

Introduction:

The Conservation Fund will treat 35 prioritized future road related sediment delivery features along 1.4 miles of abandoned logging road by implementing permanent road decommissioning treatments and 2.6 miles of maintained road by implementing storm-proofing upgrading treatments consistent with the California Salmonid Stream Habitat Restoration Manual, Volume 2, Chapters 9 and 10 (CDFW, 1998; Weaver et al., 2006) and the "Handbook for Forest, Ranch, and Rural Roads (Weaver et al., 2015). All roads and sediment delivery features to be treated are legacy infrastructure constructed for timber harvest and management.

The Permittee shall not proceed with on the ground implementation until all necessary permits, consultations, and/or Notice to Proceed are secured. All habitat improvement(s) will follow techniques in the *California Salmonid Stream Habitat Restoration Manual* (Volume 1, Chapters 9 – 10) and the "Handbook for Forest, Ranch, and Rural Roads (Weaver et al., 2015).

Objective(s):

Project Overview: The Project Site includes the Bear Flat, Bear Flat Spur 1, Lower Lookout, Lower Lookout Spur 1, and Gerry Roads that are located in the Buckeye Creek sub watershed of the South Fork Gualala River watershed and were identified in a 2017 and 2018 sediment source inventory of 43.5 miles of primarily mid and inner gorge slopes by PWA as priority road segments with potential to deliver more than 102 tons/year of coarse and fine sediment to mainstem Buckeye Creek, a Class I tributary to the Gualala River (Maps 2, 3).

This project includes permanent decommissioning of 1.4 miles of Gerry, Lower Lookout, and Lower Lookout Spur 1 Roads within the mainstem Buckeye Creek riparian corridor, including 15 stream crossing and 1 pending landslide feature. The project also includes upgrading of 2.6 miles of Bear Flat, Bear Flat Spur 1, Lower Lookout and Gerry Roads within the mainstem Buckeye Creek riparian corridor, including 17 stream crossings, 1 bank erosion fill failure, and 1 pending landslide feature. Project roads are currently unmaintained and not accessible to vehicle traffic. In total, this project will stormproof 35 features along 5 roads identified by PWA as having a high likelihood of eroding and delivering large quantities of road related sediment to mainstem Buckeye Creek and proximal tributary streams (Tables 1-3).

PWA estimates that approximately 2,550 cubic yards of road related sediment (2,300 cubic yards of episodic erosion and 250 cubic yards chronic road surface erosion) will be prevented from delivery to Buckeye Creek and its tributaries by implementation of this project (Table 2).

Project Purpose:

The purpose of the project is to accelerate fisheries recovery by permanently decommissioning currently eroding legacy timber road alignments (Gerry, Lower Lookout, and Lower Lookout Spur 1 Road segments) through riparian zones by storm-proofing 15 stream crossings and 1 pending landslide feature, and upgrading unmaintained legacy timber road alignment (Bear Flat, Bear Flat Spur 1, Lower Lookout and Gerry Roads segments) through riparian zones by storm-proofing 17 stream crossings, 1 bank erosion fill failure, and 1 pending landslide feature. Implementation of this project will result in the prevention of approximately 2,550 yd³ of future sediment delivery (Tables 1, 2, and 3), while treating approximately 14.5 acres of upslope area and 4 miles of road.

Necessity for Project:

Excessive sediment input from legacy timber practices and infrastructure have adversely affected the channel geomorphology and aquatic habitat conditions within the mainstem river and tributaries in the Buckeye Creek watershed. The Buckeye Creek watershed is considered a high priority watershed as an “Initial Focus Core Area” for restoration (NMFS, 2012 and CDFW, 2002). Suitable water temperatures in a number of tributaries contribute to this ranking along with the importance the sub-basin provides to the Gualala River watershed as a whole. Steelhead are present in the watershed and historically coho salmon were known to spawn in the system. The project area and Buckeye Creek is a 99+% wildland watershed with few inhabitants and human beneficial users of water resources. Successful restoration and meaningful improvements in aquatic habitat conditions is more likely in these wildland watershed areas that lack daily human activities and cumulative effects.

In 2001 CDFW surveyed the entirety of the Buckeye Creek main stem and determined the habitat to be deficient in canopy cover, pool frequency/depth, and shelter cover. In general, more recent Gualala River Watershed Council surveys illustrate stream reaches that are in recovery from channel simplification due to excess sediment loads and the lack of in-stream structure (Variation Index, GRWC 2013). However, pool frequency and depth, canopy cover in the main-stems and large wood are lacking in most stream reaches (GRWC, 2013).

The Buckeye Creek Super Planning Watershed has 251 miles of private roads. Road density is 6.2 mi/mi² within the basin. Key limiting factors and basin recommendations are similar for much of the Gualala River watershed. Lack of large wood abundance, excess in-stream sediment and deficient in-channel canopy density in the main-stems are key factors limiting salmonid habitat (Klamt et al., 2002). Since the agency assessments were performed at the turn of the century, PWA has observed riparian conditions that have improved substantially due to natural revegetation in this wildland riparian and watershed areas.

A major element needed for long term restoration of salmonid habitat and increased productivity is the reduction of accelerated sediment input from upland road related erosion sources. The abandoned inner gorge and mid-slope roads proposed for implementation are in a poor condition reflecting the lack of regular maintenance by the previous landowners. Excessive sediment is known to impact salmonid spawning, egg, alevin, fry survival, and salmonid feeding behavior. The implementation of erosion control and erosion prevention work is one of the most important and cost-effective steps to protecting and restoring watersheds and their anadromous fisheries (especially where accelerated sediment input is a recognized limiting factor to fisheries production, as is the case for the Gualala River). Sediment restoration and normalization efforts to reflect natural background sediment production rates has an immediate benefit to the streams and aquatic habitat of the basin. It helps ensure that the biological productivity of the watershed's streams is not impacted by future human caused erosion, and that future storm runoff can cleanse the streams of accumulated coarse and fine sediment, rather than depositing additional sediment from managed areas. Reducing sediment inputs will increase salmonid survival and improve the aquatic ecosystem through channel narrowing and deepening, increased habitat complexity, improved substrate conditions and reduced turbidity levels.

