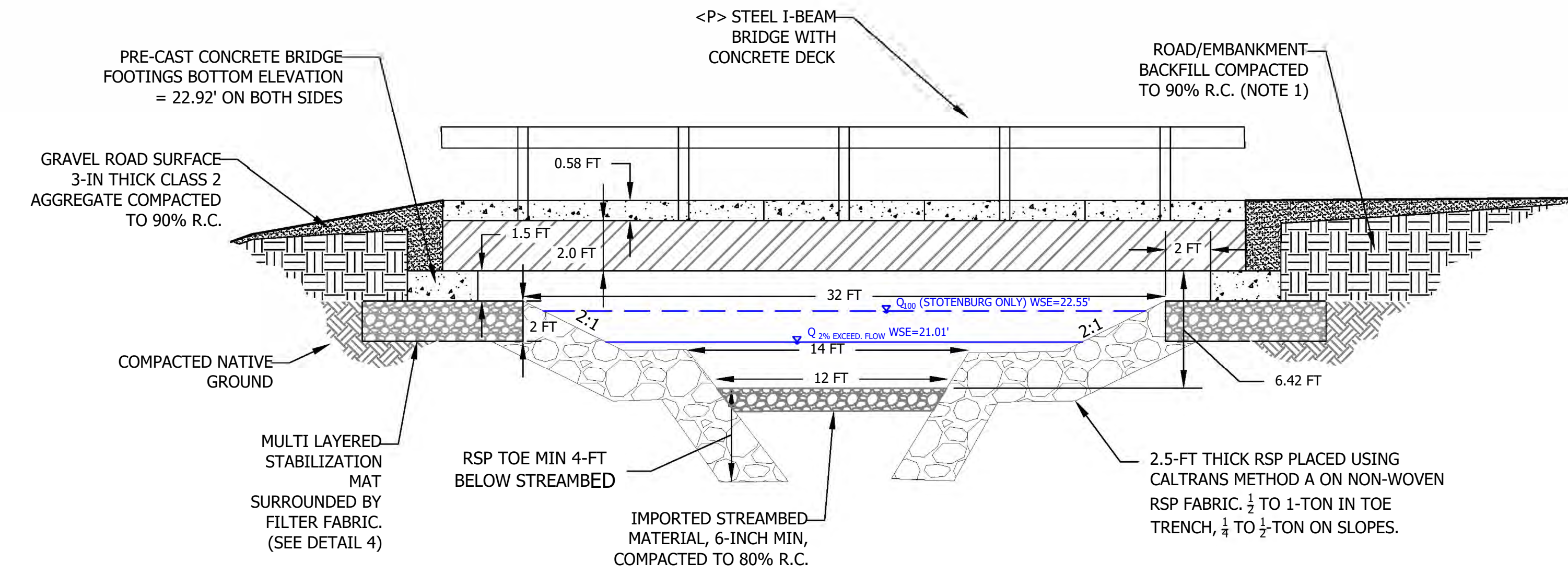
DEL NORTE COUNTY, CA

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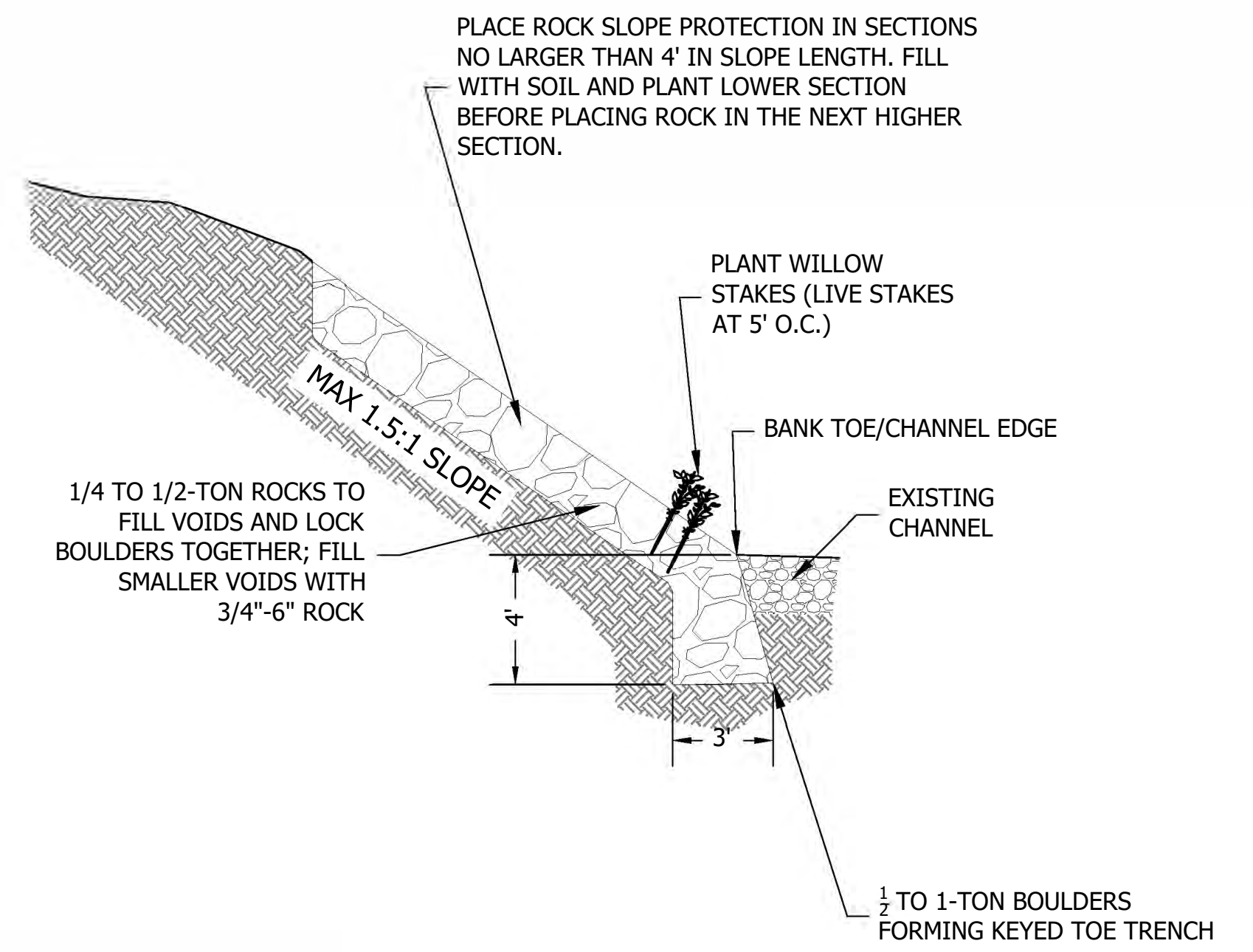
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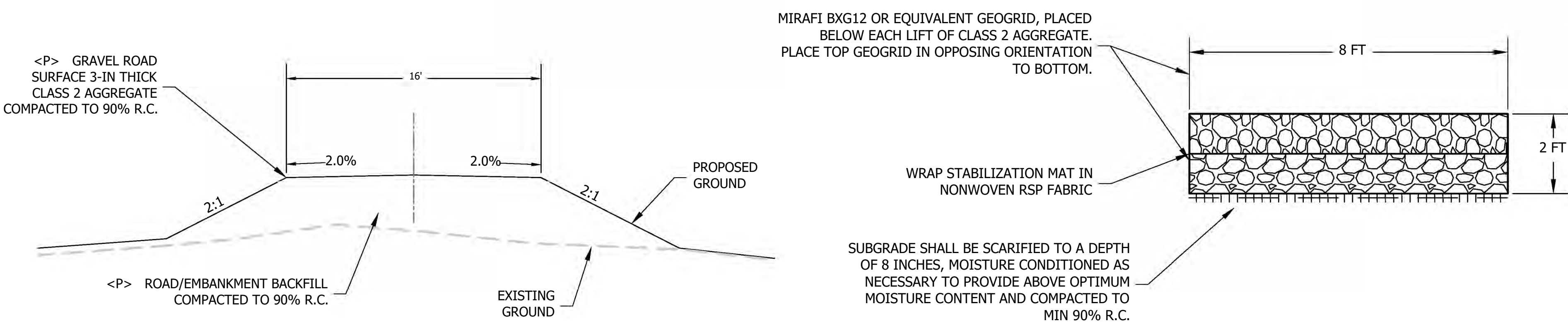
SMITH
RIVER
ALLIANCE



1 CHANNEL SECTION AT BRIDGE



2 WILLOW PLANTED ROCK SLOPE PROTECTION (RSP)

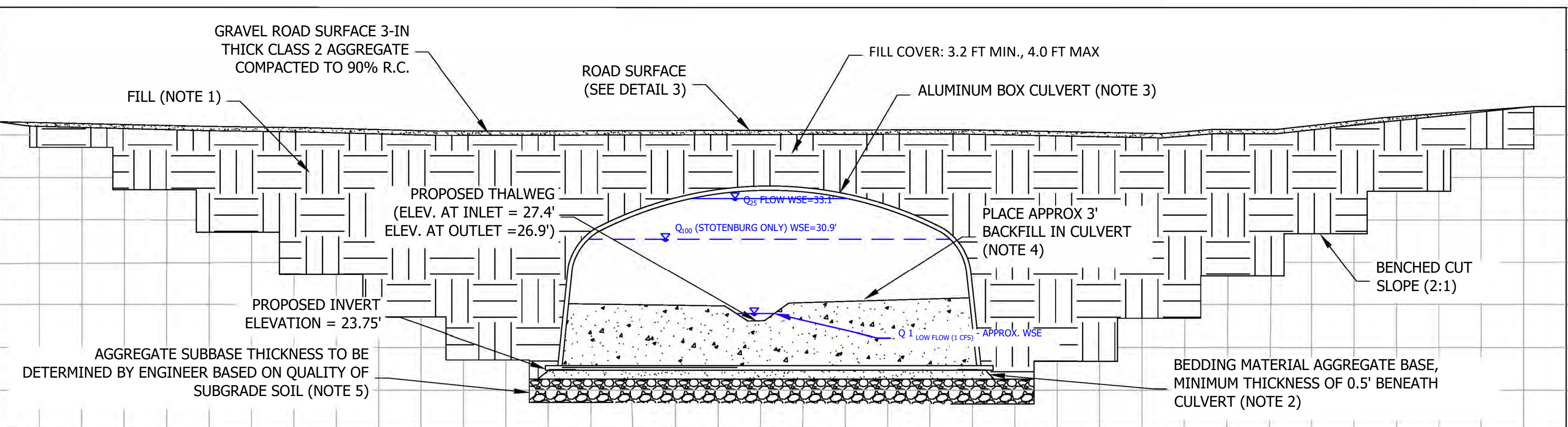


3 TYPICAL ROAD SECTION

4 MULTILAYER STABILIZATION MAT

NOTES:

- ENGINEERED FILL: WHERE FILL IS TO BE PLACED BEHIND OR ABOVE THE REINFORCED SOIL ZONE, IT SHALL CONSIST OF SOIL AND/OR SOIL-AGGREGATE MIXTURES GENERALLY LESS THAN 4 INCHES IN MAXIMUM DIMENSION, FREE OF VISIBLE ORGANIC OR OTHER DELETERIOUS DEBRIS, AND HAVE A LOW PLASTICITY ($PI < 6$). TYPICALLY, WELL-GRADED MIXTURES OF GRAVEL, SAND, NON-PLASTIC SILT, AND SMALL QUANTITIES (LESS THAN 15 PERCENT) OF CLAY ARE ACCEPTABLE FOR USE AS ENGINEERED FILL. ENGINEERED FILL SHALL BE UNIFORMLY MOISTURE-CONDITIONED TO WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT, PLACED IN HORIZONTAL LIFTS LESS THAN 8 INCHES IN LOOSE THICKNESS, AND COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION DETERMINED IN ACCORDANCE WITH AASHTO T180.
- BEDDING MATERIAL: CRUSHED STONE CONFORMING TO CALTRANS CLASS 2 AGGREGATE BASE ARE ACCEPTABLE BEDDING MATERIALS. BEDDING MATERIAL SHALL BE UNIFORMLY MOISTURE-CONDITIONED TO WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT, PLACED IN HORIZONTAL LIFTS OF LESS THAN 8 INCHES IN LOOSE THICKNESS, AND COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION DETERMINED IN ACCORDANCE WITH AASHTO T180.
- BOX CULVERT: 23'10" WIDTH X 45' LENGTH X 10'1" RISE CORRUGATED ALUMINUM BOX CULVERT BY CONTECH ENGINEERED SOLUTIONS, OR AN APPROVED EQUAL. THE BOX CULVERT SHALL BE INSTALLED PURSUANT TO THE MANUFACTURER'S RECOMMENDATIONS.
- SELECT CULVERT BACKFILL: COMPOSED OF NATIVE STREAM BED MATERIAL CONSISTING OF SILT, SAND, AND SMALL GRAVEL. CULVERT BACKFILL SHALL BE PLACED TO AN ELEVATION OF 3'5" ABOVE THE BOTTOM OF THE CULVERT TO PROVIDE A STABLE, NATURAL SUBSTRATE. A 0.75' DEEP BY 3' WIDE CHANNEL SHALL BE CONSTRUCTED WITHIN THE SURFACE OF THE BACKFILL TO PROVIDE A NARROW CHANNEL TO ENSURE ADEQUATE FLOW DEPTH UNDER LOW FLOW CONDITIONS.
- AGGREGATE SUBBASE: AGGREGATE SUBBASE BENEATH THE CULVERT SHALL CONFORM TO CALTRANS CLASS 1 AGGREGATE SUBBASE. IT SHALL BE UNIFORMLY MOISTURE-CONDITIONED TO WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT, PLACED IN HORIZONTAL LIFTS LESS THAN 8 INCHES IN LOOSE THICKNESS, AND COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION DETERMINED IN ACCORDANCE WITH AASHTO T180.
- "STOTENBURG ONLY" FLOWS DO NOT ACCOUNT FOR BACKWATERING FROM THE SMITH RIVER AND ONLY MODEL DISCHARGE FROM THE STOTENBURG CREEK WATERSHED. THESE FLOWS WERE MODELED TO SIMULATE AN EARLY-SEASON SCENARIO WHERE STOTENBURG CREEK QUICKLY RESPONDS TO A LARGE STORM EVENT BEFORE THE SMITH RIVER WATER SURFACE ELEVATION BACKWATERS THE PROJECT REACH. FLOW VELOCITY THROUGH THE CROSSINGS WOULD BE SUBSTANTIALLY GREATER UNDER THIS SCENARIO COMPARED TO WHEN THE CREEK IS BACKWATERED BY THE SMITH RIVER.



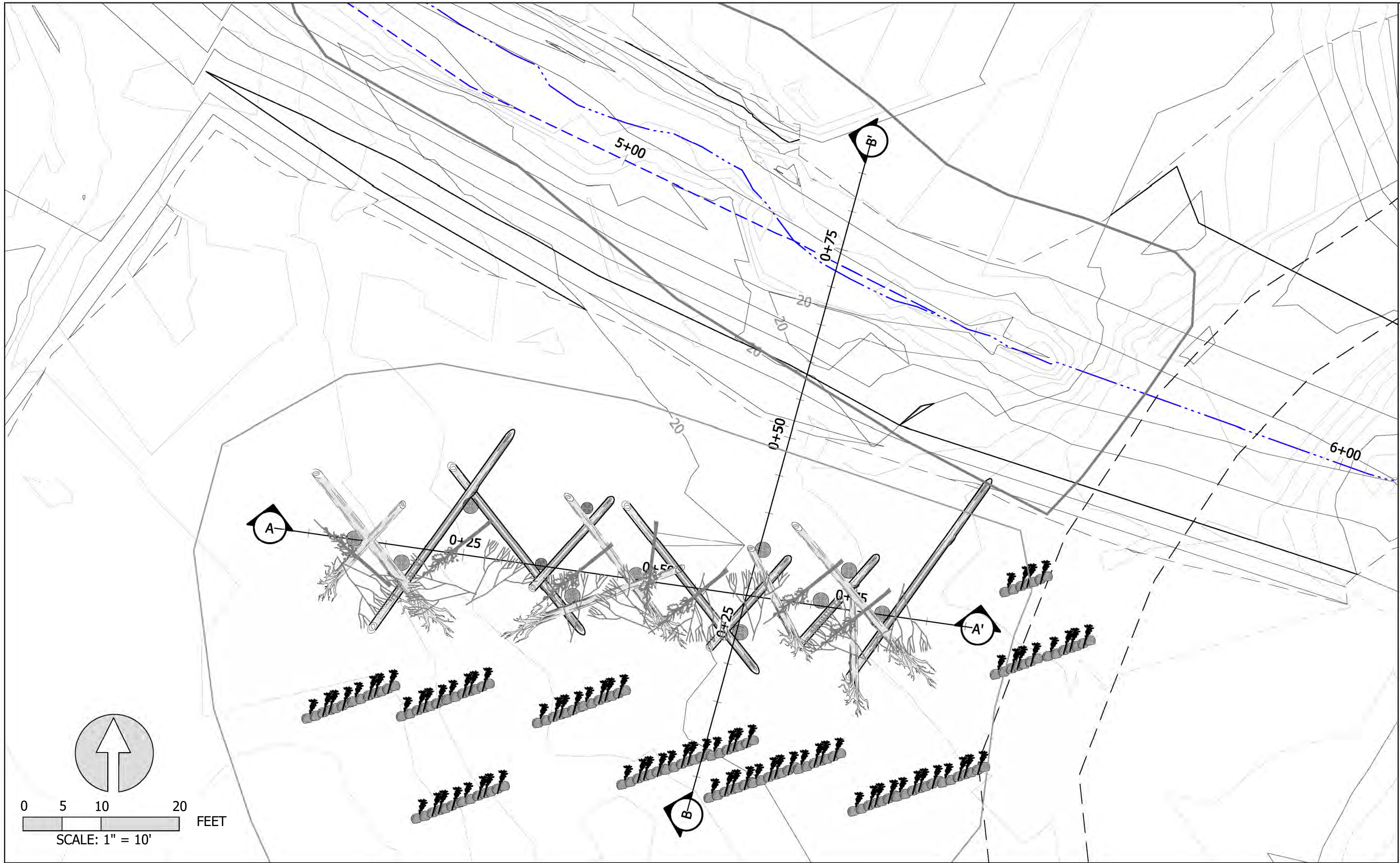
5 BOX CULVERT

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APPROVED: JM

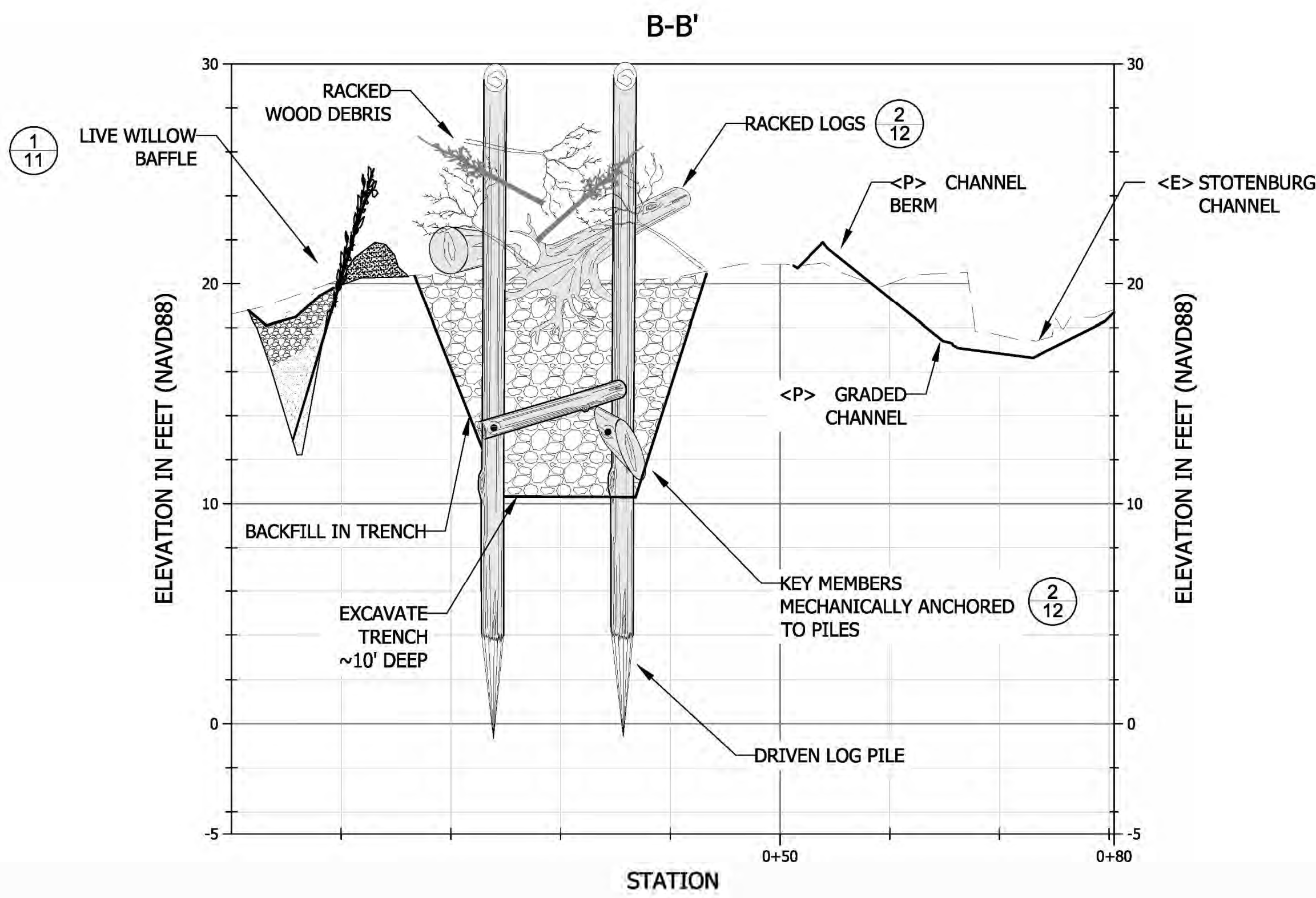
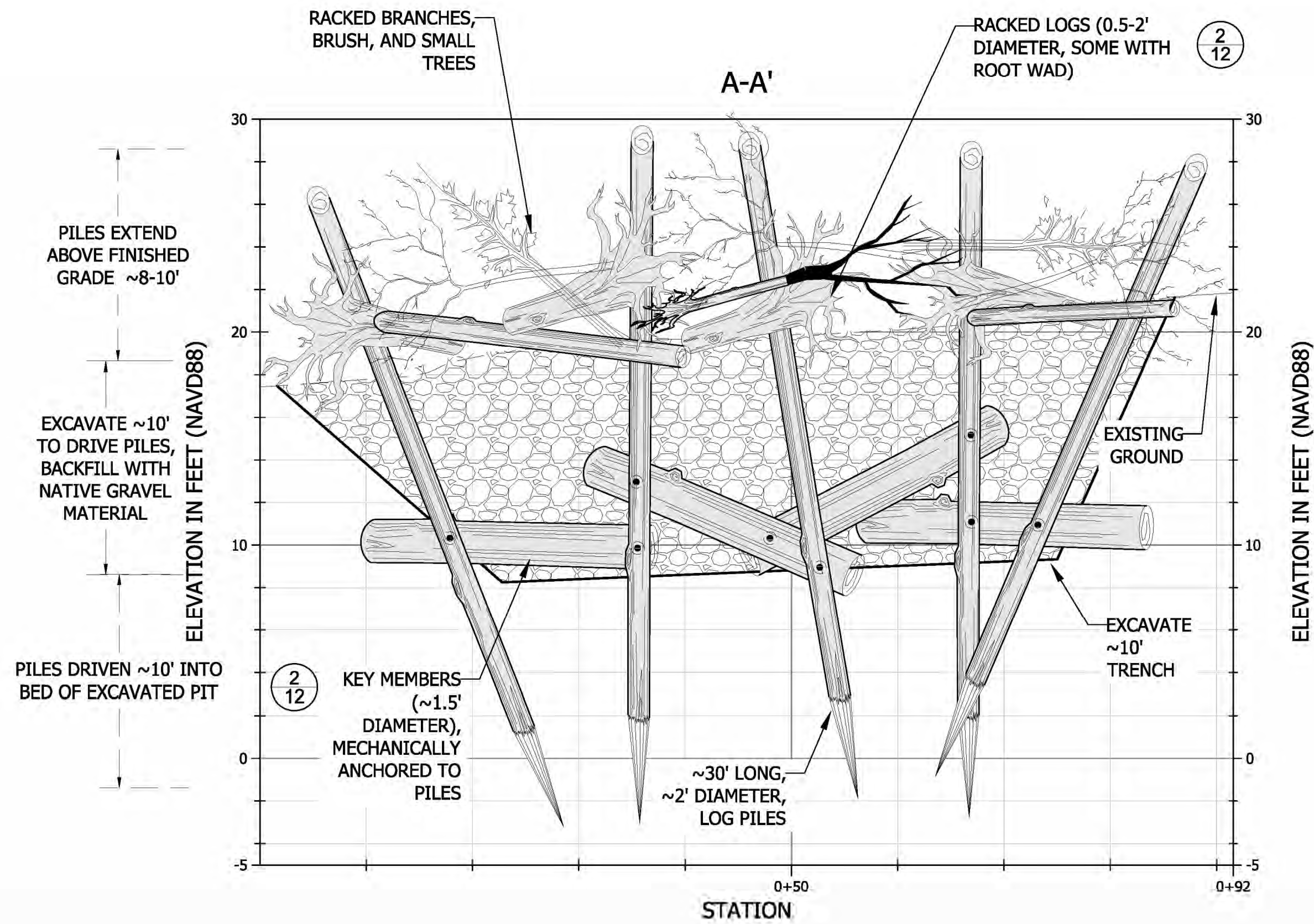


CULVERT AND BRIDGE
DETAILS



MAP SYMBOLS

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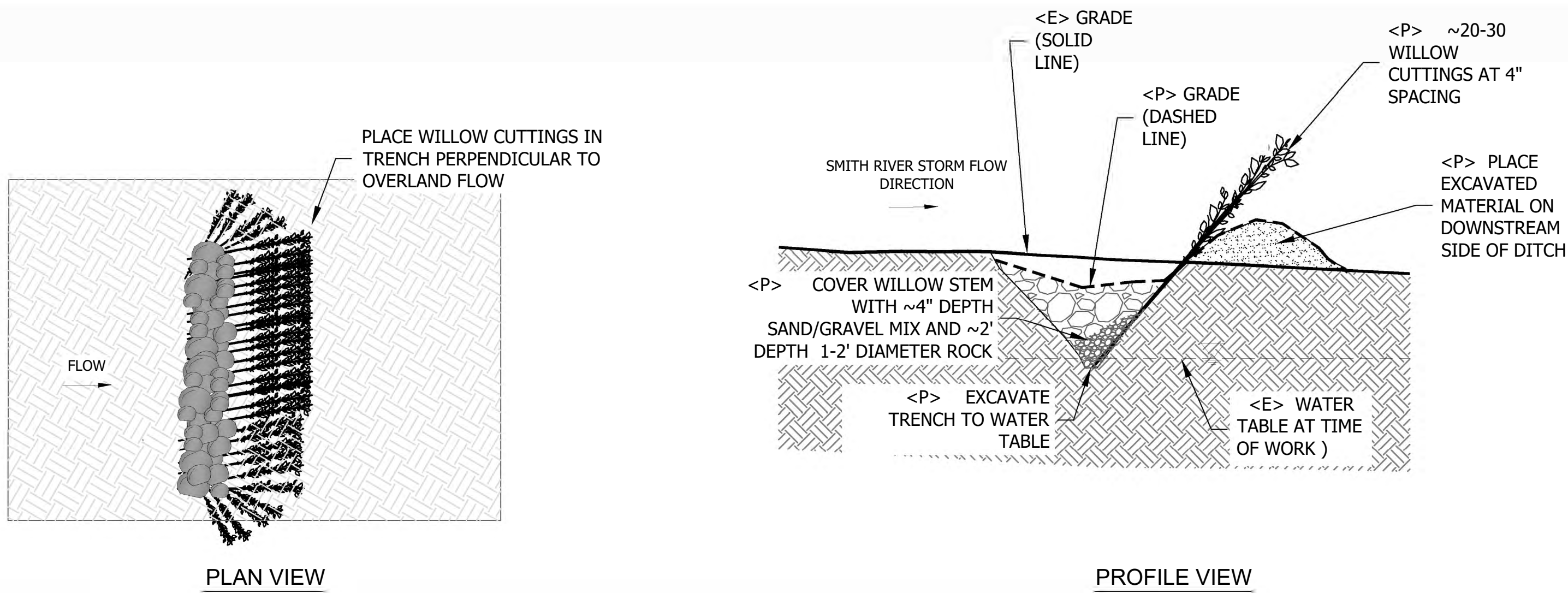
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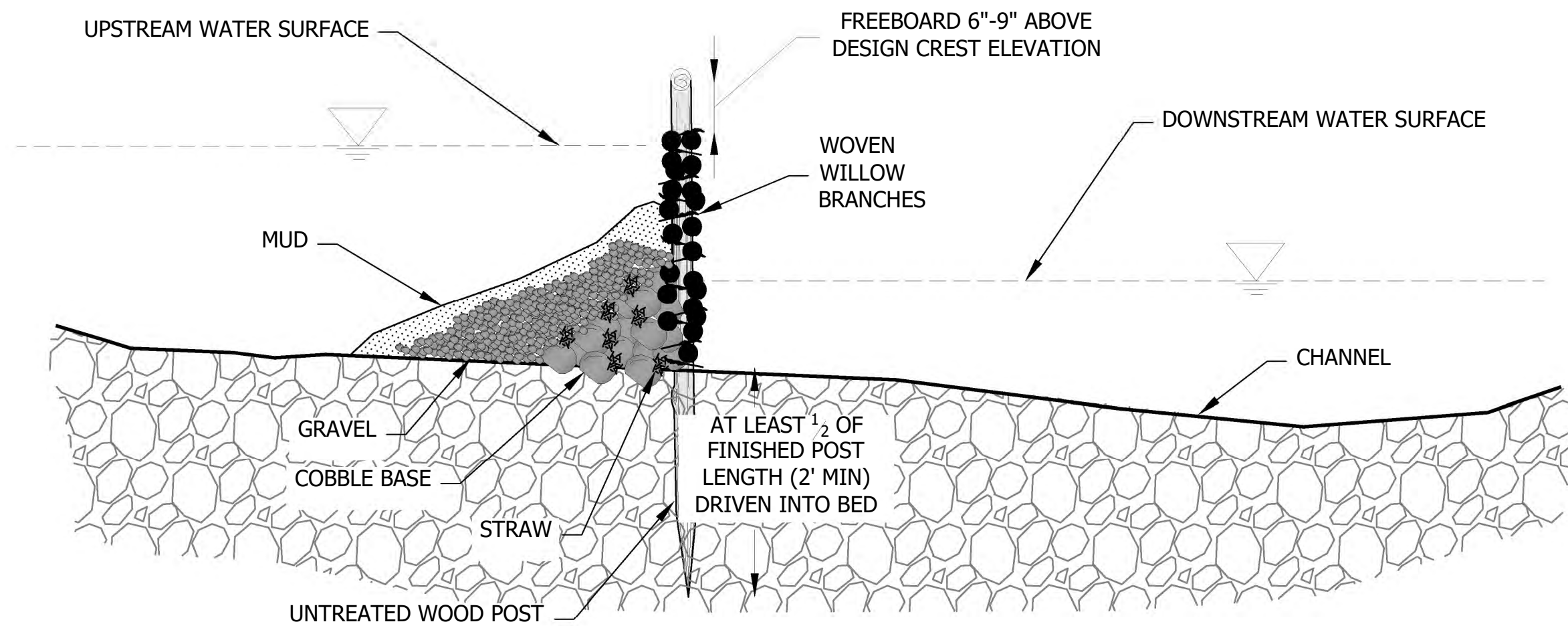
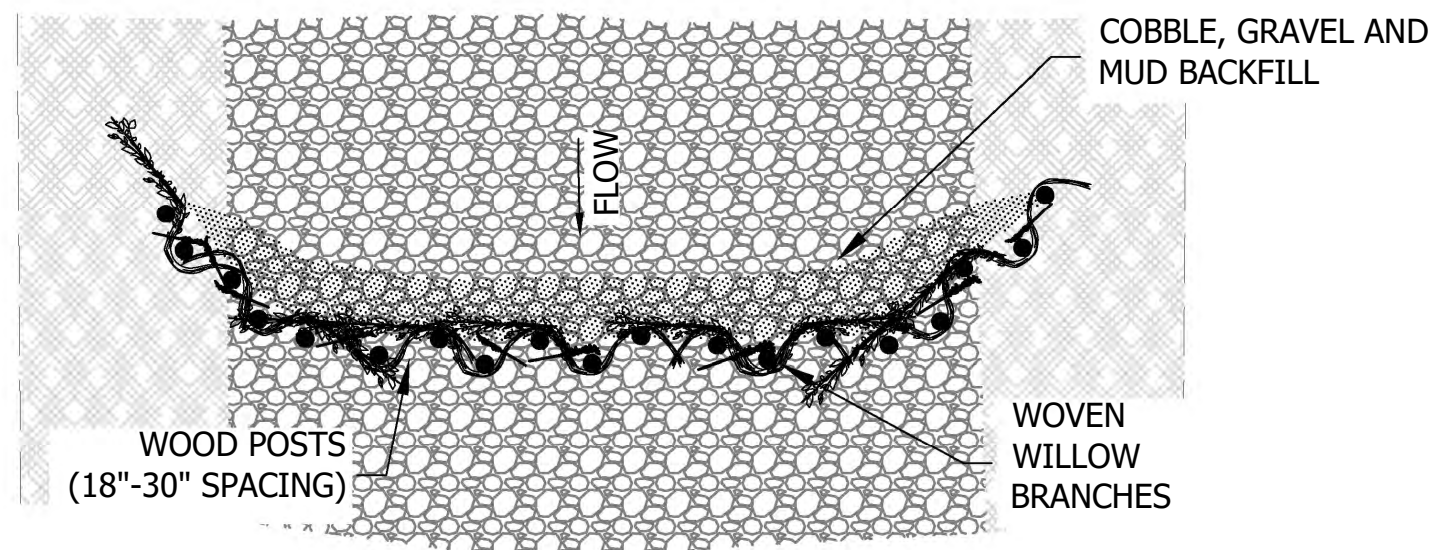
ENGINEERED LOG JAM (ELJ)

SHEET 10 OF 12



1 LIVE WILLOW BAFFLE

NTS

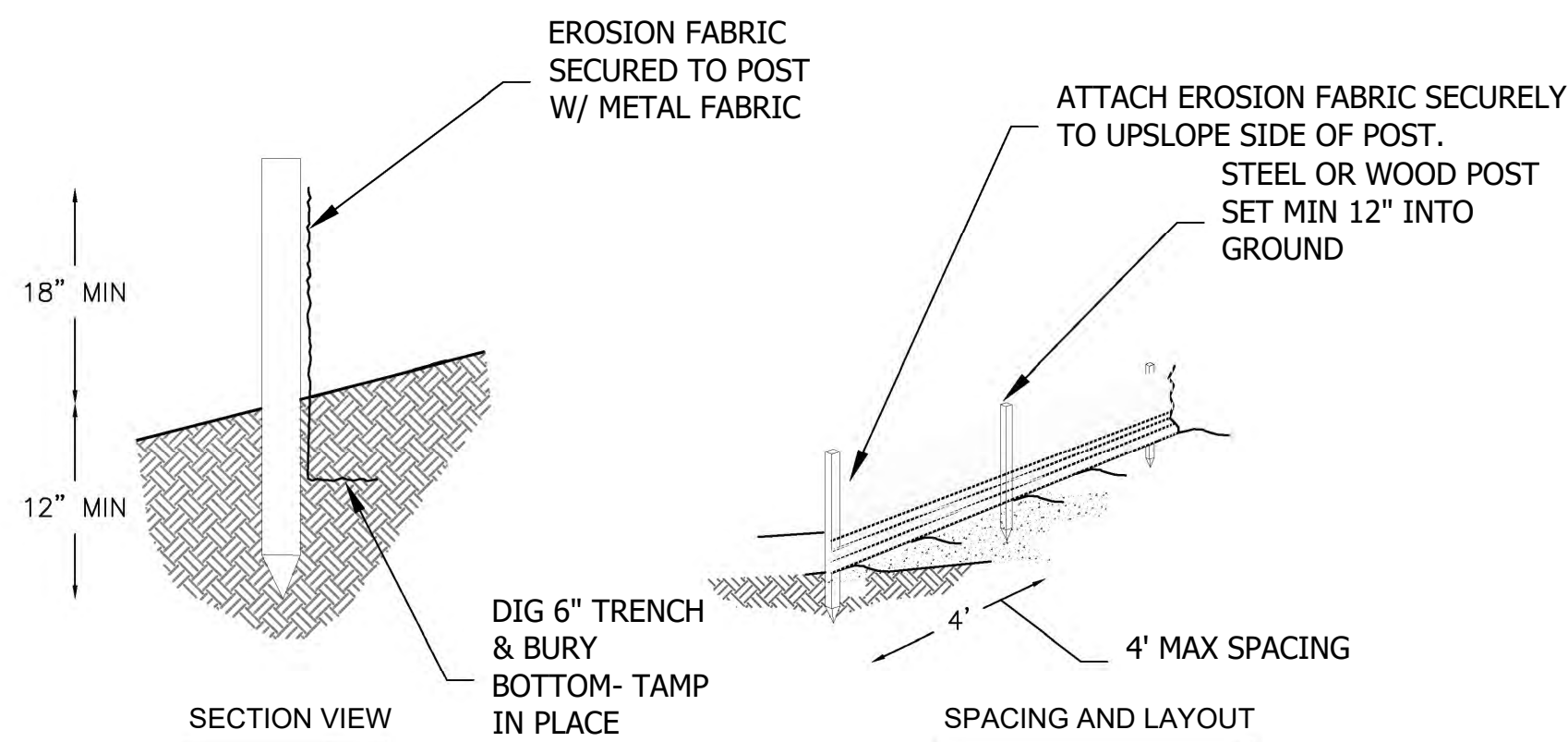


PLAN VIEW

PROFILE VIEW

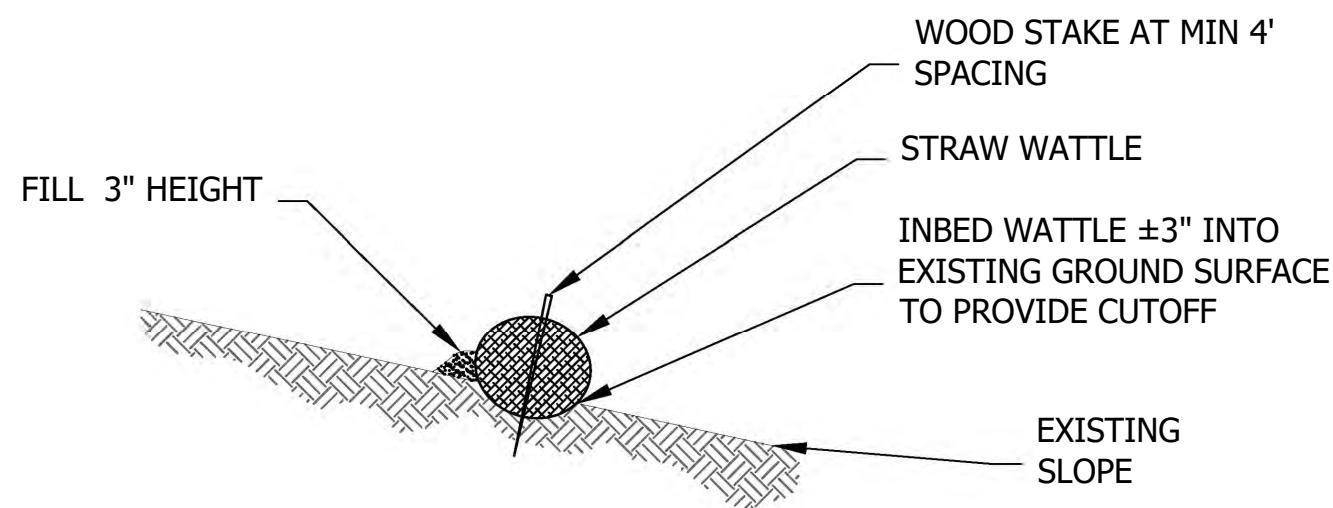
2 BEAVER DAM ANALOG

NTS



3 SILT FENCING

NTS



NTS

EROSION AND SEDIMENT CONTROL NOTES:

1. EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHALL BE INSTALLED PRIOR TO THE WET SEASON (OCTOBER 1 THROUGH APRIL 30).
2. SENSITIVE AREAS AND AREAS WHERE EXISTING VEGETATION IS BEING PRESERVED SHALL BE PROTECTED WITH CONSTRUCTION FENCING; FENCING SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION ACTIVITIES.
3. ALL AREAS DISTURBED DURING GRADING ACTIVITIES SHALL BE SEEDED WITH NATIVE GRASS SEED AND MULCHED WITH RICE STRAW.
4. PRIOR TO SEEDING AND STRAW, DISTURBED AREAS SHOULD BE ROUGHENED BY TRACK WALKING WITH A DOZER.
5. STRAW SHALL BE APPLIED AT A UNIFORM RATE OF APPROXIMATELY 4000 LBS PER ACRE BY HAND.
6. PRIOR TO ANY RAINFALL, A SILT FENCE SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER TO PREVENT SEDIMENT FROM DISCHARGING FROM THE PROJECT.
7. ALL SEDIMENT CONTROL BMPS SHALL BE MAINTAINED THROUGHOUT THE WET SEASON UNTIL NEW VEGETATION HAS BECOME ESTABLISHED ON ALL GRADED AREAS.

LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT FINAL DESIGN

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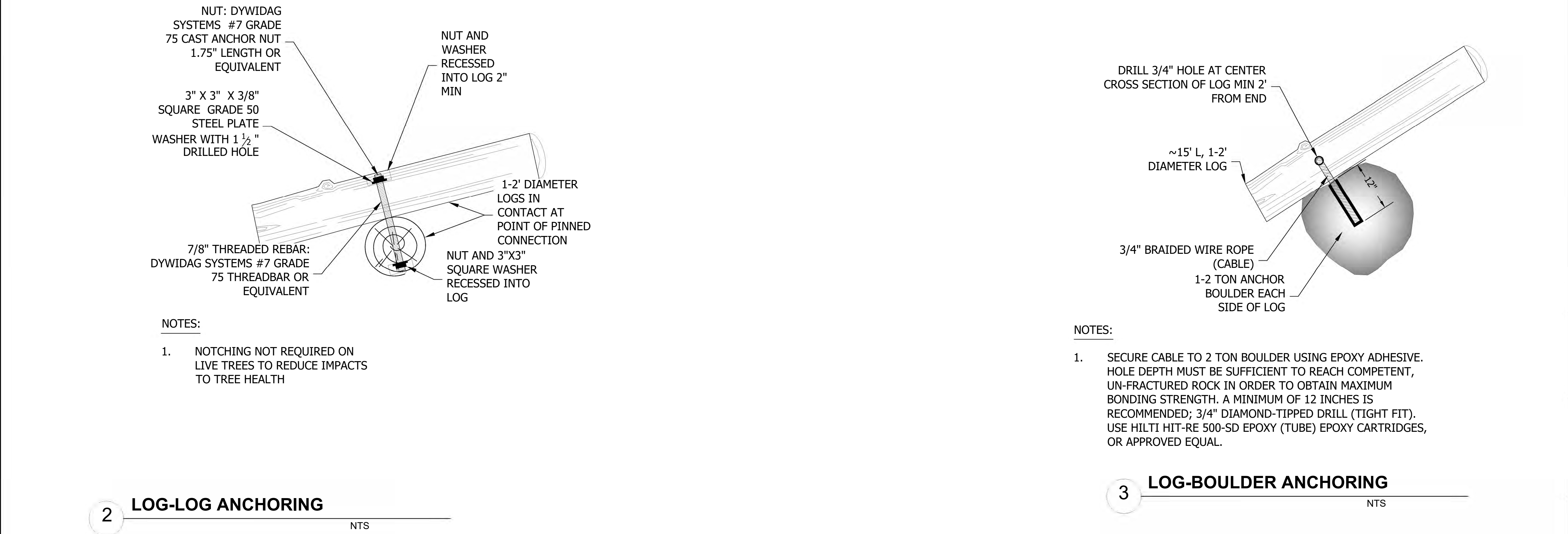
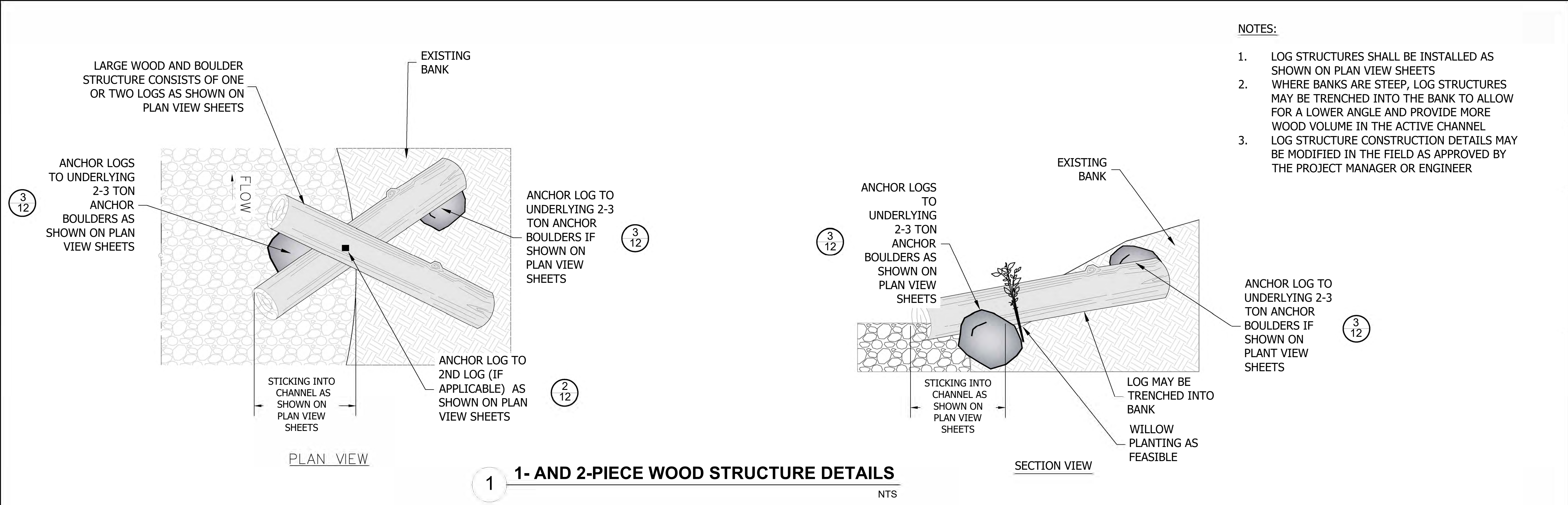
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DETAILS

SHEET 11 OF 12



LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT FINAL DESIGN

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DETAILS

SHEET 12 OF 12



Lower Stotenburg Creek Coho Habitat Enhancement Project – Project Information Supplement

Prepared by:

Smith River Alliance
PO Box 2129
Crescent City, CA 95531

Project Summary

The overall purpose of the project is to improve juvenile salmonid passage, winter rearing habitat, and native riparian vegetation along 0.5 miles of Stotenburg Creek, a tributary of the Smith River.

Stotenburg Creek is a 1.5-mile-long intermittent anadromous creek. The proposed project is located on the lowest 0.5 mile and includes the confluence with the Smith River. The creek flows through private property and is bordered by pasture on one side and by a road on the other side, with the downstream most 0.16-mile flowing away from the road and pasture.

The four undersized stream crossings in the project reach limit fish passage and interfere with the natural conveyance of water, sediment, and wood. Consequently, the channel lacks complexity and depth and increases gravel deposition at the confluence, causing a lack of connectivity between the creek and the river even during low winter flows. The crossings also impede fish passage and cause fish strandings when the creek seasonally dries. Additionally, cattle have access to the stream, impacting water quality and riparian vegetation. The riparian vegetation includes sections of dense willow with no mature conifers or riparian trees and other areas devoid of riparian vegetation. Non-native invasive blackberry is dominant and invasive canary grass is present.

The project will restore habitat by: 1) Removing the four crossings, two of which will be replaced and upgraded; 2) installing an engineered log jam, 400' of willow baffles, 5 large wood structures, and 5 beaver dam analogs to increase channel complexity and connectivity; 3) recontouring the channel to enhance connection to the Smith River and to establish floodplain connectivity; and, 4) controlling invasive and enhancing native riparian vegetation and installing cattle exclusion fencing throughout the 0.5-mile project area.

Project Timeline: January 2023 to March 2026

Anticipated Construction: August 1, 2023 to November 1, 2023

Project Setting

Stotenburg Creek flows parallel to Fred Haight Drive and enters the mainstem Smith River approximately 0.8 miles upstream from the Del Norte County boat ramp and approximately 5.9 miles upstream of the mouth of the Smith River in Del Norte County, CA. Stotenburg Creek is the first tributary downstream of the Highway 101 bridge (Dr. Fine Bridge) over the Smith River (See Figure 5 for additional details).

The project is located along 0.5 miles of Stotenburg Creek beginning at the mouth of the creek, where it meets the mainstem of the Smith River, and extends upstream to just northwest of Cedar Lodge Lane. Most of the project is located on APN: 105-020-050, a 114.2-acre parcel utilized for agricultural grazing.



The downstream most crossing (Crossing #1) is located at the following coordinates: 41.888251, -124.146447. The inlet and construction footprint of the upstream most crossing (Crossing #4) is located on APN: 105-020-068, a 2-acre parcel owned by Pacific Power.

Management Plans and Zoning

County: The project is consistent with the Del Norte County General Plan goals and policies for natural resources. The project will protect, restore and enhance habitats that support fish and wildlife species (Goal 1.E.) and support the continued viability of Del Norte County's agricultural economy (Goal 1.G.). The project will restore critical habitat protections for federally listed threatened and endangered species (Policy 1.E.2), and ensure that riparian vegetation be maintained along streams, creeks and other water courses for their qualities as wildlife habitat, stream buffer zones and bank stabilization (Policy 1.E.28.).

County Zoning:

105-020-050 – Agriculture Exclusive, Designated Resource Conservation Area – Estuary,
Designated Resource Conservation Area – Riparian.

105-020-068 – Agriculture Exclusive

The project will not impact the current agricultural use and will maintain and improve the access for the existing agricultural operation.

State: Project implementation will support achievement of the goals identified in the State Wildlife Action Plan (SWAP) for the North Coast and Klamath Province; Native Aquatic Species Assemblages/Communities. The project aids in achievement of SWAP goals for the North Coast, which includes a 5% increase by 2025 of riparian habitat, native species, desired channel patterns, and connected flood

Federal: The project will address a National Marine Fisheries Service recovery task for SONCC ESU Salmon. The SONCC Recovery Plan (2014) calls for six high-priority recovery actions for the Smith River population, five of which the project will implement.

Project Details

- **Type of approval requested:** Use Permit
- **Project type:** Habitat restoration
- **Size of Project:** 4 acres

Project Description – Plan of Operation

Specific activities include: 1) Remove four crossings that impede passage, alter sediment transport, and increase fish strandings, two of which will be replaced and upgraded; 2) install an engineered log jam, willow baffles, 5 large wood structures, and 5 beaver dam analogs to increase channel complexity and the quality of instream rearing habitat; 3) re-contour the channel to enhance connection to the Smith River and to establish floodplain connectivity; and, 4) control invasive and enhance native riparian vegetation and install cattle exclusion fencing throughout the 0.5-mile project area. The description of each activity is outlined below (see Figure 6 Action Area Map). Additional details on the plan of



operation can be found in the Engineering Designs and Construction Specifications prepared by Stillwater Sciences.

1. **Crossing Removal and Upgrade:** Of the four crossings within the project reach, two will be removed (#2 & #3) and two will be replaced (#1 & #4). Crossing #1 will be removed and a new crossing #1 will be built (bridge site) as shown on sheet 3, 4, 7, and 9 of the design set. Crossing #2 and #3 will be removed and the surrounding channel re- contoured in accordance with the 100% designs (Sheets 3 - 5). Crossing #4 will be replaced with a box culvert in accordance with 100% designs (Sheets 7 and 9). Crossing #1 will be replaced with a prefabricated Kern bridge supported by two precast concrete abutments supported on stabilization mats (See Sheet 9). At crossing #4 an aluminum box culvert is designed with rock slope protection on the headwalls and a full invert plate bottom that will backfilled with substrate (See Sheet 9). The crossing is designed for a single 16-foot-wide roadway that can support one-way traffic. (See Basis of Design Report Page 53-53, Appendix B, Sheet 6 and 7).
2. **Habitat Structures:** Willow baffles and large wood structures will be installed to protect the lowest reach of the creek and promote longevity of the connection to the Smith River alcove. This reach of the creek is currently protected by a dense willow corridor, however, there is a large area just downstream of Crossing 1 that is devoid of this willow protection. This opening in the willow corridor is an anthropogenic feature related to Crossing 1 and historical gravel mining. The engineered log jam (ELJ) and willow baffles will be installed in this open location to provide additional protection from the Smith River by initiating a process-based approach that will promote deposition of fine material, re-orient hydraulics toward the Smith River channel, and promote riparian growth. The ELJ and large wood structures are designed to withstand flood flows on the Smith River up to a 50-year flood event. The ELJ structure will be approximately 20' by 60' and anchored with pile logs. This area will be excavated to a depth of 10', piles will be driven 10' below the excavation into the ground, 13 logs with root wads will be placed in the piles, and the structure will be backfilled with excavated materials.

Live willow baffles will be installed upstream of the ELJ in 8'-10' deep trenches. Bioengineered willow structures will be used at the project site to increase bank stability, slow flood stage flows from the Smith River, catch fine sediment and improve water quality. A willow baffle totaling 400' will be installed on the downstream end of the project site. Willow baffles will be constructed with 12' to 16' willow branches planted into trenches, spaced 3" apart. Willow will be collected from within 10 miles of the project site.

A total of five one- and two-log wood structures will be placed along the margins of the new Stotenburg channel alignment. These structures are designed to strengthen the channel banks and concentrate low flow through the new alignment. These structures would be secured using partial burial and anchoring to large boulders.

The project will create low-velocity refugia by installing a sequence of five beaver dam analogues (BDAs) between crossing #3 and #4 to increase habitat complexity, expand backwatering, and extend seasonal rearing into the late spring/early summer. BDAs will be constructed with wood



posts spaced 18"-30" across the entire channel. Posts will be mechanically driven 2'-4' into the streambed and willow branches and other suitable brush will be woven between the posts to allow a 1' increase in water surface elevation upstream of each BDA. Straw, coarse gravel, cobble and mud will be packed into the upstream end of the BDA to seal the inundated area upstream. The lifespan of a BDA is limited (3-10 years), however beaver living in the system are anticipated to adapt and/or maintain the structures.

3. **Habitat Connectivity:** The connection between the mainstem Smith River and the backwater alcove at the mouth of Stotenburg Creek will be slightly deepened by up to 1 foot using manual excavation to further enhance fish passage and water quality in the alcove. The proposed dimensions of this excavation are 1' deep, 3 feet wide, and 15-20' long.
4. **Riparian Restoration:** Native plants will be installed on 0.35 acres. A total of 131 native trees and shrubs will be planted in riparian areas currently lacking riparian cover, areas disturbed by project construction, and areas cleared of invasive plants. Planting holes will be backfilled by a mixture of 50% native soil and 50% compost and mulched with a minimum of 2" thick weed free straw mulch. Plants will be certified pest and disease free. Temporary wildlife-exclusion fence will be installed to protect the initial plantings from wildlife browsing, particularly from beaver and deer. Approximately 1500' of temporary fencing will be installed. The temporary fencing will consist of 5' tall galvanized horse fencing to prevent beaver herbivory. The horse fence will be secured on eight-foot T posts placed every 10 feet. The T posts will be placed 2' into the ground one foot of excess and a single wire around the middle top of the T-post at approximately 6' to deter ruminants. The bottom of the fence will be anchored to the soil with 9" landscape stakes.

Cattle exclusion fencing will be installed between crossings #1 and #4 along 1600 feet (0.3 miles) and protect 3.67 acres of riparian area from livestock. The placement, height and fencing materials will be selected to effectively deter cattle movement while also allowing wildlife passage following CDFW guidelines for wildlife friendly fencing. The wildlife friendly design will allow for at least 12" between the top two wires, a bottom wire at least 16" from the ground, be approximately 42" tall for animals to effectively jump over and be made of visible materials in areas where wildlife concentrate and cross (Paige 2012).

Rubus armeniacus (Himalayan blackberry) a non-native species with a high weed rating by the California Invasive Plant Council (Cal-IPC), is growing in dense thickets in the riparian understory, along several road crossings and portions of the main channel. Mechanical removal (i.e. backhoe, mower, mini excavator) will be followed by manual removal (i.e. digging, hoeing, pulling, cutting). Himalayan blackberry readily propagates from root fragments and cane cuttings (Sol 2004), so crews will remove as much root material as possible during removal and slash removed from manual and mechanical removal will be removed from the site or burned onsite following regional ordinances.

Equipment

Equipment used for the project may include, but is not limited to, both track and tire equipment including dump trucks, front-end loaders, excavators, skid-steer loaders, backhoes, water tenders, and compactors. Equipment will be inspected for leaks prior to use and be kept in good working condition



throughout the project duration. Equipment will be stored at least 65 ft, and fueled at least 100 ft, away from the stream and riparian areas or other wetlands. Equipment and hand tools will be used for fence installation and revegetation and may include a tractor mounted auger, shovels, hoedads, rakes, rock bars and personal protective equipment.

Environmental Questionnaire Discussion

1. Grading of soil

Grading will take place at the stream crossings and at instream habitat enhancement locations including the large wood structures, willow baffles, and engineered log jam. Grading will improve salmonid habitat and landowner access. There is no risk of exposure to geologic hazards from the project.

2. Greenhouse Gas Emissions, Air Quality

Excavated sediment and road fill will be maintained onsite to reduce impacts to traffic, greenhouse gas emissions, and air quality. An estimated 4,000 gallons of diesel and 50 gallons of gasoline will be consumed during project construction.

The proposed project will restore and protect over 3.5 acres of native riparian vegetation. The riparian area will be enhanced by removing non-native plant species and installing over 131 native plants, including conifer trees. The riparian area will be protected with cattle exclusion fencing allowing for vegetation to mature and sequester carbon. This 3.5-acre protected riparian area will sequester 145.14 Mt CO₂-e over the first 5 years. Plant installation will take place on 0.35 acres. Native trees and shrubs will be planted in riparian areas currently lacking riparian cover, areas disturbed by project construction, and areas cleared of invasive plants. An additional 26.9 Mt CO₂-e will be sequestered over the first 5 years from this riparian planting. Carbon sequestration calculations are based on the California Department of Conservation, Carbon in Riparian Ecosystems Estimator for California (CREEC) calculator. Available at:

<https://creec.conservation.ca.gov/app/carbon>

3. Potable Water

No potable water sources will be used or altered by this project.

4. Drainage Patterns, Flood Flows, Absorption Rate, Flood Hazards

The project will not significantly impact geology, soils or hydrology. The Project will result in improved natural hydrologic, geologic, and sediment transport processes in Stotenburg Creek. All project designs have been reviewed and approved by CDFW engineers. Effective erosion control measures will be in place at all times during construction, worksites will be winterized each day when heavy rainfall is forecasted and an adequate supply of erosion control materials (e.g. gravel, straw bales and shovels) will be maintained onsite to facilitate a quick response to unanticipated storm events. Disturbed soils will be restored and revegetated at project completion to prevent erosion and ensure rapid establishment of native vegetation. The existing roads and stream crossings are within the 100-year flood zone of the Smith. The bridge structure will be bolted together during assembly to prevent risk of movement during a flood event. Additionally, in a flood scenario on the Smith River (e.g., a 100-year flood), it is possible the river could scour to near the



proposed new Crossing 1 location, as it did in the 1964 flood. If the bridge was shifted or damaged during the flood event, re-installing the bridge post-flood would be substantially more cost-effective and logistically feasible than re-installing a large box culvert.

5. Hydrology/Water Quality

The project will use best management practices (BMPs) to prevent erosion and control sediment, as described in the current California Stormwater BMP handbook for construction. Upon the completion of the site grading, all disturbed surfaces shall be treated in order to prevent erosion. Erosion control measures will cover all disturbed and or graded surfaces, with the exception of river or stream bed.

All areas disturbed by grading shall be reseeded and mulched, only native seed and weed free straw will be used in sensitive habitats. A weed free pasture seed mix may be used on access roads outside of the riparian zone. All necessary measures will be taken to minimize erosion of unfinished excavations, grading or work surfaces. Worksites will be winterized at the end of each day when significant rains are forecasted. All areas of bare soil outside the dry streambed, that are disturbed during construction will be mulched, seeded and planted with native plants after project implementation. The project will have an excess of 169 cubic yards of spoils. Fine sands and silts will be spread diffusely on pasture areas and mixed sand cobble and gravel will be stockpiled for re-use on road surfaces. All sediment control BMPs shall be maintained throughout the wet season until new vegetation is established.

6. Rare or endangered plants

The project does have the potential to impact habitat for rare or endangered plant or animal species. Please see the Biological Assessment for additional information.

7. Noise

Increased noise levels will be temporarily present in the area during the Project. Work will be conducted between the hours of 8:00 to 18:00 each day to minimize impacts to the surrounding residential housing. Additionally, the project will be conducted expeditiously to reduce the timeframe of elevated noise levels in the project area. The Project will not result in any change in noise levels after construction is completed. All operations will comply with OSHA regulations. Internal combustion engines will be equipped with a muffler of a type recommended by the manufacturer. Equipment used for restoration will utilize the best available noise control techniques (e.g. engine enclosures, acoustically attenuating shields or shrouds, ducts, ect.) whenever feasible and necessary.

8. Lighting

The project will not use lighting or have construction materials that will glare into the surrounding areas.

9. Mineral, Timber, Agriculture and Marine Resources

The Project will result in short term disturbance to the surrounding agricultural operation, road access and materials delivery. However, the upgraded crossing will benefit the surrounding agricultural operations by alleviating erosion, upgrading infrastructure, and reducing impacts from flooding and temporary access will allow agricultural operations to continue throughout project construction. There are no impacts to forestry, mineral, or marine resources.

10. Hazards & Hazardous materials

The project will not create a significant hazard to the public or environment. There is a small risk of accidental spark igniting a fire and spills of fuels or other hazardous materials, but the potential for these impacts will be reduced to a less than significant level through implementation of mitigation measures outlined in a spill prevention and response plan (available upon request). In summary: All heavy equipment will be in good condition, inspected for leaks and washed prior to working within the action area and daily to prevent spills of hazardous materials. Spill containment, absorbent cleanup materials and emergency contact numbers will be onsite at all times during project construction and all contractors and responsible parties will be trained in the appropriate steps should a spill occur. All fueling will occur at least 100 feet from any wetland or stream to prevent impacts to water quality and contamination of hazardous materials. All pumps will be placed on absorbent mats. All machinery will be stored in designated staging areas at least 65' outside of riparian areas.

11. Population/Housing

There are no houses located on the parcel where work is taking place. The project will not result in any loss of housing. Access along Cedar Lodge Lane will be temporarily halted, however access will remain open along the eastern entrance to Cedar Lodge Lane, which is located 0.25 miles away from the western entrance where access will be interrupted. There will be no long term impacts to the population.

12. Transportation/Traffic

Fred Haight Drive is a public county road and designated as a Major Collector. A county encroachment permit will be acquired prior to project construction. Traffic safety rules and regulations will be followed when hauling materials on or off-site. Project activities and staging areas will primarily be located on private property during construction to reduce impacts to traffic on Fred Haigh Drive.

13. Utilities/Service Systems

Utility service providers will be contacted prior to the Project to ensure excavation avoids all underground service lines. Overhead power lines near the project area will be avoided. In June 2019 an underground utility locator determined that the Crossing 4 fill contains a telephone and internet data cable, but no power lines. This finding was confirmed by the local foreman who was involved with constructing Crossing 4 in 2003/2004. The commercial business' phone/internet utilities are provided from another location outside the project area and we assume the residence relies on the utility lines buried in Crossing 4. Replacing Crossing 4 will require a short-term disruption of these services and a potential temporary replacement is being discussed with the residence landowner



and utility companies. Power is provided to the affected properties via overhead lines outside the project area.

14. Fuel Use

Excavated sediment and road fill will be maintained onsite to reduce impacts to traffic, greenhouse gas emissions, and air quality. An estimated 4,000 gallons of diesel and 50 gallons of gasoline will be consumed during project construction.

15. Aesthetics

Short-term impacts to aesthetics of the project area may be impacted, however the stream crossings will be visually similar to the existing crossings after construction and no long term impacts will occur. The Project will be conducted expeditiously to reduce impacts to the aesthetics of the Project area.

16. Recreation

The Project footprint is primarily located on private property and Stotenburg Creek is a small, intermittent and non-navigable waterway. The project will not impact public access or nearby recreational opportunities.

17. Historic, Cultural or Archaeological Resources

A Phase I Cultural Resource Inventory survey was completed by the United States Fish and Wildlife Service (USFWS). The USFWS recommendation is based on background research, land use history, the scope of activities, and the results of the field investigation. The USFWS has determined that the project will have a no historic properties affected outcome under 36CFR800.4.d.1.

Furthermore, the project activities with the most significant amount of earth moving including the installation of the engineered log jam, willow baffles, channel grading, and road decommissioning at Crossing 1, are located close to the mouth of Stotenburg Creek within an area that is frequently flooded, has high levels of seasonal erosion and deposition from the Smith River, and was part of the active channel in 1948 (see Figure 8).

The project will follow the following Cultural Conditions (CUL)s.

1. CUL – 1

- a. It is best practice to avoid cultural resources whenever possible. In cases of inadvertent (unplanned) discovery of cultural resources or human remains, the following procedures are required:
 - i. If buried cultural materials are encountered during construction, it is required that work stop in that area until a qualified archaeologist can evaluate the nature and significance of the find [CCR 15064.5(f)].
 - ii. A qualified archaeologist local to the project may be reached at DZC Archaeology & Cultural Resource Consulting, LLC; (707) 599-9842



2. CUL-2

- a. If human remains are encountered during future construction, it is required that work stop immediately in that area and notification be made to the Del Norte County Coroner (CCR 15064.5(e) (1) (A); HSC Sec.7050.5).
 - i. Contact information for the Chief Deputy Coroner office at the time of this report: Del Norte County Coroner; Dean Wilson– Chief Deputy Coroner. 650 5th St, Crescent City, CA 95531; *Phone: 707-464-4191*
- b. If the coroner determines the remains to Native American, the Coroner shall contact the NAHC within 24 hours and collaboratively determine the Most Likely Descendant (CCR 15064.5(e)(1)(B))

Special Studies

- Engineering designs along with a design report, hydraulic modeling, and wood stability analysis were prepared by licensed Engineers and Geologists at Stillwater Sciences. Qualified botanists and environmental scientists from Stillwater Sciences are completing Botanical and Wetland surveys for the project site with an estimated completion date of August 15, 2022.



Lower Stotenburg Creek Coho Habitat Enhancement Project – Biological Assessment

Prepared by:

Smith River Alliance
PO Box 2129
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Need for the Project

The overall purpose of the project is to improve juvenile salmonid passage, winter rearing habitat, and native riparian vegetation along 0.5 miles of Stotenburg Creek, a tributary of the Smith River.

Stotenburg Creek is a 1.5-mile-long intermittent anadromous creek. The proposed project is located on the lowest 0.5 mile and includes the confluence with the Smith River. The creek flows through private property and is bordered by pasture on one side and by a road on the other side, with the downstream most 0.16-mile flowing away from the road and pasture.

The four undersized stream crossings in the project reach limit fish passage and interfere with the natural conveyance of water, sediment, and wood. Consequently, the channel lacks complexity and depth and increases gravel deposition at the confluence, causing a lack of connectivity between the creek and the river even during low winter flows. The crossings also impede fish passage and cause fish stranding when the creek seasonally goes dry. Additionally, cattle have access to the stream, impacting water quality and riparian vegetation. The riparian vegetation includes sections of dense willow with no mature conifers or riparian trees and other areas devoid of riparian vegetation. Non-native invasive blackberry is dominant and invasive canary grass is present.

The project will restore habitat by: 1) Removing the four crossings, two of which will be replaced and upgraded; 2) installing an engineered log jam, 400' of willow baffles, 5 large wood structures, and 5 beaver dam analogs to increase channel complexity and connectivity; 3) recontouring the channel to enhance connection to the Smith River and to establish floodplain connectivity; and, 4) controlling invasive and enhancing native riparian vegetation and installing cattle exclusion fencing throughout the 0.5-mile project area.

Biological Resources

Stotenburg Creek originates on the western slope of the Coast Range mountains and flows across the coastal plain before entering the right bank of the lower Smith River just downstream from the Highway 101 bridge (Dr. Fine bridge). It is the first tributary to enter the Smith River after it exits its canyon and flows onto the coastal plain. The project area includes intact native scrub-shrub riparian habitat dominated by willow species, areas of degraded non-native riparian habitat dominated by Himalayan blackberry (*Rubus armeniacus*), pasture, and existing roads. The mouth and lower main channel of Stotenburg Creek is inundated and backwatered by the mainstem Smith River during winter high flow events and the entire project area is within the 100-year floodplain of the Smith.

Aquatic Habitat: When water is present, Stotenburg Creek provides important habitat for salmonids, including rearing habitat for juvenile Coho Salmon (Parish and Garwood 2015 and 2016), which are state and federally listed as threatened (Table 1). The primary purpose of the project is to restore instream rearing habitat and passage for juvenile salmonids.



The action falls within designated critical habitat for Southern Oregon Northern California (SONCC) Evolutionarily Significant Unit (ESU) of Coho Salmon. The National Marine Fisheries Service (NMFS) listed SONCC Coho Salmon (*Oncorhynchus kisutch*) as federally Threatened on June 18, 1997. Critical habitat for the SONCC ESU encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon.

In addition to Coho Salmon, the project site is occupied by semi-aquatic mammals including North American Beaver (*Castor canadensis*), North American River Otter (*Lontra canadensis*); fish species including Coastal cutthroat trout (*Oncorhynchus clarkii clarkii*) a Species of Special Concern, Steelhead Trout (*Oncorhynchus mykiss*), and Chinook Salmon (*Oncorhynchus tshawytscha*), Pacific Lamprey (*Entosphenus tridentatus*), and amphibian species including Northern red legged frog (*Rana aurora*), North Coast Clade foothill yellow legged frog (*Rana boylei*), Pacific tailed frog (*Ascaphus truei*), Pacific chorus frog (*Pseudacris regilla*), and rough skinned newt (*Taricha granulosa*).

Tidewater Goby (*Eucyclogobius newberryi*) is a small federally listed fish that inhabits coastal brackish water habitats within California. Tidewater goby are found in Tillas Slough approximately 4 miles from the project area, however the project site is 0.65 miles upstream of the summer tidal prism (Mizuno 1998, Parish and Garwood 2016), and does not have brackish water or suitable habitat for Tidewater Goby.

The nearest siting of Western pond turtle (*Actinemys marmorata*), is approximately 6.5 miles upstream from the project site near the confluence of the Smith River and Clarks Creek, which is the furthest downstream detection of this species. It is unlikely that this species would be present at the project site.

Birds: A number of bird species are likely to utilize the riparian corridor for nesting or foraging. Birders have observed 104 species of birds at the Del Norte County Boat Ramp, which is located approximately 1,000' from the downstream end of the project site (ebird 2022). Intact mature forest with suitable nesting sites for raptor species are limited within a 0.25-mile radius of the project site. The large Sitka Spruce and Coast Redwood trees within 0.25 miles of the project site are located along the Highway 101 corridor and would be exposed to regular noise disturbance from the highway.

There is suitable habitat for state and federally listed Yellow-billed cuckoo (*Coccyzus americanus*) and California listed willow flycatcher (*Empidonax traillii*). The nearest critical habitat for Yellow-billed cuckoo is There is not suitable late seral forested habitat for Marbled Murrelet or Spotted owl at the project site and no designated critical habitat for these species is located within 5 miles of the project site.

Mammals: Non-aquatic mammals including Roosevelt elk (*Cervus Canadensis roosevelti*), and Columbian black-tailed deer (*Odocoileus hemionus columbianus*) are present on the Smith River Plain and migrate through the project site.

The site is within the historic range of listed Coastal DPS Pacific Marten (*Martes caurina*), however this species occupies late successional forests with downed logs that are used for foraging, denning and resting. The nearest Coastal Marten population is on the Middle Fork of the Smith River approximately 16 miles from the project area (USFWS 2018). The project site lacks late successional forest and does not provide adequate food, forage, or shelter for Coastal Marten. There are no residual old growth trees with a 0.25-mile radius from the project site and the nearby open pastures would not provide adequate

cover or protection from predators. Due to the lack of suitable habitat characteristics and the distance from known populations, Coastal Marten is unlikely to utilize the project site.

Plants: Qualified botanists from Stillwater Sciences completed a rare plant survey following “Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities” (CDFW 2018). See Appendix A. Draft Lower Stotenburg Special Status Plant Survey. A scoping list of 122 special-status plant species was developed based on queries of the USFWS, CNPS, and CNDDDB databases. The USFWS, CNPS, and CNDDDB databases were queried for special status plants, host plants, and based on a search of the USGS 7.5-minute quadrangles in which the Project is located (Smith River), and the surrounding quadrangles (High Divide, Crescent City, Hiochi, Mount Emily and Brookings; the last two occur in Oregon) (Project Vicinity). Appendix A lists special-status plant species and sensitive natural communities identified from the sources described above. The survey included a CNDDDB records search and field surveys to identify any host plants for listed butterflies that may occur in the project area. See Appendix A for a list of special status plants with the potential to occur in the project area.

Based on habitat associations along with landform, soils, and known elevation range within the survey area 30 out of the 122 special-status plant species have potential to occur at the project site. Specifically, 23 have low potential to occur and seven have moderate potential to occur, in the survey area. Three legacy natural communities were identified from the CNDDDB query, coastal and valley freshwater marsh, coastal brackish marsh, and north coast salt marsh (see Appendix A).

Table 1. State or federally listed or candidate species, critical habitat, or essential fish habitat in the action area.

Common Name	Scientific Name	State Status	Federal Status	Critical habitat in the action area
Fishes				
SONCC Coho salmon	<i>Oncorhynchus kisutch</i>	T	T	Yes
Tidewater Goby	<i>Eucyclogobius newberryi</i>	-	E	No
Birds				
Willow Flycatcher	<i>Empidonax traillii</i>	E	-	No
Western Yellow-billed cuckoo	<i>Coccyzus americanus</i>	E	T	No
Marbled murrelet	<i>Brachyramphus marmoratus</i>	E	T	No
Northern spotted owl	<i>Strix occidentalis caurina</i>	T	T	No
Mammals				
Coastal DPS Pacific Marten	<i>Martes caurina</i>	E	T	No
Insects				
Oregon Silverspot butterfly	<i>Speyeria zerene hippolyta</i>	-	T	No
Plants				
Western Lily	<i>Lilium occidentale</i>	E	E	No

Table 2. California Species of Concern (SSC), and USFWS Bird of Conservation Concern (BCC)

Common Name	Scientific Name	CDFW Status	Fed Status	Likelihood to occur in project area
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Fish				
Coastal Cutthroat Trout	<i>Oncorhynchus clarkii clarkii</i>	SCC	-	High
Amphibians				
Pacific tailed frog	<i>Ascaphus truei</i>	SCC	-	Low
Northern red legged frog	<i>Rana aurora</i>	SCC	-	High
North coast clade foothill yellow legged frog	<i>Rana boylei</i>	SCC	-	Low
Birds				Likelihood of nesting in Project Area
Allen's Hummingbird	<i>Selasphorus sasin</i>	-	BCC	Moderate: Mar- July
Bald Eagle	<i>Haliaeetus leucocephalus</i>	-	BCC	Moderate: Jan – April
Black Oystercatcher	<i>Haematopus bachmani</i>	-	BCC	None: No suitable nesting habitat.
Black Swift	<i>Cypseloides niger</i>	-	BCC	Low: June - September
Black Turnstone	<i>Arenaria melanocephala</i>	-	BCC	None: Breeds elsewhere.
Cassin's Finch	<i>Carpodacus cassinii</i>	-	BCC	Low: May - June
Clark's Grebe	<i>Aechmophorus clarkia</i>	-	BCC	None: no suitable nesting habitat.
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	-	BCC	Low: June
Lesser Yellowlegs	<i>Tringa flavipes</i>	-	BCC	None: Breeds elsewhere.
Marbled Godwit	<i>Limosa fedoa</i>	-	BCC	None: Breeds elsewhere.
Oak Titmouse	<i>Baeolophus inornatus</i>	-	BCC	Low: Breeds elsewhere
Olive-sided Flycatcher	<i>Contopus cooperi</i>	-	BCC	Moderate: May – July
Rufous Hummingbird	<i>Selasphorus rufus</i>	-	BCC	Moderate: March - July
Short-billed Dowitcher	<i>Limnodromus griseus</i>	-	BCC	Low: July - August
Willet	<i>Tringa semipalmata</i>	-	BCC	None: Breeds elsewhere
Wrentit	<i>Chamaea fasciata</i>	-	BCC	Moderate: March - July

Project Impacts

Existing fish and wildlife resources that the project could substantially adversely affect include species listed in Table 1 and 2, other aquatic or riparian species, and special status plants. See Appendix A for a list of special status plants with the potential to occur in the project area.

Project construction could have effects on biological resources. These impacts include: construction noise, removal of vegetation (willow harvesting, grubbing), impacts to the bed, bank and stream that could change the habitat structure, temporary compaction or erosion from construction activities, impacts to water quality, sediment generation or erosion from the project, and impacts to natural flow during construction.

The project is designed to restore and enhance degraded fish and wildlife habitat and will follow avoidance and minimization measures to ensure the protection of biological resources.



Measures to Protect Biological Resources

Special Status and Rare Plants

An early and a late bloom survey was conducted in May 2022 and July 2022. No rare plants were detected during the early season survey and the project is not expected to have an impact on any rare plants. Neither western lily nor suitable habitat for western lily were observed in the Action Area. Based on these results the project is not likely to have impacts on western lily.

The riparian plant communities, including communities rare in California, will be enhanced by the project. Historically, Sitka spruce (*Picea sitchensis*) and coast redwood (*Sequoia sempervirens*) Forest Alliances comprised most of the habitat along the Smith River's floodplain tributaries. California ranks the Sitka Spruce Forest Alliance as imperiled in the State due to a very restricted range and very few populations, making it vulnerable to extirpation (CNPS 2022). This project will restore some of the historic range of Sitka spruce.

Aquatic Resources

Project implementation is anticipated to occur when no surface water is present. However, if water is present, SRA will work with CDFW staff to remove and exclude all fish and aquatic life from the work area prior to in-channel work. The construction contractor, McCullough Construction Incorporated, will employ a clear water diversion system to bypass creek water around the work site (if water is present) and to remove any 'nuisance' water (e.g. seepage) from within the work area following methods outlined in the California Salmonid Stream Habitat Restoration Manual, Parts IV, IX and XII.

Wastewater from the construction site will be discharged to an upland location with gentle grassed slopes and areas with high infiltration rates. A series of straw wattles downslope from the discharge site will catch and slow any overland flow to ensure a diffuse and filtered re-entry to the groundwater. If necessary, prior to stream diversion and de-watering, fish and amphibian species will be captured and relocated by a qualified fisheries biologist with all necessary State and Federal permits. Electrofishing will be conducted by trained personnel following NOAA guidelines (NMFS 2000). Fish shall be excluded from the work area by blocking the stream channel with a mesh screen upstream of the pump and coffer dam. The fish screen will be made of less than 1/8-inch diameter mesh. The bottom edge of net shall be completely secured to the channel bed to prevent fish from re-entering the construction area and sited in a low velocity portion of the stream to minimize stress for aquatic organisms. Screens will be regularly checked and kept clean of debris.

Project construction will be timed to avoid impacts to amphibians and reptiles. Construction will take place during the driest time of the year and outside of the breeding season for Northern Red-Legged Frog (November – March), and Foothill Yellow Legged Frog (March – May). Prior to construction, any amphibians or reptiles found within the project site will be moved to a safe location upstream or downstream of the work site. If amphibians or reptiles are present, SRA will notify CDFW and set up a 24" high exclusion fence between the project site and nearby suitable habitat to prevent re-entry.

Pacific lamprey have not been documented in Stotenburg Creek, however the species may benefit from increased connectivity to low velocity winter habitat. Restoration actions will be conducted during low flow and ammocete impacts are expected to be minimal. If ammocetes are observed during construction, a CDFW biologist will be consulted and BMPs will be implemented to reduce impacts. LWD



and BDA structures are known to improve habitat conditions through filtering and capturing sediments, increasing groundwater recharge and increasing habitat available for juvenile and adult Pacific lamprey (Gray and Poirier 2018)

Bird Species

The proposed activity does not degrade existing habitat for riparian nesting species including Willow flycatcher. Riparian nesting birds including listed Yellow-billed cuckoo and willow flycatcher are not expected to be present in the action area due to limited breeding in this part of California (Serena 1982, Craig and Williams 1998), however there is potential habitat for these and other riparian nesting bird species which could be disturbed by vegetation removal or construction noise.

Project staging, project construction, vegetation removal (e.g., clearing and grubbing), vegetation management activities requiring removal of riparian vegetation, or tree trimming shall be performed outside of the bird nesting season (May 1st through August 31st) to avoid impacts to nesting birds; if these activities must be performed during the nesting bird season, a qualified biologist shall conduct a preconstruction survey in the project construction and staging areas for nesting birds and verify the presence or absence of nesting birds no more than 14 calendar days prior to construction activities or after any construction breaks of 14 calendar days or more. Surveys shall be performed for the project construction and staging areas and suitable habitat within 300 feet of the project construction and staging areas in order to locate any active passerine (perching bird) nests and within 500 feet of the project construction and staging areas to locate any active raptor (birds of prey) nest. If nesting birds and raptors do not occur within 300 and 500 feet of the Project area, respectively, then no further action is required if construction begins within 14 calendar days. If active nests are located during the pre-construction bird nesting surveys, no-disturbance buffer zones shall be established around nests, with a buffer size established by the qualified biologist. Typically, these buffer distances are 100 feet for non-listed birds, 300 feet for listed birds and 500 feet for raptors. These distances may be adjusted depending on the level of surrounding ambient activity and if an obstruction, such as a building or structure, is within line-of-sight between the nest and construction. Reduced buffers may be allowed if a full-time qualified biologist is present to monitor the nest and has authority to halt construction if bird behavior indicates continued activities could lead to nest failure. Buffered zones shall be avoided during construction-related activities until young have fledged or the nest is otherwise abandoned.

Mammals:

The placement, height and fencing materials will be selected to prevent cattle access to the stream while also allowing wildlife passage following CDFW guidelines for wildlife friendly fencing. The wildlife friendly design will allow for at least 12" between the top two wires, a bottom wire at least 16" from the ground, be approximately 42" tall for animals to effectively jump over and be constructed out of visible materials in areas where wildlife concentrate and cross (Paige 2012).

Consultation with Responsible Agencies and Project Permitting

All necessary local, federal and state permits will be acquired prior to project construction. Project designs were funded by the CDFW Fisheries Restoration Grant Program. Staff from California Department of Fish and Wildlife, National Marine Fisheries Service, and North Coast Regional Water Quality Control Board participated on the Technical Advisory Committee and provided input during the project design process.



The following permits will be obtained prior to project construction:

1. County of Del Norte: SRA will apply for an encroachment permit for impacts to Fred Haight Drive, and a building permit for the bridge that will replace the undersized culvert at Crossing #1.
2. CDFW 1600 Permit: The project involves alterations to the bed and bank of Stotenburg Creek. Smith River Alliance will obtain a Lake and Streambed Alteration Agreement from the California Department of Fish and Wildlife.
3. USACE Section 404 Permit: Stotenburg Creek up to the ordinary high water mark and some of the adjacent riparian areas are considered wetland as defined under Section 404 of the Clean Water Act. Wetland impacts are limited to the stream channel and impacts to the stream channel will result in no-net loss of wetland or riparian habitat. Prior to project construction, SRA will coordinate with the USACE to apply for 404 coverage under a Nationwide Permit.
4. NOAA Fisheries Consistency Determination and Biological Opinion: SRA will coordinate with the NOAA Restoration Center on a coastal Consistency Determination for project activities that are outside of the Local Coastal Program's jurisdiction and a biological opinion.
5. NCRWQCB 401 Permit: SRA will apply for a General Water Quality Certification from the Regional Water Quality Control Board.

Summary of Best Management Practices (BMPs) to Reduce or Eliminate Potential Effects of the Project

1. Impacts to rare plants will be avoided, minimized and mitigated.
2. For project work occurring before August 31st. A nesting bird survey will be completed two weeks prior to project construction, and buffers will be established to avoid any impacts on nesting birds.
3. The project area is anticipated to be dry during construction. However, if needed, fish screens and dewatering systems will be in-place and maintained in working order at all times water is being diverted. If fish screen maintenance is needed the area shall be isolated, cleared of fish and dewatered prior to maintenance or replacement to ensure juvenile fish are not passively entrained into the project area. Fish relocation and dewatering activities will occur during lowest stream flow between June 1st and November 1st.
4. All heavy equipment will be inspected for leaks and washed prior to working within the action area. All fueling will occur at least 100 feet from any wetland or stream. Permanent removal of vegetation will be minimized. Trees removed will be documented and replanted or replaced once the project is finished. Access by equipment will occur on both sides of the stream to utilize the driest locations along the stream to reduce effects to soil.
5. The contractor will follow all best management practices outlined in the spill prevention and response plan.
6. The project will be implemented with necessary permits from all responsible agencies and according to recommendations from CDFW and other state permitting agencies.
7. All spoils that cannot be re-used during construction will be diffusely scattered across pasture areas or stockpiled with Best Management Practices installed to prevent erosion.

Project Photos and Maps

Figure 1. Left: Crossing #1 is a 3-foot corrugated metal pipe (CMP) with a shot-gun outlet that is rusting at the base. This culvert is a juvenile barrier that will be removed. Right: The road going over Crossing #1 will be removed and replaced with a bridge, further upstream.



Figure 2. Crossing #2 outlet. This crossing is undersized, limits fish passage and the natural conveyance of sediment and debris. Crossing will be removed.



Figure 3. Crossing #3 is a ford, that increases the chance of juvenile fish stranding as flows recede. This crossing will be removed to ensure connectivity to downstream habitat. Flow is from left to right.



Figure 4. The channel between Crossing #3 and #4 lacks cattle exclusion fencing. This area will be planted with native vegetation and four BDA's will be installed to increase channel depth and complexity.



Figure 5. Crossing #4 at Cedar Lodge Lane is a series of four undersized culverts, one of which is overgrown and plugged with debris. This crossing will be replaced with a culvert that meets all fish passage criteria and passes the 100-year flows.



