Introduction:

The Pacific Coast Fish, Wildlife and Wetlands Restoration Association (PCFWWRA, permittee) will implement the Ryan Creek Off-Channel Coho Habitat Implementation Project. The purpose of this project is to implement 100% engineered design plans for improved connection to an off-channel pond and creation of a large backwater alcove that will provide winter refugia and backwater rearing habitat for juvenile and adult coho salmon in the Ryan Creek watershed. In addition, the project includes construction of several instream LWD structures in mainstem Ryan Creek in the project area.

This project is necessary because various anthropogenic disturbances have constrained the coho salmon populations in Ryan Creek. This project, by reconfiguring the pond to allow for more frequent and longer duration flooding, begins to address one of the most obvious results of the disturbances; disconnection between the mainstem channel and its floodplain. Currently the mainstem of Ryan Creek exhibits steep channel banks and shows evidence of being manipulated to reduce flooding of the adjacent floodplain. This project will significantly increase surface water connectivity to a perennial tributary-fed pond and will provide much needed off-channel habitat as indicated in SONCCC Task "SONCC-HBT.2.2.2.2".

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* (Part VII).

Objective(s):

The overall goal of this project is to make improvements to instream and off-channel habitat area for coho salmon within Ryan Creek. The specific goal is to physically reconfigure a perennial pond which is rarely inundated, to allow for more frequent and longer duration connectivity with the mainstem channel during the winter and spring. The second goal is to physically create an alcove at the confluence of the tributary channel with the mainstem, in order to provide additional off-channel habitat area. Thirdly, habitat features composed of woody debris will be constructed throughout the project site, including the off-channel area, in an enlarged mainstem alcove, and within the mainstem Ryan Creek.

Specifically, the permitee will conduct the appropriate surveys to meet CEQA and other permit requirements including wetland identification, characterization, and delineation as well as paleontological, botanical, and archeological surveys. Permittee will use heavy equipment to lower the floodplain pond and sill to allow for more frequent and longer duration hydrologic connectivity with the mainstem

channel. Permittee will re-configure the outlet channel to make it more fish friendly and incorporate a large backwater alcove feature at the confluence with the mainstem. After the grading has been completed, the project team will use heavy equipment to install several LWM habitat elements throughout the footprint of the project.

Project Description:

Location:

The proposed project targets one potential off-channel feature location along mainstem Ryan Creek on Green Diamond Resource Company (GDRC) property located just east of the Humboldt County's McKay Community Forest and the city of Eureka. The feature is located approximately four miles upstream of the confluence of Ryan Creek with Freshwater Slough. See attached project location and watershed maps. Project coordinates are: 40.755499999999998 North 124.13235 West.

Project Set Up:

The Permittee will provide all contracting oversight and administration and will also be involved in rare plant and wetland surveys, re-planting efforts and management of replanting efforts.

PCFWWRA Personnel Categories
Project Manager (PM): Task 1-9. The Project Manager oversees all aspects of the project. This includes coordination and problem solving with agencies, landowner, and subcontractors. Permits, landowner agreements and grant agreements are the Manager's responsibility to make sure they are in place and that they are followed. The Manager's time is split between the field, meetings, and the office.

Administrative Assistant Manager (AAM): Task 1 and 9. The AAM drafts subcontracts, invoices, permit applications and reports, and works closely with the Project Manager. The AAM assists in tracking the project's budgets and progress. They communicate with partners, perform outreach as needed, and review/verify subcontractor invoicing.

Bookkeeper/Office Manager: Task 1. Performs various financial bookkeeping, accounting, and administrative work as needed. These include payroll, accounts receivable and payable, financial statements, and maintaining accounting records for individual contracts. Other tasks are to maintain office functions, provide communications and support as needed.

Plant Ecologist: Tasks 2, 6 and 7. The Plant Ecologist performs botanical work. Tasks include performing a comprehensive floristic survey of the project site; inventorying and mapping any special status plants or sensitive natural communities found; photographing plants and habitats; conducting a jurisdictional wetland delineation; finalizing revegetation plan and invasive species management plan; and providing other supporting materials as needed for permit acquisition.

Field Assistant: Tasks 2, 4, 6 and 7: Performs various supportive tasks out in field including, but not limited to assisting with water diversion and fish exclusion activities, erosion control materials delivery, and re-planting efforts once the construction is complete.

GIS Specialist: Tasks 2, 6 and 7. The GIS Specialist performs GIS work. Tasks include supporting field collection of botanical data and analyzing geospatial data. The GIS Specialist will prepare special status plants and natural communities maps, wetland maps, and other maps needed for reporting and permitting.

Field/Support Labor: Tasks 2, 5 and 6. The laborer will be responsible for helping PCFWWRA scientific specialists in all field tasks including rare plant surveys for CEQA, wetland delineations and characterizations for the 401/404 permit applications, and the coordination and QA/QC of replanting efforts.

ENGINEERING AND GEOLOGIC SUBCONTRACTOR (Construction layout/stakeout and oversight, monitoring and reporting).

PACIFIC WATERSHED ASSOCIATES, INC. (PWA), Personnel will support PCFWWRA with heavy equipment contractor selection, project implementation, construction oversight/management and will perform the required pre/post-construction monitoring and as-built topographic surveys for the replacement of culverts and channel reconstruction and restoration activities. In addition, PWA will provide PCFWWRA with assistance in bid document development technical engineering oversight of contractor activities during construction, evaluation and selection of construction materials, and conduct summary, annual and final reporting pursuant to FRGP contract deliverables.

Personnel Categories:
PWA Principal: Tasks 1-9. Provides technical expertise in developing contractor bid documents, implementation activities, draft and final work plan review, report editing and professional guidance for project technicians, scientists and engineers.

PWA Senior Civil Engineer: Tasks 1-9. Lead engineer in overall responsible charge of preparation of all construction documents, construction oversight, site surveys and monitoring/reporting requirements. Ensures compliance with Professional Engineers Act (California Business & Professions Code 7800).

PWA Associate Engineer (Project Manager): Tasks 1-9. Lead staff engineer who, with assistance from the PWA Senior Engineer, is also responsible for preparation of all construction documents, construction oversight, site surveys and monitoring/reporting requirements. Ensures compliance with Professional Engineers Act (California Business & Professions Code 7800).