References:

California Department of Fish and Wildlife (CDFW), 2002. Status Review of California Coho Salmon North of San Francisco.

Gualala River Watershed Council (GRWC), 2013. Gualala River Watershed Council Cooperative Monitoring Program 1998-2013, Gualala, California.

Klamt, Robert R., C. LeDoux-Bloom, J. Clements, M. Fuller, D. Morse, and M. Scruggs, 2002. Gualala River Watershed Assessment Report, North Coast Watershed Assessment Program.

National Marine Fisheries Service (NMFS), 2012. Final Recovery Plan for Central California Coast coho salmon Evolutionarily Significant Unit.

Restoration Objective and Strategy: This project will address legacy forestry impacts to mainstem Buckeye Creek and tributary streams proximal to mainstem Buckeye Creek, reducing sediment delivery to streams by treating prioritized, high value sediment sources and hydrologically connected road reaches with permanent road decommissioning and storm-proofing of culverted and unculverted stream crossings and pending fill failures on unmaintained segments of Bear Flat, Bear Flat Spur 1, Lower Lookout, Lower Lookout Spur 1, and Gerry Roads. By permanently decommissioning 1.4 miles of unmaintained, legacy

streamside and riparian road and upgrading 2.6 miles of streamside and riparian road to CDFW approved standards, this project will prevent approximately 2,550 cubic yards of sediment from entering the Gualala River watershed by treating 35 prioritized individual features.

The road decommissioning component could be described as “reverse road construction” with the goal of permanent and significant erosion prevention and sediment control. Treatments for decommissioning roads and landings included in this proposal involve full road decommissioning (closure) and incorporate outslipping; crossroad drain installation; the excavation of unstable and potentially unstable sidecast fillslope materials; road ripping, and the complete removal of all stream crossing fills. Permanent treatments act to reduce the legacy impacts within downslope and downstream proposed treatment locations. The expected benefit of completing the erosion control and erosion prevention remediation proposed in this project is the reduction of long-term sediment delivery and normalization of hillslope and channel hydrologic and runoff processes within the Buckeye Creek sub watershed. Past and future impacts of legacy road systems related to industrial logging within high-quality, fish-bearing watersheds is recognized as a significant limiting factor to anadromous fish survival and production.

Feature prioritization: The 2018 and 2019 road related sediment source inventory conducted by PWA has classified the features recommended for treatment in this restoration plan as having varied treatment priorities (Table 3, Map 3). Of the 35 proposed treatment features in the proposal, 4 (11%) are High priority and 23 (66%) are Moderate priority features, and 8 (23%) features are Low priority features (Table 3).

The following is a summary of the erosion control, erosion prevention, and watershed restoration treatments the permittee is proposing through this proposal:

Stream crossings – Permittee will perform decommissioning treatments for 15 stream crossings which include culverted and uncultivated fills and upgrading treatments at 17 stream crossings (Tables 1 & 3, Map 3) through installation of 4 culverts and 12 armored fills, and by repairing 1 armored fill crossing. Permittee estimates that, if left untreated, these stream crossings will deliver approximately 1,855 cubic yards of road related sediment to local streams as they continue to fail, which accounts for 81% of total future episodic sediment delivery predicted from point source features for the project area (Table 2).

Unstable fillslopes – Permittee will treat two (2) potential fill failures along the Lower Lookout and Gerry roads alignments (Table 1, Map 3). These unstable features are located within the inner gorge along mainstem Buckeye Creek, and

along a midslope riparian corridor. These features can be easily treated by excavation and removal of fill overburden. Permittee estimates that, if left untreated, approximately 303 cubic yards of sediment originating from fillslope failures will be delivered to stream channels, which is 13% of the projected future episodic sediment delivery from discrete sediment source features for the project area (Table 2).

Bank erosion – Permittee will treat 1 bank erosion fill failure along Bear Flat Road (Table 1, Map 3). This unstable feature is located within the inner gorge of Mainstem Buckeye Creek. This feature can be easily treated by excavation and removal of fill overburden, adjusting the road alignment to move the road in (away from the creek), and hydrologically disconnecting road surface connected to the failure. Permittee estimates that, if left untreated, approximately 143 cubic yards of sediment originating from bank erosion fill failure will be delivered to mainstem Buckeye Creek, which is 6% of the projected future episodic sediment delivery from discrete sediment source features for the project area (Table 2).

Road Drainage treatments – Permittee will storm-proof 4 miles of streamside and mid-slope riparian road by hydrologically disconnecting road surfaces capable of delivering fine sediment to Buckeye Creek and associated tributaries through the installation of rolling dips and implementation of road shaping treatments (outsloping and insloping).

Road drainage treatments on roads to be decommissioned includes in-place outsloping 2,100 linear feet of road by removing the majority of sidecast fill and placing it against the road cutbank, resulting in an aggressively outsloped road surface, representing 28% of 1.4 mi of total road decommissioning for the project. Permittee will rip 4,735 feet of road to be decommissioned with ripper blades on a bulldozer to decompact the road surface and improve rainfall infiltration, representing 64% of 1.4 miles of total road decommissioning for the project. Permittee will install 34 crossroad drains, deep, non-drivable, permanent waterbars to break up hydrological connectivity of decommissioned road surfaces (Table 4).

Road drainage treatments on roads to be upgraded include the installation of 30 rolling dips to prevent concentration of road surface runoff, road outsloping along 260 linear feet of road to improve road drainage, and 330 linear feet of insloping to prevent the discharge of road surface runoff onto unstable hillslope areas (Table 4).

Pre- and post- construction project monitoring will be conducted by PWA according to CDFW monitoring guidelines. Pre- and post-photographic monitoring will be performed at all treatment features. Pre- and post-profiles will be surveyed at a representative subset of the stream crossing features

scheduled for treatment.

Project Treatments Road Decommissioning and Upgrading

To complete the project, Permittee will implement 13 different types of erosion control and erosion prevention treatments for the project area, generally subdivided into 2 categories: feature-specific treatments and road drainage, hydrologic treatments (Table 4).