Figure 6. Action Area Map

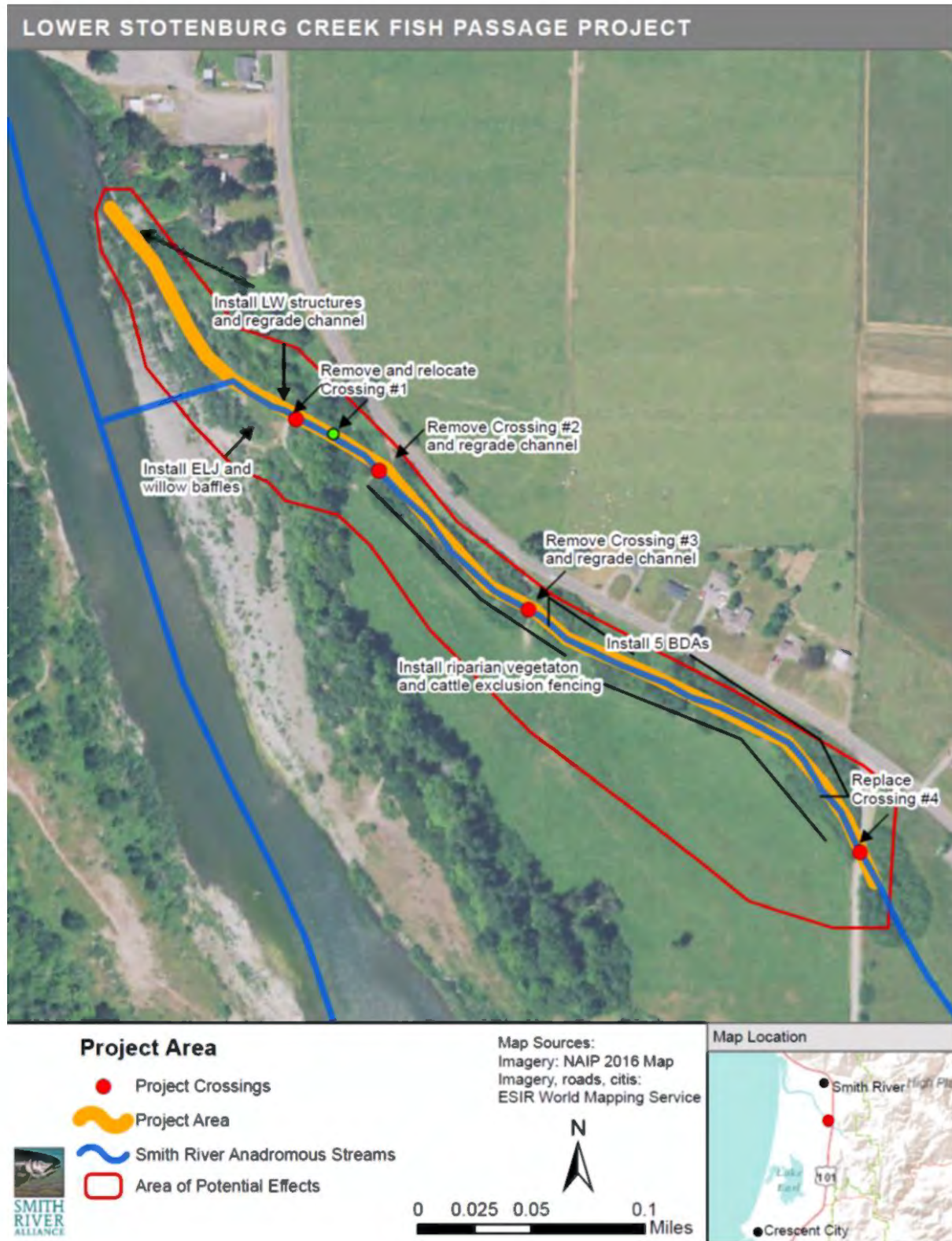


Figure 7. County Zoning Map, project area is highlighted in yellow.

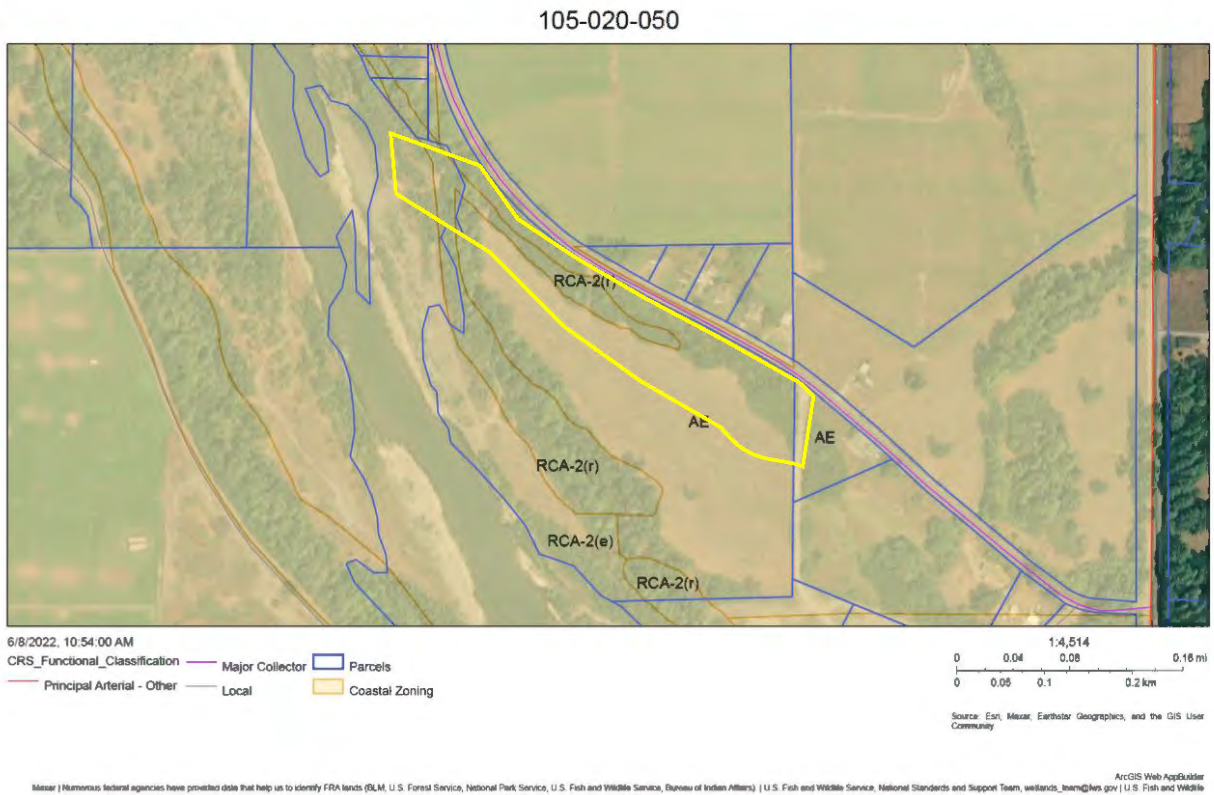


Figure 8. Map of the Lower Stotenburg project overlaid on the a georeferenced air photo from 1948, showing that certain project activities including the engineered log jam, willow baffles, and Crossing 1 removal are located within the historic channel of the Smith River.

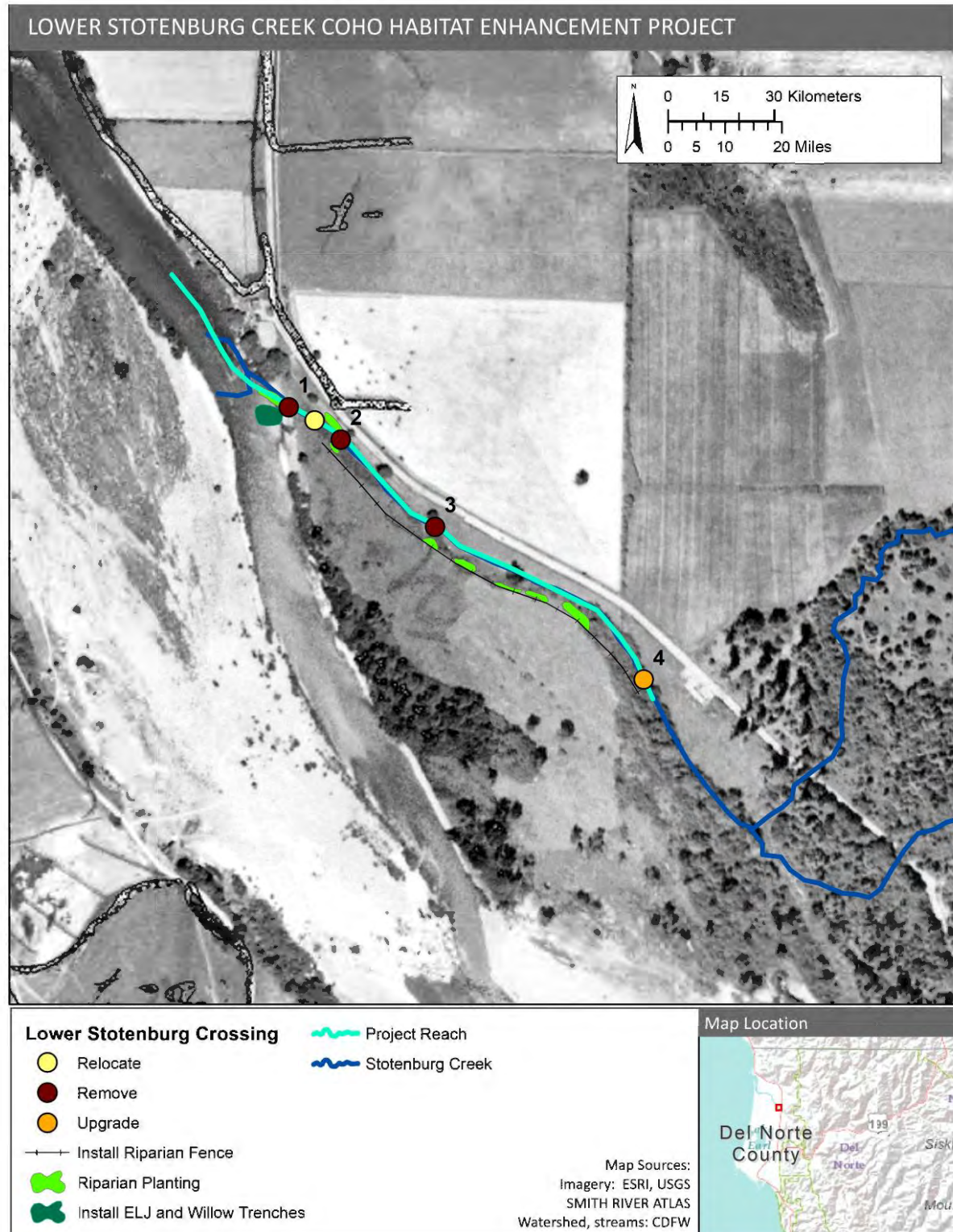
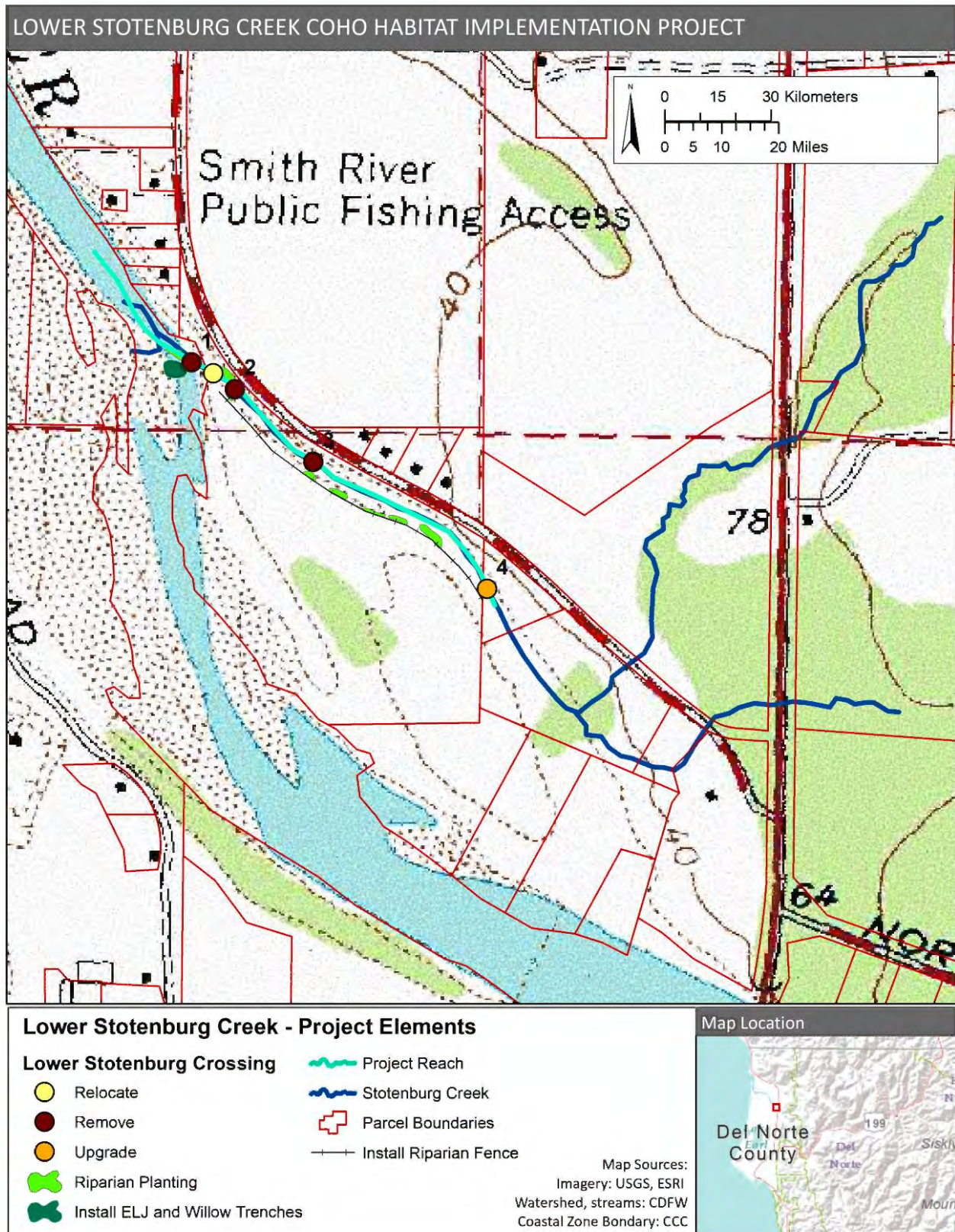


Figure 9. Topographic map of the project elements with parcel boundaries shown in red.





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FINAL REPORT - AUGUST 2022

Special-Status Plant Surveys for the Lower Stotenburg Creek Enhancement Project, Del Norte County, California



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Suggested citation:

Stillwater Sciences. 2022. Special-status Plant Surveys for the Lower Stotenburg Creek Enhancement Project. Prepared by Stillwater Sciences, Arcata, California for Smith River Alliance, Smith River, California.

Cover photos (clockwise from upper left): Photographs of riparian conditions within Lower Stotenburg Creek.

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Appendices

Appendix A. Special-status Plant and CDFW Sensitive Natural Communities Scoping Lists

Appendix B. Completed CNDDDB forms

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1 PROJECT DESCRIPTION

1.1 Project Location and Survey Area

The project site is located along lower Stotenburg Creek approximately six miles upstream from the mouth of the Smith River, and 2.75 miles south of the town of Smith River in northern Del Norte County, California. Stotenburg Creek originates on the western slope of the Coast Range mountains and flows across the coastal plain before entering the right bank of the lower Smith River just downstream from the Highway (HWY) 101 bridge (Dr. Fine bridge). Stotenburg Creek is the first tributary to enter the Smith River after it exits its canyon and flows onto the coastal plain. The project site extends approximately 0.5 miles upstream from the Smith River confluence along a low-gradient alluvial floodplain.

The project is in Sections 2 and 11 of Township 17 North, Range 1 West of the Smith River U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Elevations range from approximately 5 feet [ft] to 50 ft above mean sea level. The survey area included all features associated with 100% design provided in the 2019 *Basis of Design Report & Feasibility Analyses for the Lower Stotenburg Creek Coho Habitat Enhancement Design Project* (BOD) (Stillwater Sciences 2019).

The survey area included a 50-foot buffer surrounding both the design footprint defined in the BOD report and the temporary staging and access routes.

1.2 Purpose of the Special-status Plant Survey

The purpose of the survey was to document the presence of any special-status plant species or sensitive natural communities within the survey area. Special-status plant species are defined as those listed, proposed, or under review as threatened or endangered under the federal Endangered Species Act of 1973 (FESA) and/or the California Endangered Species Act (CESA); designated as rare under the California Native Plant Protection Act (CNPPA); and/or taxa that meet the criteria for listing as described in Section 15380 of the California Environmental Quality Act of 1970 (CEQA) Guidelines, including species listed on California Department of Fish and Wildlife's (CDFW's) *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2022a), plants with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4, and/or considered a locally significant species (i.e., rare or uncommon in the county or region). Sensitive natural communities are defined as those natural community types (i.e., legacy natural communities in CDFW's California Natural Diversity Database [CNDDB, CDFW 2022]), vegetation alliances, and/or associations with a state ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) on CDFW's *California Sensitive Natural Communities List* (CDFW 2021) or in the CNDDB (CDFW 2022b).

2 METHODS

2.1 Establishing the List of Species that Could Occur in the Survey Area

A list of special-status plants and sensitive natural communities that may occur in the survey area was developed by querying the following resources:

- The U.S. Fish and Wildlife Service (USFWS) online *Information for Planning and Consultation* (IPaC) (USFWS 2022),
- The California Native Plant Society's (CNPS) online *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2022a), and
- CDFW's CNDDb (CDFW 2022b).

The USFWS, CNPS, and CNDDb database queries were each based on a search of the USGS 7.5-minute quadrangles in which the Project is located (Smith River), and the surrounding quadrangles (High Divide, Crescent City, Hiochi, Mount Emily and Brookings; the last two occur in Oregon) (Project Vicinity). Appendix A lists special-status plant species and sensitive natural communities identified from the sources described above.

The potential for special-status plant species or sensitive natural communities listed in Appendix A to occur in the survey area was determined by: (1) reviewing the current distribution of each species (i.e., whether it overlaps with the Project); (2) reviewing the documented occurrence information from the CNDDb, Consortium of California Herbaria (CCH 2022), and CalFlora (2022); (3) reviewing existing information on vegetation in the CALVEG geodatabase (USDA Forest Service 2020) and the *Manual of California Vegetation*, online edition (CNPS 2022b); (4) comparing the habitat associations of each species with the habitat conditions documented in and adjacent to the survey area; and (5) using professional judgment to evaluate habitat quality and the relevance of occurrence data, or lack thereof.

This review and analysis resulted in the following categories of the likelihood for a special-status species to occur in the survey area:

- None: the survey area is outside the species' current distributional or elevation range and/or the species' required habitat is lacking from the survey area (e.g., coastal dunes).
- Low: the species' known distribution or elevation range is within the Project Vicinity, but not the survey area, and/or the species' required habitat is of very low quality or quantity in the survey area.
- Moderate: the species' known distribution or elevation range overlaps with the survey area and/or the species' required habitat occurs in the survey area.
- High: the species has been documented in the survey area and/or its required habitat occurs in the survey area and is of high quality.

A total of 122 special-status plant species were documented as occurring within the Project Vicinity (Appendix A). Based on habitat associations along with landform, soils, and known elevation range within the survey area 30 out of the 122 special-status plant species had potential to occur. Specifically, 23 have low potential to occur and seven have moderate potential to occur, in the survey area (Table 1 and Appendix A). Three legacy natural communities were identified from the CNDDb query, coastal and valley freshwater marsh, coastal brackish marsh, and north coast salt marsh (see Table A-2, Appendix A).

Table 1. Special-status plant species with potential to occur in the survey area.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Family	Lifeform	Habitat associations and blooming period	Likelihood of occurrence
<i>Angelica lucida</i> (sea-watch)	None, None, 4.2	Apiaceae	perennial herb	Coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps; 0–490 ft. Blooming period: April–September	Low. Coastal scrub habitat observed along Smith River strand. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Calamagrostis crassiglumis</i> (Thurber's reed grass)	None, None, 2B.1	Poaceae	perennial rhizomatous herb	Coastal scrub, marshes and swamps; 35–195 ft. Blooming period: May–August	Low. Coastal scrub habitat observed along Smith River strand. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Carex lenticularis</i> var. <i>limnophila</i> (lagoon sedge)	None, None, 2B.2	Cyperaceae	perennial herb	Gravelly (often) bogs and fens, marshes and swamps, North Coast coniferous forest; 0–20 ft. Blooming period: June–August	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Carex lyngbyei</i> (Lyngbye's sedge)	None, None, 2B.2	Cyperaceae	perennial rhizomatous herb	Marshes and swamps; 0–35 ft. Blooming period: April–August	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Carex praticola</i> (northern meadow sedge)	None, None, 2B.2	Cyperaceae	perennial herb	Meadows and seeps; 0–10,500 ft. Blooming period: May–July	Low. Grassland in survey area is managed agricultural pasture.
<i>Carex viridula</i> ssp. <i>viridula</i> (green yellow sedge)	None, None, 2B.3	Cyperaceae	perennial herb	Bogs and fens, marshes and swamps, North Coast coniferous forest; 0–5,250 ft. Blooming period: (June) July–September (November)	Moderate. Some marsh habitat along confluence with Smith River and along open riparian corridors. Two documented occurrences in the Smith River coastal plain (CalFlora 2022, CCH 2022)
<i>Castilleja ambigua</i> var. <i>ambigua</i> (johnny-nip)	None, None, 4.2	Orobanchaceae	annual herb (hemiparasitic)	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools; 0–1,425 ft. Blooming period: March–August	Low. Coastal scrub habitat observed along Smith River strand.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Family	Lifeform	Habitat associations and blooming period	Likelihood of occurrence
Downingia willamettensis (Cascade downingia)	None, None, 2B.2	Campanulaceae	annual herb	Cismontane woodland, valley and foothill grassland, vernal pools; 50–3640 ft. Blooming period: June–July (September)	Low. Grassland in survey area is managed agricultural pasture.
Empetrum nigrum (black crowberry)	None, None, 2B.2	Empetraceae	perennial evergreen shrub	Coastal bluff scrub, coastal prairie; 35–655 ft. Blooming period: April– June	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Eriogonum nudum var. paralinum (Del Norte buckwheat)	None, None, 2B.2	Polygonaceae	perennial herb	Coastal bluff scrub, coastal prairie; 15–260 ft. Blooming period: June– September	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Erysimum concinnum (bluff wallflower)	None, None, 1B.2	Brassicaceae	annual/perennial herb	Coastal bluff scrub, coastal dunes, coastal prairie; 0–605 ft. Blooming period: February–July	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Gilia capitata ssp. pacifica (Pacific gilia)	None, None, 1B.2	Polemoniaceae	annual herb	Chaparral, coastal bluff scrub, coastal prairie, valley and foothill grassland; 15–5,465 ft. Blooming period: April–August	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Hesperevax sparsiflora var. brevifolia (short-leaved evax)	None, None, 1B.2	Asteraceae	annual herb	Coastal bluff scrub, coastal dunes, coastal prairie; 0–705 ft. Blooming period: March–June	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Family	Lifeform	Habitat associations and blooming period	Likelihood of occurrence
<i>Hosackia gracilis</i> (harlequin lotus)	None, None, 4.2	Fabaceae	perennial rhizomatous herb	Roadsides broadleafed upland forest, cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, meadows and seeps, North Coast coniferous forest, valley and foothill grassland; 0–2,295 ft. Blooming period: March–July	Low. Coastal scrub habitat observed along Smith River strand, grassland in survey area is managed agricultural pasture, and some marsh habitat present along confluence with Smith River and along open riparian corridors.
<i>Lasthenia californica</i> ssp. <i>macrantha</i> (perennial goldfields)	None, None, 1B.2	Asteraceae	perennial herb	Coastal bluff scrub, coastal dunes, coastal scrub; 15–1,705 ft. Blooming period: January–November	Low. Coastal scrub habitat observed along Smith River strand.
<i>Lathyrus palustris</i> (marsh pea)	None, None, 2B.2	Fabaceae	perennial herb	Mesic bogs and fens, coastal prairie, coastal scrub, lower montane coniferous forest, marshes and swamps, North Coast coniferous forest; 5–330 ft. Blooming period: March–August	Low. Coastal scrub habitat observed along Smith River strand, grassland in survey area is managed agricultural pasture, and some marsh habitat present along confluence with Smith River and along open riparian corridors.
<i>Lysimachia europaea</i> (arctic starflower)	None, None, 2B.2	Myrsinaceae	perennial herb	Coastal bogs and fens, meadows and seeps; 0–50 ft. Blooming period: June–July	Low. Grassland in survey area is managed agricultural pasture.
<i>Oenothera wolfii</i> (Wolf's evening-primrose)	None, None, 1B.1	Onagraceae	perennial herb	Mesic (usually), Sandy coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest; 10–2,625 ft. Blooming period: May–October	Moderate. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture. Several documented occurrences in the Smith River coastal plain, one near the survey area (CalFlora 2022, CCH 2022).

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Family	Lifeform	Habitat associations and blooming period	Likelihood of occurrence
<i>Oxalis suksdorfii</i> (Suksdorf's wood-sorrel)	None, None, 4.3	Oxalidaceae	perennial rhizomatous herb	Broadleafed upland forest, North Coast coniferous forest; 50–2,295 ft. Blooming period: May–August	Moderate. Although forested habitat in the survey area was characterized as riparian, several herbarium collections were documented in the Smith River region (CCH 2022) and there may be some potential for this species to occur.
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i> (Gairdner's yampah)	None, None, 4.2	Apiaceae	perennial herb	Vernally Mesic broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools; 0–2,000 ft. Blooming period: June–October	Low. Grassland in survey area is managed agricultural pasture.
<i>Pleuropogon refractus</i> (nodding semaphore grass)	None, None, 4.2	Poaceae	perennial rhizomatous herb	Mesic lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, riparian forest; 0–5,250 ft. Blooming period: (March) April–August	Moderate. Species known to occur in riparian forest habitats in region.
<i>Polemonium carneum</i> (Oregon polemonium)	None, None, 2B.2	Polemoniaceae	perennial herb	Coastal prairie, coastal scrub, lower montane coniferous forest; 0–6,005 ft. Blooming period: April– September	Moderate. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture. Several documented occurrences in the Smith River coastal plain north of the survey area (CCH 2022).
<i>Potamogeton foliosus</i> ssp. <i>fibrillosus</i> (fibrous pondweed)	None, None, 2B.3	Potamogetonaceae	perennial rhizomatous herb (aquatic)	Marshes and swamps; 15–4,265 ft. Blooming period: Unknown	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Romanzoffia tracyi</i> (Tracy's romanzoffia)	None, None, 2B.3	Hydrophyllaceae	perennial herb	Rocky coastal bluff scrub, coastal scrub; 50–100 ft. Blooming period: March–May	Low. Coastal scrub habitat observed along Smith River strand.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Family	Lifeform	Habitat associations and blooming period	Likelihood of occurrence
<i>Sabulina howellii</i> (Howell's sandwort)	None, None, 1B.3	Caryophyllaceae	perennial herb	Serpentine chaparral, lower montane coniferous forest; 1,805– 3,280 ft. Blooming period: April– July	Low. Although out of elevation range and suitable habitat is lacking in the survey area the species was considered to have some potential to occur based on the close proximity to a 1944 occurrence collected and submitted to Cal Poly Humboldt Herbarium east of Highway 101 along North Bank Road (CDFW 2022, Record number HSC- 61625).
<i>Sagittaria sanfordii</i> (Sanford's arrowhead)	None, None, 1B.2	Alismataceae	perennial rhizomatous herb (emergent)	Marshes and swamps; 0–2,135 ft. Blooming period: May–October (November)	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Sidalcea malachroides</i> (maple-leaved checkerbloom)	None, None, 4.2	Malvaceae	perennial herb	Disturbed areas (often) broadleaved upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, riparian woodland; 0–2,395 ft. Blooming period: (March) April–August	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
<i>Sidalcea malviflora</i> ssp. <i>patula</i> (Siskiyou checkerbloom)	None, None, 1B.2	Malvaceae	perennial rhizomatous herb	Coastal bluff scrub, coastal prairie, North Coast coniferous forest; 50– 4,035 ft. Blooming period: (March) May–August	Moderate. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture. One documented occurrence in the Smith River coastal plain along Highway 101 to the north of the survey area.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Family	Lifeform	Habitat associations and blooming period	Likelihood of occurrence
<i>Sidalcea oregana</i> ssp. <i>eximia</i> (coast checkerbloom)	None, None, 1B.2	Malvaceae	perennial herb	Lower montane coniferous forest, meadows and seeps, North Coast coniferous forest; 15–4,395 ft. Blooming period: June–August	Moderate. Grassland in survey area is managed agricultural pasture however, there was a documented occurrence in the Smith River coastal plain along Palea Road.
<i>Viola palustris</i> (alpine marsh violet)	None, None, 2B.2	Violaceae	perennial rhizomatous herb	Bogs and fens, coastal scrub; 0– 490 ft. Blooming period: March– August	Low. Coastal scrub habitat observed along Smith River strand.

¹ Status:

Federal

None No federal status

State

None No state status

California Rare Plant Rank

List 1B Plants rare, threatened, or endangered in California and elsewhere

List 2B Plants rare, threatened, or endangered in California, but more common elsewhere

List 4 Plants of limited distribution, a watch list

CNPS Threat Ranks:

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

² Months in parentheses are uncommon; N/A = Not applicable

2.2 Pre-field Review

Prior to field surveys a desktop review was conducted to:

- Review key identifying characteristics and life history stages (e.g., bloom time) of the targeted special-status plant species and sensitive natural communities with potential to occur in the survey area,
- Create field maps of known locations for targeted special-status vascular within the survey area, and
- Prepare and plan for field surveys.

The timing of life history stages for each targeted species (Table 1) was reviewed to determine survey periods that would coincide with the phenological stage (e.g., flowering or fruiting) during which the special-status plant species were most easily identified in the field. An early spring survey (i.e., May) and a summer survey (i.e., July) captured all pertinent blooming periods.

To familiarize surveyors with key characteristics and natural variation of those characteristics of each special-status plant species, information was obtained through a review of: (1) CNPS (2022a) and CDFW (2022b) data; (2) photographs on CalPhotos (University of California, Berkeley 2022); and (3) key characteristics using the online *Jepson eFlora* (Jepson Flora Project 2022).

Information on known occurrences of special-status vascular and nonvascular species and sensitive natural communities was compiled and plotted in Geographic Information System (GIS) and printed onto field maps.

2.3 Field Surveys

2.3.1 Vegetation characterization

Vegetation classification and mapping efforts characterized dominant vegetation types and their plant associates. Each cover type was defined to the vegetation alliance or finer (associate-level) scale per classification described in *A Manual of California Vegetation*, online edition (CNPS 2022b). These alliances/associations were checked against CDFW's *California Sensitive Natural Communities List* (CDFW 2021) to determine if they were a sensitive natural community with a state rank of S1, S2, or S3.

2.3.2 Special-status plant surveys

The floristic surveys for special-status plant species were conducted in May and July 2022 by qualified botanists with: (1) experience conducting floristic surveys; (2) knowledge of plant taxonomy and plant community ecology and classification; (3) familiarity with the plant species of the area; (4) familiarity with appropriate state and federal statutes related to plants and plant collecting; and (5) experience with analyzing impacts of a project on native plant species and natural communities. The survey followed the methods of the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996) and *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). Specifically, surveys were comprehensive for vascular plants such that “every plant taxon that occurs in the project area is identified to the taxonomic level necessary to determine rarity and listing status” (CDFG 2018). If identification was not possible in the field, the plants were collected for identification in the

laboratory (using the “1 in 20” rule, Wagner 1991) or, if potentially a special-status plant, according to the botanists’ current CDFW plant voucher collection permit guidelines (e.g., not more than five individuals or two percent of the population, whichever is less, for one voucher sheet). All plant species were identified following the taxonomy of the *Jepson eFlora* (Jepson Flora Project 2022).

The location and population boundaries of any identified special-status species will be recorded in the field using a handheld GPS unit or recorded on a field map. Information collected for each special-status population will be recorded onto a CDFW CNDDDB *Field Survey Form* that will include the following:

- numbers of individuals,
- phenology,
- habitat description (e.g., surrounding plant communities, dominant species, associated species, substrates/soils, aspects/slopes),
- relative condition of the population (i.e., a qualitative assessment of site quality and occurrence viability [excellent, good, fair, or poor]), and
- recognizable risk factors.

In addition, photographs will be taken to document diagnostic floral characteristics, growth forms, and habitat characteristics of special-status species.

3 RESULTS

3.1 Vegetation Characterization

Vegetation communities in the survey area were formed by various coastal riparian vegetation assemblages (Figure 1). Most prevalent was the *Salix hookeriana* - *Salix sitchensis* - *Spiraea douglasii* Shrubland Alliance, a sensitive natural community (S3). This alliance was further classified and mapped into the *Salix hookeriana* and *Salix sitchensis* associations (Figure 1). These vegetation associations formed dense mid-canopy cover along Lower Stotenburg Creek with riparian canopy breaks that occurred along the left bank and along road crossings. Invasive weed *Rubus armeniacus* (Himalayan blackberry) had moderate to high understory cover throughout the left bank and sparse to moderate cover along the right bank. The project design includes enhancement of *Salix sitchensis* and *Salix hookeriana* associations with understory invasive weed management activities and subsequent interplanting. Near Lower Stotenburg Creek confluence, the new channel alignment activities may disturb some *Salix sitchensis* (Sitka willow) however any canopy cover loss will be temporary based on this species recovery after disturbance (willow species have shown rapid regrowth from intact root balls, trunks, branches). The design also includes revegetation in the riparian canopy gaps observed along the left bank of the *Salix hookeriana* Association in the project footprint. The planting palette at these locations include overstory and mid-story species observed in the riparian upper bank locations of the adjacent Smith River. These revegetation areas will enhance the currently monotypic mid-story riparian corridor by adding species known to commonly occur in this vegetation alliance and provide some additional overstory thereby increasing structure complexity and shade.

The upper bank riparian of Smith River adjacent to the project contained primarily *Alnus rubra* Forest Alliance (red alder forest) (Figure 1). In this alliance, cover by mature *Populus trichocarpa* (black cottonwood), *Salix lasiandra* (Pacific willow), *Fraxinus latifolia* (Oregon ash), and

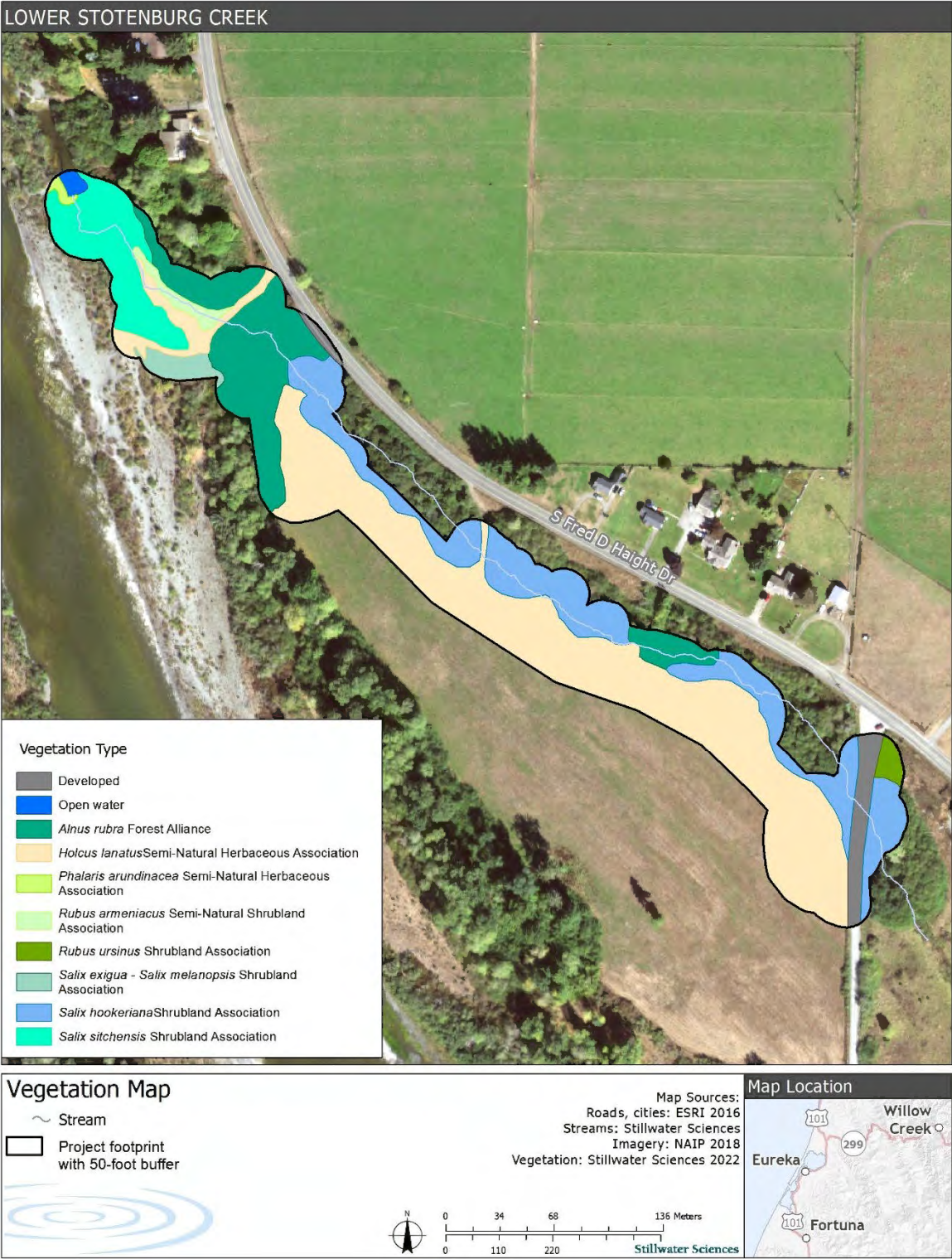


Figure 1. Vegetation communities mapped within the Lower Stotenburg Creek design footprint and 50-foot surrounding buffer.

Umbellularia californica (California bay) were prevalent. In the project footprint near Crossing One, this alliance formed a dense overstory with moderate mid-story canopy cover and an understory primarily composed of Himalayan blackberry. The small mature patch that occurred further upstream of Lower Stotenburg Creek was typical of the historical species assemblage along the creek (Figure 1). At this location, the canopy formed an intermittent overstory and nonnative Himalayan blackberry was prevalent within the understory along the unvegetated riparian right bank. The project design revegetation will infill this canopy gap and nonnative vegetation management activities are planned. In general, mature overstory tree species will be avoided by the project where this alliance overlaps with project design features except at Crossing One where around eight red alders will be removed for construction of the road crossing. Riparian enhancement by interplanting with mixed hardwoods and some evergreen conifers where invasive weed management activities are planned in this alliance.

Openings along the Lower Stotenburg riparian corridor contained stands of Himalayan blackberry (*Rubus armeniacus* Semi-Natural Shrubland Association) (Figure 1). Revegetation at these locations will first involve the mechanical removal and disposal of this invasive weed species followed by infill planting using a diverse overstory and mid-story riparian planting palette. These project activities will expand the narrowed riparian corridor at these locations and transition these nonnative stand types to native species assemblages.

A small portion of the survey area near the Smith River backwater ponded feature (typed as open water) had an open canopy with sparse to moderate cover by *Phalaris arundinacea* (reed canary grass) and was mapped as the *Phalaris arundinacea* Semi-Natural Herbaceous Association (Figure 1). Reed canary grass extended upstream into the *Salix sitchensis* Association that was mapped along the lower extent of Lower Stotenburg Creek. This weedy species had moderate cover along the riparian canopy edge and lower cover underneath the closed mid-story canopy. Reed canary grass removal and disposal will occur where design activities are planned. In addition, best management practices will be employed during construction activities to reduce the spread of seed and plant material throughout the site. One special-status species, *Carex lyngbyei* (Lyngbye's sedge) was noted in this vegetation community (see Section 3.2).

Mid-bank riparian vegetation along the Smith River riverbank was characterized by the *Salix exigua* - *Salix melanopsis* Association, where moderate cover by *Salix melanopsis* was observed. This species colonizes and stabilizes mid-bank areas and although only a small portion is mapped within the survey area, it has a wider occurrence along the Smith River riverbank. This vegetation community is naturally disturbed by fluctuating river water levels and scour. It is outside of the project footprint and will not be impacted by project activities.

3.2 Special-status Plant Surveys

One special-status species was observed in survey area: *Carex lyngbyei* (Lyngbye's sedge) (Figure 2). A completed CNDDB form for this occurrence is provided in Appendix B. A comprehensive plant list of all species observed from the May and July 2022 botanical surveys is provided in Appendix C.

Carex lyngbyei (Lyngbye's sedge)



Lyngbye's sedge is a perennial rhizomatous herb in the Cyperaceae family with a California Rare Plant Rank (CRPR) of 2B.2. It is limited to the North and Central Coast at 0–33 ft elevation (Jepson Flora Project 2022). In California, it is known to occur in Del Norte, Humboldt, Mendocino, Marin, and Napa counties where it occurs in brackish and freshwater marshes and swamps and blooms from April through August (CNPS 2022a).

In the survey area, Lyngbye's sedge occurred as a discrete small patch of less than ten individuals along the backwater channel of Smith River, just downstream of the Lower Stotenburg Creek confluence (Figure 2). This occurrence is outside of the immediate project footprint and will be avoided during project construction. This occurrence was located along the break in canopy cover along the water's edge. *Eleocharis macrostachya* (pale spikerush) was along the lower extent and reed canary grass was observed adjacent. Furthermore, an occurrence of over two dozen individuals was noted outside of the survey area along the Smith River water's edge. All noted occurrences in and adjacent to the survey area were patchy and had intermittent cover. This was characteristic of the species habit where it occurs within the riverine-estuarine ecotone. In more dynamic estuarine intertidal features, this species forms dense monotypic bands along the shoreline such as in the Elk River estuary, Humboldt County, California. Like the most upstream extent of Lyngbye's sedge populations in the Elk River, this occurrence similarly formed intermittent and patchy cover along the bank at the water's edge within open riparian canopy breaks. Potential threats to the populations noted in and adjacent to the project included competition by reed canary grass and riverbank scour.

During project implementation, the small patch identified in the project will be flagged for avoidance by a qualified biological monitor. In addition, the following minimization measures will be employed to reduce impacts to the population by project activities:

- The Project disturbance footprint will be minimized to the extent possible.
- Ground disturbance and vegetation clearing and/or trimming will be confined to the minimum amount necessary to facilitate Project implementation.
- Heavy equipment and vehicles will use existing access roads to the extent possible.
- Construction materials will be stored in designated staging areas.
- Measures to prevent the spread of invasive weeds will be taken, including, where appropriate, inspecting equipment for soil, seeds, and vegetative matter, cleaning equipment, utilizing weed-free materials and native seed mixes for revegetation, and proper disposal of soil and vegetation. Prior to entering and leaving the work site, workers will remove all seeds, plant parts, leaves, and woody debris (e.g., branches, chips, bark) from clothing, shoes, vehicles, and equipment.



Figure 2. Special-status plant occurrence in and adjacent to the Lower Stotenburg Creek survey area.