PWA Staff Engineer: Tasks 1-5, 7 and 9. Staff engineer in support of preparation of construction documents, construction oversight, site surveys and monitoring/reporting requirements. In charge of project management as it relates to staffing needs and communication and technical oversight needed to complete each task. Shares Project Manager duties with Associate Scientist.

PWA Associate Scientist (Geologist)/ (Project Manager): Task 1-9. Licensed geologist in support of preparation of construction documents, construction oversight, site surveys and monitoring/reporting requirements. In charge of project management as it relates to staffing needs and communication and technical oversight needed to complete each task. Shares Project Manager duties with Staff Engineer. Ensures compliance with Geologist and Geophysicist Act (California Business and Professions Code 7800).

PWA Senior Scientist (Paleontologist): Task 2. Conducts pre-construction paleontological survey for CEQA.PWA NR Specialist (Fisheries Biologist/Aquatic Ecologist): Tasks 2, 7 and 9. Conducts water quality compliance monitoring before, during and after all construction and dewatering activities; conducts CEQA pre-construction presence/absence survey for species of special concern, including foothill yellow-legged frogs (*Rana boylii*) and other amphibians; conducts amphibian removal before and during construction; assists with fish removal/relocation for dewatering; conducts lamprey species capture and relocation for ammocoetes during fish removal and as emerging from fine sediments during and after dewatering; conducts the First Winter Observations Summary; conducts functional use surveys for biological utilization for coho, the target species, other salmonids, and lamprey species to include post-construction surveys for flow testing within the range of the design flows, and water quality monitoring during the first and second post construction seasons. Provides weekly water quality monitoring results to the Grant Manager. Works with the Grant Manger on mitigation measures for listed biotic species if present, reviewing the sampling strategy and methods for the required first and second season monitoring, and making modification to the water quality monitoring plan to ensure efficient and meaningful data collection to meet programmatic permit

requirements. Provides results from amphibian survey and capture/relocation during construction, lamprey capture and relocation from the dewatering efforts, the first winter observation summary report, post-construction functional use and flow surveys with water quality monitoring results for the final report and the monitoring report. Collects and enters field data into electronic database(s) to include reporting to BIOS, as necessary. Develops reports of field survey results. Reports directly to Project Manager.

PWA Staff Scientists: Will help specialist professionals with all field tasks 4, 5, 7 and 9. These will include staking, surveying, monitoring, construction management, data entry, and report writing.

PWA GIS/CAD Staff: Tasks 2, 7, and 9. Provides project support through development of GIS/CAD maps and products, database interfaces, and GPS data organization and analysis. Produces field maps in support of construction, monitoring and required final report maps.Clerical Staff: Task 1. Develops invoice tracking spreadsheet analysis, maintains project cost records, and develops timely invoices pursuit contract obligations.

ARCHEOLOGICAL CEQA SUBCONTRACTOR
William Rich and Associates (WRA): Task 2. This subcontractor will be responsible for performing sensitive cultural resource surveys prior to construction.

FISHERIES BIOLOGIST SUBCONTRACTOR
ROSS TAYLOR & ASSOCIATES (RTA): Task 4. Principal Investigator and Field Staff are available to assist construction contractors with fisheries and amphibian relocation services associated with fish passage improvement projects or any streamside projects that require relocation of fish prior to dewatering of stream segments. Services include coordination with state and federal fishery agencies, capture and relocation of fish and amphibians, and completion of required state and federal reporting.

HEAVY EQUIPMENT AND LABOR CONTRACTOR (Undetermined): Task 5. Implementation. The equipment and labor contractor will construct the project. Additionally, the equipment contractor will maintain temporary fish barriers and flow diversion during construction. Personnel categories include excavator, dozer, loader, dump truck, water truck and compactor operators, and laborers. The Heavy Equipment and Labor Contractor will only be considered for the project if they are a State licensed General Engineering Contractor with demonstrated successful experience on projects of a similar nature. The contractor will be determined through a rigorous, competitive selection process after the grant contract is signed.

Materials:

Rock armor- rock will be used to anchor LWM, and for road surfacing to repair haul roads used to endhaul spoils for the project. Procured by applicant.

Erosion Control Materials - includes straw and seed, geo-textile fabric, wire, and other small hand tools. Straw will be used to provide interim erosion control at areas of ground disturbance. Other materials will help construct silt fences. This is necessary to protect water quality. Procured by applicant.

Water Diversion Materials - includes flex pipe, water pumps (water quality management), sandbags, sand, plastic sheeting, tape, wire, and other small hand tools. Materials will help construct the water bypass diversion system. This is necessary to protect water quality. Procured by applicant.

Small Equipment rental - includes chainsaw (for managing LWM), heavy-duty drill (Hole Hawg) with timber bit for drilling through LWM structure logs prior to anchoring, generator and impact driver to cinch down the nuts and washers, and water trailer to manage dirty water at the site. Procured by Sub-contractor.Log tongs- Log tong excavator attachments will be used to grapple logs and install the large wood features within the project area. Procured by Sub-contractor.

Trees, shrubs, plants, and seed - will be used to re-plant the disturbed project areas to facilitate re-growth of the vegetation community proximal to the proposed project. Procured by applicant.

Survey gear rental and materials - a total station and associated tools will be used to set and check grading boundaries for the proposed excavation and will also be used to establish baseline post construction geometries for physical monitoring of the project performance. Stakes, spikes, paint, and flagging will be purchased as reference points and markers for grading extents. Procured by subcontractor.

Fuel - gasoline and diesel fuel will be required to run the heavy equipment and to provide transportation to the project site. Procured by subcontractor.

Biological survey gear rental - includes the rental of waders and wading boots for conducting cold weather flow surveys and water quality sampling; the rental of dry suit, mask and snorkel, and minnow traps for conducting the functional use biological surveys per the FRGP Guidelines for this project type; and rite-in-the-rain paper for recording data and making field notes on observations. Procured by subcontractor.

Water quality sampling equipment rental and related materials Includes the rental of hand-held water quality meters designed for field applications that conform to and utilize a USEPA-approved algorithm/method for the sample readings. Water quality monitoring is required to collect base-line data, monitor water quality during dewatering and pre-construction activities, to document water quality post-construction and during re-watering of the construction site once natural flows are re-established, and to monitor water quality during habitat feature construction and all other in-water work. Water quality sampling for the required first and second post-construction seasons monitoring requirements as per the FRGP Guidelines. Documentation of water quality parameter results will be recorded on the required Daily Water Quality Sample Form as provided in the FRGP Guidelines. Rite-in-the-rain paper for the required daily water quality sampling form and pencils. Procured by subcontractor.