Feature-specific prescriptions include treatments such as soil excavation and complete fill removal at stream crossings and potential fillslope failures; culvert replacement, critical dip installation, armored fill installation, riprap buttressing of fillslopes, and mulching. All treatments will prevent future episodic erosion at treatment features from entering the stream system (Table 4).

As part of the proposed erosion control and erosion prevention treatments the Permittee will replant redwood (*Sequoia sempervirens*) within the “riparian corridor” along disturbed work areas including stream crossing excavations and fill failures.

Road drainage prescriptions include the installation of rolling dips, outsloping and rerocking of disturbed road surfaces along 2.6 miles of road alignments to be upgraded and cross road drains, road ripping, outsloping, and berm removal along 1.4 miles of road alignments to be decommissioned. Road drainage treatments implemented on both upgraded and decommissioned roads will disperse road surface runoff, reduce hydrologic connectivity of road surfaces, and promote infiltration and revegetation. Road drainage treatments implemented on upgraded road segments will disperse road surface runoff, reduce hydrologic connectivity of road surfaces, and harden the road surface to reduce sediment production.

- a. Total miles of road treated: 4 miles (1.4 miles decommissioning and 2.6 miles upgrading)
- b. Total acres of upslope area treated: 14.5 acres.
- c. Project specific information

Site #1

- i. Cubic yards saved: 2,550
- ii. Miles of road upgraded: 2.6 miles
- iii. Miles of road decommissioned: 1.4 miles
- iv. Number of stream crossings treated: 32
- v. Number of springs and landslides treated: 2
- vi. Type and number of upland erosion/sediment control used:

32 erosion control structures; 0 planting, 3 slope stabilization.

- d. Pre-project habitat surveys for northern red-legged frogs; pre-project presence surveys for cultural resources, spotted owls, marbled murrelets, and nesting birds will be performed. During-project monitoring will also be conducted for foothill yellow-legged frogs and northern red-legged frogs as required by FRGP consultation and LSAA agreements.
- e. Assessment and recovery plans:

CA Department of Fish and Game, 2004, Recovery Strategy for California Coho Salmon,
<https://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=Fisheries--CohoSalmon>.

California Resources Agency, and California Environmental Protection Agency, 2003, North Coast Watershed Assessment Program. Sacramento, California.
<http://coastalwatersheds.ca.gov/Watersheds/NorthCoast/Gualala/GualalaBasin/GualalaRecommendations/tabid/102/Default.aspx>.

CA North Coast Regional Water Quality Control Board (NCRWQCB), 2008, Work Plan; To Control Excess Sediment in Sediment-impaired Watersheds. Santa Rosa, California.
https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/sediment_workplan/080408sedwp/Work_Plan_Final_04-08-08.pdf.

North Coast Regional Water Quality Control Board, 2003, Gualala River Technical Support Document for the Sediment TMDL.
https://www.waterboards.ca.gov/northcoast/water_issues/programs/watershed_info/.

Mendocino_coast/gualala/The Nature Conservancy, 2001, California North Coast Ecoregional Plan,
https://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Documents/NorthCoast_ERP.pdf.

The Conservation Fund. 2015. Buckeye Forest ? Integrated Resource Management Plan. Caspar, California.
https://www.conservationfund.org/images/Buckeye_IRMP_3_6_17_Final_reducedsize.pdf.

Pacific Watershed Associates, 2019. Drought Mitigation Planning Project for the Buckeye Forest, FRGP Agreement # P1596040.

Project Description:

Location:

This project is located at a single site along Bear Flat Road in The Conservation Fund's Buckeye Forest ownership beginning at the intersection of Kelly Road with Bear Flat Road (Map 3). Kelly Road is 1.8 miles north of the intersection of Soda Springs Road and Annapolis Road. From the town of Annapolis, travel north toward Kelly Road along Soda Springs road for 1 mile, left onto Amco Road for 0.4 mile, right onto Oak Hill LO Road for 0.4 mile, and left onto Kelly Road. The Bear Flat Road intersection is another 4.9 mile along Kelly Road to the east. The Buckeye Forest is comprised of 19,645 acres of timberland in California's North Coast Range mountains. Located in northwest Sonoma County adjacent to and south of the Mendocino-Sonoma county line, the property lies approximately one mile northeast of the community of Annapolis and 6 miles east of the town of Gualala. The main drainages within the Forest are: 1) Buckeye, Franchini, and Rockpile Creek watersheds; and 2) the Wheatfield Fork of the Gualala River watershed. Primary access to the Buckeye is via Kelly Road, a private road with locked gates and strictly enforced rules. The downstream most portion of the property is approximately 9 miles upstream of the mouth of the Gualala River and 3.5 miles up Buckeye Creek from it's confluence with the South Fork Gualala River.. Project coordinates are Lat. 38.75681, Long. -123.29324

Project Set Up:

There are three fundamental tasks that need to be completed to accomplish this project: (A) grant oversight and project administration, (B) implementation of sediment reduction projects, and (C) draft and final reporting.

A – Project Administration

The Conservation Fund's (TCF) Timberlands Manager and Program Coordinator will provide all contracting oversight and project administration including but not limited to: securing contracts (grantors and subcontractors); scheduling; invoicing and reporting; and agency and landowner communications. This task will occur throughout the life of the project. The Timberlands Manager will be available on a full time basis to coordinate with subcontractors and and the grantor. The Timberlands Manager and Program Coordinator will review invoices and process subcontracts, process vendor payments, conduct grant tracking, review project reports, and provide summary reporting.

B – Implementation

Pacific Watershed Associates (PWA) will be subcontracted by TCF and function as the professional geologic subcontractor. PWA will subcontract qualified professionals to conduct cultural, and wildlife surveys as necessary to conduct

the project under FRGP's Mitigated Negative Declaration (MND). TCF will provide existing collected Northern Spotted Owl presence and perform surveying and calling as necessary. A PWA qualified botanist will provide botanical surveys for rare plants. PWA will provide paleontological resource surveys in compliance with FRGP's MND prior to project construction.