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Appendices

Appendix A

Special-status Plant and CDFW Sensitive Natural Communities Scoping Lists

Table A-1. Scoping list of special-status plant species in the Project Vicinity.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Abronia umbellata var. breviflora (pink sand-verbena)	None, None, 1B.1	CNPS, CNDDB	Nyctaginaceae	annual herb	Coastal dunes; 0–35 ft. Blooming period: June–October	None. No suitable habitat in survey area.
Angelica lucida (sea-watch)	None, None, 4.2	CNPS	Apiaceae	perennial herb	Coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps; 0–490 ft. Blooming period: April–September	Low. Coastal scrub habitat observed along Smith River strand. Some marsh habitat along confluence with Smith River and along open riparian corridors.
Antennaria suffrutescens (evergreen everlasting)	None, None, 4.3	CNPS	Asteraceae	perennial stoloniferous herb	Lower montane coniferous forest; 1,640–5,250 ft. Blooming period: January–July	None. No suitable habitat in survey area.
Anthoxanthum nitens ssp. nitens (vanilla-grass)	None, None, 2B.3	CNPS, CNDDB	Poaceae	perennial rhizomatous herb	Meadows and seeps; 4,920– 6,215 ft. Blooming period: April–July	None. No suitable habitat (out of elevation range) in survey area.
Arabis aculeolata (Waldo rockcress)	None, None, 2B.2	CNPS, CNDDB	Brassicaceae	perennial herb	Serpentine broadleafed upland forest, lower montane coniferous forest, upper montane coniferous forest; 1,345–5,905 ft. Blooming period: April–June	None. No suitable habitat in survey area.
Arabis mcdonaldiana (McDonald's rockcress)	FE, CE, 1B.1	CNPS, CNDDB, USFWS	Brassicaceae	perennial herb	Serpentine lower montane coniferous forest, upper montane coniferous forest; 445–5,905 ft. Blooming period: May–July	None. No suitable habitat in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Arctostaphylos hispidula (Howell's manzanita)	None, None, 4.2	CNPS	Ericaceae	perennial evergreen shrub	Chaparral; 395–4,100 ft. Blooming period: March–April	None. No suitable habitat in survey area.
Arctostaphylos nortensis (Del Norte manzanita)	None, None, 4.3	CNPS	Ericaceae	perennial evergreen shrub	Serpentine (often) chaparral, lower montane coniferous forest; 1,640–2,625 ft. Blooming period: February	None. No suitable habitat in survey area.
Arnica cernua (serpentine arnica)	None, None, 4.3	CNPS	Asteraceae	perennial rhizomatous herb	Lower montane coniferous forest; 1,640–6,300 ft. Blooming period: April–July	None. No suitable habitat in survey area.
Arnica spathulata (Klamath arnica)	None, None, 4.3	CNPS	Asteraceae	perennial rhizomatous herb	Lower montane coniferous forest; 2,100–5,905 ft. Blooming period: May–August	None. No suitable habitat in survey area.
Asplenium trichomanes ssp. trichomanes (maidenhair spleenwort)	None, None, 2B.1	CNPS, CNDDB	Aspleniaceae	perennial rhizomatous herb	Lower montane coniferous forest; 605–655 ft. Blooming period: May–July	None. No suitable habitat in survey area.
Boechera koehleri (Koehler's stipitate rockcress)	None, None, 1B.3	CNPS, CNDDB	Brassicaceae	perennial herb	Rocky, Serpentine chaparral, lower montane coniferous forest; 510–5,445 ft. Blooming period: (March) April–July	None. No suitable habitat in survey area.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Calamagrostis crassiglumis</i> (Thurber's reed grass)	None, None, 2B.1	CNPS, CNDDB	Poaceae	perennial rhizomatous herb	Coastal scrub, marshes and swamps; 35–195 ft. Blooming period: May–August	Low. Coastal scrub habitat observed along Smith River strand. Some marsh habitat along confluence with Smith River and along open riparian corridors.
<i>Calicium adpersum</i> (spiral-spored gilded- head pin lichen)	None, None, 2B.2	CNPS, CNDDB	Caliciaceae	crustose lichen (epiphytic)	Lower montane coniferous forest, North Coast coniferous forest; ~655 ft. Blooming period: N/A (lichen)	None. No suitable habitat in survey area.
<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> (Butte County morning-glory)	None, None, 4.2	CNPS, CNDDB	Convolvulaceae	perennial rhizomatous herb	Roadsides (sometimes), Rocky chaparral, lower montane coniferous forest, valley and foothill grassland; 1,855–5,000 ft. Blooming period: May–July	None. No suitable habitat (out of elevation range) in survey area.
<i>Cardamine angulata</i> (seaside bittercress)	None, None, 2B.2	CNPS, CNDDB	Brassicaceae	perennial herb	Streambanks lower montane coniferous forest, North Coast coniferous forest; 50–3,000 ft. Blooming period: (January) March–July	None. No suitable habitat in survey area.
<i>Cardamine nuttallii</i> var. <i>gemma</i> (yellow-tubered toothwort)	None, None, 3.3	CNPS, CNDDB	Brassicaceae	perennial rhizomatous herb	Serpentine lower montane coniferous forest, North Coast coniferous forest; 330–2,295 ft. Blooming period: April–May (June)	None. No suitable habitat in survey area.
<i>Carex arcta</i> (northern clustered sedge)	None, None, 2B.2	CNPS, CNDDB	Cyperaceae	perennial herb	Bogs and fens, North Coast coniferous forest; 195–4,595 ft. Blooming period: June– September	None. No suitable habitat in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Carex lenticularis var. limnophila (lagoon sedge)	None, None, 2B.2	CNPS, CNDDB	Cyperaceae	perennial herb	Gravelly (often) bogs and fens, marshes and swamps, North Coast coniferous forest; 0–20 ft. Blooming period: June–August	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
Carex lyngbyei (Lyngbye's sedge)	None, None, 2B.2	CNPS, CNDDB	Cyperaceae	perennial rhizomatous herb	Marshes and swamps; 0–35 ft. Blooming period: April–August	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
Carex praticola (northern meadow sedge)	None, None, 2B.2	CNPS, CNDDB	Cyperaceae	perennial herb	Meadows and seeps; 0–10,500 ft. Blooming period: May–July	Low. Grassland in survey area is managed agricultural pasture.
Carex scabriuscula (Siskiyou sedge)	None, None, 4.3	CNPS	Cyperaceae	perennial rhizomatous herb	Mesic, Seeps (sometimes), Serpentine (sometimes) lower montane coniferous forest, meadows and seeps, upper montane coniferous forest; 2,330–7,695 ft. Blooming period: May–July	None. No suitable habitat (out of elevation range) in survey area.
Carex serpenticola (serpentine sedge)	None, None, 2B.3	CNPS, CNDDB	Cyperaceae	perennial rhizomatous herb	Meadows and seeps; 195–3,935 ft. Blooming period: March– May	None. No suitable habitat (out of elevation range) in survey area. CNDDB reported occurrence north of the survey area was attributed as occurring near Wimer Road near the town of Smith River however no exact location is known. Survey area is below the known elevation range for the species, and it was considered as unlikely to occur.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Carex sheldonii</i> (Sheldon's sedge)	None, None, 2B.2	CNPS	Cyperaceae	perennial rhizomatous herb	Lower montane coniferous forest, marshes and swamps, riparian scrub; 3935–6,600 ft. Blooming period: May–August	None. No suitable habitat (out of elevation range) in survey area.
<i>Carex viridula</i> ssp. <i>viridula</i> (green yellow sedge)	None, None, 2B.3	CNPS, CNDDB	Cyperaceae	perennial herb	Bogs and fens, marshes and swamps, North Coast coniferous forest; 0–5,250 ft. Blooming period: (June) July–September (November)	Moderate. Some marsh habitat along confluence with Smith River and along open riparian corridors. Two documented occurrences in the Smith River coastal plain (CalFlora 2022, CCH 2022)
<i>Cascadia nuttallii</i> (Nuttall's saxifrage)	None, None, 2B.1	CNPS, CNDDB	Saxifragaceae	perennial rhizomatous herb	North Coast coniferous forest; 130–245 ft. Blooming period: May	None. No suitable habitat (out of elevation range) in survey area.
<i>Castilleja ambigua</i> var. <i>ambigua</i> (johnny-nip)	None, None, 4.2	CNPS	Orobanchaceae	annual herb (hemiparasitic)	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools; 0–1,425 ft. Blooming period: March– August	Low. Coastal scrub habitat observed along Smith River strand.
<i>Castilleja brevilibata</i> (short-lobed paintbrush)	None, None, 4.2	CNPS	Orobanchaceae	perennial herb (hemiparasitic)	Lower montane coniferous forest; 395–5,580 ft. Blooming period: April–July	None. No suitable habitat (out of elevation range) in survey area.
<i>Castilleja elata</i> (Siskiyou paintbrush)	None, None, 2B.2	CNPS, CNDDB	Orobanchaceae	perennial herb (hemiparasitic)	Serpentine (often) bogs and fens, lower montane coniferous forest; 0–5,740 ft. Blooming period: May–August	None. No suitable habitat in survey area.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Castilleja litoralis</i> (Oregon coast paintbrush)	None, None, 2B.2	CNPS, CNDDB	Orobanchaceae	perennial herb (hemiparasitic)	Sandy coastal bluff scrub, coastal dunes, coastal scrub; 50– 330 ft. Blooming period: June	None. Coastal scrub habitat observed along Smith River strand not sandy mostly a gravel substrate.
<i>Chrysosplenium glechomifolium</i> (Pacific golden saxifrage)	None, None, 4.3	CNPS	Saxifragaceae	perennial herb	Roadsides (sometimes), Seeps (sometimes), Streambanks North Coast coniferous forest, riparian forest; 35–720 ft. Blooming period: February–June	None. Species is not likely to occur based on the species assemblage and high disturbance of the riparian forested understory (high cover by <i>Rubus armeniacus</i>) in the survey area.
<i>Cochlearia groenlandica</i> (Greenland cochlearia)	None, None, 2B.3	CNPS, CNDDB	Brassicaceae	annual herb	Coastal bluff scrub; 0–165 ft. Blooming period: May–July	None. Known occurrence associated with sea stacks along coast. Coastal scrub habitat observed in survey area not associated with this species habitat preferences.
<i>Coptis laciniata</i> (Oregon goldthread)	None, None, 4.2	CNPS, CNDDB	Ranunculaceae	perennial rhizomatous herb	Mesic meadows and seeps, North Coast coniferous forest; 0–3,280 ft. Blooming period: (February) March–May (September–November)	None. Grassland in survey area is managed agricultural pasture and does not contain mesic lowland or swale features.
<i>Cypripedium californicum</i> (California lady's- slipper)	None, None, 4.2	CNPS	Orchidaceae	perennial rhizomatous herb	Seeps, Serpentine (usually), Streambanks bogs and fens, lower montane coniferous forest; 100–9,025 ft. Blooming period: April–August (September)	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Cypripedium montanum (mountain lady's-slipper)	None, None, 4.2	CNPS	Orchidaceae	perennial rhizomatous herb	Broadleafed upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest; 605– 7,300 ft. Blooming period: March–August	None. No suitable habitat (out of elevation range) in survey area.
Darlingtonia californica (California pitcherplant)	None, None, 4.2	CNPS	Sarraceniaceae	perennial rhizomatous herb (carnivorous)	Mesic, Seeps (usually), Serpentine (usually) bogs and fens, meadows and seeps; 0– 8,480 ft. Blooming period: April–August	None. No suitable habitat in the survey area.
Dicentra formosa ssp. oregana (Oregon bleeding heart)	None, None, 4.2	CNPS	Papaveraceae	perennial herb	Lower montane coniferous forest; 1,395–4,870 ft. Blooming period: April–May	None. No suitable habitat (out of elevation range) in survey area.
Downingia willamettensis (Cascade downingia)	None, None, 2B.2	CNPS, CNDDB	Campanulaceae	annual herb	Cismontane woodland, valley and foothill grassland, vernal pools; 50–3640 ft. Blooming period: June–July (September)	Low. Grassland in survey area is managed agricultural pasture.
Empetrum nigrum (black crowberry)	None, None, 2B.2	CNPS, CNDDB	Empetraceae	perennial evergreen shrub	Coastal bluff scrub, coastal prairie; 35–655 ft. Blooming period: April–June	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Epilobium rigidum (Siskiyou Mountains willowherb)	None, None, 4.3	CNPS	Onagraceae	perennial herb	Lower montane coniferous forest; 490–3,935 ft. Blooming period: July–August	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Erigeron cervinus (Siskiyou daisy)	None, None, 4.3	CNPS	Asteraceae	perennial rhizomatous herb	Lower montane coniferous forest, meadows and seeps; 80– 6,235 ft. Blooming period: June– August	None. Grassland in survey area is managed agricultural pasture and survey area is outside of known elevation range for this species.
Eriogonum nudum var. paralinum (Del Norte buckwheat)	None, None, 2B.2	CNPS, CNDDB	Polygonaceae	perennial herb	Coastal bluff scrub, coastal prairie; 15–260 ft. Blooming period: June–September	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Eriogonum pendulum (Waldo wild buckwheat)	None, None, 2B.2	CNPS, CNDDB	Polygonaceae	perennial herb	Serpentinite lower montane coniferous forest, upper montane coniferous forest; 755–3,280 ft. Blooming period: August– September	None. No suitable habitat (out of elevation range) in survey area.
Eriogonum ternatum (ternate buckwheat)	None, None, 4.3	CNPS	Polygonaceae	perennial herb	Lower montane coniferous forest; 1,000–7,300 ft. Blooming period: June–August	None. No suitable habitat (out of elevation range) in survey area.
Erysimum concinnum (bluff wallflower)	None, None, 1B.2	CNPS, CNDDB	Brassicaceae	annual/perenni al herb	Coastal bluff scrub, coastal dunes, coastal prairie; 0–605 ft. Blooming period: February–July	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
Erythronium hendersonii (Henderson's fawn lily)	None, None, 2B.3	CNPS, CNDDB	Liliaceae	perennial bulbiferous herb	Lower montane coniferous forest; 985–5,250 ft. Blooming period: April–July	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Erythronium howellii (Howell's fawn lily)	None, None, 1B.3	CNPS, CNDDB	Liliaceae	perennial bulbiferous herb	Serpentine (sometimes) lower montane coniferous forest, North Coast coniferous forest; 655– 3,755 ft. Blooming period: April–May	None. No suitable habitat (out of elevation range) in survey area.
Erythronium oregonum (giant fawn lily)	None, None, 2B.2	CNPS, CNDDB	Liliaceae	perennial herb	Openings, Rocky, Serpentine (sometimes) cismontane woodland, meadows and seeps; 330–3,775 ft. Blooming period: March–June (July)	None. No suitable habitat (out of elevation range) in survey area.
Eucephalus glabratus (Siskiyou aster)	None, None, 4.3	CNPS	Asteraceae	perennial herb	Openings, Rocky lower montane coniferous forest, upper montane coniferous forest; 395–8,875 ft. Blooming period: June– September	None. No suitable habitat (out of elevation range) in survey area.
Fissidens pauperculus (minute pocket moss)	None, None, 1B.2	CNPS, CNDDB	Fissidentaceae	moss	North Coast coniferous forest; 35–3,360 ft. Blooming period:	None. No suitable habitat in survey area.
Gentiana setigera (Mendocino gentian)	None, None, 1B.2	CNPS, CNDDB	Gentianaceae	perennial herb	Mesic lower montane coniferous forest, meadows and seeps; 1,100–3,495 ft. Blooming period: (April–July) August– September	None. No suitable habitat (out of elevation range) in survey area.
Gilia capitata ssp. pacifica (Pacific gilia)	None, None, 1B.2	CNPS, CNDDB	Polemoniaceae	annual herb	Chaparral, coastal bluff scrub, coastal prairie, valley and foothill grassland; 15–5,465 ft. Blooming period: April–August	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Gilia millefoliata</i> (dark-eyed gilia)	None, None, 1B.2	CNPS, CNDDB	Polemoniaceae	annual herb	Coastal dunes; 5–100 ft. Blooming period: April–July	None. No suitable habitat in survey area.
<i>Glehnia littoralis</i> ssp. <i>leiocarpa</i> (American glehnia)	None, None, 4.2	CNPS	Apiaceae	perennial herb	Coastal dunes; 0–65 ft. Blooming period: May–August	None. No suitable habitat in survey area.
<i>Hesperervax</i> <i>sparsiflora</i> var. <i>brevifolia</i> (short-leaved evax)	None, None, 1B.2	CNPS, CNDDB	Asteraceae	annual herb	Coastal bluff scrub, coastal dunes, coastal prairie; 0–705 ft. Blooming period: March–June	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.
<i>Horkelia sericata</i> (silky horkelia)	None, None, 4.3	CNPS	Rosaceae	perennial herb	Clay, Serpentine chaparral, lower montane coniferous forest; 590–3,935 ft. Blooming period: June–August	None. No suitable habitat (out of elevation range) in survey area.
<i>Hosackia gracilis</i> (harlequin lotus)	None, None, 4.2	CNPS	Fabaceae	perennial rhizomatous herb	Roadsides broadleafed upland forest, cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, meadows and seeps, North Coast coniferous forest, valley and foothill grassland; 0–2,295 ft. Blooming period: March–July	Low. Coastal scrub habitat observed along Smith River strand, grassland in survey area is managed agricultural pasture, and some marsh habitat present along confluence with Smith River and along open riparian corridors.
<i>Iris bracteata</i> (Siskiyou iris)	None, None, 3.3	CNPS	Iridaceae	perennial rhizomatous herb	Serpentine broadleafed upland forest, lower montane coniferous forest; 590–3,510 ft. Blooming period: May–June	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Iris innominata</i> (Del Norte County iris)	None, None, 4.3	CNPS	Iridaceae	perennial rhizomatous herb	Lower montane coniferous forest; 985–6,560 ft. Blooming period: May–June	None. No suitable habitat (out of elevation range) in survey area.
<i>Iris tenax</i> ssp. <i>klamathensis</i> (Orleans iris)	None, None, 4.3	CNPS	Iridaceae	perennial rhizomatous herb	Lower montane coniferous forest; 330–4,595 ft. Blooming period: April–May	None. No suitable habitat (out of elevation range) in survey area.
<i>Iris thompsonii</i> (Thompson's iris)	None, None, 4.3	CNPS	Iridaceae	perennial rhizomatous herb	Edges (often), Mesic (usually), Openings, Roadsides (sometimes), Serpentinite (often), Streambanks (sometimes) lower montane coniferous forest, North Coast coniferous forest; 295–1,970 ft. Blooming period: (March–April) May–June (July–August)	None. No suitable habitat (out of elevation range) in survey area.
<i>Kopsiopsis hookeri</i> (small groundcone)	None, None, 2B.3	CNPS, CNDDB	Orobanchaceae	perennial rhizomatous herb (parasitic)	North Coast coniferous forest; 295–2,905 ft. Blooming period: April–August	None. No suitable habitat (out of elevation range) in survey area.
<i>Lasthenia californica</i> ssp. <i>macrantha</i> (perennial goldfields)	None, None, 1B.2	CNPS, CNDDB	Asteraceae	perennial herb	Coastal bluff scrub, coastal dunes, coastal scrub; 15–1,705 ft. Blooming period: January–November	Low. Coastal scrub habitat observed along Smith River strand.
<i>Lathyrus delnorticus</i> (Del Norte pea)	None, None, 4.3	CNPS	Fabaceae	perennial herb	Serpentinite (often) lower montane coniferous forest, North Coast coniferous forest; 100–4,755 ft. Blooming period: June–July	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Lathyrus japonicus (seaside pea)	None, None, 2B.1	CNPS, CNDDB	Fabaceae	perennial rhizomatous herb	Coastal dunes; 5–100 ft. Blooming period: May–August	None. No suitable habitat in survey area.
Lathyrus palustris (marsh pea)	None, None, 2B.2	CNPS, CNDDB	Fabaceae	perennial herb	Mesic bogs and fens, coastal prairie, coastal scrub, lower montane coniferous forest, marshes and swamps, North Coast coniferous forest; 5–330 ft. Blooming period: March– August	Low. Coastal scrub habitat observed along Smith River strand, grassland in survey area is managed agricultural pasture, and some marsh habitat present along confluence with Smith River and along open riparian corridors.
Lewisia oppositifolia (opposite-leaved lewisia)	None, None, 2B.2	CNPS, CNDDB	Montiaceae	perennial herb	Lower montane coniferous forest; 985–4,005 ft. Blooming period: April–May (June)	None. No suitable habitat (out of elevation range) in survey area.
Lilium bolanderi (Bolander's lily)	None, None, 4.2	CNPS	Liliaceae	perennial bulbiferous herb	Serpentine chaparral, lower montane coniferous forest; 100– 5,250 ft. Blooming period: June– July	None. No suitable habitat (out of elevation range) in survey area.
Lilium occidentale (western lily)	FE, CE, 1B.1	CNPS, CNDDB, USFWS	Liliaceae	perennial bulbiferous herb	Bogs and fens, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, North Coast coniferous forest; 5–605 ft. Blooming period: June–July	None. Existing populations well documented in the region and known occurrences under state management.
Lilium pardalinum ssp. vollmeri (Vollmer's lily)	None, None, 4.3	CNPS	Liliaceae	perennial bulbiferous herb	Bogs and fens, meadows and seeps; 100–5,510 ft. Blooming period: (June) July–August	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Listera cordata (heart-leaved twayblade)	None, None, 4.2	CNPS	Orchidaceae	perennial herb	Bogs and fens, lower montane coniferous forest, North Coast coniferous forest; 15–4,495 ft. Blooming period: February–July	None. No suitable habitat in survey area.
Lomatium howellii (Howell's lomatium)	None, None, 4.3	CNPS	Apiaceae	perennial herb	Serpentine chaparral, lower montane coniferous forest; 360– 5,595 ft. Blooming period: April–July	None. No suitable habitat (out of elevation range) in survey area.
Lomatium tracyi (Tracy's lomatium)	None, None, 4.3	CNPS	Apiaceae	perennial herb	Serpentine lower montane coniferous forest, upper montane coniferous forest; 1495–6,400 ft. Blooming period: May–June	None. No suitable habitat (out of elevation range) in survey area.
Lycopodium clavatum (running-pine)	None, None, 4.1	CNPS	Lycopodiaceae	perennial rhizomatous herb	Edges (often), Openings, Roadsides lower montane coniferous forest, marshes and swamps, North Coast coniferous forest; 150–4,020 ft. Blooming period: June–August (September)	None. No suitable habitat (out of elevation range) in survey area.
Lysimachia europaea (arctic starflower)	None, None, 2B.2	CNPS, CNDDB	Myrsinaceae	perennial herb	Coastal bogs and fens, meadows and seeps; 0–50 ft. Blooming period: June–July	Low. Grassland in survey area is managed agricultural pasture.
Micranthes marshallii (Marshall's saxifrage)	None, None, 4.3	CNPS	Saxifragaceae	perennial rhizomatous herb	Rocky, Streambanks riparian forest; 295–6,990 ft. Blooming period: March–August	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Mitellastrum caulescens</i> (leafy-stemmed mitrewort)	None, None, 4.2	CNPS, CNDDB	Saxifragaceae	perennial rhizomatous herb	Mesic, sometimes roadsides in broadleaved upland forest, lower montane coniferous forest, meadows and seeps, North Coast coniferous forest; 15–5,580 ft. Blooming period: (March) April–October	None. Grassland in survey area is managed agricultural pasture without mesic features and roadsides with mesic condition are outside of the survey area.
<i>Moneses uniflora</i> (woodnymph)	None, None, 2B.2	CNPS, CNDDB	Ericaceae	perennial rhizomatous herb	Broadleaved upland forest, North Coast coniferous forest; 330– 3,610 ft. Blooming period: May– August	None. No suitable habitat (out of elevation range) in survey area.
<i>Monotropa uniflora</i> (ghost-pipe)	None, None, 2B.2	CNPS, CNDDB	Ericaceae	perennial herb (achlorophyllo us)	Broadleaved upland forest, North Coast coniferous forest; 35– 1,805 ft. Blooming period: June– August (September)	None. No suitable habitat in survey area. Nearby documented occurrences all associated with Douglas- fir/tanoak and coast redwood forests.
<i>Montia howellii</i> (Howell's montia)	None, None, 2B.2	CNPS, CNDDB	Montiaceae	annual herb	Vernally mesic, sometimes roadsides in meadows and seeps, North Coast coniferous forest, vernal pools; 0–2,740 ft. Blooming period: (February) March–May	None. Grassland in survey area is managed agricultural pasture without mesic features and roadsides with mesic condition are outside of the survey area.
<i>Oenothera wolfii</i> (Wolf's evening- primrose)	None, None, 1B.1	CNPS, CNDDB	Onagraceae	perennial herb	Mesic (usually), Sandy coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest; 10–2,625 ft. Blooming period: May–October	Moderate. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture. Several documented occurrences in the Smith River coastal plain, one near the survey area (CalFlora 2022, CCH 2022).

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Oxalis suksdorfii</i> (Suksdorf's wood-sorrel)	None, None, 4.3	CNPS	Oxalidaceae	perennial rhizomatous herb	Broadleafed upland forest, North Coast coniferous forest; 50–2,295 ft. Blooming period: May–August	Moderate. Although forested habitat in the survey area was characterized as riparian, several herbarium collections were documented in the Smith River region (CCH 2022) and there may be some potential for this species to occur.
<i>Packera bolanderi</i> var. <i>bolanderi</i> (seacoast ragwort)	None, None, 2B.2	CNPS, CNDDB	Asteraceae	perennial rhizomatous herb	Roadsides (sometimes) coastal scrub, North Coast coniferous forest; 100–2,135 ft. Blooming period: (January–April) May–July (August)	None. No suitable habitat (out of elevation range) in survey area.
<i>Packera macounii</i> (Siskiyou Mountains ragwort)	None, None, 4.3	CNPS	Asteraceae	perennial herb	Disturbed areas (often), Serpentine (sometimes) chaparral, lower montane coniferous forest; 1,310–3,000 ft. Blooming period: June–July	None. No suitable habitat (out of elevation range) in survey area.
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i> (Gairdner's yampah)	None, None, 4.2	CNPS	Apiaceae	perennial herb	Vernally Mesic broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools; 0–2,000 ft. Blooming period: June–October	Low. Grassland in survey area is managed agricultural pasture.
<i>Phacelia argentea</i> (sand dune phacelia)	PT, None, 1B.1	CNPS, CNDDB	Hydrophyllaceae	perennial herb	Coastal dunes; 10–80 ft. Blooming period: June–August	None. No suitable habitat in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Pinguicula macroceras (horned butterwort)	None, None, 2B.2	CNPS, CNDDB	Lentibulariaceae	perennial herb (carnivorous)	Bogs and fens; 130–6,300 ft. Blooming period: April–June	None. No suitable habitat (out of elevation range) in survey area.
Piperia candida (white-flowered rein orchid)	None, None, 1B.2	CNPS, CNDDB	Orchidaceae	perennial herb	Serpentine (sometimes) broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest; 100– 4,300 ft. Blooming period: (March) May–September	None. No suitable habitat (out of elevation range) in survey area.
Pityopus californicus (California pinefoot)	None, None, 4.2	CNPS	Ericaceae	perennial herb (achlorophyllo us)	Mesic broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest, upper montane coniferous forest; 50–7,300 ft. Blooming period: (March–April) May–August	None. No suitable habitat in survey area.
Pleuropogon refractus (nodding semaphore grass)	None, None, 4.2	CNPS	Poaceae	perennial rhizomatous herb	Mesic lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, riparian forest; 0–5,250 ft. Blooming period: (March) April–August	Moderate. Species known to occur in riparian forest habitats in region.
Poa piperi (Piper's blue grass)	None, None, 4.3	CNPS	Poaceae	perennial rhizomatous herb	Rocky, Serpentine chaparral, lower montane coniferous forest; 330–4,790 ft. Blooming period: April–May	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Polemonium carneum (Oregon polemonium)	None, None, 2B.2	CNPS, CNDDB	Polemoniaceae	perennial herb	Coastal prairie, coastal scrub, lower montane coniferous forest; 0–6,005 ft. Blooming period: April–September	Moderate. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture. Several documented occurrences in the Smith River coastal plain north of the survey area (CCH 2022).
Potamogeton foliosus ssp. fibrillosus (fibrous pondweed)	None, None, 2B.3	CNPS, CNDDB	Potamogetonaceae	perennial rhizomatous herb (aquatic)	Marshes and swamps; 15–4,265 ft. Blooming period: Unknown	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
Primula pauciflora (beautiful shootingstar)	None, None, 4.2	CNPS	Primulaceae	perennial herb	Mesic great basin scrub, meadows and seeps, pinyon and juniper woodland; 3,280–7,810 ft. Blooming period: April–June	None. No suitable habitat (out of elevation range) in survey area.
Pyrrocoma racemosa var. congesta (Del Norte pyrrocoma)	None, None, 2B.3	CNPS, CNDDB	Asteraceae	perennial herb	Serpentine chaparral, lower montane coniferous forest; 655– 3,280 ft. Blooming period: August–September	None. No suitable habitat (out of elevation range) in survey area.
Ramalina thrausta (angel's hair lichen)	None, None, 2B.1	CNPS, CNDDB	Ramalinaceae	fruticose lichen (epiphytic)	North Coast coniferous forest; 245–1,410 ft. Blooming period:	None. No suitable habitat (out of elevation range) in survey area.
Ribes laxiflorum (trailing black currant)	None, None, 4.3	CNPS	Grossulariaceae	perennial deciduous shrub	Roadsides (sometimes) North Coast coniferous forest; 15– 4,575 ft. Blooming period: March–July (August)	None. No suitable habitat in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Romanzoffia tracyi (Tracy's romanzoffia)	None, None, 2B.3	CNPS, CNDDB	Hydrophyllaceae	perennial herb	Rocky coastal bluff scrub, coastal scrub; 50–100 ft. Blooming period: March–May	Low. Coastal scrub habitat observed along Smith River strand.
Sabulina howellii (Howell's sandwort)	None, None, 1B.3	CNPS, CNDDB	Caryophyllaceae	perennial herb	Serpentine chaparral, lower montane coniferous forest; 1,805–3,280 ft. Blooming period: April–July	Low. Although out of elevation range and suitable habitat is lacking in the survey area the species was considered to have some potential to occur based on the close proximity to a 1944 occurrence collected and submitted to CalPoly Humboldt Herbarium east of Highway 101 along North Bank Road (CDFW 2022, Record number HSC-61625).
Sagittaria sanfordii (Sanford's arrowhead)	None, None, 1B.2	CNPS, CNDDB	Alismataceae	perennial rhizomatous herb (emergent)	Marshes and swamps; 0–2,135 ft. Blooming period: May– October (November)	Low. Some marsh habitat along confluence with Smith River and along open riparian corridors.
Salix delnortensis (Del Norte willow)	None, None, 4.3	CNPS	Salicaceae	perennial deciduous shrub	Riparian forest; 295–1,640 ft. Blooming period: April–May	None. No suitable habitat (out of elevation range) in survey area.
Sanguisorba officinalis (great burnet)	None, None, 2B.2	CNPS, CNDDB	Rosaceae	perennial rhizomatous herb	Serpentine (often) bogs and fens, broadleaved upland forest, marshes and swamps, meadows and seeps, North Coast coniferous forest, riparian forest; 195–4,595 ft. Blooming period: July–October	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
Sanicula peckiana (Peck's sanicle)	None, None, 4.3	CNPS	Apiaceae	perennial herb	Serpentine (often) chaparral, lower montane coniferous forest; 490–2,625 ft. Blooming period: March–June	None. No suitable habitat (out of elevation range) in survey area.
Sedum flavidum (pale yellow stonecrop)	None, None, 4.3	CNPS	Crassulaceae	perennial herb	Openings, Rocky, Serpentine, Talus, Volcanic broadleaved upland forest, chaparral, lower montane coniferous forest, upper montane coniferous forest; 1,165–7,070 ft. Blooming period: May–July	None. No suitable habitat (out of elevation range) in survey area.
Sedum patens (Smith River stonecrop)	None, None, 1B.2	CNPS, CNDDB	Crassulaceae	perennial herb	Openings, Rock crevices, Rocky, Talus, Ultramafic lower montane coniferous forest; 295– 690 ft. Blooming period: May– July	None. No suitable habitat (out of elevation range) in survey area.
Sidalcea elegans (Del Norte checkerbloom)	None, None, 3.3	CNPS	Malvaceae	perennial rhizomatous herb	Serpentine chaparral, lower montane coniferous forest; 705– 4,480 ft. Blooming period: May– July	None. No suitable habitat (out of elevation range) in survey area.
Sidalcea malachroides (maple-leaved checkerbloom)	None, None, 4.2	CNPS, CNDDB	Malvaceae	perennial herb	Disturbed areas (often) broadleaved upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, riparian woodland; 0–2,395 ft. Blooming period: (March) April–August	Low. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Sidalcea malviflora</i> ssp. <i>patula</i> (Siskiyou checkerbloom)	None, None, 1B.2	CNPS, CNDDB	Malvaceae	perennial rhizomatous herb	Coastal bluff scrub, coastal prairie, North Coast coniferous forest; 50–4,035 ft. Blooming period: (March) May–August	Moderate. Coastal scrub habitat observed along Smith River strand and grassland in survey area is managed agricultural pasture. One documented occurrence in the Smith River coastal plain along Highway 101 to the north of the survey area.
<i>Sidalcea oregana</i> ssp. <i>eximia</i> (coast checkerbloom)	None, None, 1B.2	CNPS, CNDDB	Malvaceae	perennial herb	Lower montane coniferous forest, meadows and seeps, North Coast coniferous forest; 15–4,395 ft. Blooming period: June–August	Moderate. Grassland in survey area is managed agricultural pasture however, there was a documented occurrence in the Smith River coastal plain along Palea Road.
<i>Silene hookeri</i> (Hooker's catchfly)	None, None, 2B.2	CNPS, CNDDB	Caryophyllaceae	perennial herb	Openings (often), Rocky (sometimes), Serpentine (sometimes) chaparral, cismontane woodland, lower montane coniferous forest; 490– 4,135 ft. Blooming period: (March) May–July	None. No suitable habitat (out of elevation range) in survey area.
<i>Silene serpentinicola</i> (serpentine catchfly)	None, None, 1B.2	CNPS, CNDDB	Caryophyllaceae	perennial rhizomatous herb	Gravelly (sometimes), Openings, Rocky (sometimes), Serpentine chaparral, lower montane coniferous forest; 475–5,415 ft. Blooming period: May–July	None. No suitable habitat (out of elevation range) in survey area.
<i>Streptanthus howellii</i> (Howell's jewelflower)	None, None, 1B.2	CNPS, CNDDB	Brassicaceae	perennial herb	Lower montane coniferous forest; 1,000–4,920 ft. Blooming period: July–August	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Sulcaria spiralis</i> (twisted horsehair lichen)	None, None, 1B.2	CNPS, CNDDB	Parmeliaceae	fruticose lichen (epiphytic)	Coastal dunes, North Coast coniferous forest; 0–295 ft. Blooming period: N/A (lichen)	None. No suitable habitat in survey area.
<i>Tauschia glauca</i> (glaucous tauschia)	None, None, 4.3	CNPS	Apiaceae	perennial herb	Lower montane coniferous forest; 260–5,580 ft. Blooming period: April–June	None. No suitable habitat (out of elevation range) in survey area.
<i>Tiarella trifoliata</i> var. <i>trifoliata</i> (trifoliate laceflower)	None, None, 3.2	CNPS	Saxifragaceae	perennial rhizomatous herb	Edges, Streambanks lower montane coniferous forest, North Coast coniferous forest; 560– 4,920 ft. Blooming period: (May) June–August	None. No suitable habitat (out of elevation range) in survey area.
<i>Usnea longissima</i> (Methuselah's beard lichen)	None, None, 4.2	CNPS, CNDDB	Parmeliaceae	fruticose lichen (epiphytic)	Broadleaved upland forest, North Coast coniferous forest; 165– 4,790 ft. Blooming period: N/A (lichen)	None. No suitable habitat (out of elevation range) in survey area.
<i>Vaccinium scoparium</i> (little-leaved huckleberry)	None, None, 2B.2	CNPS, CNDDB	Ericaceae	perennial deciduous shrub	Subalpine coniferous forest; 3400–7,220 ft. Blooming period: June–August	None. No suitable habitat (out of elevation range) in survey area.
<i>Vancouveria chrysantha</i> (Siskiyou inside-out- flower)	None, None, 4.3	CNPS	Berberidaceae	perennial rhizomatous herb	Serpentine chaparral, lower montane coniferous forest; 395– 4,920 ft. Blooming period: June	None. No suitable habitat (out of elevation range) in survey area.
<i>Veratrum insolitum</i> (Siskiyou false- hellebore)	None, None, 4.3	CNPS	Melanthiaceae	perennial herb	Clay chaparral, lower montane coniferous forest; 150–5,365 ft. Blooming period: June–August	None. No suitable habitat (out of elevation range) in survey area.

Scientific name (common name)	Status ¹ (Federal, State, CRPR)	Source	Family	Lifeform	Habitat associations	Likelihood of occurrence
<i>Viola langsdorffii</i> (Langsdorf's violet)	None, None, 2B.1	CNPS, CNDDB	Violaceae	perennial herb	Bogs and fens; 5–35 ft. Blooming period: May–July	None. No suitable habitat in survey area.
<i>Viola palustris</i> (alpine marsh violet)	None, None, 2B.2	CNPS, CNDDB	Violaceae	perennial rhizomatous herb	Bogs and fens, coastal scrub; 0– 490 ft. Blooming period: March– August	Low. Coastal scrub habitat observed along Smith River strand.
<i>Viola primulifolia</i> ssp. <i>occidentalis</i> (western white bog violet)	None, None, 1B.2	CNPS, CNDDB	Violaceae	perennial rhizomatous herb	Bogs and fens, marshes and swamps; 330–3,250 ft. Blooming period: April– September	None. No suitable habitat (out of elevation range) in survey area.

¹ Status:

Federal

FE Federally listed as endangered

None No federal status

State

CE California State listed as endangered

None No state status

California Rare Plant Rank

List 1B Plants rare, threatened, or endangered in
California and elsewhere

List 2B Plants rare, threatened, or endangered in
California, but more common elsewhere

List 4 Plants of limited distribution, a watch list

CNPS Threat Ranks:

0.1 Seriously threatened in California (high degree/immediacy of
threat)

0.2 Fairly threatened in California (moderate degree/immediacy
of threat)

0.3 Not very threatened in California (low degree/immediacy of
threats or no current threats known)

² Months in parentheses are uncommon; N/A = Not applicable

Table A-2. Scoping list of CDFW sensitive natural communities in the Project Vicinity

Sensitive natural community	State Status ¹	Description	Suitable habitat present in survey area?
Northern coastal salt marsh	S3	Highly productive, herbaceous and suffrutescent, salt-tolerant hydrophytes forming moderate to dense cover and up to 1 meter tall. Usually segregated horizontally with <i>Spartina</i> nearer to open water, <i>Salicornia</i> at mid-littoral elevations and a richer mixture closer to high ground. Located within hydric soils subject to regular tidal inundation by salt water for a at least part of each year (Holland 1986). It is distributed along the California coast from the Oregon border south to Point Conception in Santa Barbara County. This natural community is comprised of the <i>Salicornia pacifica</i> , <i>Distichlis spicata</i> , and <i>Spartina densiflora</i> Herbaceous Alliances (Sawyer and Keeler-Wolf 1995, Holland 1986, CNPS 2022b).	No
Coastal Brackish Marsh	S1	Dominated by perennial, emergent, herbaceous monocots to two meters tall. Cover is often complete and dense. Similar to salt marshes and to freshwater marshes with some plants characteristic of each (Holland 1986). Includes <i>Typha</i> spp. (cattails), <i>Bolboschoenus maritimus</i> , <i>Eleocharis</i> spp. (various spikerush), <i>Juncus</i> spp. (various rush), <i>Carex</i> spp. (various sedge), water parsley, and <i>Potentilla anserina</i> (Pacific cinquefoil) alliances (CNPS 2022b).	No
Coastal and Valley Freshwater Marsh	S1	Dominated by perennial, emergent monocots to 4–5 ft tall. Often forming completed closed canopies. Includes <i>Scirpus</i> and <i>Typha</i> dominated types, typically sites that lack significant current, permanently flooded by freshwater (Holland 1986) Composed of <i>Carex</i> spp. and freshwater aquatic alliances (CNPS 2022b)	In review, small backwater features no aquatic vegetation observed in spring 2022.

¹ State status

- S1 Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state
- S3 Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state.

Appendix B

Completed CNDDDB Forms

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 07/15/2022

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Carex lyngbyei*

Common Name: Lyngbye's sedge

Species Found? ☐ Yes ☐ No If not found, why?

Total No. Individuals: 40 Subsequent Visit? ☐ Yes ☐ No

Is this an existing NDDDB occurrence? ☒ No ☐ Unk. Yes, Occ. #

Collection? If yes: CALYGN001 Number Museum / Herbarium

Reporter: Kipp Pow, Emmalien Craydon

Address: 850 G St., Suite K

Arcata, CA 95521

E-mail Address: kpow@stillwatersci.com

Phone: (707) 471-8304

Plant Information

Phenology:

0 80 20
% vegetative % flowering % fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Along Smith River waterline along rocky shore

County: Del Norte Landowner / Mgr:

Quad Name: Smith River Elevation: <20 ft

T R Sec, 1/4 of 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): GPS

T R Sec, 1/4 of 1/4, Meridian: H M S GPS Make & Model: Garmin etrex

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy: 8 meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ OR Geographic (Latitude & Longitude) ☒

Coordinates: (41.88850, -124.14782)

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

- Along Smith River's edge. Lots of cobble/gravel.
- Nearby dominant vegetation: Salix melanopsis, Saponaria officinalis
- Sandy, wet soils

Please fill out separate form for other rare taxa seen at this site. N/A

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Smith River

Visible disturbances:

Threats: Invasive plants - Phalaris arundinacea nearby

Comments:

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson eFlora 2022
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? ☐ yes ☒ no

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 07/15/2022

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Carex lyngbyei*

Common Name: Lyngbye's sedge

Species Found? ☐ Yes ☐ No If not found, why?

Total No. Individuals: 10 Subsequent Visit? ☐ Yes ☐ No

Is this an existing NDDDB occurrence? ☒ No ☐ Unk. Yes, Occ. #

Collection? If yes: CALYNG002 Number Museum / Herbarium

Reporter: Kipp Pow, Emmalien Craydon

Address: 850 G St., Suite K

Arcata, CA 95521

E-mail Address: kpow@stillwatersci.com

Phone: (707) 471-8304

Plant Information

Phenology:

0 80 20
% vegetative % flowering % fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Near Stotenburg Creek confluence with Smith River

County: Del Norte Landowner / Mgr:

Quad Name: Smith River Elevation: <20 ft

T R Sec, 1/4 of 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): GPS

T R Sec, 1/4 of 1/4, Meridian: H M S GPS Make & Model: Garmin etrex

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☒ Horizontal Accuracy: 8 meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ OR Geographic (Latitude & Longitude) ☒

Coordinates: (41.88903, -124.14771)

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

- Backwater portion of Smith River, experiences seasonal inundation, located along waterline of historically excavated pit/alcove at confluence
- Dominants: Phalaris arundinacea, Salix sitchensis, Eleocharis macrostachya
- Soils: sand

Please fill out separate form for other rare taxa seen at this site. N/A

Site Information Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: along Smith River shoreline

Visible disturbances: Invasive plants

Threats: Encroachment / competition by Phalaris arundinacea, large flood events/scour (along Smith River shoreline)

Comments:

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Jepson eFlora
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? ☒ yes ☐ no

Appendix C

Comprehensive List of Vascular Plant Species Observed in the Survey Area

Table C-1. Comprehensive list of plant species observed during the May 25, and July 15, 2022 botanical surveys in the lower Stotenburg Creek survey area.