Tasks:
Task 1: Meetings and Project Management
Meetings and Project Management

Task 1.1: Project Management
Project management includes grant management, contracting oversight and administration, scheduling, landowner and agency communication, landowner access agreements, subcontracting, ongoing coordination with the various stakeholders and members of the project design team, preparing invoices and progress reports, tracking project costs and accomplishments and assisting with final report preparation. All reporting and billing will be pursuant to grant and regulatory guidelines. Contract/Project Management will be conducted by PCFWWRA. PCFWWRA will track the project budget and develop and submit invoices to the grantor on a regular basis. In addition, required annual report metrics will be generated and submitted to the CDFW Contract Manager in December of every year during the contract term. PWA will manage subcontractor staff needs, construction implementation, monitoring requirements and will analyze accrued expenses and submit invoices to PCFWWRA for payment in addition to managing staffing needs during construction. PCFWWRA will select qualified contractors based upon their work experience and qualifications. PWA will assist PCFWWRA with the selecting a qualified general contractor or LTO for the heavy equipment and labor work. PWA Project Manager and Principal Scientist will assist PCFWWRA in the evaluation of contractor experience, equipment, and other selection criteria. PCFWWRA will contract with a qualified heavy equipment contractor and coordinate construction of the project with PWA providing Construction Management.

Multi-year construction windows are included for flexibility in scheduling. Construction will likely take place in a single season, however, to plan for extenuating circumstances that may make construction difficult during the second

year (delays in permitting, wildfires, etc) and allow us to balance workload with other existing and potential future FRGP implementation projects, thus ensuring delivery of high-quality construction oversight services, PWA has planned for the possibility that construction could occur in 2023, 2024, or 2025. This will help ensure delivery of high-quality construction oversight services.

Task 1.2: Project Scoping Meeting
Project Scoping Meeting with PCFWWRA and all PWA staff who will perform various construction oversight and monitoring requirements. The purpose of this meeting is to ensure all relevant project components are identified prior to selecting a heavy equipment subcontractor**.**

Task 1.3: Pre-Construction Walkthrough
A pre-construction walkthrough with the Project Engineer, Project Geologist, Project Biologist, and all prospective contractors for the heavy equipment operators so show key project areas and discuss project elements.

Task 1.4: Pre-Construction Meeting
Pre-construction meeting with the Project Engineer, Project Geologist, Project Biologist, selected subcontractor, and landowner representatives to go over their proposed construction sequencing, dewatering plan and to address questions prior to construction.

Task 1.5: Additional Meeting
Meetings with the Project Engineer, Project Geologist, Project Biologist, selected subcontractor, and landowner representatives to go over their proposed construction sequencing, dewatering plan and to address questions prior to construction.

Task 2: Permit Development and CEQA Compliance
For this project, CDFW's FRGP should include programmatic coverage for CEQA and SWRCB 401 Certification under their Regional General Permit. PCFWWRA will submit the permit application for the CDFW LSAA 1602 and will submit all data needed to meet CEQA requirements. For the off-channel feature, we have also included budget to apply for and conform with the requirements of a SWRCB Construction General Permit and Humboldt County Grading Permit, if needed.

Several pre-construction surveys will be conducted to ensure compliance with CEQA. PWA, WRA, and a qualified Wildlife Biologist CEQA subcontractor will conduct the necessary surveys.

Task 2.1: Wetlands Assessment
PCFWWRA plant ecologist will perform a jurisdictional wetland delineation based on hydrology, vegetation and soils, following ACOE protocol (Environmental Laboratory 1987). All wetlands found will be mapped and ACOE wetland determination forms will be completed. These data will be used for the ACOE 404 Permit and SWRCB 401 Certification.

Task 2.2: Cultural and Biologic Resources Investigation and Report
The Archeologist and Plant Ecologist subcontractors will perform all pre-project cultural resource and sensitive plant surveys prior to construction. PWA NR Specialist (Fisheries Biologist/Aquatic Ecologist) will conduct pre-construction surveys for the foothill yellow-legged frog (Rana boylii) and other sensitive or listed amphibians and reptiles to develop mitigation removal efforts if present with the CDFW Grant Manager. We anticipate not needing a Qualified Ornithologist/Biologist subcontractor to perform all pre-project sensitive bird surveys as this project will be conducted late in the summer months to avoid nesting periods. The CEQA Specialty subcontractors will, at a minimum, complete the following subtasks within the designated project area: (a) Identify and document significant occurrences of sensitive species/artifacts/fossils. (b) Suggest preliminary significance of these resources. (c) Evaluate potential impacts on these resources resulting from implementation of proposed activities. (d) Present recommendations designed to protect resources and/or identify areas of avoidance. (e) Produce documentation of services and Report of Findings that will be utilized to secure environmental documents and permits required to implement the project.

Task 2.3: SWRCB General Construction Permit and SWPPP Development
The archaeological subcontractor will conduct the necessary pre-project archeological and cultural resource surveys. This data will be provided to PCFWWRA to incorporate into the necessary permit applications and CEQA submittal requirements.

Task 2.4: Additional Permit Development
PCFWWRA will complete the necessary vegetation mapping for and prepare and submit the applications for the following permits: CDFW LSAA 1602, ACOE 404 Permit, SWRCB 401 Certification, Humboldt County Grading Permit and Streamside Management Permit. PWA will provide supporting documentation, such as maps and figures and a grading plan package for these permits, as needed. CDFW's FRGP may include programmatic coverage for the LSAA and SWRCB 401 Certification under their Regional General Permit.

Task 3: Heavy Equipment and Labor Contractor Selection
PCFWWRA will select qualified contractor(s) based upon their work experience and qualifications. PWA will assist PCFWWRA with selecting a qualified heavy equipment general contractor.

Task 3.1: Conference Call and Field Meeting Preparation
This task includes attending one telephone conference call meeting where contractor specifications and requirements will be addressed.

Task 3.2: Evaluation of contractors and response to questions
PWA Project Manager and Principal Scientist will work with PCFWWRA in the evaluation of contractor's experience and equipment, and selection of the contractor. PCFWWRA will contract with a qualified heavy equipment contractor and coordinate construction of the project.