PWA Certified Engineering Geologist Colin Hughes (CEG #2717) and PWA Staff geologist will update 60% road logs to account for existing conditions at the time of construction and incorporate recommendations from environmental surveys. . TCF Timberlands Manager will review and provide input into the finalized road logs produced by PWA to ensure conformance with landowner's property management requirements and project expectations. PWA will contract a qualified licensed heavy equipment subcontractor to implement project construction. The PWA Engineering Geologist and Staff Geologist will provide technical oversight throughout construction, pre- and post-construction photo monitoring, and pre- and post-construction stream crossing surveys. PWA Staff Geologist and Engineering Geologist will produce required project reporting and final metrics. PWA will purchase all steel culverts, culvert materials, and erosion control materials for the project.

PWA Principal Geomorphologist will provide oversight of all PWA staff operations, review and approve PWA and vendor invoices, and field review project operations.

PWA GIS Specialist will produce final construction maps for permitting and contractor's use and final report maps.

PWA Clerical Staff will produce invoices for PWA's staff time, materials, and expenses.

C – Draft and Final Reporting

Pre-and post-project information will be compiled and analyzed in a manner to satisfy requirements of the CDFW Grant Agreement. Project information will be synthesized in Annual Progress Report(s) and a Draft and Final Report. The TCF Program Coordinator will compile, format, and submit invoices, reports, and a final budget to CDFW according to grant timelines. The PWA Principal, PWA Certified Engineering Geologist, PWA Project Scientist, PWA Clerical Staff will assist with final data management and technical reporting tasks.

Materials:

Materials Trees (planting): Approximately 500 Coast Redwood (sequoia sempervirens) seedlings will be planted in the riparian zone of decommissioned stream channels. Tree materials will be sourced for the local climatic setting and

be purchased by PWA.

Straw: Approximately 150 bales of weed-free rice straw mulch will be used for erosion control on disturbed ground surface areas to reduce post-construction sediment production and delivery to watercourses. Straw mulch will be used in combination with native tree slash. Slash materials will be developed by the Contractor during construction.

Road Rock: Approximately 120 yd³ of road rock will be developed onsite and applied to armored fills and rolling dips in specific locations to replace existing road surfacing or reduce production of sediment from the road surface. **Culverts:** The project will require 150 ft of 24 inch diameter culvert (12 ga) and 60 ft of 30 in diameter culvert (12 ga), all galvanized steel culvert and coupler materials, to replace undersized culvert infrastructure at four stream crossings.

Culvert materials will be provided by PWA. **Plate compactor:** A vibratory plate compactor will be used to aid in the compaction of stream crossing backfill at culvert upgrade features. Plate compactor will be provided by the heavy equipment contractor.

Pump: A sump pump and/or trash pump will be used to remove nuisance water from excavations. Pump(s) will be provided by the heavy equipment contractor.

PWA materials include flagging and staking for feature identification, treatment locations, and survey locations. Water quality monitoring materials include a water quality meter (pH, DO, temp) device and a turbidity meter. Reporting materials include supplies for printing of paleontology and other resource assessment report.

Tasks:

List all tasks to be accomplished to complete the goals and describe how tasks will be achieved (Multi-list: Task, Description of Activities)

Task 1

Grant Oversight and Project Administration

TCF personnel will provide all contracting oversight and administration as pursuant to grant and regulatory guidelines. This includes but is not limited to obtaining securing contracts, scheduling, coordination, invoicing, reporting, and agency communications. Upon final execution of the Grant and prior to receiving a Final Notice to Proceed, TCF will provide all subcontracts and assure all permits are finalized. Additionally, the TCF Accounting Staff will be available to assist with invoicing and vendor payment. This task will occur throughout the life of the project.

Required TCF Personnel: Timberlands Manager, Forestry Technician, Accounting Staff.

Required TCF Materials: TCF travel needs for site visits and meeting with partners, TCF mileage, TCF field/office supplies, TCF printing/duplication, and TCF postage.

Task 2

Pre-Implementation Activities

Pacific Watershed Associates (PWA) will be responsible for managing project implementation. The heavy equipment and labor subcontractor (Contractor) which will perform construction activities will be selected through TCF's procurement process.

Task B1.1: Project Permitting and Environmental Regulatory Compliance - PWA will prepare and submit a Lake and Streambed Alteration Agreement Notification for the project. Qualified biological subcontractors will perform habitat and presence surveys for California red-legged frogs and other state and federally listed species and perform biological trainings to educate the Contractor to identify listed species as required by the LSAA and NOAA and USFW consultation. CEQA compliant cultural and paleontology resource surveys will be provided by a qualified subcontractor. In order to avoid impacts to rare plants, PWA qualified botanist will survey all work sites for rare plants prior to any ground disturbing activities. Rare plants and their associated survey methods are defined in the "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018) and CNPS botanical Survey Guidelines" (California Native Plant Society 2001). The survey will be floristic in nature and occur once in early spring and again in mid-summer. Deliverables include a detailed report of existing vegetation, mitigation recommendations, and associated map. PWA will perform a paleontological resource assessment in compliance with FRGP's MND.

PWA Staff Required: Engineering Geologist, Staff Geologist, Associate Geologist, Qualified Biologist

Materials Required: PWA materials, PWA per diem, PWA lodging

Task B1.2: Pre-project layout - PWA will flag or stake construction and excavation boundaries (layout) as well as spoils disposal sites, equipment exclusion areas for biological or cultural resource protection. Construction Road logs will be finalized by PWA based on final construction layout and staking and will include all impact minimization requirements of LSAA and resource surveys/assessments. PWA staff will setup photo point monitoring stations at all project features. Pre-construction photographic monitoring will be performed by PWA in a manner consistent with CDFW guidelines. PWA staff will purchase all culvert and rock materials and coordinate their delivery.