Scientific name	Common name	Family	Native status	Cal-IPC Inventory rating	Wetland rating (WMVC)
<i>Achillea millefolium</i>	common yarrow	Asteraceae	native	None	FACU
<i>Acmispon americanus</i> var. <i>americanus</i>	American bird's-foot trefoil	Fabaceae	native	None	FACU
<i>Agrostis stolonifera</i>	creeping bent	Poaceae	naturalized	Limited	FAC
<i>Aira caryophyllea</i>	silver hair grass	Poaceae	naturalized	None	FACU
<i>Alnus rubra</i>	red alder	Betulaceae	native	None	FAC
<i>Alopecurus geniculatus</i>	water foxtail	Poaceae	native	None	OBL
<i>Alopecurus pratensis</i>	meadow foxtail	Poaceae	naturalized	Watch	FAC
<i>Anthoxanthum odoratum</i>	sweet vernal grass	Poaceae	naturalized	Limited	FACU
<i>Athyrium filix-femina</i> var. <i>cyclosorum</i>	common ladyfern	Athyriaceae	native	None	FAC
<i>Avena fatua</i>	wild oat	Poaceae	naturalized	Moderate	NL-UPL
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	native	None	NL-UPL
<i>Brassica nigra</i>	black mustard	Brassicaceae	naturalized	Moderate	NL-UPL
<i>Briza maxima</i>	rattlesnake grass, large quaking grass	Poaceae	naturalized	Limited	NL-UPL
<i>Bromus diandrus</i>	ripgut grass	Poaceae	naturalized	Moderate	NL-UPL
<i>Bromus hordeaceus</i>	soft chess	Poaceae	naturalized	Limited	FACU
<i>Bromus sitchensis</i> var. <i>carinatus</i>	California brome	Poaceae	native	None	NL-UPL
<i>Bromus tectorum</i>	cheat grass	Poaceae	naturalized	High	NL-UPL
<i>Buddleja davidii</i>	butterfly bush	Scrophulariaceae	naturalized	None	FACU
<i>Calandrinia menziesii</i>	red maids	Montiaceae	native	None	NL-UPL
<i>Callitriche heterophylla</i>	twoheaded water-starwort	Plantaginaceae	native	None	OBL
<i>Carex leptopoda</i>	slender-footed sedge	Cyperaceae	native	None	FAC
<i>Carex lyngbyei</i>	Lyngbye's sedge	Cyperaceae	native	None	OBL
<i>Carex obnupta</i>	slough sedge	Cyperaceae	native	None	OBL
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	common mouse-ear chickweed	Caryophyllaceae	naturalized	None	FACU
<i>Chamerion angustifolium</i> subsp. <i>circumvagum</i>	fireweed	Onagraceae	native	None	FACU
<i>Cirsium arvense</i>	canada thistle	Asteraceae	naturalized	Moderate	FAC
<i>Cirsium vulgare</i>	bull thistle	Asteraceae	naturalized	Moderate	FACU
<i>Conium maculatum</i>	poison hemlock	Apiaceae	naturalized	Moderate	FAC
<i>Cortaderia jubata</i>	purple pampas grass, jubata grass	Poaceae	naturalized	High	FACU
<i>Cotoneaster franchetii</i>	franchet's cotoneaster	Rosaceae	naturalized	Moderate	NL-UPL
<i>Crocasmia x crocosmiflora</i>	montbretia	Iridaceae	naturalized	Limited	FAC

Scientific name	Common name	Family	Native status	Cal-IPC Inventory rating	Wetland rating (WMVC)
<i>Cynosurus echinatus</i>	bristly dogtail grass	Poaceae	naturalized	Moderate	NL-UPL
<i>Cyperus eragrostis</i>	tall flatsedge	Cyperaceae	native	None	FACW
<i>Cytisus scoparius</i>	scotch broom	Fabaceae	naturalized	High	NL-UPL
<i>Dactylis glomerata</i>	orchardgrass	Poaceae	naturalized	Limited	FACU
<i>Danthonia californica</i>	California oat grass	Poaceae	native	None	FAC
<i>Daucus carota</i>	carrot, Queen Anne's lace	Apiaceae	naturalized	None	FACU
<i>Dryopteris expansa</i>	spreading woodfern	Dryopteridaceae	native	None	FACW
<i>Eleocharis macrostachya</i>	pale spikerush	Cyperaceae	native	None	OBL
<i>Elymus triticoides</i>	beardless wild rye	Poaceae	native	None	FAC
<i>Epilobium ciliatum</i>	fringed willowherb	Onagraceae	native	None	FACW
<i>Epilobium minutum</i>	chaparral willowherb	Onagraceae	native	None	FACU
<i>Equisetum arvense</i>	common horsetail	Equisetaceae	native	None	FAC
<i>Equisetum telmateia</i> subsp. <i>braunii</i>	giant horsetail	Equisetaceae	native	None	FACW
<i>Erigeron</i>	fleabane daisy	Asteraceae	n/a	None	N/A
<i>Erythranthe guttata</i>	seep monkeyflower	Phrymaceae	native	None	OBL
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	native	None	NL-UPL
<i>Festuca arundinacea</i>	tall fescue	Poaceae	naturalized	Moderate	FAC
<i>Festuca bromoides</i>	brome fescue	Poaceae	naturalized	None	FAC
<i>Festuca myuros</i>	rattail sixweeks grass	Poaceae	naturalized	Moderate	FACU
<i>Festuca perennis</i>	rye grass	Poaceae	naturalized	Moderate	FAC
<i>Fragaria vesca</i>	wood strawberry	Rosaceae	native	None	FACU
<i>Frangula purshiana</i>	casacara	Rhamnaceae	native	None	FAC
<i>Fraxinus latifolia</i>	Oregon ash	Oleaceae	native	None	FACW
<i>Galium aparine</i>	goose grass	Rubiaceae	native	None	FACU
<i>Genista monosperma</i>	bridal veil broom	Fabaceae	naturalized	Moderate	NL-UPL
<i>Geranium dissectum</i>	cutleaf geranium	Geraniaceae	naturalized	Limited	NL-UPL
<i>Glyceria declinata</i>	low manna grass	Poaceae	naturalized	Moderate	FACW
<i>Hedera helix</i>	English ivy	Araliaceae	naturalized	High	FACU
<i>Hirschfeldia incana</i>	shortpod mustard	Brassicaceae	naturalized	Moderate	NL-UPL
<i>Holcus lanatus</i>	common velvet grass	Poaceae	naturalized	Moderate	FAC
<i>Holodiscus discolor</i>	oceanspray	Rosaceae	native	None	FACU
<i>Hordeum murinum</i>	wall barley	Poaceae	naturalized	Moderate	FAC
<i>Hosackia oblongifolia</i> var. <i>oblongifolia</i>	streambank bird's-foot trefoil	Fabaceae	native	None	OBL
<i>Hypericum perforatum</i> subsp. <i>perforatum</i>	Klamathweed	Hypericaceae	naturalized	Limited	FACU
<i>Hypochaeris glabra</i>	smooth cat's-ear	Asteraceae	naturalized	Limited	NL-UPL
<i>Hypochaeris radicata</i>	rough cat's-ear	Asteraceae	naturalized	Moderate	FACU

Scientific name	Common name	Family	Native status	Cal-IPC Inventory rating	Wetland rating (WMVC)
<i>Juncus bufonius</i>	toad rush	Juncaceae	native	None	FACW
<i>Juncus effusus</i>	soft rush	Juncaceae	native	None	FACW
<i>Lapsana communis</i>	common nipplewort	Asteraceae	naturalized	None	FACU
<i>Lathyrus latifolius</i>	perennial sweet pea	Fabaceae	naturalized	None	NL-UPL
<i>Leucanthemum vulgare</i>	ox-eye daisy	Asteraceae	naturalized	Moderate	FACU
<i>Linum bienne</i>	pale flax	Linaceae	naturalized	None	NL-UPL
<i>Lonicera involucrata</i>	twinberry	Caprifoliaceae	native	None	FAC
<i>Lupinus bicolor</i>	miniature lupine	Fabaceae	native	None	NL-UPL
<i>Marah oregana</i>	coast man-root	Cucurbitaceae	native	None	NL-UPL
<i>Melilotus albus</i>	white sweetclover	Fabaceae	naturalized	None	FACU
<i>Oemleria cerasiformis</i>	Indian plum	Rosaceae	native	None	FACU
<i>Oenanthe sarmentosa</i>	water parsely	Apiaceae	native	None	OBL
<i>Parentucellia viscosa</i>	yellow glandweed	Orobanchaceae	naturalized	Limited	FAC
<i>Petrorhagia dubia</i>	hairypink	Caryophyllaceae	naturalized	None	NL-UPL
<i>Phalaris arundinacea</i>	reed canary grass	Poaceae	native	None	FACW
<i>Physocarpus capitatus</i>	Pacific ninebark	Rosaceae	native	None	FACW
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	naturalized	Limited	FACU
<i>Plantago major</i>	common plantain	Plantaginaceae	naturalized	None	FAC
<i>Poa annua</i>	annual blue grass	Poaceae	naturalized	None	FAC
<i>Poa pratensis</i> subsp. <i>pratensis</i>	Kentucky blue grass	Poaceae	naturalized	Limited	FAC
<i>Polygonum</i>	knotweed	Polygonaceae	n/a	None	N/A
<i>Polypodium glycyrrhiza</i>	licorice fern	Polypodiaceae	native	None	NL-UPL
<i>Polypogon monspeliensis</i>	annual beard grass, rabbitfoot grass	Poaceae	naturalized	Limited	FACW
<i>Polystichum munitum</i>	western sword fern	Dryopteridaceae	native	None	FACU
<i>Populus trichocarpa</i>	black cottonwood	Salicaceae	native	None	FAC
<i>Potentilla anserina</i>	silverweed cinquefoil	Rosaceae	native	None	OBL
<i>Poterium sanguisorba</i>	garden burnet	Rosaceae	naturalized	None	UPL
<i>Prunella vulgaris</i>	common selfheal	Lamiaceae	native	None	FACU
<i>Prunus</i> sp.	domestic plum	Rosaceae	naturalized	None	NL-UPL
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir	Pinaceae	native	None	FACU
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	hairy brackenfern	Dennstaedtiaceae	native	None	FACU
<i>Ranunculus repens</i>	creeping buttercup	Ranunculaceae	naturalized	Limited	FAC
<i>Raphanus sativus</i>	radish	Brassicaceae	naturalized	Limited	NL-UPL
<i>Ribes divaricatum</i> var. <i>pubiflorum</i>	straggle bush	Grossulariaceae	native	None	FAC
<i>Rubus armeniacus</i>	Himalayan blackberry	Rosaceae	naturalized	High	FAC

Scientific name	Common name	Family	Native status	Cal-IPC Inventory rating	Wetland rating (WMVC)
<i>Rubus parviflorus</i>	thimbleberry	Rosaceae	native	None	FACU
<i>Rubus spectabilis</i>	salmonberry	Rosaceae	native	None	FAC
<i>Rubus ursinus</i>	California blackberry	Rosaceae	native	None	FACU
<i>Rumex acetosella</i>	sheep sorrel	Polygonaceae	naturalized	Moderate	FACU
<i>Rumex conglomeratus</i>	clustered dock	Polygonaceae	naturalized	None	FACW
<i>Rumex crassus</i>	willow dock	Polygonaceae	native	None	FACW
<i>Rumex crispus</i>	curly dock	Polygonaceae	naturalized	Limited	FAC
<i>Rumex occidentalis</i>	western dock	Polygonaceae	native	None	FACW
<i>Rumex pulcher</i>	fiddle dock	Polygonaceae	naturalized	None	FAC
<i>Salix hookeriana</i>	coastal willow	Salicaceae	native	None	FACW
<i>Salix lasiandra</i>	Pacific willow	Salicaceae	native	None	FACW
<i>Salix melanopsis</i>	dusky willow	Salicaceae	native	None	OBL
<i>Salix scouleriana</i>	Scouler's willow	Salicaceae	native	None	FAC
<i>Salix sitchensis</i>	Sitka willow	Salicaceae	native	None	FACW
<i>Sambucus racemosa</i>	red elderberry	Adoxaceae	native	None	FACU
<i>Saponaria officinalis</i>	soapwort, bouncingbet	Caryophyllaceae	naturalized	Limited	UPL
<i>Scrophularia californica</i>	California figwort	Scrophulariaceae	native	None	FAC
<i>Senecio jacobaea</i>	tansy ragwort	Asteraceae	naturalized	Limited	FACU
<i>Silene gallica</i>	small-flower catchfly	Caryophyllaceae	naturalized	None	NL-UPL
<i>Sonchus asper</i> subsp. <i>asper</i>	prickly sow thistle	Asteraceae	naturalized	None	FACU
<i>Sonchus oleraceus</i>	common sow thistle	Asteraceae	naturalized	None	UPL
<i>Stachys chamissonis</i>	coastal hedgenettle	Lamiaceae	native	None	FACW
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	snowberry	Caprifoliaceae	native	None	FACU
<i>Symphyotrichum chilense</i>	Pacific aster	Asteraceae	native	None	FAC
<i>Tellima grandiflora</i>	bigflower tellima	Saxifragaceae	native	None	FACU
<i>Tolmiea diplomenziesii</i>	pig-a-back plant	Saxifragaceae	native	None	FACW
<i>Trifolium dubium</i>	little hop clover	Fabaceae	naturalized	None	FACU
<i>Trifolium pratense</i>	red clover	Fabaceae	naturalized	None	FACU
<i>Trifolium repens</i>	white clover	Fabaceae	naturalized	None	FAC
<i>Trifolium subterraneum</i>	subterranean clover	Fabaceae	naturalized	None	NL-UPL
<i>Trifolium wormskioldii</i>	cow clover	Fabaceae	native	None	FACW
<i>Typha latifolia</i>	broad-leaved cattail	Typhaceae	native	None	OBL
<i>Umbellularia californica</i>	California laurel	Lauraceae	native	None	FAC
<i>Urtica dioica</i>	stinging nettle	Urticaceae	native	None	FAC
<i>Veronica scutellata</i>	marsh speedwell	Plantaginaceae	native	None	OBL
<i>Vicia hirsuta</i>	tiny vetch	Fabaceae	naturalized	None	NL-UPL
<i>Vicia sativa</i>	garden vetch	Fabaceae	naturalized	None	UPL

Scientific name	Common name	Family	Native status	Cal-IPC Inventory rating	Wetland rating (WMVC)
<i>Vicia tetrasperma</i>	sparrow vetch	Fabaceae	naturalized	None	NL-UPL

SEPTEMBER 2022

Preliminary Delineation of Waters and Wetlands for the Lower Stotenburg Creek Enhancement Project, Del Norte County, California



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Cover photos: Overview of the wetland delineation survey area in the lower Stotenburg Creek Enhancement Project, Del Norte County, California.

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1 INTRODUCTION

1.1 Project Description and Proponent

In 2019, Smith River Alliance and Stillwater Sciences conducted a feasibility study to assess coho habitat enhancement opportunities within the lower Stotenburg Creek. The study reach included the confluence with Smith River to approximately 0.5 miles upstream. In coordination with the project's Technical Advisory Committee (TAC), comprised of various agencies and stakeholder groups, the *Basis of Design Report & Feasibility Analyses for the Lower Stotenburg Creek Coho Habitat Enhancement Design Project* (hereinafter, *Basis of Design Report*) (Stillwater Sciences 2019) was compiled, and a design selected for implementation.

The lower Stotenburg Creek enhancement project will address key limiting factors for the juvenile coho salmon life stage in the Smith River, including passage barriers, the lack of floodplain and channel structure, and other impacts related to agricultural practices. The project is designed to help SONCC coho salmon recover in the Smith River by improving fish passage, enhancing habitat complexity and riparian function, and extending migration timing and survival for juvenile coho salmon rearing in Stotenburg Creek. Other salmonid species in the Smith River, including Chinook salmon, steelhead, and cutthroat trout will also benefit from this project.

The final design plans are presented in the project's *Basis of Design Report* and key features include:

- Construct a new channel alignment from Sta 1+60 to 2+75 to reduce excessive channel sinuosity, utilize existing low-lying topography, and maintain a consistent channel slope. Re-aligning the channel further to the northeast also incidentally widens the existing willow buffer distance from the Smith River, which serves to intercept fine sediment and debris during high flows.
- Fill old channel alignment downstream of Sta 2+75 and split flow channel at Sta 4+10 to keep surface flow concentrated to a single primary channel, which will maintain greater depths into the late spring/early summer.
- Grade channel from Sta 4+50 to 6+00 to maintain a consistent channel slope and widen this narrow and confined reach.
- Remove Crossing 1, regrade natural channel banks, and excavate aggraded fine sediment on upstream side (~1 foot at Sta 6+10 tapering to existing thalweg grade at Sta 6+90).
- Construct new crossing at Sta 6+75 with a prefabricated bridge (e.g., Kern Construction bridge or equivalent), Construct new northern road approach from existing road to new crossing.
- Construct new southern approach from new crossing with one alignment to access the pasture and a second alignment to connect to the existing road on the lower floodplain. Constructing the lower road alignment would require removing approximately eight 12-inch to 18-inch diameter at breast height (DBH) alders.
- Construct inset floodplain benches in confined reach from Sta 7+00 to 8+50.
- Remove Crossing 2 and regrade natural channel banks.
- Remove Crossing 3 by excavating road armoring and aggraded fine sediment on upstream side (up to 1-foot excavation at Sta 13+30 tapering to natural thalweg grade at Sta 13+90).
- Construct sequence of five BDA's with 6 or 9-inch crest elevation increases.

- Remove Crossing 4 and replace with an aluminum box culvert. The box culvert is designed with a road width to accommodate a single 16-foot-wide lane.
- Riparian and conifer plantings at select areas devoid of vegetation.
- Riparian plantings will be protected from beaver and ungulate browsing by perimeter fencing around each planting polygon.
- Riparian plantings will be temporarily irrigated during the dry season until becoming established (2-3 years).
- Cattle exclusion fencing along pasture between Crossings 1 and 4.
- Construct willow baffles in the clearing on the Smith River gravel bar adjacent to Sta 4+50 – 5+50 to reduce flood flow velocity from the river and promote deposition of fine sediment before intersecting the Stotenburg channel.
- Construct engineered log jam (ELJ) in conjunction with willow baffles to intercept LWD from the Smith River, reduce fine sediment deposition in the new Stotenburg Creek channel, and dissipate/deflect high velocity Smith River flows.
- Construct multiple (~5) large wood structures along the margins of the new Stotenburg channel alignment from Sta 2+00 to 4+00 to strengthen channel banks and concentrate flow through the new alignment.
- Minor grading of left-bank connection with off-channel alcove at Sta 6+40 to enhance inundation and access across wider range of low flows.
- Mechanical and hand removal of invasive Himalayan blackberry throughout project reach. The areas where Himalayan blackberry is mechanically removed will also be replanted with native riparian species.

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1.2 Project Location and Survey Area

The project site is located along lower Stotenburg Creek approximately six miles upstream from the mouth of the Smith River, and 2.75 miles south of the town of Smith River in northern Del Norte County, California (Figure 1-1). Stotenburg Creek originates on the western slope of the Coast Range mountains and flows across the coastal plain before entering the right bank of the lower Smith River just downstream from the Highway (HWY) 101 bridge (Dr. Fine bridge). Stotenburg Creek is the first tributary to enter the Smith River after it exits its canyon and flows onto the coastal plain. The project site extends approximately 0.5 miles upstream from the Smith River confluence along a low-gradient alluvial floodplain.

The wetland delineation survey area includes the enhancement design footprint and temporary access and staging roads, all with a 50-foot surrounding buffer (Figure 1). The project site can be accessed by heading west on South Fred D. Haight Drive from the US-101 (Figure 1).

The survey area is in Sections 2 and 11 of Township 17 North, Range 01 West in the Smith River U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. It has an approximate elevation of 5 to 45 feet above mean sea level.

1.3 Purpose of the Wetland Delineation

The purpose of this delineation is to: (1) assess the geographic extent of water and wetland resources in PA1; (2) delineate any waters of the U.S., including wetlands, potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act of 1899; (3) delineate any additional waters of the State that may be subject to the jurisdiction of the State Water Resources Control Board (SWRCB), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC).

The wetland features in the survey area are considered preliminary until verified by the San Francisco Regulatory Branch of the USACE. The USACE determines CWA jurisdiction of the wetland features in the survey area.



Figure 1. Location of the lower Stotenburg Creek enhancement project vicinity with wetland survey area depicted.

2 METHODS

2.1 Existing Conditions

Prior to the delineation of jurisdictional waters and wetlands, existing information on soils, hydrology, and precipitation in the survey area was evaluated. Information on potential jurisdictional waters and wetlands was obtained from the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) online application, *Wetlands Mapper* (USFWS 2022). Available data from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey website were reviewed for the surveyed area and nearby vicinity (NRCS 2022a). Precipitation and climate records from the weather station at the CEC (USW00024286) were reviewed.

2.2 Field Delineation

A delineation of potential jurisdictional waters and wetlands were conducted by qualified personnel led by wetland specialist Emmalien Craydon paired with botanists Victoria Bryant and Kipp Pow on May 25, and July 15, 2022, in accordance with the *Corps of Engineers Wetlands Delineation Manual* (1987 Manual, USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (WMVC Supplement; USACE 2010).

The delineation included any feature that could potentially meet the definition of a water protected under the Clean Water Act (and thus be subject to USACE-jurisdiction), Rivers and Harbors Act (USACE-jurisdiction), the Porter Cologne Act (SWRCB [State]-jurisdiction), Fish and Game Code Section 1602 of Streambed Alteration Agreement (CDFW-jurisdiction), and the California Coastal Act (CC-jurisdiction). USACE has jurisdiction over Waters of the U.S., including wetlands, pursuant to Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. Section 404 of the CWA applies to all Waters of the U.S., including wetlands, which are defined in the U.S. Code of Federal Regulations (33 CFR 328.3 and 40 CFR 120.2). Additionally, per Section 10 of the Rivers and Harbors Act, the USACE has jurisdiction over all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide (i.e., traditionally navigable waters) as defined in 33 CFR 328.3 and 40 CFR 120.2.

2.2.1 Waters determination

Under Section 404 of the CWA, the limits of USACE jurisdiction of non-tidal waters are defined at the Ordinary High Water Mark (OHWM). The OHWM is defined as the elevation established on the shore by water fluctuations and is indicated by physical characteristics such as: (a) a clear, natural line impressed on the bank; (b) shelving; (c) changes in the character of soil; (d) destruction of terrestrial vegetation; (e) the presence of litter and debris; or (f) other appropriate means that consider the characteristics of the surrounding areas. The OHWM was investigated in accordance with the USACE RGL 05-05 (USACE 2005) and the OHWM Guide (Mersel and Lichvar 2014). Furthermore, waters of the State include any surface water or groundwater, including saline waters, within the boundaries of the state (Porter-Cologne Act, Section 13050).

The USACE San Francisco District Regulatory Branch *Navigable Waterways List* (USACE 1971) and accompanying 2004 USACE guidance memorandum were reviewed to assess upstream limits of listed navigable waters of the U.S. in the survey area. As stated in the USACE

(2004) guidance document, the “determination of navigability, once made ... is not extinguished by later actions or events which impede or destroy navigable capacity” (33 C.F.R. §329.4) and “if a waterway at one time was navigable in its natural or improved state, or was susceptible to navigation by way of reasonable improvement, it retains its navigable status even though it is not presently used for commerce, or is presently incapable of use because of changed conditions or the presence of obstructions. *United States v. Appalachian Elec. Power Co.*, 311 U.S. 377, 408 (1940).” Smith River is a listed waterway on the 1971 *Navigable Waterways List* therefore the Section 10-jurisdictional upstream limit, referred to as head of navigation, was assessed prior to the field delineation to determine whether Section 10-jurisdictional waters were present in the survey area.

2.2.2 Wetland determination

Wetlands were delineated in accordance with the 1987 Manual (USACE 1987) and WMVC Supplement (USACE 2010). The 1987 Manual and WMVC Supplement provide technical guidelines and methods for the three-parameter approach to determining the location and boundaries of USACE jurisdictional wetlands. This approach requires that an area must support positive indicators of hydrophytic vegetation, hydric soils, and wetland hydrology to be considered a jurisdictional wetland. CDFW jurisdictional limits extend to the top of the stream bank or the outer edge of riparian vegetation, whichever is wider. As such, CDFW-jurisdiction in the survey area was extended to the outer dripline edge of riparian canopy, regardless of the delineated three-parameter wetland boundary. Additionally, the California Coastal Commission’s *Procedural Guidance for the Review of Wetland Projects in California’s Coastal Zone* (CCC 1994) was used to identify waters/wetlands in the California coastal zone potentially subject to regulation under the California Coastal Act (1976). This approach requires one positive indicator to be present at the sampled location for an area to be delineated as a water or wetland.

Six data points were sampled in potential USACE- jurisdictional wetlands in the survey area. If a data point met all three wetland parameters, it was considered an USACE wetland; if a point met two or less wetland parameters it was considered upland, or if within the Coastal Zone a preliminary CC-jurisdictional wetland. Potential wetland areas were identified based on information generated from the pre-field review (e.g., the NWI *Wetland Mapper* results), the topographic landscape (i.e., results from the topographic survey providing one-foot elevation contours in the project)), review of the project reach’s flow hydraulics that were modeled using the USACE *Hydrologic Engineering Center’s River Analysis System* (HEC-RAS) (Stillwater Sciences 2019), and observations of hydrology and vegetation in the field. If a data point met all three parameters for a USACE jurisdictional wetland, then a paired data point was placed along the preliminary transition zone (the area in which a change from wetland to non-wetland conditions occurs) to determine the wetland/upland boundary. At each data point, a soil core was taken, and the following information was recorded using the USACE (2010) data forms:

1. **Vegetation:** Dominant plant species for each stratum (i.e., tree, sapling/shrub, herb, woody vine) by scientific name (genus and species) following the taxonomy the online *Jepson eFlora* (Jepson Flora Project 2022). Absolute percent cover and dominance were determined using the 50/20 rule outlined in the *WMVC Supplement*, and the wetland indicator status (OBL [obligate], FACW [facultative-wet], FAC [facultative], FACU [facultative-upland], and UPL [upland]) defined for the WMVC Region in the *National Wetland Plant List: 2020 Wetland Ratings* (USACE 2020). Plant species not listed in the *2020 National Wetland Plant List* were considered upland (UPL) species. A dominance test was performed to determine if the data point exhibited hydrophytic vegetation. If the

dominance test was not conclusive and wetland hydrology and hydric soils were present, then the prevalence index was calculated.

2. **Hydrology:** Presence and depth of surface water, groundwater, and/or soil saturation were recorded. In addition, if primary (e.g., oxidized rhizospheres along living roots) and secondary indicators (e.g., drainage patterns, saturation visible on aerial imagery, FAC-neutral test) were observed, then they were also recorded at each data point. The modeled HEC-RAS results in the project reach were assessed to identify potential, duration and frequency for saturated/inundated conditions along the creek.
3. **Soils:** Moistened soil matrix descriptions were recorded for each data point using the following: depth of the sample, color (as defined in Munsell soil color charts [Munsell Color 2000]), and texture. If present, redox features were then described by type (e.g., concentration, depletion, reduced matrix) and location (e.g., pore lining, root channel, or matrix). Hydric soils were determined using the *WMVC Supplement* primary indicators, such as redox dark surface (F6) as well as referencing *Field Indicators of Hydric Soils in the United States* (Vasilas et al. 2010). In addition, mapped soil units (described in Section 3.1.2) were considered, and the current National List of Hydric Soils (NRCS 2022b) was consulted.

The location of each data point and wetland boundaries were recorded using a sub-meter accuracy GPS. All GPS data were post-processed, corrected, and incorporated into GIS. Mapped wetlands were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979, Federal Geographic Data Committee [FGDC] 2013) based on the vegetation composition and areal cover within each strata to identify the dominant life form at the data points.

3 RESULTS

3.1 Historical Conditions

Historical conditions were described in the project's *Basis of Design Report* (Stillwater Sciences 2019) based on review of historical aerial photographs along Stotenburg Creek from 1942 to present. These conditions are briefly summarized in this section to describe the influence and change from Smith River flood events and agricultural/industrial activities over time. The latter included the construction of four private road crossings, three culverts and one ford within the project site.

In 1942 and 1948 photographs, the project reach was primarily along the same alignment as it is today. The project vicinity along the lower Smith River had already begun to be utilized for agricultural purposes, as evidenced by fences, hedge rows, and managed fields with different uses. The floodplain pasture along the southwestern side of the creek does not appear to have been modified for agricultural use. The current alignment of Highway 101 had not yet been built and Fred Haight Dr. was the primary road through the area. Some evidence of gravel mining is visible on Smith River gravel bars upstream and downstream from the project site. The Stotenburg Creek confluence was near the present-day location of Crossing 1, which had not yet been built. The ford at Crossing 3 is visible in the 1948 photograph.

Despite the significant geomorphic changes to the Smith River, the Stotenburg Creek alignment was not altered by the 1964 flood based on review of 1965 historic imagery. However, removal of

riparian vegetation and scouring along the lower reaches was evident and the entire project reach was likely inundated during the 1964 flood based on widespread fine sediment deposition.

The 1972 photograph was taken in the summer following the 1972 flood, which is the second largest on the Smith River in the period of record with a flood frequency of approximately 55 years. The lateral migration of the river effectively extended the length of Stotenburg Creek by more than 900 feet along the back edge of the gravel bar. Stotenburg Creek channel alignment upstream of the Crossing 1 location remained stable and unaffected. Riparian vegetation regrowth is evident along lower Stotenburg Creek, but areas further upstream from the project reach were logged, likely to expand cattle grazing. Crossing 3 appears to be actively utilized and gravel mining operations continued nearby on Smith River gravel bars.

Per 1988 photographs, the Stotenburg Creek alignment remained stable and riparian vegetation continued to expand along the creek and river corridors, as well as on the gravel bars scoured during the 1964 and 1972 flood events. Crossing 1 is evident in the photograph indicating construction occurred sometime between 1972 and 1988. The crossing appears to have been built to support gravel mining operations on the bar at the mouth of Stotenburg Creek. Mining excavations are evident on the gravel bar. Additionally, it appears Crossing 1 was initially constructed without a culvert and Stotenburg Creek was routed to the south along the back edge of the gravel bar and into the Smith River in an excavated ditch. This route follows the edge of the floodplain that was scoured during the 1964 flood. Crossing 3 continued to be actively utilized.

By 1993, Crossing 1 was rebuilt with a culvert and Stotenburg Creek can be seen flowing through the crossing and meeting the Smith River. The Stotenburg channel between Crossing 1 and the Smith River is straight, narrow, and is along the same alignment as it is today. Crossing 2 may have been built however it was not confirmed in the imagery. By 2003, substantial changes were associated with a large gravel mining harvest from the bar at the Stotenburg Creek confluence. The harvest consisted of skimming an area of approximately 1 acre at the Stotenburg confluence and excavating a pit (approximately 230 feet long by 60 feet wide) just downstream. The pit, or alcove, persists to this day and has remained relatively unchanged. Between 2003 through 2004, Crossing 4 and a new road at the Crossing 4 location were constructed. After 2004, the most noticeable changes were increased riparian vegetation along Stotenburg Creek. Furthermore, riparian revegetation of the skimmed gravel bar “locked-in” the meandering planform as it flows across the gravel bar and enters the Smith River at the excavated alcove to present day conditions.

3.2 Existing Conditions

3.2.1 Hydrology

The project is located within the Smith River Watershed (Hydrologic Unit Code [HUC] 12: 180101010404). The project consists of the main Stotenburg Creek channel extending approximately 2,700 feet (0.5 miles) upstream from its confluence with the Smith River. This reach of the creek flows northwest through a low-gradient Smith River alluvial floodplain and along the distal edge of a broad alluvial fan. The most downstream reach of the creek flows off the flood plain and across a vegetated gravel bar before meeting the Smith River in a backwater alcove. Smith River flows directly into the Pacific Ocean approximately six miles downstream of the Stotenburg Creek confluence.

The NWI *Wetlands Mapper* included palustrine freshwater emergent wetlands in the upstream portion of the project reach and coarsely characterized the Smith River channel as riverine waters in the survey area (Figure 2). The palustrine wetlands encompass a larger footprint of the survey area when compared to the NWI map (Figure 2, Section 3.3). Riverine waters were extended to elevation break that characterized Smith River OHWM of the Smith River.

3.2.2 Soil units

The Stotenburg Creek drainage is located on the western coastal portion of the Smith River watershed, on the transition from the Coast Range mountains to the Smith River coastal plain.

Soil units in the survey area included Russ, 0–2 % slopes and Big River, 2 to 5% slopes (Figure 3). These units are both classified as prime farmland if irrigated and are described further below.

Russ (0–2% slopes) mapped soil unit is composed of 85% Russ and similar soils with 15% minor components. It is found from 10 to 160 feet above mean sea level with a mean annual precipitation of 35–80 inches, a mean annual air temperature of 50–55°F, and a frost-free period of 275–330 days (NRCS 2022a). Russ is located on the backslope of natural levees and has a slope of 0–2%. A typical profile consists of a loam in the upper 0–12 inch with fine sandy loam forming all other horizons below to 50 inches. It has a drainage class of well drained with a depth to water table of about 39 to 60 inches and is nonsaline to very slightly saline (NRCS 2022a). Russ soils are occasionally flooded for brief periods December through February and are used for pasture, hay, and truck garden produce where native vegetation (red alder, black cottonwood, willow, and Sitka spruce) was removed (National Cooperative Soil Survey [NCSS] 2016). This mapped soil unit does not have a hydric soil rating. Minor components includes Swainslough (5%, hydric), Ferndale (5%), Madriver (3%), and Grizzlybluff (2%).

Big River (2–5% slopes) is located in backslopes of flood plains consisting of an alluvium derived from mixed sources. A typical profile consists of an organic horizon composed of slightly decomposed plant material in the upper two inches, a fine sandy loam from two to four inches, and a stratified loamy fine sand from 4 to 61 inches. It has a drainage class of well drained with a depth to water table of more than 80 inches with a nonsaline to very slightly saline profile (NRCS 2022a). Big River (2–5%) does not have a hydric soil rating. Minor components includes Battery (10%) and Typic udifluvents.

All field data points (1, 2, 3, 101, 102, and 103) had soil colors similar to the Russ series with matrix soil colors of 2.5Y 3-4/2-3 in the upper 18 inches of the predominantly loam or silt loam profile. Redox concentrations observed in sampled soil profiles were mostly dark yellowish brown (10YR 3 or 4/6) and considered hydric when the positive primary indicator, redox dark surface (F6) was identified (Appendix A).



Figure 2. National Wetlands Inventory map of the lower Stotenburg Creek survey area.

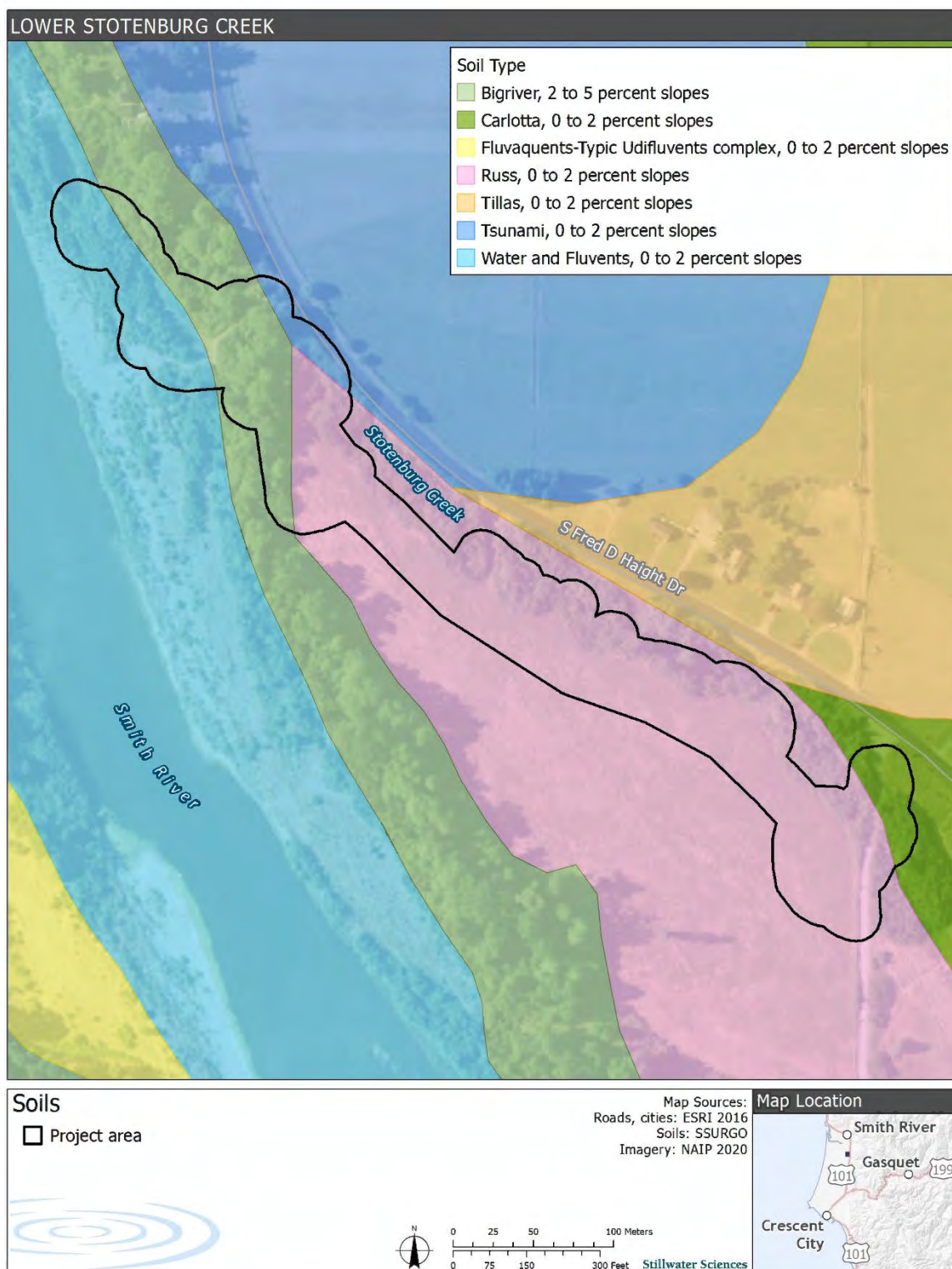


Figure 3. Mapped soil units in the lower Stotenburg Creek survey area.

3.2.3 Precipitation

Local climate conditions are influenced by the conditions of the Pacific Ocean, with moderate temperatures throughout the year with considerable winter rainfall and cool foggy summers. Rainfall occurs primarily between October through April, with a mean annual rainfall of 64 inches (based on the 1981–2010 period of record monthly normal [normal] at the CEC weather station [NCDC 2022]). The average monthly temperature range is approximately 47–49° F in winter and 54–58° F in the summer (NCDC 2022).

The field delineations were conducted in May and July 2022. These months received slightly above average rainfall for the region based on the normal range from long-term (30-year) weather records reported for CEC in WETS, 1.49 inches above normal in May and just 0.27 inches above normal in July (Appendix B). Even so, the abnormally dry drought condition status for Del Norte County was sustained in May 2022 and July 2022 due to the below average precipitation reported from November 2021 through March 2022 in the region (monthly averages ranged from one inch to 5.5 inches below monthly normal) (National Drought Mitigation Center 2022, Appendix B).

Weather conditions during the wetland delineations were sunny and clear with a high of 57° F and 64° F, close to the CEC weather station normal average maximum temperatures for May and June (58° F and 61.9° F, respectively) (NCDC 2022). The average growing season length at this location is February through December based on dates where the average mean temperature has a 50% probability to be above 32°F (NCDC 2022).

3.2.4 Vegetation

Established vegetation communities within the survey area includes mesic coastal grassland pasture primarily used for organic dairy production, and riparian scrub and forested communities. California invasive weed Himalayan blackberry occurs throughout much of the riparian understory and patches of invasive, reed canary grass are present near the Smith River confluence.

3.3 Preliminary Jurisdictional Wetlands

The survey area contains 1.8 acres of USACE-jurisdictional waters and 1.9 acres of USACE-jurisdictional adjacent wetlands subject to Section 404 of the CWA (Table 1, Figure 4, Appendices A and C). No additional USACE- jurisdictional waters subject to Section 10 and/or Section 404 of the CWA were observed. The preliminary USACE-jurisdictional features are also considered to be waters of the State under State-, CC- and CDFW-jurisdiction. In addition, there are 1.74 acres of additional riparian features that are only subject to CC- and CDFW-jurisdiction (Table 1, Figure 4).

Table 1. Preliminary USACE-jurisdictional features in the lower Stotenburg Creek survey area.

Description	Acreage
Waters of the U.S.¹	
<i>Other Waters of the U.S.</i>	
Smith River; Palustrine broad-leaved deciduous scrub-shrub (W-1)	1.30
Smith River; Riverine lower perennial aquatic bed (W-2)	0.08
Smith River; Riverine lower perennial unconsolidated bed (W-3)	0.07
Lower Stotenburg Creek; Riverine intermittent streambed (W-4)	0.37
<i>Adjacent Wetlands</i>	
Palustrine broad-leaved deciduous forest (PF-1)	0.71
Palustrine broad-leaved deciduous scrub-shrub wetland (PS-1)	1.14
Palustrine persistent emergent wetland (PE-1)	0.08
Additional CC- and CDFW-Jurisdiction	
One-parameter riparian	1.74

¹ Subject to Section 404 of the CWA thus under USACE-jurisdiction, as well as State-, CC-, and CDFW-jurisdiction (see Section 2.2)

² Riparian vegetation adjacent to waters of the state is interpreted by CDFW as being within the streambed and thereby falls under CDFW jurisdiction (Section 2.2). As such, riparian features that did not pass as three-parameter wetlands but were composed of primarily hydrophytic species were considered one-parameter riparian subject to CC- and CDFW-jurisdiction.



Figure 4. Preliminary jurisdictional wetlands in the lower Stotenburg Creek survey area.

3.3.1 Waters

Per the *Navigable Waterways List* (USACE 1971), Smith River is a tidal navigable water of the U.S. subject to Section 10 and Section 404 jurisdiction up to its head of navigation landmark 4.5 miles upstream of the river mouth. The USACE Section 10 jurisdiction terminates roughly two miles downstream of the project at the “island near Morrison Creek Junction (to Rowdy Creek)” (USACE 1971). As such, Section 10 jurisdictional waters are not in the survey area and Smith River was characterized as Waters of the U.S. subject to Section 404 jurisdiction (Figure 4, Table 1).

There are a total of 1.82 acres of Other Waters of the U.S. subject to Section 404 jurisdiction in the survey area associated with the Smith River and lower Stotenburg Creek (Table 1, Appendices A and C). Preliminary jurisdictional waters associated with Smith River in the survey area were delineated by the OHWM indicators: wracking/debris, destruction of terrestrial vegetation, and clear line impressed on the bank. The perennially inundated historical excavated pit or alcove near the confluence (see Section 3.1) contained emergent aquatic vegetation (*Eleocharis macrostachya* [pale spike rush]) and was classified as riverine lower perennial aquatic bed (W-2, Figure 4). The existing streambed was classified as riverine lower perennial unconsolidated bottom and totaled 0.07 ac in the survey area (W-3) (Figure 4). The establishment of willow riparian scrub/shrub habitat along the Smith River channel bank had evidence of wracking and debris in the understory from annual high flows (W-1) and these features were classified within the OHWM (Figure 4). The OHWM was extended along the shoreline within the corresponding one-foot elevation contour where OHWM evidence was observed in the field (Figure 4). Patches of the nonnative, invasive *Phalaris arundinacea* (reed canary grass) were noted within the palustrine wetlands of this feature.

Other Waters of the U.S. subject to Section 404 jurisdiction also included the riverine intermittent streambed of lower Stotenburg Creek that totaled 0.37 ac in the survey area (W-4) (Table 1, Figure 4). The OHWM indicators observed included destruction or change in terrestrial vegetation, wracking/debris, and clear impression along the channel bank. The extent of these waters largely correlate with the 20% exceedance inundation from the HEC-RAS model.

3.3.2 Wetlands

Wetlands delineated within the survey area occurred along the immediate riparian corridor adjacent to the delineated waters of Smith River and lower Stotenburg Creek. These palustrine wetlands were described by their dominant vegetation composition and classified as temporarily flooded broad-leaved deciduous forest, broad-leaved deciduous scrub/shrub wetlands, and persistent emergent wetlands (Table 1, Figure 4, Appendix C).

FGDC (2013) defines the palustrine system as all nontidal wetlands dominated by trees, shrubs, persistent emergent plants, emergent mosses or lichens (i.e., non-vascular) and all similar wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand. Emergent wetlands are characterized by erect, rooted herbaceous hydrophytes, excluding mosses and lichens, that are the tallest life form, have at least 30% areal coverage, and are present for most of the growing season in most years (FGDC 2013). Broadleaved deciduous scrub-shrub and forested wetlands are characterized by woody plants of this leaf type that are less than 20 feet tall (scrub-shrub) or woody trees (at least 20 feet tall) (forested) that are the dominant life form with at least 30% areal coverage (FGDC 2013). FGDC (2013) defines temporarily flooded as when surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the

ground surface for the most of the season. This water regime was confirmed for palustrine wetlands in the survey area based on surface water observations noted throughout the year and review of the HEC-RAS model results that indicated inundation frequency between 5 and 10 years (Stillwater Sciences 2019).

Palustrine emergent wetlands were characterized by the mesic pastureland occupying the lower gradual slopes adjacent to the lower Stotenburg Creek waters edge. Characteristic species include *Glyceria declinata* (low manna grass, FACW), *Ranunculus repens* (creeping buttercup, FAC), *Festuca perennis* (rye grass, FAC), and *Holcus lanatus* (common velvet grass, FAC). Data point 1 best characterized the emergent persistent wetlands in the survey area. Placed along an opening within the riparian corridor, dominant vegetation was composed of primarily ryegrass and *Poa pratensis* subsp. *pratensis* (Kentucky blue grass, FAC) and the dominance test confirmed hydrophytic vegetation was present (Appendix A). The entire 18-inch soil profile consisted of a silt loam with a soil matrix color of 2.5Y 3/2. Common and prominent redox concentrations (5%) were observed throughout the entire soil profile (i.e., within the upper 0–18 inches of the mineral soil) and confirmed the primary hydric soil indicator redox dark surface (F6) (Appendix A). The primary wetland hydrology indicator oxidized rhizospheres along living roots (C3) and one secondary wetland hydrology indicator geomorphic position (D2) were observed during the field delineation and wetland hydrology was confirmed (Appendix A). Features with similar species composition and topographic position (based on desktop assessment of matching elevation contours adjacent to the OHWM elevation) were characterized as emergent persistent wetlands throughout the project reach (Figure 4, Table 1).

Palustrine broad-leaved deciduous scrub/shrub wetlands were the most prevalent wetland type within the survey area. Containing mostly hydrophytic species including *Salix hookeriana* (dune willow, FACW), *Salix sitchensis* (Sitka willow, FACW), and *Salix scouleriana* (Scouler's willow, FACW), these willow stands formed dense mid-canopy cover along the project reach. Wetland parameters were evident in contour elevations roughly two to six feet above the delineated OHWM depending on proximity to Smith River confluence. Wetland boundaries near the Smith River confluence confirmed hydric soils and wetland hydrology at higher elevations, approximately six to seven feet above delineated waters of lower Stotenburg Creek, due to higher annual inundation from Smith River's winter flows. Smith River annual winter flow has less influence on surface water inundation in the upstream area of lower Stotenburg Creek in the survey area and wetland boundaries were typically 2 to 3 feet above the delineated waters (Figure 4). The palustrine broad-leaved deciduous scrub-shrub wetlands were characterized by data point 200. Per the "50/20 rule," dominant hydrophytic species were observed within all strata and included Sitka willow, dune willow, *Rubus spectabilis* (salmonberry, FAC), *Rubus armeniacus* (Himalayan blackberry, FAC), and common velvet grass (Appendix A). The dominance test passed for hydrophytic vegetation and confirmed hydrophytic vegetation was present. The soil profile at data point 200 contained a loam with a matrix of 2.5Y 3/2 in the upper 18 inches below ground surface. Redox concentrations of 3 and 5% (10 YR 3/6) were documented throughout the soil matrix and the primary hydric soil indicator redox dark surface (F6) was confirmed. The primary wetland hydrology indicator, redox dark surface (C3) and two secondary indicators geomorphic position (D2) and FAC-Neutral Test (D5), were observed and confirmed the presence of wetland hydrology (Appendix A). Vegetation communities within this category, when lacking hydric soils and wetland hydrology, composed the CC- and CDFW-jurisdictional riparian features (Table 1, Figure 4).