Task 4: Site Preparation
PWA will identify and flag equipment access trails to each of the project work locations, establish pre-project photo documentation, conduct the pre-treatment amphibian and reptile surveys and conduct base-line water quality sampling,) and finalize the instream LWD feature designs for approval by the CDFW Grant Manager. PCFWWRA will purchase and deliver materials for water quality protection and setting up the water diversion. RTA will carry out pond draw down and electrofishing/trapping of the pond to relocate fish, ammocoetes, and amphibians.

Task 4.1: Construction Stakeout
PWA will provide construction layout/stakeout for the project. The stakeout will include establishment of elevation control and placement of stakes to denote the location and stationing of the proposed centerline of the stream channel, pond and left/right streambank configurations, and alcove perimeter. In addition, spoil areas will be delineated. Once staking is complete, it will be the obligation of the contractor to maintain the stake locations and to determine locations of non-staked items. PWA Project Manager and Technical Staff will layout the temporary construction access, define the stockpile locations and establish the limits of disturbance for the contractor utilizing flagging, stakes and/or paint. The PWA Project Manager or their designee, will oversee construction operations.

Task 4.2 Finalize LWD Structure Plan and Layout
PWA will conduct water quality monitoring beginning with gathering baseline water quality data before dewatering and construction begins, followed by measuring water quality parameters during the de-watering activities. Water quality monitoring will continue three times daily taken at the beginning, middle, and end of the day, during all construction activities. Once the construction is completed, water quality monitoring will be made as the channel is rewatered

and after flows are completely restored to the channel. Additional water quality monitoring will be conducted every 4 hours during any in-water work for constructing and anchoring fish habitat improvement features. See attached Water Quality Monitoring Plan in Supplemental Documents section.

Task 4.3 Fish and Amphibian Relocation
Ross Taylor and Associates will conduct all pre-project fish and amphibian relocation activities. These include: a pre-construction site walk; stream draw down; fish and amphibian relocation; and reporting. The Principal Investigator will also be available for calls on an as needed basis during construction.

Task 5: Construction and Construction Oversight
Construction of pond, alcove, and channel will be undertaken according to engineered plan set. Either concurrently or immediately after, we will construct 18 instream LWD structures within project reach, spread native seed and place erosion control mulch on all exposed bare soil areas.

Task 5.1 Construction and Construction Oversight
All earthwork, erosion, sediment and water pollution controls, stream dewatering, instream structure construction, and revegetation will conform to the 100% Design Submittal Plans and Special Provisions detailed in the Ryan Creek Phase II Off-Channel Coho Habitat Improvement Design Project. Any deviations from these Plans and Special Provisions MUST obtain approval from the PWA Project Engineer and PCFWWRA prior to taking place. It is expected that temporary access development, earthwork, instream LWD structure construction, site stabilization and revegetation efforts will take several weeks. Heavy equipment (e.g. excavator, bulldozer, dump trucks) and labor are required to complete these tasks; other materials include large woody debris, rock, plants, and erosion control supplies. All project contractors and personnel will adhere to CDFW invasive species prevention and equipment decontamination protocols. When applicable, all heavy equipment, survey and field gear will abide by the protocols outlined by CDFW (see Supplementary Documents). Moreover, all mitigation measures described in the CDFW Regional General Permit will be followed and all other required permit provisions will be followed by the Contractor. Additionally, all the requirements of the SWRCB General Construction Permit and/or EPA Small Project Rainfall Erosivity Waiver will be met for construction of the off-channel feature.

The PWA Project Manager, Engineers, and Scientific Staff will coordinate to provide daily construction operations management and oversight to ensure timeliness, completion, and conformance with the Plans and land management goals of the landowner, the project, and to resolve contractual issues. PWA Project Manager will notify PCFWWRA to order and schedule for delivery required materials. PWA Project Manager and Scientific and Engineering Staff

will oversee materials stockpiling and evaluate and ensure the contractor maintains the effectiveness of erosion control efforts throughout construction. PWA will perform oversight during the implementation phase to oversee grading operations and large wood structure placement in the channel/ponds. During construction, PWA will check the constructed grades of the restored channel to ensure compliance with the design and be available to clarify the intent of the design plans, when necessary. The project team will schedule construction progress meetings for addressing unforeseen conditions that arise and to make field changes, as necessary. PWA engineering staff will also be available for fit-in-the-field of all complex large wood structures and to verify buoyancy calculations. Installation and field fits of all complex large wood structures require on-site oversight by the Project Engineer.

Construction Closeout: Punchlist walkthrough: when the project is near completion, PWA, PCFWWRA, the Owner, CDFW Grant Manager, and Contractor will walk the site and identify any items needing modification or completion. A Punch list will be generated identifying any unfinished work. Final walkthrough: Following substantial completion, PWA, PCFWWRA, the Owner and the Contractor will walk the site for the final inspection. Recommendations for changes will be made to the Contractor or project will be approved.

Task 5.2: Construction Meetings (weekly)
The project team will schedule one construction kickoff meeting and weekly construction progress meetings. During those meetings, PCFWWRA and PWA will be available to make recommendations for addressing unforeseen conditions that arise and for making field changes, as necessary.

Task 5.3: As-Built Design Modifications
Any deviations from the Plans and Special Provisions MUST obtain prior written approval from the PWA Senior Engineer (or Associate Engineer) and PCFWWRA prior to taking place.

Task 5.4: SWPPP Monitoring
This task includes completing all monitoring and reporting requirements necessary to comply with the SWRCB?s General Construction Permit and the storm water pollution prevention plan as necessary for this project.

Task 6: Riparian Replanting
PCFWWRAs Botanist and Wetland Scientist will prepare a Riparian Revegetation and Wetland Restoration Plan and revegetation locations will be delineated for plant placement. Once moisture conditions are favorable, the PCFWWRA field assistant will plant native trees, shrubs, and other plants following the Riparian Revegetation Plan with oversight by the PCFWWRA Botanist.

Task 7: Pre/Post Construction Monitoring
This task includes as-built drawings of the constructed features, pre- and post-project cross-sections of the off-channel feature, pre- and post-project photo monitoring, construction water quality monitoring reports and removal/rescue/mitigation efforts by species and activity, the monitoring report on the functional use by the target species, flow surveys of the inlet/outlet and other critical hydrologic features, and water quality monitoring for the first and second post-construction seasons, and the, and First Winter Observations of the complex wood structures.