PWA Staff Required: Engineering Geologist, Staff Geologist, Principal Geomorphologist

Task 3

(B2) Mobilization and Road Opening

Task B2.1 Mobilization- Contractor low bed trucks will be used to move heavy equipment in and out of the project area at the beginning and end of the work season, these will require a pilot car on public roadways. In accordance with the invasive species protocol included in this proposal, all heavy equipment will be cleaned before and after entering/leaving the work area.

Heavy Equipment Required: Lowboy, truck and trailer

Materials Required: Contractor Transportation

Task B2.2 Road Opening- An excavator and bulldozer will be used to reopen roads to be decommissioned by removing the vegetation and conducting earthmoving required for temporary heavy equipment access. All Large Wood Debris generated from road opening and project treatments will be staged for future instream enhancement projects within the Buckeye Forest. Heavy Equipment Required: Excavator, Bulldozer, Labor

Task 4

(B3) Implementation - Task B3.1 Construction

Task B3.1 Construction- The excavator, bulldozer and dump truck will be used to remove the anthropogenic road fill material from the proposed stream crossing decommissioning features and other site-specific features specified for decommissioning treatments. Similarly, they will be used to treat and restore all road surface drainage as they work their way out from the end of the road. Concurrently working with the excavator and bulldozer, the dump truck will end haul spoil from decommission areas to designated spoil disposal sites. Slash generated through decommissioning will be applied by excavator to disturbed stream banks as erosion control materials, cover for straw mulch, and habitat. Contractor laborers will be used to spread straw. PWA staff or TCF staff will plant coast redwood seedlings in disturbed riparian areas during winter months.

The Contractor's excavator will be used to remove culverts to be replaced, construct armored fills, and excavate the road fill on roads to be upgraded. The excavator will also be used for removal of unstable road fill at future fill failure locations. The culverts will be replaced with corrugated steel culverts sized to convey 100-year flood flows and debris in accordance with the final road logs, and in accordance with the specifications in Chapter X of the California Salmonid Stream Habitat Restoration Manual (Weaver et al., 2006) and the Handbook for Forest, Ranch, and Rural Roads (Weaver, Weppner, and Hagans, 2015). Contractor labor will utilize a gas-powered water pump to remove nuisance water from excavations and protect water quality during replacement of the culverts.

Contractor labor will couple culverts together and utilize a mechanical compactor to compact backfill around the stream crossing culverts. The Contractor's dump truck will be used to end haul spoil to safe designated stockpile locations. The Contractor's bulldozer will manage temporarily excavated fill, install rolling dips on either side of features as indicated in the final road logs, and spread road rock for resurfacing. The Contractor's water truck will be used to moisture condition stream crossing backfill and the road surface at rolling dip installations and areas of road shaping. The Contractor's roller will be used to further compact stream crossing backfills and the re-rocked road surface at rolling dips, and areas of road shaping. In accordance with the invasive species protocol included in this proposal, all heavy equipment will be cleaned before and after entering/leaving the work area.

Heavy Equipment Required: Excavator, bulldozer, dump truck, water truck, roller, labor.

Materials Required: Pump/hoses, seed, straw, trees, rock armor, road rock, pressure washer, Contractor transportation.

Task 5

(B3) Implementation - Task B3.2 Construction Oversight and Monitoring

Task B3.2 Construction Oversight and Monitoring- Construction oversight and adaptive management will be conducted by PWA CEG, Staff Geologist and Principal throughout the construction period. Photographic monitoring will be conducted by PWA throughout the project and after completion of construction. Post-construction stream crossing surveys at key sites will be conducted by PWA staff, consistent with the CDFW guidelines. PWA Staff Geologist will develop as-built road logs detailing completed project work. PWA Staff Geologist will compile and provide CDFW annual and final metrics reporting.

Water quality will be monitored at site(s) 175 and 176, for a total of 2 sites. These sites were previously evaluated during the PWA assessment, and we determined dewatering will likely be necessary for the proposed work. The surface water volume is manageable for pumping or gravity bypass during construction, and it is anticipated that the flows may be contiguous with the downstream watercourses.

Spatial Sampling Scale (horizontal and vertical)

- Upstream & downstream: Water quality samples will be taken at two locations: 1) upstream from the project activities far enough to be completely out of the influence of the project activities, and 2) 300 feet downstream from the project activities.
- Across the channel:

- Vertically in the water column: Water quality sampling will be made in situ within the water column at mid-depth, total depth and the sampling depth(s) will be recorded for each sample taken. In instances where the water is too shallow (<6") to take a mid-column sample, surface water sampling will be made.

Temporal Sampling Scale

Water quality samples will be taken a minimum of three times in a full workday or should the work time frame be less than a full day, three samples will be taken relative to the work duration from beginning to end. These three samples will be taken: 1) before the activities commence, 2) during the middle of the full workday (or the middle of the construction activity), and 3) at the end of the full workday or after the construction activity has been completed for that day.

Parameters and Meters

The water parameters that will be sampled include but are not limited to turbidity (NTU), pH (Standard international units), temperature (°C), and Dissolved Oxygen or DO (mg/L and % saturation). A hand-held meter designed for field applications will be used to take the water quality measurements. The meter(s) will conform to and utilize a USEPA-approved algorithm/method for the sample readings and the meter(s) will be calibrated and maintained as per the manufacturer's instructions for reading accuracy; a calibration and maintenance log will be kept with each meter. Observational surface water quality monitoring will be conducted continuously throughout the work period. These visual inspections will be made for visible construction related pollutants that may include foam, petroleum and hydraulic product sheen, construction related excavated materials that are earthen or organic in nature, or any other visible signs for water quality degradation.

Reporting

All water quality sample results will be recorded in the daily water quality sample form, as provided within the 2021 FRGP Guidelines. These water quality data forms will be provided to the Grant Manager weekly, from the beginning of the in-water work until the work is completed or done for the season.

PWA Staff Required: Engineering Geologist, Staff Geologist, Principal Geomorphologist, PWA Biologist.