Palustrine broad-leaved deciduous forest wetlands adjacent to delineated waterways totaled 0.75 ac in the survey area (Figure 4, Table 1). These wetlands were characterized where facultative overstory trees occurred along the creek banks at the topographic break where hydric soils and

wetland hydrology were evident during field investigations (see data points 1, 2, 100, and 200 for hydric soil and wetland hydrology indicators observed at corresponding project elevations along delineated waterways) (Figure 4, Appendix A). Dominant trees in these wetlands included hydrophytic species *Alnus rubra* (red alder), *Populus trichocarpa* (black cottonwood), *Physocarpus capitatus* (Pacific nine-bark), and *Salix lasiandra* (Pacific willow).

Upland conditions were characterized by data point 3 and 300 in the survey area (Figure 4). At these locations plant species assemblages were primarily composed of upland pasture grasses and forbs and failed the dominance test for presence of hydrophytic vegetation. Furthermore, hydric soils and wetland hydrology were lacking (Figure 4, Appendix A). These sampled upland areas lacked all three-wetland parameters and were not vegetated riparian areas, thereby not subject to the USACE-, State-, CC-, or CDFW-jurisdiction.

4 POTENTIAL IMPACTS AND MINIMIZATION MEASURES

Construction activities associated with the lower Stotenburg Creek enhancement project have the potential to affect preliminary USACE-, State-, CC- and CDFW-jurisdictional features. Table 2 presents a summary of project actions characterized by effect on waters and wetlands in the project footprint including enhancement, temporary impact, permanent impact, and creation. All design actions are intended to enhance the existing streambed, wetland, and riparian habitat in the long-term. All enhancement actions (i.e., recontouring the existing stream channel, riparian interplanting, installation of beaver dam analog and large wood structures, recontour alcove connection, grading channel banks and inset benches, and invasive weed management followed by native revegetation) are anticipated to have a temporary impact to the existing jurisdictional features during the work activity period.

Table 2. Impacts assessment of the lower Stotenburg Creek enhancement actions on jurisdictional features in the Project footprint

Action	Result	Area (acre)
Jurisdictional Adjacent Wetlands (PE-1, PF-1, PS-1)		
New road crossing, rock slope protection and bridge footings	Permanent impact	0.04
Road construction, removal of approximately ten 12- to 18-inch DBH hardwoods	Permanent impact	0.08
Invasive weed removal followed by revegetation with riparian planting palette; riparian revegetation of disturbed nonnative emergent wetland (PE-1)	Enhancement	0.12
Type conversion of wetlands to waters (e.g., widening channel, creation of inset benches)	Enhancement	0.06
Beaver dam analog installation	Enhancement	0.001
Grading design channel bed and banks	Enhancement	0.03
Jurisdictional Waters		
Smith River (W-1, W-2, W-3)		
Net conversion of wetlands to waters ¹	Enhancement	0.07
Invasive weed removal followed by revegetation with riparian planting palette	Enhancement	0.04
Installation of willow baffles	Enhancement	0.11

Action	Result	Area (acre)
Improve alcove connection, minor grading	Enhancement	0.004
Grading design channel bed and banks	Enhancement	0.12
Lower Stotenburg Creek (W-4)		
Rock slope protection at new road crossings (not anticipated to impair waterway will line channel bank)	Temporary impact	0.01
Remove ford crossing surface, recontour surface	Enhancement	0.04
Non-Jurisdictional Upland		
Installation of willow baffles	Creation	0.04
Nonnative/invasive weed removal and riparian planting	Creation	0.15
Removal of ford crossing, restore channel bed and bank	Creation	0.04
CC- and CDFW-Jurisdictional One-Parameter Riparian		
Road construction, road crossing (rock slope protection, bridge footing)	Permanent impact	0.05
Invasive weed removal followed by revegetation with riparian planting palette	Enhancement	0.06

¹ Net conversion of wetlands to waters was calculated by summing the total area of wetlands converted to waters (e.g., widening of channel, convert Himalayan blackberry wetland scrub to widened channel bed and bank, new channel alignment) and subtracting the total area of waters converted to wetlands (e.g., fill of old channel to prevent split flow)

Some permanent impacts to jurisdictional wetland riparian habitat by the road crossing improvements is anticipated. Bridge footings and the rock slope protection will displace 0.04 ac of adjacent wetlands composed of palustrine broadleaved deciduous scrub-shrub (PS-1) and forest (PF-1) wetlands. Road construction at the downstream road crossing location will remove approximately ten 12- to 18- inch diameter breast height hardwoods within the palustrine broadleaved deciduous forest wetlands (PF-1) in a 0.08 ac area. Overstory canopy is anticipated to remain high at this location by the retained adjacent riparian. Even so, the project includes 0.12 ac of enhancement activities in the existing jurisdictional riparian wetlands associated with nonnative, invasive weed management and revegetation with riparian plantings (Table 2). Additionally, planned riparian plantings will expand into the existing grassland pasture creating 0.15 ac of riparian habitat.

The rock slope protection installed within the existing waterway footprint (0.01 ac) is not anticipated to impair waters and was considered a temporary impact on jurisdictional waters of lower Stotenburg Creek (W-4). The removal of the existing ford crossing surface and the recontouring of this feature is anticipated to enhance 0.04 ac and create/restore 0.04 ac of the lower Stotenburg Creek bed and bank features (Table 2).

Road construction associated with the new crossings are anticipated to impact some CC- and CDFW-jurisdictional one-parameter riparian features (0.05 ac). This includes mostly willow scrub riparian habitat with no large diameter trees noted in the proposed road footprint. Enhancement of 0.06 ac of CC- and CDFW-jurisdictional one-parameter riparian features involving invasive weed removal and revegetation is planned. Furthermore, restoration activities, installation of willow baffles adjacent to the existing riparian corridor (0.04 ac) and the previously discussed riparian plantings (0.15 ac-acre), will provide riparian cover continuity in the existing canopy gaps along the stream corridor (Table 2).

Type conversion is anticipated within the jurisdictional features in the project. Design actions of recontouring and widening the streambed will convert approximately 0.06 acres of existing adjacent wetland types to jurisdictional waters of lower Stotenburg Creek. Within the delineated OHWM of Smith River (W-1–W-3), design activities will convert approximately 0.10 acres of riparian scrub to riverine streambed, and 0.03 ac of riverine streambed to riparian wetland (Table 2). This enhancement activity includes the conversion of some low-quality riparian scrub that contains high understory cover by nonnative, invasive Himalayan blackberry and reed canary grass, to restored riverine streambed.

The following measures will be implemented to minimize any potential negative impacts on these waters and avoid impacting waters outside of the Project footprint:

- The Project footprint will be minimized to the extent possible.
- Heavy equipment and vehicles will use existing and temporary access roads to the extent possible.
- Work will be conducted during the dry season to the extent possible.
- Construction materials will be stored in designated staging areas.
- The following erosion, sediment, material stockpile, and dust control best management practices will be employed on-site:
 - Locate temporary storage areas away from vehicular traffic
 - Locate stockpiles a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets
 - Protect all stockpiles from storm water run-on using a temporary perimeter sediment barrier such silt fences, compost socks, or sandbag barriers.
 - Keep stockpiles covered or protected with soil stabilization measures to avoid direct contact with precipitation and to minimize sediment discharge.
 - Implement wind erosion control practices as appropriate on all stockpiled material.
- All construction equipment will be well maintained to prevent leaks of fuels, lubricants, or other fluids and extreme caution will be used when handling chemicals (fuel, hydraulic fluid, etc.). Service and refueling procedures will not be conducted where there is potential for fuel spills to seep or wash into wetlands or waters. Appropriate materials will be on-site to prevent and manage any spills.

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Appendices

Appendix A

Wetland Delineation Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Lower Stotenburg Creek Enhancement Project City/County: Smith River / Del Norte Sampling Date: 05/25/22
 Applicant/Owner: Smith River Alliance/Private Landowner State: CA Sampling Point: 001
 Investigator(s): Emmalien Craydon, Victoria Bryant Section, Township, Range: 2 11, 17 North, 1
 Landform (hillslope, terrace, etc.): Alluvial terrace Local relief (concave, convex, none): Concave Slope (%): 25
 Subregion (LRR): A Lat: _____ Long: _____ Datum: WGS 84
 Soil Map Unit Name: Russ, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: Hydrophytic vegetation, Hydric soils, Wetland Hydrology confirmed. Sampling point 001 is in a wetland. Region is in moderate drought.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>4m²</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>4m²</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: <u>4m²</u>) 1. <u>Festuca perennis</u> 45 yes FAC 2. <u>Daucus carota</u> 2 _____ 3. <u>Plantago lanceolata</u> 3 _____ 4. <u>Poa pratensis</u> 15 yes FAC 5. <u>Anthoxanthum odoratum</u> 5 _____ 6. <u>Holcus lanatus</u> 10 _____ 7. <u>Festuca arundinacea</u> 5 _____ 8. <u>Trifolium repens</u> 5 _____ 9. <u>Ranunculus repens</u> 10 _____ 10. _____ 11. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: <u>4m²</u>) 1. <u>Rubus armeniacus</u> 50 yes FAC 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Dominance test passed. Vegetation is hydrophytic				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

SOIL

Sampling Point: 01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No

Remarks:

Redox concentrations observed in upper 6", (F6)

Low chroma matrix colors confirmed F6.

Soils are hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except |
| <input type="checkbox"/> High Water Table (A2) | MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Drift Deposits (B3) | <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? Yes _____ No X Depth (inches): _____

Saturation Present:
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Oxidized rhizospheres observed along roots (C3) confirming wetland hydrology

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Lower Stotenburg Creek Enhancement Project City/County: Smith River / Del Norte Sampling Date: 05/25/22
 Applicant/Owner: Smith River Alliance/Private Landowner State: CA Sampling Point: 002
 Investigator(s): Emmalien Craydon, Victoria Bryant Section, Township, Range: 2 11, 17 North, 1
 Landform (hillslope, terrace, etc.): Alluvial terrace Local relief (concave, convex, none): Concave Slope (%): 25
 Subregion (LRR): A Lat: _____ Long: _____ Datum: WGS 84
 Soil Map Unit Name: Russ, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: Hydrophytic vegetation, Hydric soils, and Wetland Hydrology confirmed. Sampling point 001 is in a wetland. Region is in moderate drought.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>4m²</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Sapling/Shrub Stratum (Plot size: <u>4m²</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) <u>341.7</u> (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Herb Stratum (Plot size: <u>4m²</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Poa pratense</u>	<u>15</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Festuca arundinacea</u>	<u>10</u>	_____	_____	
3. <u>Galium aparine</u>	<u>2</u>	_____	_____	
4. <u>Vicia sativa</u>	<u>3</u>	_____	_____	
5. <u>Anthoxanthum odoratum</u>	<u>5</u>	_____	_____	
6. <u>Dactylis glomerata</u>	<u>15</u>	<u>yes</u>	<u>FACU</u>	
7. <u>Holcus lanatus</u>	<u>15</u>	<u>yes</u>	<u>FAC</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
Woody Vine Stratum (Plot size: <u>4m²</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1. <u>Rubus armeniacus</u>	<u>45</u>	<u>yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Dominance test passed. Vegetation is hydrophytic				

SOIL

Sampling Point: 100

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 3-2	94	10YR 4-6	6	C	PL	Silt Loam	
12-15	2.5Y 3-2	96	10YR 4-6	4	C	PL	Silt Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): n/aHydric Soil Present? Yes X No _____

Remarks:

Redox concentrations observed in upper 6", (F6)
 Low chroma matrix colors confirmed F6.
 Soils are hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Saturation Visible on Aerial Imagery (C9)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)
☐ Raised Ant Mounds (D6) (**LRR A**)
☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water Table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Oxidized rhizospheres observed along roots (C3) confirming wetland hydrology

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Lower Stotenburg Creek Enhancement Project City/County: Smith River / Del Norte Sampling Date: 5/25/22
 Applicant/Owner: Smith River Alliance/Private landowner State: CA Sampling Point: 003
 Investigator(s): Emmalien Craydon, Victoria Bryant Section, Township, Range: 2 11, 17 North, 1
 Landform (hillslope, terrace, etc.): Alluvial terrace Local relief (concave, convex, none): none Slope (%): 5
 Subregion (LRR): A Lat: _____ Long: _____ Datum: WGS 84
 Soil Map Unit Name: Russ, 0-2% slope NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks: No hydrology parameters observed. Sampling Point 003 is in an upland area. Region is in a moderate drought.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m²</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>10m²</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: <u>10m²</u>) 1. <u>Avena fatua</u> 35 yes NL-UPL 2. <u>Bromus hordeaceus</u> 5 _____ 3. <u>Bromus diandrus</u> 8 _____ 4. <u>Festuca myuros</u> 15 yes FACU 5. <u>Trifolium subterraneum</u> 10 _____ 6. <u>Holcus lanatus</u> 15 yes FAC 7. <u>Plantago lanceolata</u> 5 _____ 8. <u>Anthoxanthum odoratum</u> 15 yes FACU 9. <u>Trifolium dubium</u> 2 _____ 10. _____ 11. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: <u>10m²</u>) 1. _____ 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Dominance test failed and hydrophytic vegetation is not present.				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>

SOIL

Sampling Point: 003

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

- ☐ 2 cm Muck (A10)
 - ☐ Red Parent Material (TF2)
 - ☐ Very Shallow Dark Surface (TF12)
 - ☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: mixed gravel

Depth (inches): 12"

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Lower Stotenburg Creek Enhancement Project City/County: Smith River / Del Norte Sampling Date: 07/15/22
 Applicant/Owner: Smith River Alliance/Private Landowner State: CA Sampling Point: 100
 Investigator(s): Emmalien Craydon, Kipp Pow Section, Township, Range: 2 11, 17 North, 1
 Landform (hillslope, terrace, etc.): Alluvial terrace Local relief (concave, convex, none): Concave Slope (%): 30
 Subregion (LRR): A Lat: 41.887890 Long: -124.145836 Datum: _____
 Soil Map Unit Name: Russ, 0-2% slope NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: Hydrophytic vegetation, Hydric soils, Wetland Hydrology confirmed. Sampling point 001 is in a wetland. Region is in moderate drought.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m²</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83%</u> (A/B)														
1. <u>Salix sitchensis</u>	<u>80</u>	<u>yes</u>	<u>FACW</u>															
2. <u>Salix hookeriana</u>	<u>60</u>	<u>yes</u>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____	Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>140</u></td> <td>x 2 = <u>280</u></td> </tr> <tr> <td>FAC species <u>195</u></td> <td>x 3 = <u>585</u></td> </tr> <tr> <td>FACU species <u>40</u></td> <td>x 4 = <u>160</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>375</u> (A)</td> <td><u>341.7</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>0.91</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>140</u>	x 2 = <u>280</u>	FAC species <u>195</u>	x 3 = <u>585</u>	FACU species <u>40</u>	x 4 = <u>160</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>375</u> (A)	<u>341.7</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>140</u>	x 2 = <u>280</u>																	
FAC species <u>195</u>	x 3 = <u>585</u>																	
FACU species <u>40</u>	x 4 = <u>160</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>375</u> (A)	<u>341.7</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>10m²</u>) 1. <u>Rubus spectabilis</u> <u>50</u> <u>yes</u> <u>FAC</u> 2. _____ 3. _____ 4. _____ 5. _____ <u>50</u> = Total Cover																		
Herb Stratum (Plot size: <u>10m²</u>) 1. <u>Holcus lanatus</u> <u>75</u> <u>yes</u> <u>FAC</u> 2. <u>Aira caryophyllea</u> <u>40</u> <u>yes</u> <u>FACU</u> 3. <u>Festuca perennis</u> <u>20</u> <u>no</u> <u>FAC</u> 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ <u>135</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>10m²</u>) 1. <u>Rubus armeniacus</u> <u>50</u> <u>yes</u> <u>FAC</u> 2. _____ <u>50</u> = Total Cover % Bare Ground in Herb Stratum <u>0</u>																		
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Hydrophytic Vegetation Present? Yes <u>X</u> No _____																		
Remarks: Dominance test passed. Vegetation is hydrophytic																		

SOIL

Sampling Point: 100

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 3-2	95	10YR 3-6	5	C	PL	Loam	minor amount of sand
12-18	2.5Y 3-2	97	10YR 3-6	3	C	PL	Loam	minor amount of sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Redox concentrations observed in upper 6", (F6)
 Low chroma matrix colors confirmed F6.
 Soils are hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Saturation Visible on Aerial Imagery (C9)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☒ FAC-Neutral Test (D5)
☐ Raised Ant Mounds (D6) (**LRR A**)
☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Oxidized rhizospheres observed along roots (C3) confirming wetland hydrology

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Lower Stotenburg Creek Enhancement Project City/County: Smith River/ Del Norte Sampling Date: 7/15/22
 Applicant/Owner: Smith River Alliance/Private landowner State: CA Sampling Point: 200
 Investigator(s): Emmalien Craydon, Kipp Pow Section, Township, Range: 2 & 11, 17 North, 1
 Landform (hillslope, terrace, etc.): Alluvial terrace Local relief (concave, convex, none): flat Slope (%): 5
 Subregion (LRR): A Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Russ, 0-2% slope NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: Region is currently in a moderate drought.					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m²</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Salix hookeriana</u>	<u>30</u>	<u>yes</u>	<u>FACW</u>	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
<u>30</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>10m²</u>)				Total % Cover of: _____ Multiply by: _____
1. _____	_____	_____	_____	OBL species _____ x 1 = _____
2. _____	_____	_____	_____	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
<u>0</u> = Total Cover				Column Totals: _____ (A) _____ (B)
Herb Stratum (Plot size: <u>10m²</u>)				Prevalence Index = B/A = _____
1. <u>Festuca perennis</u>	<u>10</u>	<u>no</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Holcus lanatus</u>	<u>50</u>	<u>no</u>	<u>FAC</u>	
3. <u>Aira cayophyllea</u>	<u>60</u>	<u>yes</u>	<u>FACU</u>	
4. <u>Plantago lanceolata</u>	<u>2</u>	<u>no</u>	<u>FACU</u>	
5. <u>Rumex pulcher</u>	<u>1</u>	<u>no</u>	<u>FAC</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>123</u> = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>10m²</u>)				
1. <u>Rubus armeniacus</u>	<u>20</u>	<u>yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
<u>20</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Dominant vegetation is hydrophytic				

SOIL

Sampling Point: 200

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	
0-18	2.5Y 3-2	95	0YR 3-6	5	C	PL	Loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): N/AHydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Saturation Visible on Aerial Imagery (C9)
☒ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)
☐ Raised Ant Mounds (D6) (**LRR A**)
☐ Frost-Heave Hummocks (D7)

Field Observations:Surface Water Present? Yes _____ No X Depth (inches): _____Water Table Present? Yes _____ No X Depth (inches): _____Saturation Present? Yes _____ No X Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Lower Stotenburg City/County: Smith River / Del Norte Sampling Date: 7/15/22
 Applicant/Owner: _____ State: CA Sampling Point: 300
 Investigator(s): Emmalien Craydon, Kipp Pow Section, Township, Range: 2 11, 17 North, 1
 Landform (hillslope, terrace, etc.): Alluvial terrace Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): A Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Russ, 0-2% slope NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>	
Wetland Hydrology Present?	Yes _____ No <u>X</u>	
Remarks: No hydrology parameters observed. Sampling Point 003 is in an upland area. Region is in a moderate drought.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m²</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>10m²</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 0 = Total Cover				
Herb Stratum (Plot size: <u>10m²</u>) 1. <u>Rumex acetosella</u> 10 no FACU 2. <u>Trifolium dubium</u> 4 no FACU 3. <u>Achillea millefolium</u> 4 no FACU 4. <u>Aira caryophylla</u> 75 yes FACU 5. <u>Holcus lanatus</u> 70 yes FAC 6. <u>Vicia sativa</u> 2 no UPL 7. <u>Senecio jacobea</u> 4 no FACU 8. <u>Hypochaeris radicata</u> 2 no FACU 9. <u>Plantago lanceolata</u> 2 no FACU 10. <u>Trifolium repens</u> 1 no FAC 11. <u>Bromus hordeaceus</u> 25 no FACU 199 = Total Cover				
Woody Vine Stratum (Plot size: <u>10m²</u>) 1. _____ 2. _____ 0 = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Dominance test failed and hydrophytic vegetation is not present.				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>

SOIL

Sampling Point: 300

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	2.5Y 3-3	99	10YR 3-6	1	C	PL	Loam	
2-18	10YR 3-3	100					Loam	
18+	2.5Y 3-3	90	2.5Y 4-2	10	D	M	Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)
☐ Raised Ant Mounds (D6) (**LRR A**)
☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? Yes _____ No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present.

Appendix B

WETS Table

WETS Station:
CRESCENT CITY
MCNAMARA AP, CA

Requested years:
1991 - 2022

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	54.6	41.7	48.2	8.47	5.21	10.24	13	-
Feb	54.1	41.4	47.7	6.41	3.78	7.79	10	-
Mar	54.4	42.5	48.4	7.61	5.29	9.05	13	-
Apr	55.4	43.8	49.6	5.06	3.21	6.10	9	-
May	58.0	46.8	52.4	2.22	0.86	2.69	5	-
Jun	60.6	49.4	55.0	1.54	0.67	1.82	3	-
Jul	61.9	51.8	56.9	0.22	0.06	0.21	1	-
Aug	63.0	52.5	57.8	0.28	0.08	0.28	1	-
Sep	63.0	50.0	56.5	1.20	0.37	1.36	2	-
Oct	60.6	47.4	54.0	4.39	1.59	5.29	6	-
Nov	57.2	44.0	50.6	7.20	4.84	8.61	11	-
Dec	54.1	41.5	47.8	11.14	7.14	13.42	14	-
Annual:					48.81	62.98		
Average	58.1	46.1	52.1	-	-	-	-	-
Total	-	-	-	55.74			88	-

GROWING SEASON DATES

Years with missing data:	24 deg = 10	28 deg = 10	32 deg = 12
Years with no occurrence:	24 deg = 22	28 deg = 22	32 deg = 4
Data years used:	24 deg = 22	28 deg = 22	32 deg = 20
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	1/31 to 12/26: 329 days
70 percent *	No occurrence	No occurrence	1/12 to 1/15: 368 days

* Percent chance
of the growing
season occurring
between the
Beginning and
Ending dates.

Appendix C

Field Delineation Photographs



Figure C-1. Photograph illustrating conditions in a delineated palustrine persistent emergent wetland (PE-1) in the survey area.



Figure C-2. Photograph illustrating conditions below Smith River's OHHM, foreground depicting the riverine permanently flooded aquatic streambed (W-2), background illustrating the palustrine broad-leaved deciduous scrub-shrub (W-1).



Figure C-3. Photograph illustrating riparian conditions. To the left, overstory canopy subject to CC- and CDFW-Jurisdiction only, to the right, palustrine broad-leaved deciduous forest wetlands (PF-1).



Figure C-4. Photograph illustrating upland conditions within the pasture (left), and overview of the palustrine broad-leaved deciduous scrub-shrub wetlands (PS-1) adjacent to lower Stotenburg Creek (right). This image also captures the outer riparian features only subject to CC- and CDFW-jurisdiction.

Appendix F

Construction Specifications

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1 GENERAL

The Contractor shall take all reasonable precautions to restrict their operations to the least area of work possible and shall not disturb private property beyond the areas of work. The Contractor shall make every effort to minimize their work area and keep the construction area clean and free of all excess trash, debris, pollutants, and dust at all times.

The Contractor shall be cognizant if the project involves work within the County road right of way or adjacent to private property. The Contractor shall not use or access the project site through private property without submitting written approval from the property owners to the Engineer or Geologist. Access to the creek shall be graded per the Design Plans and within the existing disturbed areas as much as possible. Unless otherwise indicated by the Design Plans, all trees are to be protected. The Contractor shall notify the Project Proponent a minimum of one week prior to commencement of work. The Contractor shall notify adjacent property owners by written notification 72 hours prior to commencement of work.

The Contractor shall keep driveway access open to adjacent neighbors at all times. Before road closure, a minimum of 7 calendar days advanced notice is required. Signage and barricades are the responsibility of the Contractor. The closure area shall be barricaded at all times in order to protect the public from any open trenches.

Normal working hours for the work site shall not be earlier than 8:00 a.m. or later than 5:00 p.m. weekdays, unless otherwise approved by the Engineer or Geologist.

Should the Contractor need to stage equipment and materials along public roads, there shall be unobstructed access for residents at all times. The Contractor shall provide any additional equipment or material staging areas at their own expense. Any damages to the existing asphalt beyond the limits of work as shown on the Design Plans shall be repaired at the Contractor's expense. Disturbed areas resulting from stockpiling materials along the edge of pavement will be required to be restored by applying the grass seed mix listed herein and installation of erosion control per the approval of the Engineer or Geologist.

Any damage or use of private property, non-county-maintained road, or facility is the responsibility of the Contractor. The Contractor shall be responsible for any damage to existing utilities, adjacent roads, or property caused by their activities; and shall also use suitably sized equipment to prevent such damage.

Debris, soil, silt, bark, trash, 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 and/or entering public waters. Any of these materials, placed within or where they may enter a stream, by the Contractor 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 predators of salmonids will be properly contained, removed from the work site, and disposed of daily.

Dimensions noted on the Design Plans take precedent over scale.

1.1 Order of Work/Progress Schedule

The Contractor shall install advance notice construction and road closure signs at either end of the work site, as indicated by the Engineer or Geologist.

Construction work for the site shall not commence until all materials are available. Construction work for the site shall be coordinated with any work by utility entities performing utility relocations to avoid conflicts. Monetary reimbursement for any right of way delays regarding work by utility entities shall not be allowed.

The Contractor shall prepare and submit a work plan and progress schedule in a form provided by or acceptable to the Engineer or Geologist. The above items shall clearly disclose the Contractor's proposed procedures and methods of operation, including identifying any special equipment intended for use on the project. The Contractor shall allow 5 working days for review and approval of this item by the Engineer or Geologist. The Progress Schedule will be reviewed weekly for accuracy. Any modifications to the Progress Schedule shall be submitted to the Project Proponent in writing. Modifications to the Progress Schedule will not constitute approval for a work schedule extension.

The Contractor shall submit a separate weekly schedule, separate from the entire project schedule, which shall indicate daily planned work activities. This separate weekly schedule shall be suitable for publishing in local news sources. A digital version and paper copy of the separate weekly schedule shall be submitted to the Engineer or Geologist no later than the Wednesday preceding the workweek. The Project Proponent shall have the right to publish part of this schedule on their website or in a local publication.

No work may begin under the contract until the Engineer or Geologist has approved the Progress Schedule. Time required for review and approval of these items shall not constitute a basis for time extension.

Full compensation for complying with these provisions shall be considered as included in the contract price paid for various items and no separate payment shall be made.

2 EXISTING FACILITIES

2.1 General

If the Contractor requires overhead power lines to be de-energized in order to facilitate work, the Contractor shall notify the power utility as soon as possible with the expectation of 1-2 weeks to de-energize lines.

In order to avoid conflicts, construction work for the site shall be coordinated with any work by utility entities performing utility relocations. The Contractor shall also coordinate with the utilities, such that the utilities may have sufficient time to install their facilities in the roadway prior to final grading/paving. Reimbursement for right-of-way delays regarding work by utility entities shall not be allowed.

Existing utility poles, communication, and telephone lines shall be protected in place during construction. If the contractor requires utilities to support the pole or lines during construction, the Contractor shall coordinate with relevant utilities prior to construction activities.

It is not the intent of the Design Plans to show the exact location of existing or relocated utilities, and the Engineer or Geologist assumes no responsibility therein. Whenever any such utilities are indicated therein, the Contractor shall be responsible for verifying their actual location and depth in the field. The Contractor shall notify the appropriate Underground Service Alert (USA) for their location 48 hours prior to excavation.

Where excavations are performed in the vicinity of underground utility services the Contractor shall, as necessary, perform initial exploratory excavations (e.g., potholing) to determine their exact depth and location. Payment for exploratory excavation shall be included in the various items of work needed to complete the excavation work.

Extreme care shall be exercised to avoid damage, and it will be the Contractor's responsibility to have repairs made to existing facilities at their expense in the event of damage. Where existing utilities require temporary or permanent relocation to accommodate proposed work the Contractor will work with the utilities to provide a minimum of interruption to local service.

Full compensation for complying with the above provisions shall be considered as included in the contract price for the various bid items and no separate payment will be made.

3 CONSTRUCTION STAKING

3.1 General

The **Client** or other approved party shall provide construction staking for the project. If it is desired that the Engineer conduct the staking, the Contractor shall submit a survey request to the Engineer at the preconstruction meeting. The Contractor shall notify the Engineer 10 working days in advance of when construction stakes will be required.

Any undue destruction of stakes by the Contractor shall constitute cause to hold the Contractor liable for the cost of re-staking and said cost shall be deducted from any monies due the Contractor.

Full compensation for complying with the above provisions shall be considered as included in the contract price for the various bid items and no separate payment will be made.

4 SIGNS AND TRAFFIC CONTROL

4.1 General

All signs and other warning devices (including construction and warning signs placed beyond the limit of work), shall be provided by the Contractor, and shall remain their property after the completion of the contract.

The Contractor shall refer to the current California Manual of Temporary Traffic Controls for Construction and Maintenance Work Zones and the Uniform Signs Chart issued by the California Department of Transportation, and shall furnish, erect, maintain, and remove all necessary signs and devices during the length of this contract.

Work shall be accomplished in such a manner as to provide access to all intersecting streets and adjacent properties whenever possible. If during the course of the work it is necessary to restrict access to certain driveways for an extended period of time, the Contractor shall notify the affected residences and the Engineer or Geologist in writing, at least 48 hours in advance.

If necessary, the Contractor shall post temporary ROAD CLOSURE signs. Road closure signs shall read as follows with street name inserted in blanks: “_____ Street CLOSED. No through traffic on _____ Street”. Signs shall be placed a minimum of 72 hours in advance of construction activities. Where existing road signs are in conflict with the proposed work, the Contractor shall relocate such signs to temporary or permanent locations as directed by the Engineer or Geologist. It shall be the responsibility of the Contractor to maintain signs and barricades overnight and on weekends.

Open trenches shall be adequately barricaded to protect the public at all times. Road closure barricades shall be equipped with flashing beacons that are visible at night. The Contractor shall be responsible for maintaining all barricades and flashing beacons for the duration of the project. Any non-functioning beacons shall be repaired by the end of the work shift. In addition, Type II barriers shall be placed across the roadway to ensure observance of road closure during all hours for pedestrian and vehicular safety at all times. K-rail barriers shall be placed on road at the boundaries of excavation to prevent vehicles from approaching or falling into excavation in the roadway.

It is the responsibility of the Contractor to arrange for the towing and removal of any vehicles which interfere with the work operations. Full compensation for the removal of the vehicles shall be considered as included in the price paid for the various items of work and no additional compensation will be allowed.

At the end of each day’s work, and at other times when construction operations are suspended, all equipment and other obstructions shall be removed from that portion of the roadway open for use by local residents.

Where existing road signs are in conflict with the proposed work, the Contractor shall cover existing signs or relocate such signs to temporary locations as directed by the Engineer or Geologist.

The Contractor shall examine the entire project site at the end of each day and verify that all necessary warning signs are in place and have effective night reflective visibility.

Full compensation for complying with the above provisions shall be considered as included in the contract price for the various bid items and no separate payment will be made.

5 CLEARING AND GRUBBING

5.1 General

Clearing and grubbing, especially with concern for existing native vegetation, shall be limited to the maximum extent practicable to those areas actually affected by the planned construction, and for access as shown by the plan. No other access shall be allowed unless otherwise approved by the Engineer or Geologist, and written approval is obtained from the property owner if desired access goes over private property.

Clearing and grubbing shall include, but not be limited to the following:

- Removal of concrete, wooden debris, abandoned ACC pipe or other type of piping as encountered during the excavation
- The Contractor may remove portions of abandoned utilities that are in conflict with project construction. Prior to such removal, the Contractor shall verify with the applicable utility entity that the subject facility is abandoned.
- All sawcutting of asphalt concrete necessary for removal in the roadway shall be included in the price paid for Clearing and Grubbing in this section.
- Remove trees that are in conflict with the design as indicated on the Design Plans and or marked by the Engineer or Geologist in the field. Existing trees throughout the project not marked for removal shall be protected from equipment at all times. Other trees not marked for removal may require trimming/limbing to accommodate equipment movement within the project limits. Tree trimming will be limited to the minimum amount necessary and at the discretion of the Engineer or Geologist. The Contractor shall protect the tree root systems for trees in the proximity of construction and make every effort to modify their operation to not jeopardize the health of the trees.
- Remove roots as necessary that interfere with the work being performed within the project limits (e.g., rock structure placement and excavation for new channel).
- Remove any debris, existing signs, or facilities that are in conflict with the proposed work and all other items conflicting with the work as shown on the Design Plans as necessary to accommodate construction operations, or as directed by the Engineer or Geologist.
- All removed materials, unless otherwise indicated on the Design Plans and specified herein, shall become the property of the Contractor and disposed of outside the road right-of-way at a legal dumpsite.

Full compensation for complying with the above provisions shall be considered as included in the contract price for the various bid items and no separate payment will be made.

6 EARTHWORK

6.1 General

This section includes excavation, site preparation and grading, fill placement, compaction, rough grading, and finish grading to the lines and grades shown on the Design Plans and as directed by the Engineer or Geologist.

Earthwork shall consist of performing all operations necessary to excavate and fill all materials, regardless of character and subsurface conditions per the Design Plans. Earthwork shall also include all moving and compacting of earthen materials, and the creation and removal of any necessary access ramps within roadways or stream channels, as shown on the Design Plans.

Earthwork includes channel realignment, crossing removal and replacement, floodplain excavation, as well as trenching and backfill for large wood structures. Cross sections are shown on the Design Plans to illustrate the intent, but grading may also be adjusted in the field as directed by the Engineer or Geologist. In general, any suitable excavated material should be used for backfill on top of logs and large wood structures and compacted to as close to 90% relative compaction as possible.

6.2 Backfill Materials

Backfill may consist of 95% Structure Backfill-(95% Relative Compaction, unless otherwise noted on the Design Plans), 90% Structure Backfill-(90% Relative Compaction, unless otherwise noted on the Design Plans), or other material referenced herein or shown on the Design Plans. Unless specified otherwise on the Design Plans or herein, all other backfill materials shall be compacted to a relative compaction of at least 90%.

95% Structure Backfill-(95% Relative Compaction) shall have a Sand Equivalent value of not less than 20 and the following gradation:

U.S. Standard Sieve Size	% Passing
3 inch	100
No. 4	30–60
No. 30	5–35

90% Structure Backfill-(90% Relative Compaction) shall consist of material free of clasts and lumps exceeding 3 inches in greatest dimension, organic, and other unsatisfactory material as determined by the Engineer or Geologist. Excavated material deemed suitable by the Engineer or Geologist meeting said requirements, may be used as 90% Structure Backfill-(90% Relative Compaction) and may be used for backfill of most channel stabilization and habitat structures unless otherwise noted on the Design Plans.

6.3 Rough Grading

Although encountering bedrock is not expected at the work site, the Contractor shall be aware if there is bedrock within the riverbed of the project area and prepare for hard digging accordingly. Where the installation of any rock structures conflicts with existing bedrock, the Contractor shall cut into and notch the existing bedrock per the approval of the Engineer or Geologist such that placement of any large boulders, logs, or fill are supported against the flow of water, and do not roll off, rotate, or translate downstream.

The Contractor shall excavate unsuitable subgrade below the lower limits of excavation as shown on the Design Plans, only when directed by the Engineer or Geologist. If this is necessary, the Contractor shall replace the excavated area below said lower limits of excavation with structurally suitable material as directed by the Engineer or Geologist.

Earthen material generated from excavation that is not contaminated with construction debris can be utilized as fill/backfill per the approval of the Engineer or Geologist (soil is preferred for some applications and must be excavated selectively for quality), stockpiled on site, or transported to another location at the Contractor's expense.

All excess excavated material as well as unsuitable and/or oversized native material which cannot be used for backfill/fill purposes shall become the property of the Contractor and be disposed of at a legal dumpsite. No extra or separate payment will be made for stockpiling or re-handling of any material.

6.4 Finish Grading

The Contractor shall fine grade all channel slopes to eliminate rough or low areas and maintain channel slope and all levels, profiles, and contours of subgrade. Grades at work areas shall conform to the Design Plans. Depressed or mounded surfaces shall not be accepted. Finished grades are to be within 0.2 feet of the elevation shown on the Design Plans. Finish each area to present a neat and uniform appearance satisfactory to the Engineer or Geologist.

Grades not otherwise indicated shall be uniform levels (1% minimum) or slopes between points where elevations are given. Finished grades shall be smooth, even, and on a uniform plane with no abrupt change of surface.

All finish grades shall provide for positive runoff to the creek channel without low spots or pockets of water ponding more than 2 inches in depth. The Engineer or Geologist shall inspect final grades prior to completing work.

Whenever reference to finish grade is made, it shall be considered to be the finished surface of graded channel embankments and/or any completed channel stabilization features (e.g., crossings, wood structures, willow baffles, excavations, BDAs) as shown on the Design Plans.

Tolerances for finished grading shall be ± 0.2 feet vertical and ± 0.5 feet horizontal, unless otherwise specified in the Design Plans or by the Engineer or Geologist.

6.5 Erosion Prevention and Sediment Control

The Contractor shall employ best management practices (BMPs) to prevent erosion and control sediment, as described in the current California Stormwater BMP handbook for construction. Upon the completion of the site grading, all disturbed surfaces shall be treated in order to prevent erosion. Erosion control measures will be installed as shown on the Design Plans and covering all disturbed and or graded surfaces, with the exception of river or stream bed. At a minimum, the following best management practices shall be implemented:

- Erosion and sediment control BMPs shall be installed prior to the wet season (1 October through 30 April).
- Sensitive areas and areas where existing vegetation is being preserved for erosion control objectives shall be protected with construction fencing; fencing shall be maintained throughout construction activities.
- All areas disturbed during grading activities shall be seeded with native grass seed and mulched with rice straw.
- Prior to seeding and straw, disturbed areas should be roughened by track walking with a dozer.
- Straw shall be applied at a uniform rate of approximately 4,000 lbs per acre by hand.
- At the completion of the project, straw wattles shall be placed as shown on the Design Plans and/or directed by the Engineer or Geologist.
- All sediment control BMPs shall be maintained throughout the wet season until new vegetation has become established on all graded areas.

6.6 Temporary Access Features

The Contractor shall be entirely responsible and liable for stability and safety of all temporary access features. The Engineer or Geologist should be informed of any discrepancies on the Design Plans or other stability or safety concerns. The Contractor shall stay within specifically designated limits of work and access routes, as shown on the Design Plans. The Engineer or Geologist should be notified if any existing tree roots or existing geomorphological features, not noted on the Design Plans, will be impacted by temporary access features or construction equipment. Existing tree roots on banks should be preserved and protected by material specified by the Engineer or Geologist.

Temporary access features shall be composed of clean gravel installed in channels as shown on the Design Plans. Sites requiring dewatering shall be dewatered prior to installation of temporary access features unless otherwise noted on the Design Plans. Channel beds shall be thoroughly checked for structural stability to bear loads of construction equipment. Gravel ramps shall be entirely removed upon completion of project. Some temporary access features can be graded into the channel bed upon project completion if substrate size is suitable. If this option is not noted on the Design Plans, the Engineer or Geologist must be informed and provide approval before the beginning of project work; and gravel quality must be approved by the Engineer or Geologist.

6.7 Measurement

Earthwork quantities have been measured based on grading in AutoCAD using the limits shown on the Design Plans. Earthwork quantities are final, but may be adjusted in the field, as needed, under the direction of the Engineer or Geologist.

Reconstruction of engineered embankment fill using suitable native excavated material will not be measured or paid for. Excavation for any new channel stabilization features (e.g., wood structures, willow baffles, BDAs) or any other construction features will not be measured or paid for.

6.8 Payment

The price paid per cubic yard for earthwork shall be for the quantities stated in the Engineer's Cost Estimate and no additional payment will be made unless the dimensions, as shown on the Design Plans, are changed by the Engineer. Payment for earthwork, complete in place, will be made at the cubic yard price bid for earthwork as set forth on the bidding sheet.

The cubic yard price bid for earthwork shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in excavating, backfilling, compacting to the specified relative compaction, furnishing water necessary to moisten, place or otherwise aid in backfilling and compaction operation, stockpiling and moving excavated material regardless of number of times, rough and finish grading, and off-hauling of surplus material, complete in place, as shown on the Design Plans, as specified herein, and as directed by the Engineer or Geologist.

No separate payment for excavation necessary for any diversion or control of water shall be made. Payment for such excavation shall be considered included in the price bid for dewatering.

The cost of excavation and backfill below finish grade elevations for any individual channel enhancement or stabilization features shall be included in the individual cost of the various channel enhancement and stabilization features.

7 SITE DEWATERING AND AQUATIC SPECIES RELOCATION

7.1 General

The work site shall be dewatered, to the Engineer's or Geologist's satisfaction, to provide working conditions free of detrimental water, prior to the start of any construction. The amount of flow in the project area may fluctuate. This variance can be attributed to, but not limited to, storms, domestic runoff, irrigation practices upstream, etc. Although surface flow is not expected in the creek reach during construction, groundwater may be encountered.

The Contractor shall develop and submit a dewatering plan for dewatering the project site, even if the creek is dry, in the event of encountering groundwater, rain, other upstream discharge to the creek. The dewatering plan shall be approved by the Engineer or Geologist prior to beginning work.

The Contractor shall maintain the work site in a dewatered condition. No work shall begin until the dewatering system has been installed and such installation has been approved by the Engineer or Geologist.

The Contractor shall not lay claim against the Project Proponent for damages by surface and/or groundwater flows to their work, property, or materials. The Contractor shall comply with all applicable laws, statutes, and permit provisions with regards to their dewatering system.

The dewatering system shall be maintained by the contractor until all construction is completed.

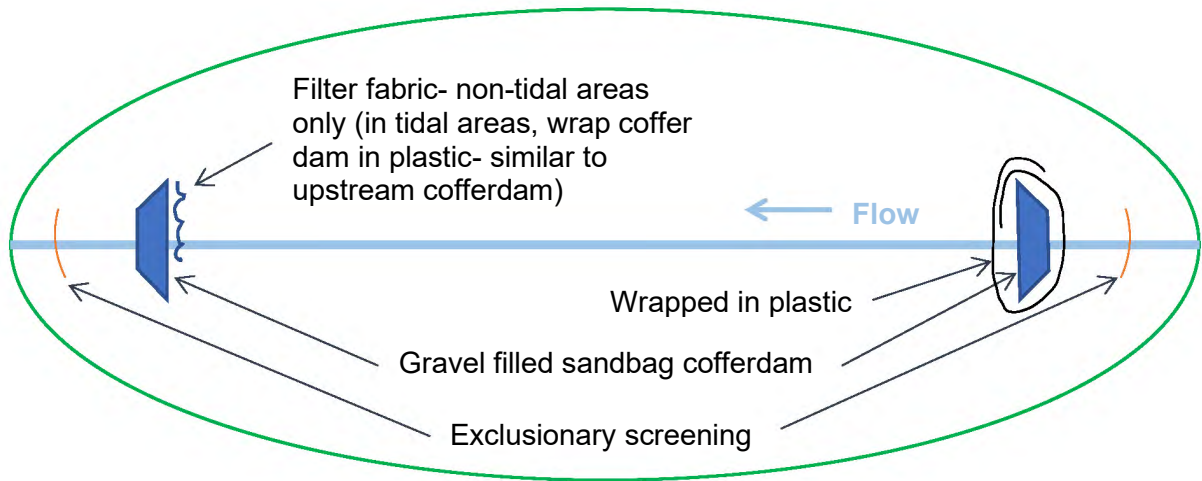
The dewatering system shall not be removed until authorized by the Engineer or Geologist.