Task 7.1 As-Built Surveys
PWA will prepare as-built drawings using the construction drawings with red-line markups of the construction documents of any changes that occurred during construction. Final elevations of the channel, if they differ from the design drawings, will be noted on the as-built drawings. These will be used for final reporting requirements. Hydraulic cross sections will be surveyed within the project area as directed by the Project Engineer. Stakes will be installed as markers to provide a base line for any future monitoring activities. This may help inform sedimentation rates in the short term and provide a mechanism to study long range sedimentation processes.

Task 7.2: Physical Monitoring
PHOTOGRAPHIC MONITORING: (PWA) Pre- and post-construction photographs will be taken at established photo point monitoring stations to capture site conditions before, during and after implementation for the first and second post-construction required monitoring. Photographic monitoring will occur pre- and post-construction and, when required, as part of the First Winter Observations. The intent of the photographic monitoring is to visually evaluate project components including excavated features, hydraulic structures, large wood features, and revegetation efforts. The intent of the photographic monitoring is to visually evaluate project components including excavated features, hydraulic structures and seasonal flow conveyance fluctuations through the inlet and outlet.
FIRST WINTER OBSERVATIONS: PWA will complete post-project monitoring of the complex wood structures following the first winter after construction. This will include inspecting the structures for changes such as storm damage, missing key pieces, and counts of both large and small wood pieces accumulated on the structure. Photo observations will also be included.
OFF-CHANNEL FEATURE MONITORING: PWA will conduct pre-and-post construction photographic monitoring, collect cross-sections, and conduct a flow survey of the constructed inlet/outlet of the off-channel pond, the alcove, and other critical hydraulic features.
. Additionally, PWA will provide a written description stating if and/or when the off-channel features became active.

WATER QUALITY MONITORING: PWA will conduct Pre-, during- and post-construction water quality monitoring within the project area. A monitoring site array will be established and will include but is not limited to, sampling control in situ locations upstream and outside the influence of the construction activities within the mainstem Ryan Creek above the connective channel to the alcove and pond, and in the second order tributary above the diversion area for dewatering should it be conveying surface water; downstream sampling locations will include sites 300 feet downstream from the project inlet/outlet and if the tributary has surface flow, any effluent from diverted tributary (clean water) water, and 300 feet downstream from the point of discharge. Water quality sampling will also be conducted within the existing pond prior to construction and dewatering, and after construction is completed during rewatering. All activities within Ryan Creek or live channels of the inlet /outlet will be monitored during construction and post construction, upstream and out of the influence of the construction activities and 300 feet downstream from the construction activities. Water quality monitoring will be taken a minimum of three times daily; before construction begins, during construction, and at the end of the day or when construction is complete. Turbidity, Dissolved Oxygen, pH, and temperature will be monitored at a minimum. Please see the Water Quality Monitoring Plan for a more detailed description of the sampling locations, spatial and temporal sampling scales for the different construction activities, minimum water quality parameters to be monitored and meters, and reporting. Hand-held water quality meters designed for field applications that conform to and utilize a USEPA-approved algorithm/method for the sample readings will be used for all water quality monitoring. Water quality monitoring will also be conducted for the off-channel monitoring requirements for the first and second post-construction seasons? monitoring efforts as per the FRGP Guidelines. For these water quality monitoring efforts, replicate sampling will occur at the established sampling locations and at new locations within the pond and backwater alcove to detect changes in parameters at varying water depths and proximity to the inlet/outlet channel and the second order tributary the flows into the pond. Sampling will occur primarily during the target season, winter, but water quality samples will also be taken when back flooding from Ryan Creek is initiated and as flows recede into the summer months when disconnection timing is most probable, if it were to occur. Results from the water quality sampling efforts will be summarized with in the Monitoring Report that will also include the other monitoring parameter requirements. Hopefully, the two post-construction seasons of monitoring will contribute to the data pool for the broader scale monitoring needed to facilitate a better understand of the merits for a project type that is considered to be experimental and relatively new to California.

Task 7.3 Biological Monitoring

Biological Surveying and Reporting (PWA) As per the monitoring requirements within the FRGP Guidelines for off-channel features, biological surveying for

functional use of the constructed habitats will be conducted, for juvenile coho salmon (target species and target life stage), other salmonid juveniles, primarily once the rainy season has begun through to when the flows begin to recede as summer begins (anticipated time of use). Direct underwater observations through snorkeling will be the primary survey technique. This is the best suited method for determining functional habitat use by species at age within lentic and lotic systems, as habitat utilization can actually be watched, and behaviors can be identified with little effort expressed as time observing at one site or in making a pass through the pond and alcove. Visibility can be a confounding factor during the winter and when visibility is limited, minnow trapping will be used for presence/absence within the pond at different locations near the constructed LWM habitat features and other physical features of the pond, within the alcove, and in the inlet/outlet. This biological surveying will begin the first season after construction has been completed and be continued through the second post-construction season has ended with declining late spring/summer flows. The biological survey results will include all species observed and will be summarized with in the Monitoring Report that will also include the other monitoring parameter requirements. Hopefully, the two post-construction seasons of monitoring will contribute to the data pool for the broader scale monitoring needed to facilitate a better understand of the merits for what is considered to be an experimental project type and relatively new to California.

All physical and biological monitoring will be summarized into one comprehensive report. This will primarily be comprised of the first and second post-construction season monitoring required for off-channel habitat features within the FRGP Guidelines which include: A) Pre and post-project monitoring, B) Pre- and post-construction and design flows surveys at the inlet and outlet, and any other critical hydraulic feature, C) Describing if and when the inlet and outlet become inundated or become dewatered, D) The functional use of the target species at age during the expected time frame of use, and E) Water quality monitoring. The First Winter Observations Summer will also be included and any other physical and/or biological surveys and/or observations will be included with the intent to contribute to the broader scale monitoring to evaluate the merits of these new project types.

Task 8: Maintenance Activities

PROJECT MAINTENANCE: The proposed project is designed to be self-maintaining. However, if post-project conditions exceed monitoring thresholds and maintenance appears necessary, PCFWWRA and PWA will attend meetings with the appropriate resource agencies, including CDFW, to determine if maintenance action is warranted. If action is warranted, PWA will provide construction oversight. PCFWWRA will coordinate all permitting and project coordination. If necessary, heavy equipment or laborers may perform temporary periodic intervention to maintain or enhance the functional use of the restored

channel and off-channel habitat features. This task includes meetings, communications, and field-based oversight, as needed. During annual re-vegetation monitoring inspections, if overall performance standards are not being met, then PCFWWRA will conduct maintenance according to the Revegetation Plan requirements.