Materials Required: PWA Mileage, PWA Lodging and Per Diem, Water quality instruments, Field and Office Supplies

TCF Staff Required: Timberlands Manager, Forestry Technician

Materials Required: Mileage, Field and Office Supplies, trees for replanting, water quality meter, turbidity meter

Task 6 (C) Reporting

PWA Engineering Geologist and Staff Geologist will develop a draft and final report based on CDFW requirements that documents the work completed and the total costs to implement the project. TCF staff will review the summary report of implementation and TCF will conduct all final grant reporting. PWA Staff Geologist will provide annual metrics reporting to TCF and CDFW as required by the grant agreement.

PWA Staff Required: Engineering Geologist, Staff Geologist, Principal Geomorphologist, GIS Specialist, Clerical

Required TCF Personnel: Timberlands Manager, Forestry Technician, Accounting Staff

Materials Required: TCF office supplies, PWA office supplies

Deliverables:

Task 1

- Adherence to grant requirements.
- Timely completion of the project.

Task 2

- Contracts with subcontractors.
- Execution of all required environmental regulatory permits
- Final road logs

Task 3

- Equipment on site
- Roads open and ready for treatment

Task 4

- Contracts with subcontractors.
- Execution of all required environmental regulatory permits

Task 5

- Completion of work described in finalized road logs to achieve approximately 2,550 cubic yards of sediment savings at identified features on project roads.
- Photographic and stream survey monitoring

- CDFW metrics

Task 6

Annual metrics reporting will be provided to the CDFW Grant Manager by PWA and TCF. All required permit reporting will be provided to the pertinent regulatory agencies. Upon completion of the project PWA and TCF will submit a written completion draft and final report which contains: (1) general grant information, (2) location of work, (3) project access, (4) participating landowner's name and address, (5) description and analysis of the restoration and planning person hours expended, (6) quantified description of the results of the project, including as-built road logs, (7) dates of work and the number of person hours expended, (8) labeled before-and-after photos of selected restoration activities and techniques, (9) grant dollars spent and contributed and/or in-kind services used to complete the project, (10) GIS generated maps and shapefiles of the project area, and (11) monitoring checklists, databases, spreadsheets and any other data products produced under this grant, if awarded.

Timelines:

Task 1

Start Date* 04/01/2022
End Date* 12/31/2024

Task 2

Start Date* 05/15/2022
End Date* 07/01/2024

Task 3

Start Date* 05/15/2023
End Date* 07/01/2024

Task 4

Start Date* 05/16/2022
End Date* 11/01/2024

Task 5

Start Date* 05/16/2022
End Date* 11/01/2024

Task 6

Start Date* 10/31/2022

End Date* 12/31/2024

Additional Requirements:

The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual projects start and end dates, within this timeframe, are at the discretion of the California Department of Fish and Wildlife.

No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment. Any and all equipment will be removed from the streambed and flood plain areas at the end of each workday.

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

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

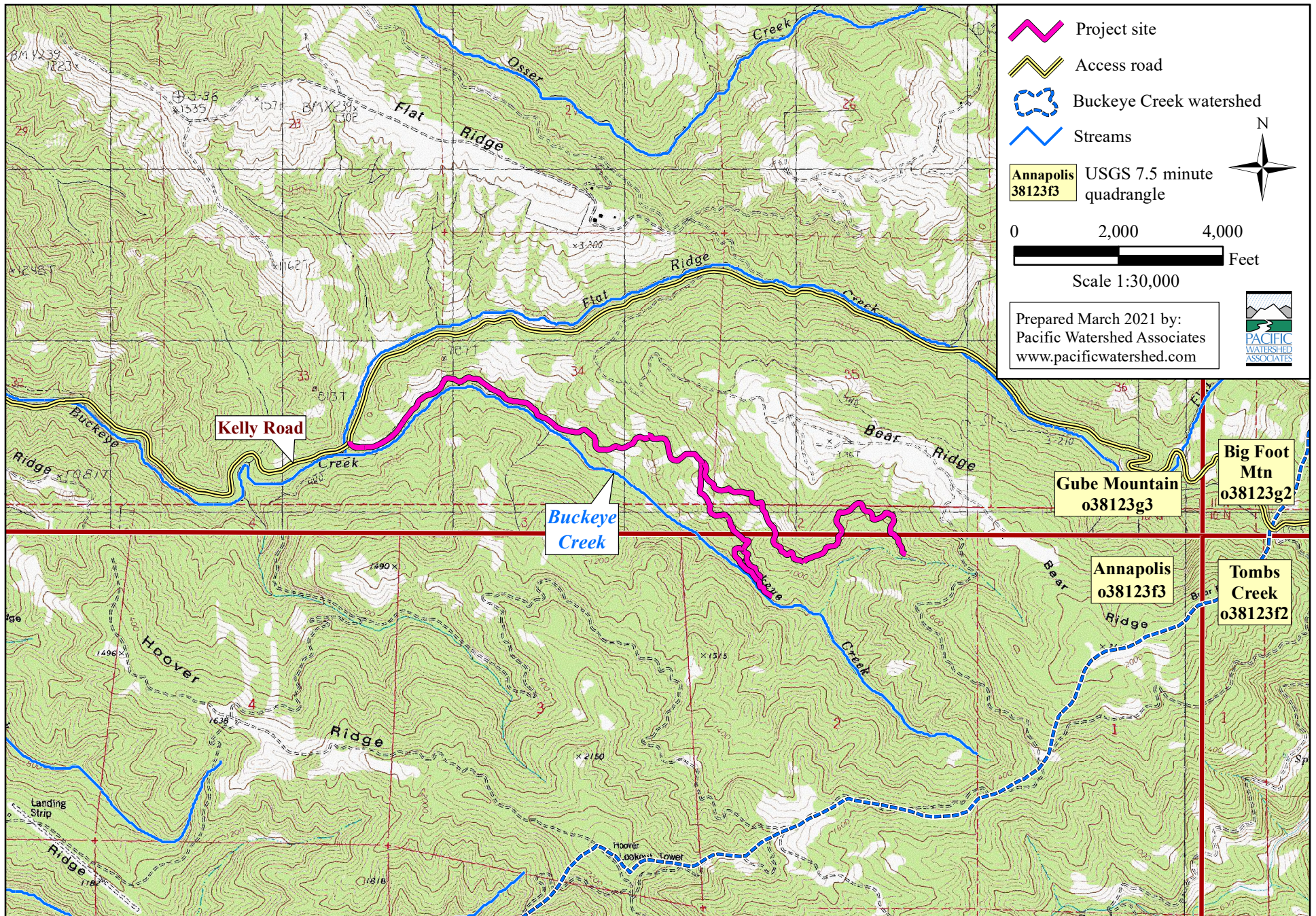
All road decommissioning will be done in accordance with techniques described in the Handbook for Forest and Ranch Roads, (PWA, 1994c.) and the *California Salmonid Stream Habitat Restoration Manual*, Volume II, Part X. All road upgrade and decommissioning sites and techniques shall be approved by the Grantor Project Manager before any equipment work takes place.