Although surface flow in the creek reach is not expected during construction, if it is encountered, site dewatering work shall preferentially be performed on one reach at a time to ensure adequate time to thoroughly relocate the aquatic species within each project reach, dewater the individual reach and perform project construction and/or remove sediment, per the Design Plans, thereby creating a less significant impact to the overall length of the reach at any one time. An approved, qualified biologist shall coordinate timing on when to begin dewatering and sediment removal within each reach as each reach is isolated, and species sufficiently removed and relocated prior to starting work in the next reach.

The dewatering process typically includes the following steps (see figure below):

- Install exclusionary screening across channel upstream of location for upper cofferdam.
- Install exclusionary screening across channel downstream of location for lower cofferdam in this reach.
- Biologists seine low-flow channel and any pools between exclusionary screens to capture and relocate native freshwater fish and shall continue until as many fish as possible have been captured and relocated from the reach. Portable pumps shall be used as needed to complete dewatering of any pools.

- When biologists have completed fish relocation efforts, they will authorize installation of the cofferdams, to be installed just inside the exclusionary screening at the upstream and downstream limits of the reach.
- After cofferdams have been installed, further dewatering will occur (if necessary).
- After dewatering, construction and/or sediment removal may proceed.
- Removal of cofferdams and exclusionary screening.
- Complete any grading and install erosion control, and plantings as needed.



7.2 Project Biologist

To avoid conflicts the Contractor's work shall be coordinated with any work performed by biologists associated with fish relocation activities. Fish relocation activities must be completed by a qualified fish biologist, experienced with fish capture and handling.

A CDFW-approved "Qualified Biologist" will direct the native fish capture and relocation efforts, along with a team of their and the Engineer's or Geologist's choosing. Biologists shall have appropriate permits from CDFW (SC-806) and NMFS (1045-1) to capture and handle listed salmonids and other aquatic species, and shall, ideally, have experience performing this task in multiple other similar reaches. Biologists shall follow CDFW and NMFS guidelines and notify these agencies at least one week prior to beginning of fish capture activities.

7.3 Exclusionary Screening

Prior to fish removal, installing cofferdams, and dewatering, exclusionary screens shall be securely installed at the downstream and upstream work limits as shown on the Design Plans. Exclusionary netting shall be a fine mesh block net placed across the full wetted channel of the creeks within each individual reach to assist in isolating individual areas for more thorough fish capture by the Biologist.

All fish screens, including exclusionary netting, shall have openings no larger than 3/32 inch in diameter (or diagonally if rectangular) and shall comply with CDFW/NMFS screening criteria for

salmonids. When used to screen intakes on portable pumps, the screen shall be in the form of a basket of sufficient size to comply with CDFW/NMFS criteria for water velocity across the screen face, in order to not entrain fish and cause them to be impinged against the screen.

Exclusionary screening may also be installed where the biologist determines the downstream limit of fresh-water fish capture should be. In this case, the Biologist will determine an appropriate location for the lower limit of freshwater aquatic species, and exclusionary screening will be placed across the channel in this location. Fish capture and relocation downstream of the limit of active freshwater fish capture will be per the recommendation of the Biologist.

The Biologist shall determine exact locations for exclusionary screening and netting in the field sufficient to minimize the length of creek that will require fish relocation and at the same time that adequately relocate fish that could be impacted by the planned work. The fish capture should begin only when the exclusionary screens and nets are in place for each reach.

7.4 Fish Salvage and Relocation

The Contractor shall coordinate with and provide assistance to the Project Proponent and the qualified project fisheries biologist to relocate any fish occupying the pools remaining throughout the project reach prior to start of work. The Contractor shall contact the Engineer or Geologist a minimum of one week prior to dewatering to arrange the specific day for this work to occur.

The Biologist shall walk through the upstream reaches of the project to identify pools, undercut areas, or other locations where native fish are more likely to be found. The Biologist shall also attempt to verify that native fish smolts appear to have emigrated, so only juveniles are expected. During this walkthrough the Biologist shall also direct the appropriate party to remove overhanging and in-stream vegetation that could interfere with fish removal efforts.

At least one “designated driver” will be constantly transporting buckets and/or tubs of fish to the relocation sites while a crew of “fishers” will assist the biologists in collecting fish with dip nets and seines. Fish will be relocated within 30 minutes of capture or less at the discretion of the Biologist. Designated drivers will handle the buckets/tubs in which fish will be transported carefully in order to avoid sloshing and minimize stress and injury to the relocated aquatic species. During transit, the designated driver will travel slowly and smoothly while another crewmember monitors the containers. After confirming that water temperature in the containers is within 2-3 degrees of ambient stream temperature at the relocation site, the buckets and tubs will be lowered slowly into the pools at the relocation sites, and not dumped. If there is a thermal difference of more than 2–3 degrees, stream water will gradually be mixed with the water in the containers over a few minutes time, to allow the fish to acclimate to the ambient stream water temperature before they are released.

The designated drivers shall use direct routes to the relocation sites to minimize the time that aquatic species will spend in transit. Sites shall, if possible, have easy and short access from the work site, expediting the fish relocation process. All relocation sites should be, if possible, either downstream of the project dewatering boundaries and areas of dewatering impact. Fresh water species shall be relocated to suitable freshwater habitat downstream of the project area. The Biologist shall inspect the sites before fish relocation begins. Fish shall not be relocated to any pools that do not also have good in-stream shelter for the fish (e.g., boulders, undercut ledges, rootwads, vegetation, etc.).

Multiple relocation sites shall be used, where feasible, in order to reduce competition for resources with resident fish and the sites shall be spaced far enough apart to facilitate fish dispersal. The buckets/tubs shall be filled with clean, clear water from the stream near where those fish are removed and shall be continuously aerated during fish capture to ensure dissolved oxygen concentration is near saturation. The buckets/tubs shall be large enough and contain small enough numbers of fish to avoid overcrowding. Steelhead shall be placed in insulated buckets (3-gal., covered bait buckets or in larger insulated coolers) and segregated by size classes and from all other species. To minimize stress and injury to the fish, waterlogged leaves or twigs may be added to the containers to provide shelter (and to reduce sloshing during transport). Toxic vegetation and most other live vegetation shall not be placed in the containers.

Wading gear and all equipment brought to the site shall be sterilized prior to entering the water according to CDFW's Aquatic Invasive Species Disinfection/Decontamination Protocols. Formula 409 disinfectant shall not be used. Gear shall be sterilized again at the end of each workday or before it is used in a different body of water.

Water temperatures shall be monitored with thermometers to ensure that water in the buckets/tubs are at or below water temperatures in the creek where the fish were collected. If necessary, sealed bags of ice may be floated in each container. All fish buckets/tubs will be kept in quiet, still, shaded areas and fish will be held in these containers for a minimal amount of time per the discretion of the Biologist.

Capture nets shall be made of non-abrasive, soft, knotless nylon and the mesh shall be small enough (1/8-3/16th-inch) to capture the smallest juveniles or fry encountered. As many as possible of the native fish encountered shall be captured and relocated, although it is not always feasible to capture all of the smallest (<0.5-inch) fry of native species potentially present. The seines, dip nets, crewmembers' hands, and all other materials/equipment used shall be washed with stream water and remain wetted prior to any contact with aquatic species and shall be free of any substances such as hand sanitizer, sunscreen, and insect repellent.

Portable pumps shall be used as needed to lower water surface elevations in isolated pools to increase fish capture efficiency. As water levels are brought down, fish are forced to leave hiding places and move to the center of the channel where they can be captured more easily. Pump intakes shall be screened per NMFS criteria for anadromous salmonids having openings no larger than 3/32 inches in diameter (or diagonally if rectangular). One two-inch portable pump and one three-inch portable pump, or as needed for the project area, shall be on hand to lower water surface elevations in pools during fish relocation. The appropriate size pump shall be selected based on the size of the pool to be dewatered. This water should be pumped downstream of the reach being dewatered as long as it is clean and clear of sediment. Otherwise, it should be pumped and discharged above and beyond the top of bank where it may diffusely infiltrate into the surrounding vegetation and soils.

Captured species shall be identified and counted, except for extremely abundant species, as determined by the Biologist. Non-native species found will be destroyed. All turtles encountered, including Western pond turtles, will be identified, measured and sexed by the Biologist prior to relocation.

If any salmonids are found dead or injured, the Biologist will contact CDFW/NMFS immediately by phone to determine if additional protective measures are to be taken. Mortalities will be retained in a sealed plastic bag with a label indicating the date and location of collection and fork

length. They will be frozen as soon as possible and kept frozen until CDFW/NMFS gives specific instructions.

7.5 Installation of Cofferdams

Cofferdams shall be constructed upstream and downstream of the work area to bypass all flow from upstream of the upstream cofferdam to downstream of the downstream cofferdam. The cofferdams can be constructed of clean river gravel or sandbags. Clean river gravel may be left by grading into natural bed elevation following construction, if the Engineer or Geologist determines substrate size distribution is suitable, whereas sandbags (and sheet plastic) must be removed.

As each reach has been approved by the Biologist for completion of fish relocation, the Biologist shall authorize the crews to install the cofferdams and dewater as necessary. With the approval of the Biologist, once cofferdams and dewatering has occurred for each reach at a time, construction can begin.

The Biologist and team will monitor the project site throughout cofferdam installation and dewatering. The upstream cofferdam for each reach shall be installed first, then the lower cofferdam shall be installed. The Engineer or Geologist shall determine if bypass pumping from upstream of the upper cofferdam around the reach is necessary or if construction and/or sediment removal within each reach can be completed before significant ponding above the upper cofferdam occurs. Dewatering shall begin only after authorized by the Biologist.

The upstream cofferdams for each reach shall be constructed by excavating the top portion of pervious gravels from the creek bed, placing a large sheet of plastic sheeting down into the excavated bed, backfilling across the plastic sheeting in the creek channel with gravel filled sand bags, and then wrapping the gravel bag cofferdam with the plastic sheeting. Downstream cofferdams not located in tidal areas shall also be constructed from gravel filled sandbags, and shall be placed on top of the existing creek channel, and shall have geotextile fabric wrapped over the upstream face of the dam as a preventative measure to help filter any suspended sediment from flowing downstream.

Downstream cofferdams located in tidal areas shall be constructed similar to upstream cofferdams, with plastic sheeting, so as to keep the tidal water out of the reaches during dewatering and construction activities. The downstream cofferdam shall be installed at a very low tide to minimize the amount of tidal water to be pumped out of the project area.

7.6 Water Bypass

Water bypass shall be conducted using a gravity feed or pumped bypass line as recommended by the Design Plans. Bypass pipe diameter shall be sized to accommodate, at a minimum, twice the summer base flow. The Contractor is required to maintain free flowing water bypass at all times during the project including nighttime and weekends. Bypass water shall be discharged to the channel in a location approved by the Engineer or Geologist and may require energy dissipation at the outlet, which shall be installed and maintained at the Contractor's expense.

Existing stream flow and or existing pool water levels upstream of the project work area and downstream of the project work area shall be maintained at or near normal summer low flows during construction. Pumping rates should be monitored to ensure water levels upstream are not being inadvertently lowered by excessive pumping.

7.7 Dewatering

Pumps shall be placed in flat areas, well away from the wetted stream channel. Pumps shall be secured in place (staked or tied back) to prevent movement caused by vibration. Pumps shall be refueled in an area that is well away from the stream channel and be placed on top of fuel absorbent mats. Spill control kits shall be available at the project site at all times and construction personnel trained in the proper spill control procedures. In no case shall turbid, or any contaminated water be discharged directly to any waterway.

Pumped water shall be discharged to a filtration/settling system (i.e., filter fabric, turbidity curtain, or settling basin) downstream of work area to reduce turbidity, or discharged to vegetated upland areas for infiltration, where the water may be absorbed by the ground and not flow back into a stream within the work area. The Contractor is responsible for establishing infiltration or sediment basin locations to be approved by the Engineer or Geologist and the landowner (if on private property). All sediment collected from dewatering the construction area shall be disposed of off-site by the Contractor to an approved location.

7.8 Sediment Removal

Sediment shall be removed, where called for on the Design Plans, when the water surface is at its lowest level, with minimal surface water flows. To reduce turbidity, sediment removal shall occur only after wet project reaches are dewatered.

7.9 Removal of Exclusionary Screen and Cofferdams

All cofferdams, pumps, screens, gravel filled sandbags, and any other materials shall be removed from the stream upon construction completion as soon as possible and in a manner that will allow flow to resume with the least disturbance to the channel substrate. Cofferdams shall be removed carefully and methodically to prevent erosion and increased turbidity of water flow back into the downstream reach. Cofferdams shall be removed such that surface elevations of water impounded above the cofferdam will not be reduced by a rate greater than one inch per hour. This will minimize the risk of beaching and stranding fish as the water surfaces of areas upstream are lowered.

7.10 Reporting

Within 30 days of completion of aquatic species capture and relocation, the Project Proponent or other specified party shall submit a report to CDFW and NMFS including:

- Dates of construction start and finish,
- Date and time of relocation,
- Species encountered,
- Species capture methods,
- Methods used for handling and minimization of stress to aquatic species,
- Methods of equipment cleaning and disinfection,
- Sizes of containers used for transporting and holding species,
- Description(s), map(s), and photo(s) of relocation site(s),
- Numbers by species of all captured fish, and

- All instances of mortality and injury and description of any problems and unforeseen effects.

7.11 Measurement

Not applicable.

7.12 Payment

Payment for designing, implementing, operating, and removing the dewatering system will be made as set forth on the bidding sheet and no separate payment shall be made herein.

The contract lump sum price bid for dewatering shall include full compensation for furnishing all labor (filtering and cleaning), materials, tools, equipment (including baker tanks, if necessary), and incidentals, and for doing all work involved in designing, implementing, operating, and removing the dewatering system as specified herein, required by the permits as directed by the Engineer or Geologist.

8 ROCK STRUCTURES

8.1 General

This scope of work includes materials, purchase, delivery, site preparation, and placement of rock at the elevations and locations shown on the Design Plans and as directed by the Engineer or Geologist. The various mixtures of rocks and backfill required for each structure shall be placed to the dimensions and at the locations shown on the Design Plans or as directed by the Engineer or Geologist.

Rocks shall be placed by equipment suitable for handling material of the sizes required, and no dumping will be allowed. Caltrans Type A placement shall be used for all placement. In general, rocks should be placed in such a way to maximize stability with the largest flat side on the bottom, where possible. Plan view diagrams and cross sections shown on the Design Plans illustrate the rock placement intent, but adjustments may be made in the field as directed by the Engineer or Geologist.

These structures shall be constructed using the dimensions, elevations, and tolerances indicated on the Design Plans. All rock placement shall be reasonably homogeneous with larger rocks uniformly distributed and firmly in contact with one another and smaller rocks filling voids between larger rocks. Rocks shall be placed by equipment suitable for handling material of the sizes required. Hand or manual labor shall be used to place smaller rocks within the voids of the larger rocks to seal all gaps larger than 2–3 inches. No placed rock shall exhibit movement when walked upon. If necessary, iron bars and other methods such as manually manipulating the rock shall be used to ensure a solid mass of interlocking rock is constructed.

8.2 Rock Structure Materials

All of the rocks imported to the site shall be fresh, un-weathered, hard, resistant to water action, and of a suitable quality to ensure permanence in the climate in which they are to be used. They shall be reasonably well graded and shall range in size as shown on the Design Plans. No broken

concrete or asphalt shall be allowed. If possible, neither the width nor the thickness of any rock shall be less than one-third of its length. The general rock specifications for all types and mixes shall be:

Density (apparent specific gravity)	2.5 min per Caltrans
Rock gradation types	Caltrans Standard 1 ton, ½ ton, ¼ ton, Backing No. 1, and Backing No. 2 (see table below for definition of each class)
Durability index	52 min. per Caltrans, California Test 229
Soil material	Backfill rocks with suitable native excavated materials
Color	Rocks shall be of color which blends into the natural conditions of the area and must be approved by the Engineer or Geologist

Prior to commencement of the contract, the Contractor shall locate potential sources of rock, and the chosen quarry should be contacted a minimum of one month prior to the beginning of the project to ensure that sufficient rock is available.

Local sources of rock are preferred. Samples or documentation of rock color and durability shall be submitted to the Engineer or Geologist to determine whether the rock meets the requirements as set forth in these Construction Specifications. If rock is to be used for rock slope protection (RSP), the Contractor shall be responsible for obtaining from the rock supplier a certification that the rock meets Caltrans Durability Specifications for rock riprap.

Rock class gradation table:

RSP Class	D ₅₀ Size ¹ (in.)	D ₅₀ Weight (lb.)
1 Ton	36	2200
1/2 Ton	28	1100
1/4 Ton	23	550
Backing No. 1	12	75
Backing No. 2	8	25

¹ Assumes rock density = 165 lb/ft³

8.3 Rock Slope Protection

Before placing RSP and filler, prepare the subgrade to the required lines and grades shown on the Design Plans. Compact any local fill required in the subgrade to a density approximating that of the surrounding undisturbed material. Overfill any depressions with smaller backing rock or channel cobbles. Remove brush, trees, stumps and other objectionable material.

RSP structures provide bank stabilization at critical locations at stream crossings and shall constructed using the Revetment Mix specified below:

Revetment Mix:

- 20%—Caltrans standard size gradation – RSP 1 ton,
- 60%—Caltrans standard size gradation – RSP ½ ton to ¼ ton, and
- 20%—Caltrans standard size gradation – Backing No. 1 and No. 2

Installation steps are as follows:

- Cut the subgrade sufficiently deep so that the finished grade of the RSP will be at the approximate elevation of the surrounding banks. Channel toe should be excavated sufficiently to allow placement of the rock in a manner such that the finished inside dimensions and grade of the rock meets design specifications for toe depth and thickness as shown on the Design Plans. Allow for smooth transition and bank key-in at upstream and downstream extents.
- Place rock and soil backfill to its full thickness in a sequencing operation proceeding up-slope from the toe in sections no more than 3 to 4 feet in slope length. Place rock so that it forms a dense, well-graded mass of stone with a minimum of voids. All rocks shall have a minimum of three contact points. Before finishing one section and proceeding to the next, voids in the newly placed rock shall be backfilled with soil, watered, and planted with live willow cuttings, where suitable (see below).
- Do not place rock by dumping through chutes or other methods that cause segregation of rock sizes. Use Caltrans Type A placement. Take care not to dislodge the underlying base or filter when placing rock.
- The toe of the rock slope should be keyed into a stable foundation at its base. The toe should be excavated to a depth approximately 1.5 times the design thickness of the RSP and should extend horizontally from the slope, or as shown on the Design Plans.
- The finished slope should be free of clusters of small rocks, except where chinked into voids. Some final hand placing with a cable or wrecking bar may be necessary to achieve the proper distribution of rock sizes to produce a relatively smooth, uniform surface.
- The finished grade of RSP should be apparent and should transition smoothly to adjacent slopes.
- RSP placement shall be reasonably homogeneous with larger rocks uniformly distributed and firmly in contact with one another, with smaller rocks filling voids between larger rocks.
- Rocks shall be placed by equipment suitable for handling material of the sizes required. Armor and toe rocks shall be placed to the grades shown on the Design Plans and cross sections. The intention is for the RSP to be built to at least the grade lines, with the outer surfaces reasonably even and uniform in appearance, and without extreme ranges in tolerance between adjacent rocks. Hand labor shall be utilized as required to improve rock arrangement and produce thickness and surface as specified, and a neat appearance.
- Construct RSP to slope gradient and dimensions shown on the Design Plans to avoid or minimize impingement of toe section into low-flow channel.
- Willow cuttings shall be installed while the rock is being placed. Plantings shall average 4 to 5 feet on center, inserted into soil. Willows should be planted as soon as possible after harvesting. Cut willows should be stored in water prior to planting no longer than 72 hours. Willow cuttings must be harvested from local sources, either on the site or from nearby drainages.
- Backfill joint/voids with soil to near top of crowns of rock after placement of willow cuttings. Cut off willow cuttings to no more than 10 inches above grade. Minimize damage

to willow cuttings by final course local hand placement of soil. If necessary, trim off damaged ends of willow cuttings.

8.4 Boulder and Large Wood Structures

Boulder and large wood structures have a variety of purposes including bank and channel protection, high-flow and debris deflection, and habitat enhancement.

Generally, boulders used in these structures should consist of 1 to 4 ton unless otherwise specified on the Design Plans or directed by the Engineer or Geologist.

Installation steps are as follows:

- The majority of channel and stream bank grading (if shown on the Design Plans) shall be completed before placing boulders.
- Excavate ~1–3 feet into existing grade where Design Plans show boulder placement to provide a solid foundation for the boulders.
- Place boulder such that the largest flattest face is against the excavated surface to provide maximum stability.
- Use excavator bucket to push boulder into the underlying substrate.
- After placing boulder, smooth surrounding grade to ensure a smooth transition between the feature and adjoining channel and banks.
- Consult the Engineer or Geologist during boulder installation to ensure proper placement.
- Place large wood and anchor structure as described in Section 9 *Large Wood Structures* of these Construction Specifications.

8.5 Measurement

Measurement for rock structures will be determined by the weight of boulder imported onto the site by the ton for each respective size. To ensure that the Contractor is utilizing the appropriate tonnage and type of rock for each structure, each truckload of rock arriving on-site shall be accompanied by a certified weight ticket furnished by a licensed weigh master. The Contractor shall supply the Engineer or Geologist daily with a copy of each certified weight ticket for the Engineer's records.

8.6 Payment

Payment for all rock features will be paid for by item, linear foot, or tonnage as described above in and as set forth in the bidding sheet. The price bid per item, linear foot, or tonnage shall include but is not limited to full compensation for furnishing all labor, materials (including rock), tools, equipment and incidentals, and for doing all the work involved in constructing the structure, complete in place, including delivery and all necessary, mixing, placing, sealing/jetting, excavation below finish grade, compaction, and coir packing, and other incidentals as shown on the Design Plans, as specified herein, and as directed by the Engineer or Geologist.

The Contractor is responsible for verifying locations of each feature and no payment will be made for any excavation, compaction, rock placement, or other work resulting from misplacement of features. In addition, a copy of all rock weight slips shall be furnished to the Engineer or

Geologist with a description of the location and type of structure for which the rock was used. No payment will be made until Engineer or Geologist verifies that the appropriate amount and type of rock was utilized for the installation of each enhancement and stabilization feature. No adjustment in the contract unit price for Rock Placement shall be made for increases or decreases of more than the percentage of the quantities as set forth in the schedule of bid prices.

9 LARGE WOOD STRUCTURES

9.1 General

This scope of work includes purchase, delivery, site preparation, and placement of Large Wood Structures including all materials, excavation, fill, compaction, rock placement, and anchoring required to install the features at the elevations and locations shown on the Design Plans and as directed by the Engineer or Geologist. Plan view diagrams and cross sections shown on the Design Plans illustrate the wood placement intent, but adjustments may be made in the field as directed by the Engineer or Geologist.

The general anchoring techniques used for this project will follow procedures listed in the CDFW Restoration Manual with log-to-log and log-to-rock anchoring. Log-to-log connections shall be made with threaded rebar. Log-to-rock anchoring shall use 7/8-inch diameter threaded rebar, cast eye nuts, and 1/2-inch screw pin anchor shackles with alloy pin & body. This will provide clean and durable connections and eliminates the need for cable which is more likely to rust and break down over time. Additional anchoring techniques including gravel ballast and pile skin friction will be utilized in the engineered log jam.

9.1.1 Structure types

This work item involves furnishing and installing Large Wood Structures as shown on the Design Plans. Large Wood Structure locations, though shown on the Design Plans, may be adjusted in the field by the Engineer or Geologist.

9.1.2 Source of large wood

The contractor shall be responsible for sourcing of the large wood.

9.1.3 Logs and rootwads

Rootwads shall include the root mass/ root ball of a tree and a portion of the trunk. Care should be taken to preserve as much of the root material as possible in transport, as it provides critical fish habitat and debris retention capability. Contractor should refer to the Design Plans for length of trunk required at specific locations. Rootwads should generally have a basal diameter of 18 inches unless otherwise approved by the Engineer or Geologist. The Contractor shall be responsible for sourcing the logs and rootwads, but they should be, in general, Douglas fir or coastal redwood in good condition with no rot, visible cracks, large knots, mold, or decayed wood. Other species may be used if approved by the Engineer or Geologist. The Contractor must submit proposed log source and samples prior to installation.

9.1.4 Anchoring materials

- Logs shall be in good condition with no rot and must be Douglas fir, coastal redwood, or other species to be approved by the Engineer or Geologist. The Contractor must submit proposed log source and samples prior to installation.
- Logs shall be of sufficient quality to provide structural integrity to the Large Wood Structures. No visible cracks, large knots, moldy, or decayed wood shall be accepted.
- Log lengths and diameters shall be determined from the Design Plans.
- All bolts shall conform to ASTM A307, and all reinforcing steel shall conform to ASTM A615.
- 7/8-inch diameter threaded reinforcing steel shall be DYWIDAG Systems #7 Grade 75 Threadbar or equivalent.
- 1-inch threaded reinforcing steel shall by Dywidag Systems #8 Grade 75 Threadbar or equivalent.
- Nuts shall by DYWIDAG Systems #7 Grade 75 Cast Anchor Nut 1.75-inch length or equivalent.
- Eye nuts shall be DYWIDAG Systems #7 Grade 75 Cast Eye Nut or equivalent.
- Anchor shackles shall be ½-inch screw pin with alloy pin and body (WLL= 31/3 tons min- Peerless Industrial Group shackles- Part # 8058503 or equivalent).
- Square washers shall be 3-inch X 3-inch X 3/8-inch thick Grade 50 Steel plate washers with 1 ½-inch drilled hole.
- Epoxy shall be Hilti HIT-RE 500 Epoxy System or equivalent.

9.1.5 Placement

Below is a general procedure for installation of large wood structures although this can be modified based on site conditions or as directed by the Engineer or Geologist.

- After rough grading to the finish grades and lines shown on the Design Plans excavate trench into bank for placement of the Large Wood Structure where specified. The trench should be of sufficient width and depth to accommodate a log and anchor boulders as shown on the Design Plans.
- Where wood to wood connections are made, logs shall be pinned together with threaded rebar and 3 inch by 3inch square washers recessed into the logs as shown on the Design Plans.
- If anchored to a boulder, position boulder and log anchoring points as close together as possible and use methodologies shown on the Design Plans and as described in the epoxy manufacturers specifications.
- Large wood should be anchored to sufficient boulders to ensure stability of the structures per Wood Stability Analyses.
- Boulder-to-boulder anchoring may be required to meet required boulder weight.
- Anchoring redundancy should be conducted as directed by the Engineer or Geologist.
- Place willow cuttings in and around Large Wood Structures.
- Place specified size and number of rocks around Large Wood Structures as shown on Design Plans for anchorage so that Wood Structures will not be dislodged by high flow.

- Backfill and compact trenches with native substrate, as applicable.

9.2 Measurement

Measurement and payment for installation of Large Wood Structures will be made per each piece of wood.

9.3 Payment

The price bid per each unit of Large Wood Structures shall include full compensation for furnishing logs, preparation of anchoring system as shown on the Design Plans, furnishing and placing specified number of rocks and sizes, excavation, placement of willow stakes, furnishing all labor (including drilling rock anchors), materials (including rock, anchor bolts, fasteners, adhesives, etc.), tools, equipment, and incidentals, and for doing all work involved in installing Large Wood Structure as specified herein, as shown on the Design Plans and as directed by the Engineer or Geologist.

The Contractor is responsible for verifying locations of each feature and no payment will be made for any excavation, compaction, or work resulting from misplacement of features.

10 WILLOW BAFFLES

10.1 General

This item consists of furnishing and installing Willow Baffles in locations shown on the Design Plans. An excavation shall be made along the stream bank or floodplain to place the Willow Baffles. The Baffles are constructed with a combination of imported branchy willow material and appropriate brushy material obtained during on-site clearing and grubbing.

10.2 Description of Work

This scope of work includes purchase, delivery, site preparation, and installation of Willow Baffles including all excavation, placement, and compaction required to install Willow Baffles at the elevations and locations shown on the Design Plans and as directed by the Engineer or Geologist.

10.3 Materials

The Contractor shall locate a live willow source area preferably within 10 miles of the project site, a minimum 7 days prior to construction. Appropriate brushy material can be obtained during on-site clearing and grubbing. Live willow cuttings and brush shall be 2 to 4 inches in basal diameter at the cut end. All willow and brush shall be left as bushy and branchy as possible. Willow branch lengths shall be as follows: 12-foot to 16-foot length; 3-inch spacing, alternate willow and brush.

10.4 Installation

- Excavate toe trench to the groundwater level.
- Willow branches shall be collected (harvested) and soaked in water a minimum of 6 hours prior to placement, but no earlier than 2 days before placement.
- The Contractor must give a minimum of 48 hours notice to the Engineer or Geologist prior to construction of Willow Baffles. The Engineer or Geologist will inspect conditions of willow branches and ensure they are not desiccated. Failure to properly store willow branches and cause desiccation or to install properly may require the reconstruction of these features at no additional cost to the Project Proponent.
- When placing willow cuttings in the excavated toe trench, they should be placed immediately after initial excavation so that they are in maximum contact with the underlying substrate. The butt end of the willow cuttings must be in firm contact with the bottom of the toe trench.
- Willow cuttings shall have a minimum of 3 feet of contact with the underlying native material.
- Following placement of willow cuttings, the brushy material should be placed in the trench.
- The trench should be backfilled with moist native substrate or gravelly sand mixture to cover all willow cuttings within the trench.
- Following placement of moist substrate, baffles shall be filled with rock as shown on the Design Plans.
- Willow Baffles shall be watered until the first significant rainfall of the season to ensure survival.

10.5 Measurement

Willow Baffles will be measured by the linear foot, complete in place.

10.6 Payment

Payment for installing Willow Baffles will be made as per linear foot of baffle installed, as set forth on the bidding sheet.

The price bid per linear foot of Willow Baffle shall include full compensation for, excavation, placement, backfill, and furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in installing Willow Baffles as specified herein, as shown on the Design Plans, and as directed by the Engineer or Geologist.

11 LIVE WILLOW STAKES

11.1 General

This section applies to the furnishing and planting of Live Willow Stakes during construction of habitat enhancement and bank and channel stabilization features as directed by the Engineer or Geologist. Live Willow Stakes must have sufficient sunlight and moisture to survive.

11.2 Materials

The Contractor shall source the live willow stakes on-site. If an appropriate source is not available on-site, the Engineer or Geologist shall provide a secondary local source, ideally within 10 miles of the project site. Live Willow Stakes shall be 1 to 3 inches in basal diameter by \pm 4 feet long.

11.3 Installation

- Live Willow Stakes shall be collected (harvested) and soaked in water a minimum of 12 hours prior to placement, but no earlier than 7 days before placement. Live Willow Stakes can be stored for up to seven (7) days in large watertight bins (trash cans) filled with water and placed in the shade to prevent significant drying of ends.
- The Contractor must give a minimum of 48 hours notice to the Engineer or Geologist prior to construction of any features that require Live Willow Stakes. The Engineer or Geologist will inspect conditions of willow stakes and ensure they are not desiccated. If the Engineer or Geologist approves Live Willow Stake conditions, the Engineer or Geologist will direct the Contractor on installation procedures. Failure to properly store willow stakes and cause desiccation or failure to install properly may require the reconstruction of these features at no additional cost to the Project Proponent.
- When staking Large Wood Structures, Live Willow Stakes shall be placed immediately after trenches are excavated so that they are in maximum contact with the underlying substrate. Small rocks and soil can then be placed in and around the stakes such that they are generally vertical and shall be trimmed as necessary to have no more than 24 inches extending above the rock or grade line.
- Willow stakes shall have a minimum of 24 inches of contact with the underlying native material.
- Live Willow Stakes shall be planted during the placement of all features. **WILLOW STAKES SHALL NOT BE PLANTED AFTER FEATURES ARE INSTALLED.**
- Minimize damage to cuttings by laying final course or rock by hand placement. If necessary, trim off damaged ends of cuttings and remove and replace damaged stakes at discretion of the Engineer or Geologist at no additional cost to the Project Proponent.
- Willow shall be watered until the first significant rainfall of the season to ensure survival.

11.4 Measurement

Live Willow Stakes shall be measured by each stake installed and visible from the surface, complete in place and watered as necessary during construction. Payment for excessively damaged stakes (determined by the Engineer or Geologist) that are removed and replaced will not be paid for.

11.5 Payment

Payment for furnishing and planting Live Willow Stakes will be made per each live willow stake, as set forth on the bidding sheet. The unit price bid for Live Willow Stakes shall include full compensation for harvesting, transporting, furnishing, and installing Live Willow Stakes including all storage, preparation, labor, materials, tools, equipment, and incidentals and for doing

all work involved in planting Live Willow Stakes as shown on the Design Plans, as specified herein, or as directed by the Engineer or Geologist.

12 ROAD-STREAM CROSSINGS

The project consists of removing crossings 1, 2, and 3 and restoring these sites to natural stream channels as shown in the Design Plans and described in the Basis of Design Report. Crossing 1 will be rebuilt at a new location utilizing a 16-foot wide by 40-foot long prefabricated bridge (i.e., Kernan bridge, or equivalent). Crossing 4 will be rebuilt in the same location with a 23-foot–10-inch wide by 45-foot long by 10-foot–1-inch rise aluminum box culvert (i.e., Contech Engineered Solutions culvert No. 74R1, or equivalent). Crossings 1 and 4 shall be constructed following the details shown in the Design Plans, described in the Basis of Design Report, and under specific adherence to the manufacturer’s specifications and installation procedures.

13 BEAVER DAM ANALOGUES (BDAs)

13.1 General

This item consists of furnishing and installing Beaver Dam Analogues (BDAs) in locations shown on the Design Plans. BDAs shall be installed in the stream channel using a combination of machinal and manual methods. The BDAs are constructed with a combination of imported and locally sourced materials.

13.2 Materials

BDAs are constructed using wooden posts, woven willow branches, other brushy material, straw, cobble/gravel aggregate, turf, and mud. Wooden posts shall be untreated, 3–6 inches in diameter, and of sufficient length to meet the design crest elevations specified in the Design Plans while retaining at least half of the finished post length (2-foot minimum) driven into the channel bed. A variety of post types are suitable for BDA construction and the Contractor shall select a post type at the approval of the Engineer or Geologist. The Contractor shall locate a willow source area preferably within 10 miles of the project site, a minimum 7 days prior to construction. Appropriate brushy material can be obtained during on-site clearing and grubbing. Cobble/gravel aggregate, sod, and mud can also be sourced onsite during earthworks activities.

13.3 Installation

This scope of work includes purchase, delivery, site preparation, and installation of BDAs including all clearing, driving, placement, and compaction required to install BDAs at the elevations and locations shown on the Design Plans and as directed by the Engineer or Geologist.

- Clear the BDA alignment and identify general post installation locations. Minor alignment alterations are permitted at the approval of the Engineer or Geologist.
- The BDAs shall be well keyed into the channel banks. Excavate toe trench into both stream banks to facilitate placement of willow weave and other backfill material below the finished stream bank grade.

- Wood post tips shall be sharpened using a chainsaw or other equivalent method. Posts shall be driven to an adequate depth, as specified in the Design Plans, using either a manual or tractor-mounted hydraulic post driver, or other equivalent method. At least half of the finished post length, and 2 feet minimum, must be driven into the stream bed.
- Post shall be driven with 18-inch to 30-inch spacing.
- The finished post length shall retain 6 to 9 inches of freeboard above the design crest elevation, as specified in the Design Plans. The design crest elevation is the top of the willow weave, not the top of the posts.
- Willow branches and other suitable brushy material shall be woven into the posts. Additional straw, aggregate (cobble and gravel), turf, and mud shall be backfilled and compacted on the upstream side of the BDAs, as shown in the Design Plans.
- The bank trenches shall be backfilled with moist native substrate and compacted around willow weave.

13.4 Measurement

BDAs will be measured by the linear foot, complete in place.

13.5 Payment

Payment for installing BDAs will be made as per linear foot of installed structure, as set forth on the bidding sheet.

The price bid per linear foot of BDA shall include full compensation for, excavation, placement, backfill, and furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in installing BDAs as specified herein, as shown on the Design Plans, and as directed by the Engineer or Geologist.

14 PLANTING AND REVEGETATION

14.1 General

The Contractor shall furnish all labor, materials, tools, equipment, and incidentals to complete all planting shown on the Design Plans and related work for revegetating any areas disturbed by construction activities and those areas shown on the Design Plans. Planting and revegetation shall be performed by a C-27 licensed landscaping contractor.

Prior to excavation for planting or placing, the Contractor will locate all cables, conduits, and utility lines so that proper precautions may be taken not to damage such facilities. In the event of a conflict between such lines and plant locations, the Contractor will promptly notify the Engineer or Geologist, who will arrange for relocation of one or the other. Failure to follow this procedure places upon the Contractor the responsibility to repair damages, at their own expense, which result from work hereunder.

The Contractor shall plant the following species, numbers, and sizes of native plants as indicated by the location zones on the Design Plans or as directed by the Engineer or Geologist. Plant materials shall be those that have been propagated from local sources only.

Native grass seed shall be planted at the site primarily in areas disturbed by equipment access.

The Contractor shall have plants delivered to the site no sooner than 2 days prior to planned installation. Prior to planting, the Contractor shall flag the location of all plantings for approval by the Engineer or Geologist. Plants shall be planted in holes that are a minimum of 1.5 times the diameter of the pot size and have a minimum 6 inches of backfilled soil underneath the potted plant.

Backfill for the holes shall be a sandy loam soil fill consisting of 50% approved native material, and 50% compost mixed together. The prepared soil shall be mixed in an adjacent area to the planting work and shall be accurately proportioned using a suitable measuring container such as a wheelbarrow of measured capacity. A minimum 2-inch thickness of mulch shall be placed around all plants to cover any loosened soil. If straw mulch is used, it shall be certified weed free. Plants shall be watered thoroughly on the same day they are planted.

Plants shall be well grown, free from insect pests and disease, and shall be grown in nurseries which have been inspected by the State Department of Agriculture and have complied with the regulations thereof. All plants shall comply with Federal and State laws requiring inspection for plant diseases and infestations. Only Phytophthora-free native plant nurseries shall be used.

Plants shall be of symmetrical growth typical for the species and variety. Plants shall be well-rooted, and roots shall show no evidence of having been restricted or deformed at any time. Root condition of plants in containers will be determined by removal of earth from the roots of not less than two plants nor more than two percent (2%) of the total number of plants of each species or variety. When container-grown plants are from several sources, the roots of not less than two plants of each species or variety from each source will be inspected by the Engineer or Geologist. In case the sample plants inspected are found to be defective, the Project Proponent or Engineer or Geologist reserves the right to reject the entire lot or lots of plants represented by the defective samples. Any plants rendered unsuitable for planting because of this inspection will be considered samples and will not be paid for.

All seed shall be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. In addition, the container shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained. Seed shall be purchased from Pacific Coast Seed (<http://www.pcseed.com>) or approved equivalent.

Inspection certifications required by law shall accompany each shipment of plants, and certificates shall be delivered to the Engineer or Geologist. The Contractor shall obtain clearance from the County Agricultural Commissioner, as required by law, before installing plants delivered from outside the County. Evidence that such clearance has been obtained shall be presented to the Engineer or Geologist.

Plant names listed shall conform to the U.S. Department of Agriculture, Natural Resources Conservation Plants Database <http://plants.usda.gov/java/>. Common planting species and corresponding scientific names are shown on the Design Plans.

14.2 Installation

- Planting shall occur at the end of the project and the Engineer or Geologist shall approve the general location of tree plantings before installation.
- The species, size, and location of trees to be planted as part of this project have been defined on the Design Plans. The Engineer or Geologist shall approve final location of tree plantings before installation.
- Each plant shall be handled and packed in the approved manner for that species or variety and all necessary precautions shall be taken to ensure that the plants will arrive at the work site in proper condition for successful growth. Trucks used for transporting plants shall be equipped with covers to protect plants from windburn.
- No plants shall be transported to the planting area that are not thoroughly wet throughout the ball of earth surrounding the roots. Any plants that, in the opinion of the Engineer or Geologist, are dry or in a wilted condition when delivered to the planting area will not be accepted and shall be replaced by the Contractor at their expense.
- Any plants delivered to the site which are found to be not true to name, or unsuitable in growth or condition, shall be removed from the site immediately and replaced with acceptable plants. Plants shall not be pruned prior to delivery unless authorized by the Engineer or Geologist. Trees shall not be topped before delivery. The Contractor shall maintain each plant in a healthy growing condition from the time it is delivered until planting has been accepted.
- Planting operations shall be conducted in such a manner that no damage will result to adjacent site improvements and existing plantings. The Contractor shall be responsible for any damage resulting from their operations and shall repair or replace such damage at their expense.
- No planting shall be done in soil that is too wet or too dry or otherwise in a condition not generally accepted as satisfactory for planting from a horticultural standpoint.
- Vehicles of any kind will not be allowed to pass over curbs, planted areas, etc., unless proper protection is provided.
- Plants shall be removed from the containers in such a manner that the balls of earth surrounding the roots are not broken. Plants will be planted and watered as specified immediately after removal from the containers. Containers shall not be cut prior to delivery of the plants to the planting area.
- Pruning after planting shall be limited to the minimum necessary for the removal of injured twigs and branches. On any branches larger than one-half inch in diameter, the cuts shall be coated with tree wound compound.
- The Contractor shall maintain all container grown plants from the initial planting through acceptance of the planting phase. This includes but is not limited to regular watering and weeding, promptly replacing sick, dead, or lost plants, and controlling pests and infestations. The purpose of the Maintenance Period is to ensure that the plants are healthy and well-established prior to the acceptance of the plantings.
- Each plant shall be planted in the center of the pit. No soil in muddy condition shall be used for backfilling. No filling will be permitted around trunks or stems. All broken or frayed roots shall be properly cut off. Pits shall be backfilled with compacted prepared backfill to the bottom of the root ball. The top of the root ball after planting shall be 1 inch higher than the grade of the existing ground. The rest of the plant pit shall be filled with prepared backfill and compacted by tamping and watering.

- All pits for trees shall be dug with vertical sides and level bottoms. Scarify sides to remove the glaze if drilling is used to prepare pits. Foot-tamp backfill material below root ball to prevent settling of plant.
- After planting operations have been completed, the Contractor shall remove all trash, excess soil, empty plant containers, and other debris from the work site. All scars, ruts or other marks in the project area caused by the revegetation work, shall be repaired and the work site left in a neat orderly condition.

14.3 Native Grass Seed

The native erosion control grass seed shall be spread by hand broadcasting methods over all disturbed, exposed soil in rock slope protection and on graded surfaces, with the exception of the creek bed. Incorporate the seed uniformly at the specified rates per acre. Provide seed of the latest crop, labeled in accordance with the California Food Agricultural Code with the ingredients per acre as described on the Design Plans.

14.4 Tree Stakes

- Double stake all trees higher than 3 feet.
- Double stakes shall be at right angles to the prevailing wind, except where otherwise indicated.
- Set stakes plumb.
- Use only 2-inch diameter stakes set outside rootball and driven 12 inches into undisturbed soil.
- Stakes must not protrude through root ball.

14.5 Inspections

The Contractor or their authorized representative shall be on the site at each inspection.

The Engineer or Geologist will conduct inspections at the following times:

- The first planting inspection will be when shrubs and trees are spotted for planting, but before planting holes are excavated. Final positioning of all trees is subject to approval of the Engineer or Geologist. The Contractor shall notify the Engineer or Geologist at least 3 days prior to the delivery date for plant materials. The number of plants delivered to the job site on any day will be no more than can be planted and watered on that day. Inspection of materials shall include quality, nomenclature, health, habit of growth, and root condition as specified herein.
- The second inspection will take place within 24 hours after the trees have been planted and the pits have been backfilled.
- The acceptance of planting inspection will be held when all specified work, except the Maintenance Period, has been completed.
- The final inspection will be at the completion of the 90-day Maintenance Period. The purpose of this inspection will be to inspect and to review the quality of maintenance, the health of the plants, and to determine which plants, if any, are to be replaced. Before final acceptance by the Engineer or Geologist, all plant basins shall be clean and free of debris

and weeds, plant materials shall be living, healthy and free of infestations and all damaged or lost plants replaced.

14.6 Measurement

Measurement for Planting and Revegetation will be per each unit, complete in place as specified on the Design Plans.

15 IRRIGATION

15.1 General

This element of work consists of furnishing and installation of the Irrigation System as shown on the Design Plans.