Task 9: Final Project Report
The proposed project is designed to be self-maintaining. However, if post-project conditions exceed monitoring thresholds and maintenance may be necessary, PCFWWRA and PWA will attend meetings with the appropriate resource agencies, including CDFW, to determine if a maintenance action is warranted. If action is warranted, PWA will provide construction oversight. PCFWWRA will coordinate all permitting and project coordination. If necessary, heavy equipment or laborers may perform temporary periodic intervention to maintain or enhance the functional use of the channel and habitat features.

Deliverables:
Task 1: Meetings and Project Management
- Meeting summaries, annual progress reports, regular invoices

Task 1.1: Project Management
- Meeting agendas, notes, emails, annual progress reports, regular invoices

Task 1.2: Project Scoping Meeting
- Meeting notes

Task 1.3: Pre-Construction Walkthrough
- Meeting notes

Task 1.4: Pre-Construction Meeting
- Meeting notes

Task 1.5: Additional Meeting
- Meeting notes

Task 2: Permit Development and CEQA Compliance
- permit applications, report of findings and CEQA surveys.

Task 2.1: Wetlands Assessment
- Wetland Assessment report

Task 2.2: Cultural and Biologic Resources Investigation and Report
- Cultural and Biologic Resources Investigation Report

Task 2.3: SWRCB General Construction Permit and SWPPP Development
- Submit required PRDs and submit them into the SMARTS database

Task 2.4: Additional Permit Development
- Submit permit applications

Task 3: Heavy Equipment and Labor Contractor Selection
- Selection of heavy equipment contractor, Meeting agendas, notes, emails, addendums

Task 3.1: Conference Call and Field Meeting Preparation
- Meeting notes

Task 3.2: Evaluation of contractors and response to questions
- Selection of Contractor

Task 4: Site Preparation
- Final LWD Designs, Fish Relocation data/report

Task 4.1: Construction Stakeout
- Construction staking and marking for construction.

Task 4.2 Finalize LWD Structure Plan and Layout
- Finalize plan, photographs

Task 4.3 Fish and Amphibian Relocation
- Relocation reports

Task 5: Construction and Construction Oversight
- Completed reconfiguration of the pond and adjacent floodplain, Large wood habitat structures installed, Construction logs, meeting notes, punchlist and final inspection outcome.

Task 5.1 Construction and Construction Oversight
- A Punch list will be generated identifying any unfinished work. Final walk through
- Recommendations for changes will be made to the Contractor or project will be approved.

Task 5.2: Construction Meetings (weekly)
- Meeting notes

Task 5.3: As-Built Design Modifications

- As-built designs

Task 5.4: SWPPP Monitoring
- Water quality monitoring reports

Task 6: Riparian Replanting
- Revegetation Plan and plants installed

Task 7: Pre/Post Construction Monitoring
- As-built drawings, pre- and- post-construction monitoring of the off-channel feature, report describing the connectivity of the off-channel feature with the mainstem, before and after photos of up to 10 features, construction, the removal/rescue/mitigation efforts by species and activity, the monitoring report on the functional use of the enhanced pond and structures/features within it and other constructed features associated with the project goals, by the target species, flow surveys of the inlet/ outlet channel, alcove, and other critical hydrologic features, and water quality monitoring for the first and second post-construction seasons, and the First Winter Observations Summary.

Task 7.1 As-Built Surveys
- As built drawings and report

Task 7.2: Physical Monitoring
- Photographic First Winter Observations, Off-Channel Feature Monitoring, Water Quality Monitoring

Task 7.3 Biological Monitoring
- Biological Surveying and Report

Task 8: Maintenance Activities
- As-built memo style report (only if any maintenance occurs)

Task 9: Final Project Report
- A FNL report will be completed near the end of the contract. FNL report includes:
    - Actual performance measures per site described in the grant agreement.
    - As-built drawings that include feature placement, design changes where applicable, alignment, sizes, and quantity of material.
    - Before/after photos
    - Pre/post longitudinal profiles and cross-sections where channel grade is restored or otherwise modified by the project.

- Biological surveys within the constructed habitats for functional use by juvenile coho, the target species at age, other juvenile salmonids during the rainy season velocities are high in Ryan Creek and any other biological observation made.
- Pre/post-construction flow surveys of constructed inlet and outlet of the off-channel pond, and other critical hydraulic features.
- Description of if and/or when the off-channel pond became inundated by backwater channel flow or disconnected from the main channel flow.
- Summary of the First Winter Observations of all complex LWM.

Timelines:
Task 1: Meetings and Project Management
04/01/2022 to 03/31/2026
Task 2: Permit Development and CEQA Compliance
06/01/2022 to 06/15/2023
Task 3: Heavy Equipment and Labor Contractor Selection
05/15/2023 to 07/19/2024
Task 4: Site Preparation
01/01/2024 to 09/08/2025
Task 5: Construction and Construction Oversight
08/01/2024 to 10/31/2025
Task 6: Riparian Replanting
10/15/2024 to 02/15/2026
Task 7: Pre/Post Construction Monitoring
08/01/2024 to 03/31/2026
Task 8: Maintenance Activities
10/01/2023 to 03/31/2026
Task 9: Final Project Report
11/01/2024 to 03/31/2026

Additional Requirements:
The Permittee will not proceed with on the ground implementation until all necessary permits and consultations are secured and a “notice to proceed” letter has been received from the Grantor Project Manager. Work in flowing streams is restricted per the Army Corp of Engineers Regional General Permit. Actual project start and end dates, within this timeframe, are at the discretion of the Grantor.