All crossings treated in fish bearing reaches of streams will follow the National Marine Fisheries Service (NMFS 2001) Guidelines for Salmonid Passage at Stream Crossings and the criteria for adult and juvenile salmonid fish passage as described in Volume II, Part IX of the *California Salmonid Stream Habitat Restoration Manual*.

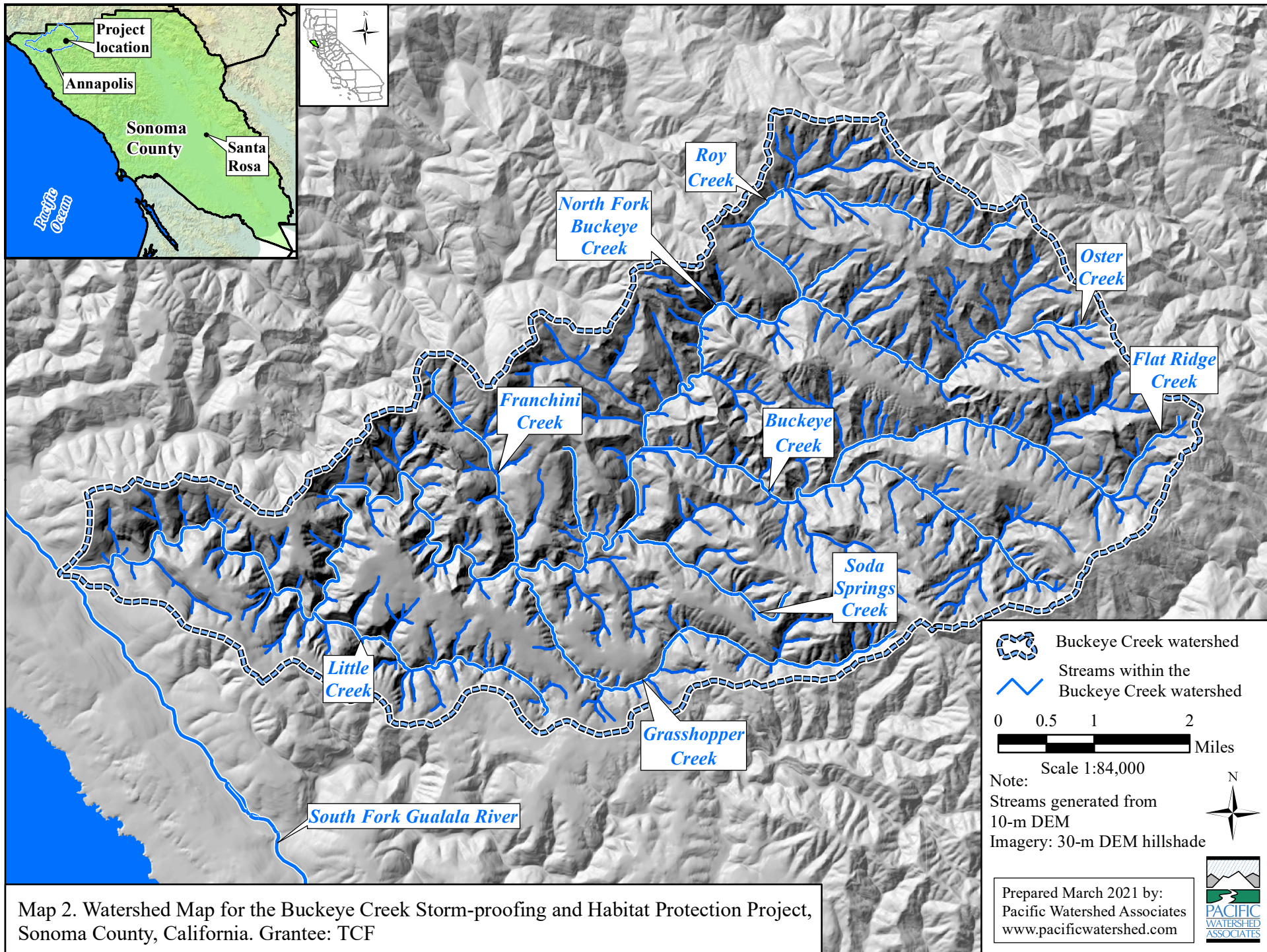
Seeding and mulching of all exposed soils shall be done for all slopes which may deliver sediment to a stream. Woody debris will be concentrated on finished slopes adjacent to stream crossings. The standard for success is 80% ground cover for broadcast planting of seed, after a period of three years. Mulching and seeding will take place as sites are completed to avoid unforeseen erosion. Planting of tree seedlings will take place after December 1 or when sufficient rainfall has occurred to insure the best chance of survival of the seedlings.

Sites that are expected to erode and deliver sediment to the stream are the only locations where work will be authorized for reimbursement under the terms of this agreement. Reimbursement will not be authorized for work done to improve aesthetics only.

The landowner or responsible party must sign an access agreement stating they agree to maintain the erosion control project for a period of not less than 10 years. Maintenance will consist of repair to the road or stream crossing to a level that will effectively reduce sediment from entering the stream. In the event of an act of nature which results in partial or complete failure of the project, the landowner or applicant will not be held responsible for costs incurred after the act of nature. Acts of nature include, but are not limited to floods, earthquakes, volcanic eruptions, and windstorms.