Watering shall occur for minimum duration necessary to keep new plantings healthy. Be careful not to oversaturate stream bank.

The Contractor shall maintain and protect any above and below grade utilities indicated to remain.

The Contractor shall use materials as specified in Design Plans or get written approval by the Engineer or Geologist for substitutions. All materials to be incorporated in this system shall be new, without flaws or defect, and of quality and performance as specified. All material overages at the completion of the installation are the property of the Contractor and are to be removed from site.

All required irrigation systems shall be maintained in working condition as approved. Any equipment or material needing replacement is to be replaced immediately with equipment or material of the same type and performance standards as the originally approved irrigation system. On-grade piping shall not be allowed where subject to adjacent pedestrian traffic or vandalism. All components shall be of non-corrosive materials.

Just before placement, each pipe section shall be inspected to ensure that all foreign material is removed from inside the pipe. The pipe ends shall be free of foreign material when assembled. In turn, all systems shall be capable of flushing out accumulated particulate matter. System designs shall provide a means for servicing such flushing requirements with a minimum of erosion or disruption to the surrounding landscape.

Install plastic pipe in accordance with manufacturer's installation instructions. Lay pipes to lines and grades indicated on drawings. Lift or roll pipe into position. Do not drop or drag pipe over prepared bedding. Shore pipe to required position; retain in place until after compaction of adjacent fills. Ensure pipe remains in correct position and to required slope.

Pipe shall be delivered and handled with adequate support such that it is not subjected to undue stresses or damage. Pipe shall be inspected carefully upon arrival for any damage or defects. When handling and placing plastic pipe, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting (by metal edges and/or surface or rocks). The manufacturer's special handling requirements shall be strictly observed. Special care shall be taken to avoid

impact when the pipe must be handled at a temperature of 40 degrees Fahrenheit or less. Pipe shall be stored on a relatively flat surface so that the barrels are evenly supported. Unless the pipe is specifically manufactured to withstand exposure to ultraviolet radiation, it shall be covered with an opaque material when stored outdoors for 15 days or longer. HDPE pipe shall have a smooth interior, conforming to AASHTO M294. Both inside and outside diameter of piping shall correspond precisely with the size of fittings used in order to avoid leaks, blow-outs, or stripped threads on fittings. The Contractor shall be responsible for any problems caused by incorrectly matched fittings.

15.2 Point of Connection

Point of Connection (POC) shall be located per project Design Plans. The Contractor may adjust location based on landowner input and location of existing water supply. Additional plumbing may be necessary to supply water to the POC and shall be supplied by the Contractor within the lump sum irrigation project cost.

15.3 Valves

Gate Valve shall be Nibco T-113 Class 125 bronze valves or equivalent with a 200 psi cold working pressure per specifications located at:
<http://www.nibco.com/Valves/Gate-Valves/Bronze-Gate-Valves-%E2%80%93-Irrigation/T-113-K-Gate-Valve-Bronze-Class-125-Irrigation/>

Gate Valve Boxes shall be Carson 10-inch Grade 910 or equivalent and composed of HDPE per specifications located at:
<http://www.oldcastleprecast.com/plants/Enclosures/products/irrigation/Pages/specgrageplastics.aspx>

15.4 Sprinklers

Sprinklers shall be Rainbird Full or Part-Circle Impact Sprinkler or equivalent per specifications located at:
<https://rainbird.com/homeowner/products/impacts/index.htm>

15.5 Mainline

Mainline shall be 1-inch Schedule 40 PVC. Use Schedule 40 PVC for 1-inch to 2-inch quick coupling line. Sleeves shall be Class 315 PVC.

15.6 Trenching

Large stones or other hard matter shall be removed which could damage piping or impede consistent backfilling or compaction. Onsite material used for compacted earth bedding shall be free of rocks greater than 1 inch in diameter and earth clods greater than 2 inches in diameter. Excavate pipe trench to 6 inches below pipe invert, and place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 8 inches compacted depth. During installation, the pipe shall be firmly and uniformly bedded throughout its entire length, to the

depth and in the manner as shown on the Design Plans. Blocking or mounding beneath the pipe to bring the pipe to final grade is not permitted. The bedding shall be compacted to ample bearing strength and of uniform density when filled with water to support the pipe without noticeable differential settlement. Trench backfill shall be native material, compacted to 90% minimum, relative compaction (maintain moisture content of bedding material to attain required compaction density). The pipe shall be loaded sufficiently during the compaction of bedding under the haunches and around the sides of the pipe to prevent displacement from its final approved placement. When sand, gravel, or crushed rock bedding is specified, the pipe shall be firmly and uniformly placed on the bedding material.

Minimum depth of cover over all pipe shall be 18 inches unless otherwise specified. Initial backfill to 6 inches above the top of the conduit is required. Initial backfill material shall consist of soil material that is free of rocks, stones, or hard clods more than 1 inch in diameter. Initial backfill shall be placed in two stages. In the first stage (haunching), backfill is placed to the pipe spring line (center of pipe). In the second stage, it is placed to 6 inches above the top of the pipe. The first stage material shall be worked carefully under the haunches of the pipe to provide continuous support throughout the entire pipe length. The haunching backfill material shall be placed in layers that have a maximum thickness of 6 inches and compacted.

During compaction operations, care shall be taken to ensure that the tamping or vibratory equipment does not come in contact with the pipe and the pipe is not deformed or displaced. Final backfill shall consist of placing the remaining material required to complete the backfill from the top of the initial backfill to the ground surface, including mounding at the top of the trench. Final coarse backfill material within 18 inches of the top of the pipe shall be free of debris or rocks larger than 3 inches nominal diameter and shall be the specified sand, gravel, or crushed rock. Final backfill shall be placed in approximately uniform, compacted layers. Protect pipe and bedding from damage or displacement until backfilling operation is in progress. Vehicles or construction equipment shall not be allowed to cross the pipe until a minimum of 18 inches of earth cover and required density has been obtained.

15.7 Measurement

The Irrigation System shall be measured Lump Sum, as shown on the Design Plans or as specified by the Engineer or Geologist.

15.8 Payment

Payment for Irrigation System shall be paid by the Lump Sum for Irrigation as set forth on the bidding sheet. 100% of the payment shall be following complete construction of the Irrigation System. The Lump Sum Bid shall include full compensation for furnishing and installing Erosion Control Fabric, including all labor, materials, tools, equipment, and incidentals as shown on the Design Plans, as specified herein, and as directed by the Engineer or Geologist.

16 PLANT ESTABLISHMENT AND MAINTENANCE PERIOD

16.1 General

The work required under this section includes but is not limited to all labor, tools, materials, equipment, and incidentals required to conduct the Establishment and Maintenance Period at the

project site as shown on the Design Plans, contained in these Construction Specifications, and as directed by the Engineer or Geologist.

It is recommended that post-construction monitoring and/or maintenance is conducted in relation to four specific areas.

16.2 Implementation Effectiveness Monitoring

Following project completion, as-built Design Plans shall be created so that the actual constructed project can be compared to the proposed project. In addition, restoration effectiveness monitoring should be conducted using protocols described in the CDFW California Salmonid Stream Habitat Restoration Manual or other equivalent approach. The purpose of these activities is to ensure that specific habitat enhancement goals were met as described in the Design Plans.

16.3 Large Wood Structures Monitoring and Maintenance

Following storm events with 1.5-year recurrence or greater flow discharges, it is recommended that field monitoring be conducted to ensure that the bank stabilization and habitat enhancement features are functioning as designed. Field photos and observations should document any evidence of the following conditions:

- Scour beyond expected pool formation that could undermine the structure or cause extensive bank erosion.
- Significant shifting of a structure.
- Failure or potential failure of anchoring hardware.
- Extensive racking of new large wood on a structure.

Based on monitoring results, maintenance activities may be recommended such as removing excess racked wood or installing new anchoring hardware. Note that racking of new wood is generally considered to be a positive project outcome, and this wood should only be modified or removed if the Engineer or Geologist determines that the racked wood may lead to instability of an enhancement feature or excessive scour.

16.4 Riparian Plant Maintenance

It is recommended that a “3- to 5-year plant maintenance and replacement” clause is included in the contract with the landscape contractor who is hired to perform the project revegetation, as described in the Design Plan and in these Specifications. Three to five years of plant survival maintenance and monitoring is likely to be required as a part of project permitting. As soon as all planting is completed, a planting review and preliminary inspection and punch list for the plantings will be held by the Engineer or Geologist upon request of the Contractor.

- Upon written approval of the work by the Engineer or Geologist, the Plant Establishment and Maintenance Period shall begin. The first day of that period shall be specified in the Engineer’s report, but not before all planting and irrigation punch list items are complete.
- It shall be the responsibility of the Contractor to notify the project inspector that maintenance crews will be on site to perform work during the Maintenance Period. The contractor shall notify the project inspector by either providing 24 hours notice in writing, or, provide a schedule for the entire Maintenance Period in writing, to be approved by the

Engineer or Geologist. Upon notification, crews must meet the project inspector each day they are on site to verify their presence. Payment will not be made for those scheduled days if crews are on site without notification and verification by the project inspector, or if crews are not on site on scheduled days.

- The Contractor must have prior experience in maintaining native herbs, grasses, and shrubs in north coastal California. The Contractor must have successfully completed at least two other projects involving native plants. The Contractor must use maintenance techniques and practices appropriate for native wetland plants, and will plan for the appropriate level of effort to provide the required maintenance as described in this Section in a timely manner. The Contractor must be able to distinguish between native and non-native plants.
- The Contractor shall ensure that container plant survival and weeding performance standards are met through plant maintenance activities during the Maintenance Period. These activities shall include, but are not limited to, watering, replanting of diseased or dead plants, litter control, weed control, fertilizing, rolling, cultivating, repair of irrigation systems, erosion control and control of diseases and pests and the general care and nurturing of installed container plants and emergent seedlings.
- Provided that the Contractor has met all other previous requirements related to site preparation, earthwork, seeding and planting, and plant maintenance, the Engineer or Geologist has the discretion, at any time during the Maintenance Period, to reduce the performance standards, or otherwise modify them to lower levels, if there are environmental or biological factors beyond the control of the Contractor that could not be reasonably foreseen by the Contractor and that would clearly prevent the Contractor from achieving the stated performance standards. Failure to achieve performance standards shall require replanting by the Contractor, as approved by the Engineer or Geologist.
- In the event of a flood, severe drought, or windstorm, as determined by the Engineer or Geologist, the Contractor shall not be required to provide replacement plantings without a contract change order.
- During each inspection, the Contractor shall record general observations of plant survival and weed cover. The results of these observations shall be used to identify problems as they begin, so that corrective maintenance actions can be taken before a larger problem develops. The Engineer or Geologist will also conduct periodic independent assessments of plant survival.
- The performance standards for the Maintenance Period related to plant survival shall be formally measured by the Contractor at the end of the Contract Period:
 - At that time, 95% of all installed container plants present at the beginning of the Maintenance Period must be present, live, healthy, undamaged, and free from infestations.
 - Planting areas shall be free of all broadleaf and grass weeds.
 - Plantings that do not conform to these specifications shall be replaced and brought to a satisfactory condition before final acceptance of the work.

If these performance standards have not been met, the Engineer or Geologist shall specify the amount of replanting to be conducted by the Contractor at the end of the Maintenance Period necessary to achieve the performance standards. In the event that the plantings are not acceptable at the end of the Maintenance Period, liquidated damages may be assessed.

The performance standard for weed control throughout the Maintenance Period is that plant cover by noxious invasive weeds at the project site shall not exceed 5% of the total vegetative cover at

any time. The cover of native and non-native plants will be measured on a periodic basis during the Maintenance Period by the Engineer or Geologist to determine if the performance standard has been achieved. Failure to meet the standard shall require the Contractor to increase weeding efforts.

16.5 Submittals

- **MONTHLY INSPECTION REPORT.** The Contractor shall submit a monthly inspection report to the Engineer or Geologist during the Maintenance Period. The report shall indicate the status of installed plants, condition of temporary irrigation system, and recommendations for future actions, as necessary.
- **HERBICIDE TREATMENT PLAN.** Contractor shall provide a description of the herbicide to be used at the project site for the plant maintenance including dilution and application rates; manufacturer's name; application equipment and methods; measures to protect park users, including signs, barriers, notifications, etc; measures to avoid spraying protected plants; measures to avoid discharge into creek water; evidence that the applicator is licensed to apply the herbicide; statement that the herbicide is approved by state and federal agencies for work in the type of environment at the project site.

16.6 Replacement Plants

For the sake of bidding, the Contractor shall assume 25% replacement plants (for purposes of labor estimate) to be installed at the end of the Maintenance Period.

Immediately replace any plant materials that die or are damaged. Replacements shall be made to the specifications as required for original plantings.

16.7 Pesticide and Herbicide

Pesticides and herbicides shall be approved by the Engineer or Geologist prior to use.

16.8 Water

Water for irrigation during the Maintenance Period shall be provided by the landowner from adjacent points of connection. The landowner shall supply water to the project irrigation system at no cost to the Contractor. The Contractor shall have full authority to use water as needed to meet these Construction Specifications.

16.9 Watering

- The Contractor shall be responsible for watering the installed plants with irrigation system as necessary to maintain the plants in a healthy and vigorous condition throughout the duration of the Maintenance Period and before final acceptance.
- The frequency and duration of watering operations shall depend on current weather patterns and site-specific soil moisture conditions. The Contractor shall be responsible for receiving approval from the Engineer or Geologist on the watering schedule and application rates.

- Watering shall provide an adequate supply of moisture within the root zone of each plant during the normal growth period of the plant. The moisture content in all planted areas shall be sufficient to insure healthy plants and vigorous growth. This shall be accomplished by means of visual observation of plant material and the surrounding surface soil conditions within any given area.
- Observed deficiencies or excesses in watering program will be corrected immediately by the adjustment of controllers, as required. Controllers shall be programmed to water deeply without runoff by use of short repeat cycles. Irrigation shall be controlled and individual heads adjusted to prevent overspray and runoff onto paved areas.
- The Contractor shall be responsible for conducting site investigations as necessary throughout the Maintenance Period to evaluate the condition of plants, the need for irrigation, and the application of water. These investigations will include inspection of all plants for signs of inappropriate watering, including water stress (caused by lack of water or overwatering), stunted growth, wilting, premature leaf loss, and premature yellowing of leaves. If most of the plant material appears to be stressed and in danger of perishing, the Contractor shall consult the Engineer or Geologist to determine the frequency and duration of additional or decreased watering. The Engineer or Geologist shall provide approval to the Contractor of any modifications to the approved watering schedule.
- At no time shall water be applied in a way that will cause erosion, damage to plants, runoff, or damage to existing or naturally colonizing vegetation. If the watering application rates need adjustment, the Contractor shall be responsible for immediately contacting the Engineer or Geologist. The Contractor will assume full responsibility for corrective actions resulting from inappropriate water applications and failure to contact the Engineer or Geologist for direction.

16.10 Replacement Planting

Replacement planting shall occur during the Maintenance Period unless otherwise directed by the Engineer or Geologist. The Contractor shall provide all replacement plants. The Contractor shall provide the Engineer or Geologist with 30 days advance written notice when requesting replacement plant materials.

- Installation methods for replacement plants shall be in strict conformance to the Design Plans, these Construction Specifications, and the Engineer's or Geologist's direction. Plants shall be installed as described in these Construction Specifications.
- After each replacement, the Contractor shall submit to the Engineer or Geologist a marked planting plan and written documentation recording the time, species, and location of all replacements.
- The Landowner shall assume responsibility of maintaining the replacement plants once the Engineer or Geologist accepts the plantings as conforming to these Construction Specifications.
- The Contractor may recommend a different native plant for replacement planting if the Contractor believes original plant species is not performing well at site; subject to discretion of the Engineer or Geologist.

16.11 Weed Control

- The Contractor is responsible for maintaining all individual plants and all areas in between, as shown on the record drawings, free of weeds during the duration of the Maintenance Period in accordance with these Construction Specifications.
- Throughout the Maintenance Period, weeds shall be removed before reaching 4 inches in height or forming flowering all times of the Maintenance Period.
- Weed removal at the trunks of individual plants, or within 10 inches, shall be done by hand pulling or mechanical methods. Weed removal shall cause minimal disruption to the root systems of the installed plants, adjacent trees, and seed germinated plants.
- Herbicide shall be used for weed control in selected areas upon approval by the Engineer or Geologist. When herbicides are to be used for weed control, the Contractor shall notify the Engineer or Geologist 5 days in advance, the type of herbicide and any additives to be used, and the rate of herbicide application.
- The Contractor shall be responsible for spot applications of herbicide to invasive weed species as directed by the Engineer or Geologist at the project site.
- Hand crews shall spray individual plants using backpack units with a narrow spray to minimize drift and accidental spraying of nearby native species. Herbicide shall be applied so that it will not drift, or show signs of drift, outside the designated re-vegetation planting area. At all times, existing and installed plants must be protected from herbicide drift. The applicator shall avoid spraying during windy conditions; if windy conditions persist, the applicator shall use a large droplet size and low tank pressure and shall use a movable impermeable barrier while spraying to protect against drift. The Contractor shall exercise great caution in applying the herbicide to the targeted plants only. Non targeted plants shall not be sprayed, nor shall not receive drift from nearby spraying.
- The Contractor shall be responsible for replacing plants that are killed due to herbicide drift or mistaken application at their sole cost, including plant material and installation labor.
- Dead weed material shall remain in place, except for large weeds, as indicated in the field by the Engineer or Geologist.
- The Contractor must adhere to best management practices and application procedures when applying herbicides.

16.12 Pruning

- Pruning shall be done only at the direction of the Engineer or Geologist.
- Pruning shall be done by thinning and shaping to achieve a natural appearance. Excessive pruning or stubbing back will not be permitted.
- Pruning cuts shall be allowed to heal naturally and not painted over with wound dressing or asphaltic emulsion.
- All pruning cuts shall be made flush to the bark curl and shall be cleanly cut with no tearing of the bark.
- All cuttings shall be removed from the site or used in BDA construction.
- Do not remove lower branches from low-branching or multi-trunk trees, unless directed to do so by the Engineer or Geologist.

16.13 Cleanup

Throughout the Maintenance Period, the Contractor shall keep the work site, areas adjacent to the work site, and access roads in a neat and orderly condition and free and clear from debris and discarded materials.

16.14 Record Drawings

- The Contractor shall keep up-to-date as-built record drawings during the Maintenance Period. These drawings shall be updated, as needed, and submitted to the Engineer or Geologist at the end of the contract period.
- The record drawings shall include information on the location and size of the planting indicated by species. A legend listing all materials shall be included on the record drawings.

16.15 Guarantee

- Plants installed under the contract shall be guaranteed for the length of the Maintenance Period against mortality resulting from defects in maintenance.
- Plant materials, including seeded areas and transplanted plants, that are dead, missing, or found to be unhealthy because of poor maintenance practices and that are therefore not in conformance with the Design Plans and Construction Specifications; shall be replaced according to the Engineer or Geologist at the Contractor's expense, by the Contractor within 15 days of written notification by the Project Proponent. All replacements shall be in strict conformance to the Design Plans and Construction Specifications.

16.16 Inspections and Final Acceptance

- The Engineer or Geologist will conduct periodic site inspections during the Maintenance Period.
- At the end of the Maintenance Period, at the Contractor's request, the Engineer or Geologist shall inspect the project site to evaluate the acceptability of the maintenance practices.
- Areas determined as unacceptable, due to lack of performance in accordance with the Construction Specifications, shall be reworked and replanted at the Contractor's expense, as necessary, according to the Construction Specifications. The Contractor shall be responsible for any resulting extension of the Maintenance Period and will do so at no additional cost.
- At the time of the final acceptance observation by the Engineer or Geologist, the Contractor shall have maintained the project in its entirety according to the performance standards, the Design Plans, these Construction Specifications, and the Engineer's or Geologist's direction. If, after inspection, the Engineer or Geologist is satisfied with the maintenance practices and all plant survival and weed cover goals have been met, the Contractor shall be notified in writing of final project acceptance. If, after inspection, the Engineer or Geologist is dissatisfied with the maintenance to date and its conformance to the Design Plans and Construction Specifications, the Engineer or Geologist will prepare a written punch list of necessary corrective actions on defective work for that stage. The corrections must be completed by the Contractor within 10 days of the initial observation.

16.17 Measurement and Payment

The lump sum contract price paid for the Plant Establishment and Maintenance Period on the bidding sheet shall include full compensation for furnishing all labor, plants, materials, tools, equipment, and incidentals and for doing all the work covered in this section, complete in place as shown on the Design Plans, as required by these Construction Specifications, and as directed by the Engineer or Geologist.

17 BIOLOGICAL MONITORING

17.1 General

Biological monitoring will be conducted in the project area and along access routes by the qualified Biologist as per the permit requirements. Sensitive species with potential habitat within the project area will be assumed present to avoid impacts to those species. The qualified Biologist will do pre-implementation reconnaissance surveys, including monitoring and surveying access routes and staging areas, and will advise or inform necessary agencies per the permit requirements.

The project is intended to improve habitat for various species with special status protections including, but not limited to, salmonids, northern red legged frogs, foothill yellow-legged frogs, and western pond turtle. These species are present, or could be present, in the project area currently. Visual surveys for special status species in the project area will be completed prior to construction. We will assume presence of northern red legged frog and will monitor for that species during construction. We plan that additional work will be needed under this task to comply with required avoidance measures.

All aspects of construction, including staging and implementation, will comply with all permit requirements such as worker training, exclusionary fencing, revegetation, and species avoidance. If necessary, biological monitors will be on-site during all construction activities to ensure compliance with all permits.

18 INVASIVE SPECIES

18.1 General

Implementation of this project will be conducted to avoid the spread of aquatic invasive species (AIS), most notably New Zealand mudsnail, quagga mussels, and zebra mussels. Protocols will be used consistent with CDFW (2016) to decontaminate all gear (e.g., waders, boots, etc.) and equipment (e.g., survey rods, excavators, block nets, etc.) prior to entering the project reach to ensure protection from AIS.

Himalayan blackberry (*Rubus armeniacus*) and reed canary grass (*Phalaris arundinacea*) grow in the project area and can re-establish from very small stem and root fragments. Measures should be taken during implementation to avoid spreading these species and introducing them to other areas in the project vicinity.

Appendix G

Technical Advisory Committee (TAC) Meeting Notes

**LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT
DESIGN PROJECT
1ST TAC MEETING - CONCEPTUAL DESIGNS
DRAFT MEETING MINUTES
APRIL 9TH, 2019**

GOAL: Review and discuss draft Basis of Design Report and 30% design plans

INTRODUCTIONS

Dylan Caldwell, Stillwater Sciences
Joel Monschke, Stillwater Sciences
Bob Pagliuco, NMFS
Beatrijs deWaard, CDFW

Mark Smelser, CDFW
Dan Free, NMFS
Marisa Parish, SRA
Linda Crockett, Del Norte RC

Presentation

Smith River Alliance provided a brief summary of the past fisheries monitoring and general habitat conditions and limitations in Stotenburg Creek. Stillwater Sciences provided a summary of the site assessments conducted along the project reach and findings from these surveys. Assessments included geology, geomorphology, hydrology, hydraulics, and conceptual engineering feasibility. These assessments and findings are thoroughly discussed in the draft Basis of Design report. Stillwater staff explained how these assessments have led to the recommendations and alternatives identified in the Conceptual Alternative Designs and Feasibility Analysis.

The conceptual designs recommend removing crossings #1, #2, and #3 and building a new crossing approximately 100 feet upstream from the current location of crossing #1. Crossing #1 is currently within the bankfull channel of the Smith River and crossing #2 is in a natural low-lying area of the channel. The proposed new crossing is identified as either a precast concrete box culvert or prefabricated bridge located at a naturally narrower and higher channel cross section outside of the Smith River bankfull channel. The new crossing would meet all of the landowner needs that crossings #1, #2 and #3 currently provide, including: 1) access to the river bar, 2) cattle passage to the pasture, and 3) equipment access to the pasture. By providing all three access requirements, two culverts and one ford are proposed to be replaced with a single crossing. Crossing #4 will likely be replaced with a precast concrete box culvert, although a prefabricated bridge is also being evaluated.

Other design elements include modifications at the creek mouth and along the channel to enhance habitat, increase surface connection in the spring during downstream migration, and increase riparian condition and protection with fencing and planting. Proposed habitat enhancements along the creek include constructing a sequence of BDA's and excavating inset floodplain benches in a confined reach. Proposed modifications at the mouth consists of 2 alternatives, one of which includes more extensive large wood structures and willow baffling to protect the designed modifications to Stotenburg Creek.

Discussion and Site Visit

The group had some discussion at the RCD office and proceeded to the site to see the project area and proposed design elements. The group started at the downstream end of the project and

worked upstream. Due to a recent storm, the Smith River flows were elevated, and the confluence and lower project area were inundated, precluding an evaluation. Below is a summary of the comments from discussion and questions during the site visit.

- The TAC requested that a figure showing the Smith River backwatering at a 20% exceedance flow (i.e., typical winter baseflow) be added to the design figures.
- Add more details about the vulnerability of the backwater at the confluence of Stotenburg and the Smith River to the report.
- The proposed location for the new crossing (new #1) would be in the 100-year floodplain of the Smith River and will need to get a variance to permit from NMFS. – Bob will follow up with Margaret about this.
- Are there any underground utilities in the project area? – SRA will work to determine this for the 65% designs.
- The older water pipes around crossing #1 and infrastructure (crossing/tide gate) under Fred Haight need to be added to design maps and learned more about.
- Mark asked about specific attributes and design elements of the Beaver Dam Analogs, including upstream sediment deposition, fish passage, and keying-in the margins.
- Bob recommends using perimeter fencing around the few areas of riparian planting to protect from beavers rather than single cages for each plant.
- Factor of safety - Based on the vehicle use of crossing #4 (trucking company), would a single lane bridge work or is a double lane bridge required?
- Another access point would be needed for traffic during construction of crossing #4. -SRA will work with landowners to discuss this need.
- Bob recommended that the Coastal Commission permits should be started sooner than later. The programmatic permit that includes coastal consistency determination may be an option.

Next Steps

SRA and Stillwater will work to address the comments and questions provided by the TAC and incorporate these into the 65% designs. The group is set to review 65% designs in June 2019 though the date is TBD.

Below are Bob's comments provided as a summary follow up from the meeting

1. We like that you found a way to reduce the crossings from 4 to 2 and we like the new location of the lower crossing and agree that a bridge would be best here.
2. We like Alternative 2 and think that the baffles and LWD structures will help the longevity of the entrance. We also realize that restoration investments in this lower confluence area might not persist after large Smith River flooding events and we believe that the benefits of this project outweigh the risks associated with natural geomorphic processes. We expect the Smith River to flood and the channel to scour and we believe that the willow baffles and wood structures proposed will help maintain this area for as long as geomorphically possible.
3. We recommend that you fence the riparian planting polygons from beaver until the plants are established.
4. We recommend that you fence the restored area with a minimum 35 ft from top of bank and try for a wider riparian if possible. The lack of cattle access will allow for more

- natural riparian and geomorphic processes to persist and a dense riparian forest is necessary to suppress the reed canary grass within the project reach.
5. We like the concept, locations and associated low velocity rearing habitat associated with the BDAs. We recommend keying those features into the bank quite a distance to avoid flanking and use techniques described in the Beaver Restoration Guidebook. We also recommend checking out the BDAs on McGarvey Creek or the Scott River to understand how they have been functioning over time.
 6. We will defer to the engineers regarding if a bridge or a box culvert will be chosen for this site. We do not recommend it being wide enough to fit 2 passing big rig trucks.
 7. Things to note: Start a conversation regarding the Coastal Zone permitting, check with PacifiCorp and other utility companies regarding underground or adjacent utilities within the project footprint, check for existing water lines and what pipes can be abandoned during the project, ensure that the elevations of crossing 4 will be beneficial for the Upper Stotenburg project that was funded in 2018.

Below are Marks's comments provided as follow up from the meeting

1. Details regarding the geomorphology and hydraulics of the confluence between Stotenburg Creek and the Smith River are limited and we have not had a chance to reconnoiter the area. It is suggested that a more detailed geomorphic/topographic map of this area be prepared and that a more explanation be provided regarding the anthropogenic modifications of this area, along with how it is expected to function and evolve through time. Additionally, once that information is provided, it would be good to then reconnoiter the site during the low flow time of year.
2. There are several anthropogenic constraints that should be formally identified, documented, and fully characterized. These include: areas of rip-rap slope protection; above ground utility lines; old tide gates; abandoned and active water(?) lines; and the electricity power station. In particular, we need to know if there are any underground utility lines that follow along the road alignment. As we know, the discovery of such utilities can quickly derail an implementation project.
3. It appears that the upstream crossing (#4) replacement effort will require closing this road for a period of time, and such closure is assumed to represent an adverse impact to both a residence and commercial business. It is therefore imperative that the design team plan for, or utilize an alternative access road and include this element as a formal part of any design.

**LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT
DESIGN PROJECT
2ND TAC MEETING - 65% DESIGNS
DRAFT MEETING MINUTES
JUNE 13TH, 2019**

GOAL: Review and discuss draft 65% design plans

ATTENDEES

Dylan Caldwell, Stillwater Sciences
Joel Monschke, Stillwater Sciences (On Phone)
Beatrijs deWaard, CDFW
Mark Smelser, CDFW
Justin Garwood, CDFW
Marisa Parish, SRA

Notes

The group worked through the presentation prepared by Stillwater Sciences, which outlined the additions and edits incorporated into the designs since the 1st TAC meeting (April 9th, 2019).

Selection of a Preferred Alternative to advance to 65% designs

Based on feedback from the first meeting, Alternative 2 was selected as the preferred alternative. This alternative included all the same elements in Alternative 1 as well as the following additions: (1) five 1 & 2 log structures in the most downstream reach; (2) engineered log jam and willow baffles in clearing near Crossing 1; (3) slightly deepened opening to left bank alcove near inlet of Crossing 1; (4) prefabricated bridge for new Crossing 1 (rather than box culvert); (5) a sequence of 5 BDAs upstream of Crossing 3; (6) a box culvert for Crossing 4; (7) riparian plantings protected with perimeter wildlife fencing; and, (8) mechanical and hand removal of Himalayan blackberry.

Riparian Vegetation Assessment

Since the April meeting, a botanical field assessment was conducted in the project area. The 65 % design BOD report includes the findings and recommendations from this survey. Based on the survey, the botanist assembled the recommended project plan species list. Additionally, the botanist recommended that mechanical and hand removal of Himalayan blackberry be included in the design tasks.

The group discussed this task regarding how blackberry removal would impact stream temperature. The group believes that given the extensive native (predominantly willow) vegetation composition of the channel, blackberry removal would have a minimal impact on water temperatures. Additionally, based on temperature monitoring in 2017, water temps did not exceed 20 °C at Cedar Lodge Lane until mid-June, approximately 2 weeks prior to loss of all surface flow. Water temperature never reached 20 °C near the mouth (while surface flow was present). Therefore, blackberry removal is not anticipated to raise water temperature above the tolerance of coho salmon.

The blackberry removal areas were identified in the field assessment and they will be delineated in the 90% designs. The 90% designs will also include plant specific mapping plans. The planting plan includes conifers, to help add shade and for future wood recruitment material, and other shrub species to create a multi-story riparian area.

Reed canary grass is also present in the area, although not pervasively. Strawberry Creek has had extensive restoration efforts to shade/out compete RCG, and Beatrijs offered to share some literature from that site which may help guide planting techniques and management needs.

Hydraulic Modeling

A 2-D model was developed for the project area and the adjacent Smith River main channel. The model included spatially variable surface roughness (Manning's n) based on vegetation and sediment conditions. The model was ran at 1.5-, 10-, and 50-year flows. Multiple calibration points were used, including:

- the USGS gage stage record at the upstream boundary of the model,
- multiple low and moderate flow surveyed water surface elevations at the Stotenburg Creek - Smith River confluence,
- the continuous water surface elevations from the LiDAR dataset, and
- the continuous water's edge from the aerial photograph showing summer low flow conditions.

The 65% designs were updated to show where the Smith River backwaters Stotenburg Creek based on the model results and field observations from the 2018/2019 winter. Based on the modeled flow vectors from the 50-year event, the angle of the engineered log jam (ELJ) was slightly adjusted to better serve the purpose of a deflection structure.

Main take-away of restoration structures: The upgraded Crossings 1 and 4 would have reduced velocities at all flows, though backwatering from the Smith River mutes the flow reduction at higher flows. The BDAs have the most benefit at low flows as they would only increase surface water area up to the 1.5-year event; higher flows would inundate the BDAs.

The group discussed site hydrology and the best methods for determining relevant flows (i.e., flow exceedances and recurrence interval peak-flow estimates) to model and design for. The designs use flows calculated from a combination of USGS Streamstats and flow transference from the Little River and Bull Creek USGS gage records. These gage records were selected because: 1) they have long periods of record (i.e., greater than 50 years), 2) they have relatively comparable drainage areas to Stotenburg Creek, 3) their proximity to the project area, and 4) they have similar topography, climate, and underlying geology to Stotenburg Creek. There are other north coast creeks with more comparable drainage area to Stotenburg Creek, however, their periods of record are short (less than ~12 years), which can present issues with statistical uncertainty in analysis results. Regardless, additional gage records will be evaluated in the 90% submittal. Mark and Dylan plan to discuss this further on July 15th.

The group discussed possible concerns of fish stranding between Crossing 2 & 3, as the BDA habitat may encourage longer residency. The group recommends evaluating the timing of stream drying in relation to typical out-migration timing. While stranding is natural, the project should not exacerbate possible stranding and disconnected flow. The group agrees the objectives of the project include increased duration of surface flow on the descending limb of the hydrograph and the various project elements should reduce stranding compared to current conditions.

BDA design was discussed regarding a single-post versus a double-post with a willow mattress on the downstream end of each structure. This was further discussed with Bob, Dylan, and Marisa on June 18th. See Bob's comments included below.

Additional questions that arose during the meeting with answers:

- Does the 2D model have uniform mesh cell size?
 - No, although the majority of the terrain is a uniform 10'x10' mesh. Areas proximal to the Stotenburg Creek alignment, which were surveyed in the field, have a finer cell size down to approximately 3'x3'.
- Are eddies accounted for in 2 D hydraulic model? How would velocities changer/occur around eddies, particularly at lower flows and at sediment transport flows? Does not need to be included in 90% designs but are something to keep in mind.
 - Eddies are simulated by the 2-D model. Eddies are more prevalent at lower flows (e.g., < than 50-year event) and along velocity and roughness transitions near the Stotenburg Creek alignment where the mesh cell size is smaller. Eddies are less common in the 50-year model run due to deep high-velocity flow moving downstream. As plans are advanced to 90% additional consideration will be given to how eddies may interact with the enhancement features.

Feasibility and Risk Assessments

A wood stability analysis was conducted for the ELJ and other 1- and 2-log structures. The main concern is scour around the structures and how this would impact stability. The ELJ is designed to have wood protruding 8-10 ft above gravel and a 20-year life span based on typical wood decay. By this time, the process-based goals of capturing fine sediment and debris from the Smith River to prevent/minimize deposition in the Stotenburg Creek channel should be established. Although not likely, an extreme flood event (> 50-year flow) could result in disassembling the structures. However, given the lack of instream infrastructure downriver, there is limited liability concerns for the structures disarticulating.

The ELJ is designed to be installed with pile driving. This practice is not covered in the FRGP manual and would therefore not be covered under the FRGP programmatic CEQA review. The Mattole conducted similar work and could be a good reference to learn about permitting. While excavating deeper during construction may be easier to permit, it is likely infeasible considering site constraints (e.g., depth to groundwater, necessary side slopes of pit, etc.) and would not be cost-effective.

A bridge design was advanced to 65% as an excavator can do the install, compared to needing a crane for the box culvert. Although the new Crossing #1 location is outside of the scour zone from the 1964 flood, it is possible a future historic flood could scour this area. In this scenario, re-installing a prefabricated bridge would be more feasible and cost-effective than a box culvert. Lastly, fewer trees will need to be removed to construct the bridge compared to a box culvert. The impact to % canopy cover is unquantified at this time.

The group discussed the connection between the mainstem Smith River and downstream end of the backwater alcove that was constructed in 2003. The group agreed that minor hand-excavation at this location should be added to the 90% designs to increase project success and potentially increase summer rearing habitat for juvenile salmonids.

65% Design Cost Estimate

The cost estimate was briefly reviewed. A few items will be added for the 90% designs. These include (1) new fencing on the southern end of the project area (near Crossing #4) where access will be used to transport materials to the new location of Crossing #1; (2) a new gate and fence rebuild at Crossing #1; (3) arborist crew for tree thinning and removal; (4) riparian irrigation water supply; and, (5) minor excavation at the connection point of the 2003 backwater and the Smith River.

Next Steps – 90% and 100% Designs and Additional Questions and Discussion

- 90% designs will be shared in early August.
- Mark asked for the design team to evaluate the potential of an arch culvert at crossing 4 (Cedar Lodge Lane)
- Include additional design specs at Crossing #1.
- Include additional design specs for Crossing #4 (e.g., fill slope angles, bench and key dimensions, etc.)
- Call on July 15th with Mark to discuss hydrologic gage comparison and other assessment decisions.

Bob's comments from June 22nd email:

1. The overall design looks good and it appears that you have incorporated my comments from the 30% design into this version. The configuration of the LWD structure, the willow baffles and the reconfiguration of the Stotenburg mouth are consistent with what we talked about during the last meeting.
2. BDAs - I saw in the presentation that the project team was considering a double row of posts combined with a downstream willow mattress across the face of the BDAs based on ideas taken from the 2019 "Low Tech Process Based Restoration Guidebook" to minimize scour potential and piping in the structure. I have some concerns with this approach based on the monitoring data that I have observed at the Sugar Creek BDAs on the Scott River. At Sugar Creek, a multi-pathway PIT tag study was designed to assess juvenile coho and *O. Mykiss* migration pathways through a series of BDAs. The juvenile salmonids had a choice of either swimming around the BDAs up a steep, roughened riffle, or jumping over them over a 16" weir flow. There was a slight preference for swimming around rather than jumping over for both species, but 49% of the coho jumped over at least one of the BDAs and the majority that jumped, jumped over the 16" high BDA. I believe the key to the fish passing this structure was the plunge pool located below the BDA, and your current concept of the BDA with the willow mattress on the downstream face would likely eliminate the plunge pool below and could reduce fish passage at these sites.

Some BDAs in McGarvey Creek have been undermined via piping and scour and I understand your concerns for this happening in the Smith, but I do not share those concerns for a few reasons. The BDAs in McGarvey Creek experienced a 15- to 2-year flow event in April and has significantly more stream power than Stotenburg Creek. Stotenburg Creek has a 2 year flow estimate of 109 cfs and has a much gentler grade than McGarvey Creek, therefore adding double rows of posts and a downstream mattress might not be necessary.

Your current design shows the BDA jump heights at 6". With 6" height differentials between structures, the amount of deep, slow water habitat is significantly reduced compared to a series of structures that have a 9" or 12" differential between structures. Since the Sugar Creek study I mentioned above shows juvenile coho (the target species for Stotenburg) can jump 16 inches over BDAs, I recommend designing BDAs

with a minimum of 9 inches between structures to increase the depth and quality of the backwatered habitat. You might want to consider designing the lowermost BDA with a 6" jump in case that BDA scours and creates a greater jump for salmonids as the structure evolves over time.

Because beavers are already within the project reach, they might colonize and maintain these structures, but I recommend adding a maintenance and repair element in the permitting process so that you have the ability to make changes as these structures evolve. I think the redundancy of BDA structures is a key element to their resiliency and I think 5 BDAs within this reach will meet that goal.

July 25, 2019

Hello All,

I am writing to follow up on our July 15th conference call and plan for the 90% design review. We plan to share the 90% designs with you on August 2nd. Dylan will send these out as I will be in the field that day. We would like to schedule a conference call for the following week to allow for your input from the designs. Here is a link for a doodle poll to hopefully find a time that works for us all on either August 8th or 9th. <https://doodle.com/poll/ydvx37t5n9bspcze>
Below is a summary of the topics covered on the July 15th call and some information that has been updated over the past 10 days.

1. Gage comparison: Since the 65% design meeting Dylan evaluated additional local gages including Little Lost Man, Harris Creek, Lopez Creek, and Jacoby Creek. These watersheds are smaller than Bull Creek and Little River. The additional gages have watershed similar in size to Stotenburg but have a shorter period of record than Bull Creek or Little River. Adding these gages to the hydraulic modeling resulted in slightly lower stream flows for the various T-year flows (i.e., 1.5 – 100 year flows). These findings provide further confidence that our designs will successfully accommodate the various design flows. This analysis will be included in the 90% designs.
2. BDA design: Based on Bob's recommendation we are advancing the single post design for the BDA (rather than double post with willow mattress on downstream side). The posts will be extended far into the bank to minimize flanking. As beavers occur in the project area, monitoring and photo points after implementation will document how beavers add to the structures and improve on our designs. Per Bob's recommendation and recent research on fish passage around beaver dams and BDAs, we are increasing the height of the upper 4 BDAs to a 0.75 foot jump (rather than 0.5'). The downstream most BDA will continue to have a 0.5' jump as this structure has the highest likelihood for scour without the backwatering effect of a downstream structure. These modifications will be included in the 90% designs.
3. Aluminum box culvert: At the 65% design meeting Mark requested the design team to evaluate an aluminum box culvert for crossing #4 (Cedar Lodge Lane). Since the July 15th meeting Stillwater has completed the assessment of this design

**LOWER STOTENBURG CREEK COHO HABITAT ENHANCEMENT
DESIGN PROJECT
3RD TAC MEETING - 90% DESIGNS
DRAFT MEETING MINUTES
AUGUST 8TH, 2019**

GOAL: Review and discuss draft 90% design plans

ATTENDEES

Dylan Caldwell, Stillwater Sciences
Joel Monschke, Stillwater Sciences
Beatrijs deWaard, CDFW

Mark Smelser, CDFW
Justin Garwood, CDFW
Dan Free, NMFS
Marisa Parish, SRA

Notes

Based on comments received from the TAC during the 65% review and further design progress new elements were included in the 90% designs. These elements include: 1) additional USGS stream gage analysis, (2) refining BDA designs, (3) evaluating the feasibility of an aluminum box culvert at crossing #4, (4) refined vegetation mapping information, and (5) updated cost estimate that incorporates any adjustments. Between the 65% and 90% designs a conference call was held on July 15th. See those notes for additional details on topics 1-3.

1. Little Lost Man Creek, Harris Creek, Lopez Creek, and Jacoby Creek USGS gage data were included in the hydrologic analysis. These additions resulted in a slightly lower stream flows for the various T-year flows (i.e., 1.5- to 100-year flows). These findings provide further confidence that our designs will successfully accommodate the various design flows.
2. The jump height of BDAs #2-5 were increased from 0.5 ft to 0.75 ft; the downstream most BDA (#1) remains a 0.5 ft jump height. This has a negligible effect on water surface elevation above the 1.5 year bankfull flow but reaches the goal discussed during the July 15th conversation of increasing the area of surface water and available habitat at winter base flows. Feedback from Bob Pagliuco and recent literature provides support that this increased jump height will not limit fish passage and upstream access. However, a variance will be needed for permitting.

ACTION: Literature and additional dialog documenting the decision to increase BDA height needs to be included in the final BOD report.

3. After an evaluation and comparison of aluminum and concrete box culverts (for crossing #4) it was determined that an aluminum box is more cost effective and can be built to meet the hydraulic capacity and structural safety needed at the site. The 90% designs have the specifications for this structure and the Kernan bridge that will be built at the new location for crossing #1. The abutment design for the Kernan bridge has been updated to include a stabilization mat consisting of a multi-layered bed of well-graded crushed aggregate and two layers of geogrid, one at the base of the crushed rock, and one at mid-height. Both crossings will be built within the 100-yr floodplain of the Smith River and will need a variance for permitting.

ACTION: Add modeled water surface elevations for flood flows through crossings #1 and #4, as well as the low flow channel through crossing #4.

4. The vegetation mapping was not discussed during the call though the 90% designs now identify polygon locations of where mechanical removal of blackberry is needed. The designs also include planting locations and species types.
5. The updated cost estimates were presented and discussed. An identified edit was noted for line 8 of the budget which will be corrected in the final designs. With the new crossing #4 design the project cost estimate has been reduced by ~\$26,448 since the 65% designs.

ACTION: Update line 8 of budget.

Other Comments

Overall the progression of the project has gone smoothly and the TAC has worked well to develop a good project. The TAC is identified in the BOD report.

ACTION: Add notes from meetings as an appendix to BOD report.