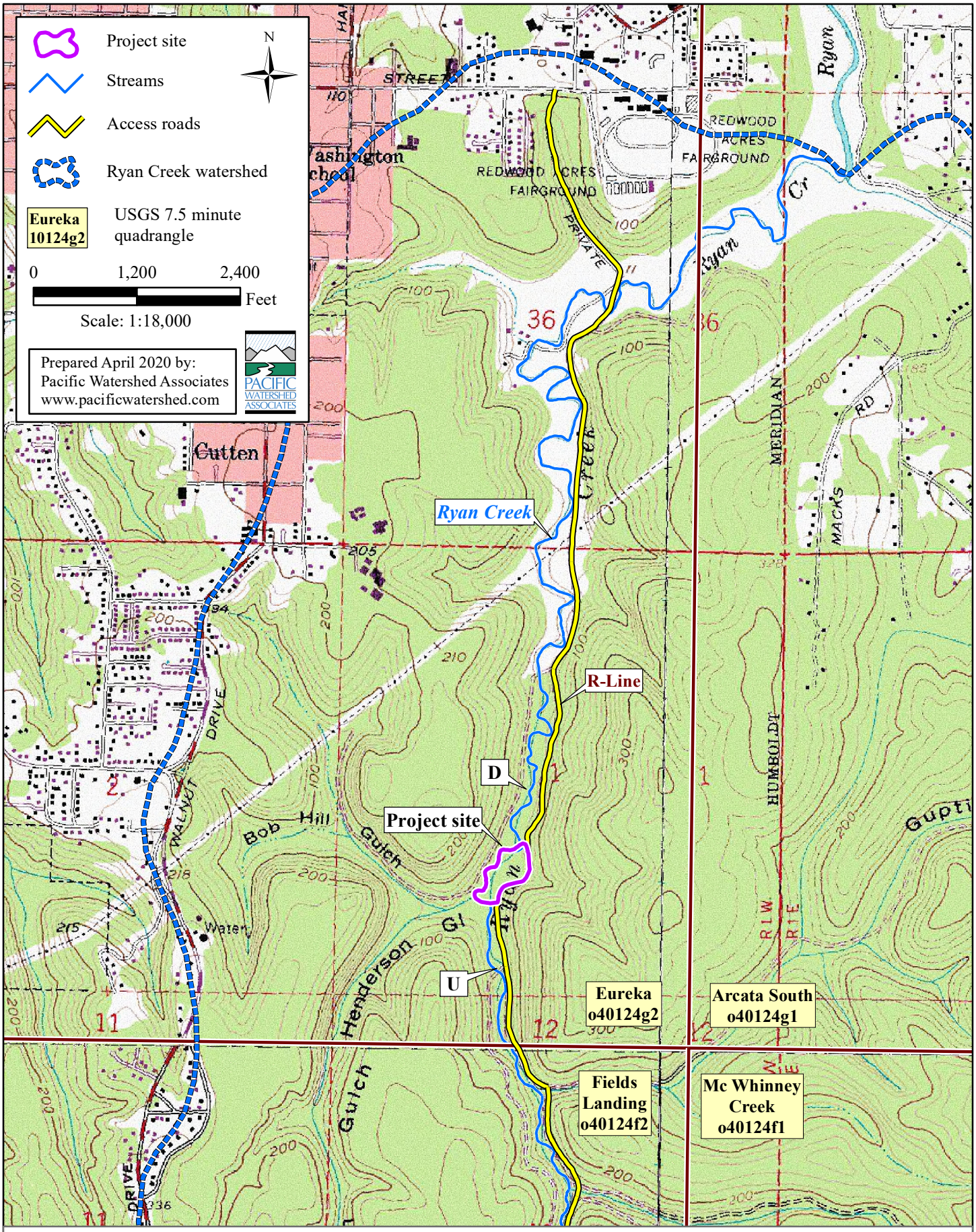
No equipment maintenance will be performed within or near the stream channel where pollutants (such as petroleum products) from the equipment may enter the channel via rainfall or runoff. Appropriate spill containment devices (e.g., oil absorbent pads, tarpaulins) will be used when refueling equipment.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

of each workday when there is a threat of heavy rains which will cause flooding.

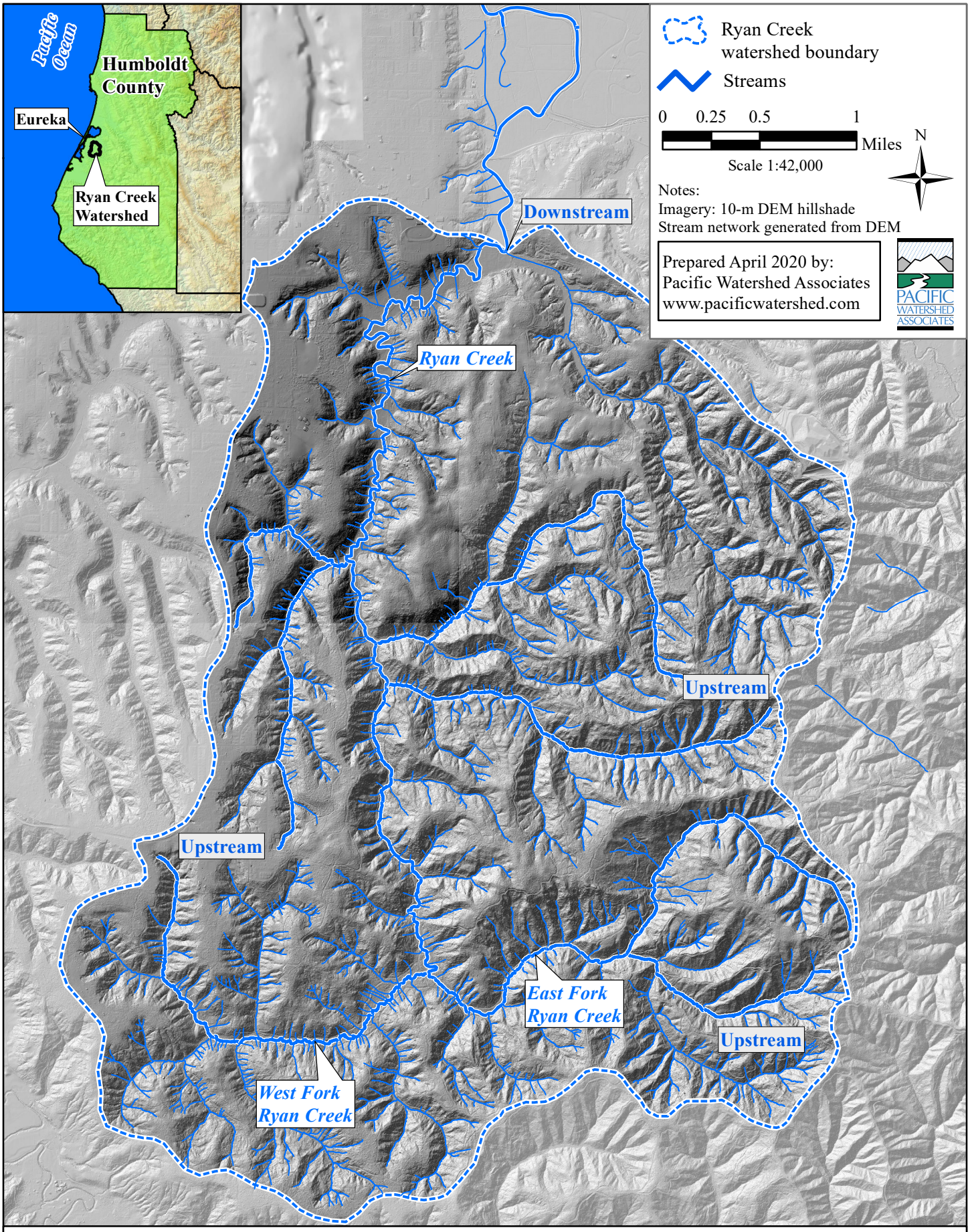
All equipment and gear will be brushed with a stiff brush prior to leaving each stretch of stream to avoid the transport of aquatic invasive species (AIS). All crew members will decontaminate equipment and shoes for AIS according to the standards detailed in the California Department of Fish and Wildlife 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.