Map 1. Project Location Topographic Map for the Buckeye Creek Storm-proofing and Habitat Protection Project, Sonoma County, California. (Gube Mountain and Annapolis USGS 7.5' quadrangles). Grantee: TCF



Map 2. Watershed Map for the Buckeye Creek Storm-proofing and Habitat Protection Project, Sonoma County, California. Grantee: TCF



Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad< IS (Gube Mountain (3812373) OR Big Foot Mtn. (3812372) OR Tombs Creek (3812362) OR Annapolis (3812363) OR Stewarts Point (3812364) OR McGuire Ridge (3812374) OR Zeni Ridge (3812384) OR Ornbaun Valley (3812383) OR Yorkville (3812382))

Possible species within the Gube Mountain and surrounding quads for 1726145 - Buckeye Creek Storm-proofing and Habitat Protection Project, Sonoma County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Accipiter gentilis</i> northern goshawk	ABNKC12060	None	None	G5	S3	SSC
<i>Agrostis blasdalei</i> Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
<i>Ammodramus savannarum</i> grasshopper sparrow	ABPBXA0020	None	None	G5	S3	SSC
<i>Antrozous pallidus</i> pallid bat	AMACC10010	None	None	G4	S3	SSC
<i>Arboreus pomo</i> Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
<i>Arctostaphylos bakeri ssp. sublaevis</i> The Cedars manzanita	PDERI04222	None	Rare	G2T2	S2	1B.2
<i>Arctostaphylos stanfordiana ssp. raichei</i> Raiche's manzanita	PDERI041G2	None	None	G3T2	S2	1B.1
<i>Astragalus agnicidus</i> Humboldt County milk-vetch	PDFAB0F080	None	Endangered	G2	S2	1B.1
<i>Bombus caliginosus</i> obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
<i>Brachyramphus marmoratus</i> marbled murrelet	ABNNN06010	Threatened	Endangered	G3	S2	
<i>Brasenia schreberi</i> watershield	PDCAB01010	None	None	G5	S3	2B.3
<i>Calochortus raichei</i> The Cedars fairy-lantern	PMLIL0D1L0	None	None	G2	S2	1B.2
<i>Calystegia purpurata ssp. saxicola</i> coastal bluff morning-glory	PDCON040D2	None	None	G4T2T3	S2S3	1B.2
<i>Campanula californica</i> swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
<i>Carex saliniformis</i> deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2
<i>Ceanothus confusus</i> Rincon Ridge ceanothus	PDRHA04220	None	None	G1	S1	1B.1
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
<i>Cryptantha dissita</i> serpentine cryptantha	PDBOR0A0H2	None	None	G3	S3	1B.2



Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Danaus plexippus pop. 1</i> monarch - California overwintering population	IILEPP2012	Candidate	None	G4T2T3	S2S3	
<i>Dicamptodon ensatus</i> California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
<i>Emys marmorata</i> western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
<i>Erigeron supplex</i> supple daisy	PDAST3M3Z0	None	None	G2	S2	1B.2
<i>Eriogonum cedrorum</i> The Cedars buckwheat	PDPGN087A0	None	None	G1	S1	1B.3
<i>Gilia capitata ssp. pacifica</i> Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
<i>Gilia capitata ssp. tomentosa</i> woolly-headed gilia	PDPLM040B9	None	None	G5T2	S2	1B.1
<i>Haliaeetus leucocephalus</i> bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
<i>Harmonia guggolziorum</i> Guggolz's harmonia	PDAST650M0	None	None	G1	S1	1B.1
<i>Hesperevax sparsiflora var. brevifolia</i> short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
<i>Horkelia tenuiloba</i> thin-lobed horkelia	PDROS0W0E0	None	None	G2	S2	1B.2
<i>Lasiurus cinereus</i> hoary bat	AMACC05030	None	None	G3G4	S4	
<i>Lasthenia californica ssp. macrantha</i> perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
<i>Lathyrus palustris</i> marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
<i>Lavinia symmetricus parvipinnis</i> Gualala roach	AFCJB19025	None	None	G4T1T2	S2S3	SSC
<i>Lilium maritimum</i> coast lily	PMLIL1A0C0	None	None	G2	S2	1B.1
<i>Lupinus sericatus</i> Cobb Mountain lupine	PDFAB2B3J0	None	None	G2?	S2?	1B.2
<i>Lycopodium clavatum</i> running-pine	PPLYC01080	None	None	G5	S3	4.1
<i>Myotis yumanensis</i> Yuma myotis	AMACC01020	None	None	G5	S4	
<i>Oncorhynchus kisutch pop. 4</i> coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G5T2T3Q	S2	
<i>Oncorhynchus mykiss irideus pop. 16</i> steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Piperia candida</i> white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
<i>Rana boylei</i> foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
<i>Rana draytonii</i> California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
<i>Sidalcea calycosa ssp. rhizomata</i> Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2	1B.2
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
<i>Sidalcea malviflora ssp. purpurea</i> purple-stemmed checkerbloom	PDMAL110FL	None	None	G5T1	S1	1B.2
<i>Speyeria zerene behrensii</i> Behren's silverspot butterfly	IILEPJ6088	Endangered	None	G5T1	S1	
<i>Streptanthus glandulosus ssp. hoffmanii</i> Hoffman's bristly jewelflower	PDBRA2G0J4	None	None	G4T2	S2	1B.3
<i>Streptanthus morrisonii ssp. morrisonii</i> Morrison's jewelflower	PDBRA2G0S3	None	None	G2T1?	S1?	1B.2
<i>Taricha rivularis</i> red-bellied newt	AAAAF02020	None	None	G2	S2	SSC
<i>Taxidea taxus</i> American badger	AMAJF04010	None	None	G5	S3	SSC
<i>Tracyina rostrata</i> beaked tracyina	PDAST9D010	None	None	G2	S2	1B.2
<i>Trifolium buckwestiorum</i> Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
<i>Usnea longissima</i> Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2

Record Count: 53