Final structure design and placement will be determined by field consultation between the Permittee and the Grantor Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual.*



Map 1. Project Location Map, Ryan Creek Off Channel Coho Habitat Implementation Project, Humboldt County, California. (Eureka USGS 7.5' quadrangle). Applicant: PCFWWRA



Map 2. Watershed Map, Ryan Creek Off Channel Coho Habitat Implementation Project, Humboldt County, California. Grantee: Pacific Coast Fish, Wildlife and Wetlands Restoration Association (PCFWWRA)

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Eureka (4012472) OR Arcata South (4012471) OR McWhinney Creek (4012461) OR Fields Landing (4012462) OR Cannibal Island (4012463) OR Tyee City (4012482) OR Arcata North (4012481))

Possible species within the Eureka and surrounding quads for 1726150 - Ryan Creek Off-Channel Coho Habitat, Humboldt County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Acipenser medirostris green sturgeon	AFCAA01030	Threatened	None	G3	S2	SSC
Anodonta californiensis California floater	IMBIV04220	None	None	G3Q	S2?	
Aplodontia rufa humboldtiana Humboldt mountain beaver	AMAFA01017	None	None	G5TNR	SNR	
Arborimus albipes white-footed vole	AMAFF23010	None	None	G3G4	S2	SSC
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Ascaphus truei Pacific tailed frog	AAABA01010	None	None	G4	S3S4	SSC
Astragalus pycnostachyus var. pycnostachyus coastal marsh milk-vetch	PDFAB0F7B2	None	None	G2T2	S2	1B.2
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3	S2	
Cardamine angulata seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
Carex arcta northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
Carex leptalea bristle-stalked sedge	PMCYP037E0	None	None	G5	S1	2B.2
Carex lyngbyei Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Carex praticola northern meadow sedge	PMCYP03B20	None	None	G5	S2	2B.2
Castilleja ambigua var. humboldtiensis Humboldt Bay owl's-clover	PDSCR0D402	None	None	G4T2	S2	1B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2S3	SSC
Charadrius nivosus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S2	
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Coastal Terrace Prairie Coastal Terrace Prairie	CTT41100CA	None	None	G2	S2.1	
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Entosphenus tridentatus Pacific lamprey	AFBAA02100	None	None	G4	S4	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	
Fissidens pauperculus minute pocket moss	NBMUS2W0U0	None	None	G3?	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Gilia capitata ssp. pacifica Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S3	1B.2
Lampetra richardsoni western brook lamprey	AFBAA02180	None	None	G4G5	S3S4	SSC
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lathyrus japonicus seaside pea	PDFAB250C0	None	None	G5	S2	2B.1
Lathyrus palustris marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
Layia carnosa beach layia	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
Lilium occidentale western lily	PMLIL1A0G0	Endangered	Endangered	G1	S1	1B.1
Lycopodium clavatum running-pine	PPLYC01080	None	None	G5	S3	4.1
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Martes caurina humboldtensis Humboldt marten	AMAJF01012	Threatened	Endangered	G4G5T1	S1	SSC
Mitellastra caulescens leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
Monotropa uniflora ghost-pipe	PDMON03030	None	None	G5	S2	2B.2
Montia howellii Howell's montia	PDPOR05070	None	None	G3G4	S2	2B.2
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Foredune Grassland Northern Foredune Grassland	CTT21211CA	None	None	G1	S1.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Oenothera wolfii Wolf's evening-primrose	PDONA0C1K0	None	None	G2	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oncorhynchus clarkii clarkii coast cutthroat trout	AFCHA0208A	None	None	G5T4	S3	SSC
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	AFCHA02032	Threatened	Threatened	G5T2Q	S2	
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	AFCHA0209Q	Threatened	None	G5T2T3Q	S2S3	
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pekania pennanti Fisher	AMAJF01020	None	None	G5	S2S3	SSC
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Puccinellia pumila dwarf alkali grass	PMPOA531L0	None	None	G4?	SH	2B.2
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G3T1	S1	FP
Rana aurora northern red-legged frog	AAABH01021	None	None	G4	S3	SSC
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rhyacotriton variegatus southern torrent salamander	AAAAJ01020	None	None	G3G4	S2S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Scaphinotus behrensi Behrens' snail-eating beetle	IICOL4L070	None	None	G2G4	S2S4	
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
Sidalcea oregana ssp. eximia coast checkerbloom	PDMAL110K9	None	None	G5T1	S1	1B.2
Silene scouleri ssp. scouleri Scouler's catchfly	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
Sitka Spruce Forest Sitka Spruce Forest	CTT82110CA	None	None	G1	S1.1	
Spergularia canadensis var. occidentalis western sand-spurrey	PDCAR0W032	None	None	G5T4	S1	2B.1
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sulcaria spiralifera twisted horsehair lichen	NLT0042560	None	None	G3G4	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Thaleichthys pacificus eulachon	AFCHB04010	Threatened	None	G5	S2	
Trichodon cylindricus cylindrical trichodon	NBMUS7N020	None	None	G4G5	S2	2B.2
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
Viola palustris alpine marsh violet	PDVIO041G0	None	None	G5	S1S2	2B.2

Record Count: 86