Introduction:

The Pacific Coast Fish, Wildlife and Wetlands Restoration Association (PCFWWRA) will implement the Lower Little River Off-Channel Coho Habitat Improvement Project. The Little River supports populations of endangered Coho Salmon. The purpose of the project is to improve habitat in the Lower Little River. Salmonid recovery plans recommend restoring natural tidal channel form and function. Restoring tidal function to Little River will create quality, off-channel rearing habitat for juvenile Coho Salmon.

The Permitee 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 https://www.wildlife.ca.gov/Grants/FRGP/Guidance).

Objective(s):

The objective of this project is to enhance connectivity to the floodplain by creating off-channel pond(s)/channel(s) which enhance winter high-flow refugia and rearing habitat for coho salmon in the lower Little River estuary.

Project Description:

Location:

The project location is along a portion of the lower 1.6-miles and surrounding floodplain of Little River near McKinleyville, California. The focal area of the project is near where an unnamed tributary enters into Little River from its left bank approximately 0.6-miles upstream from the Highway 101 bridge and 1.3-miles upstream from the Little River/Pacific Ocean confluence. Project coordinates are: 41.012511 North and 124.105103 West.

Project Set Up:

PCFWWRA will provide all contracting oversight and administration including but not limited to obtaining permits; securing contracts (grantors, subcontractors, and landowner); project scheduling; invoicing; report preparation; as well as facilitating agency and landowner communications.

PCFWWRA Personnel Categories - Project Manager (PM): Task 1-5. 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 they sure are in place and that they are followed. The PM regularly reviews the progress of the project and completed work with respect to the approved

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budget, as well as working regularly with technical consultants to make sure it is being done to the required standards. Evaluating information developed during the project and identifying realistic permitting strategies for implementation will be a task for the Project Manager. The PM will also expend time on tasks for compliance with requirements contained in the Agreement's Exhibit 1.b Non-Public Entities General Grant Provisions during the entire project. The PM is responsible for the review, editing, and submission of all invoices and reporting on projects. The Manager's time is split between the field, meetings and the office.

Plant Ecologist: Tasks 2 & 5. The Plant Ecologist performs botanical work. Tasks include performing a comprehensive floristic survey of the project site, mapping vegetation, inventorying and mapping any sensitive plants or natural communities found, photographing plants and habitats, preparing reports, and providing other supporting materials as needed for permit acquisition. Additionally, the Plant Ecologist will work with PWA staff to delineate wetlands prior to restoration and to monitor wetland response for three years following restoration. The Plant Ecologist's time is split between the field and office.

GIS Specialist: Tasks 2 & 5. The GIS Specialist performs GIS work. Tasks include supporting field collection of botanical data and analyzing geospatial data. The GIS Specialist will prepare vegetation maps, sensitive plants and natural communities maps, wetland maps, and other maps needed for reporting and permitting. The GIS Specialist spends the majority of time in the office but also assists on-site as needed.

Administrative Assistant Manager (AAM): Task 1 & 5. 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. The Assistant position also expends time on tasks required for compliance with contained in the Agreement's Exhibit 1.b Non-Public Entities General Grant Provisions during the entire project. The AAM spends the majority of time in the office but also assists on-site as needed.

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 maintainoffice functions, provide communications and perform site visits and support as needed. This position also tracks and completes tasks required for compliance contained in the Agreement's Exhibit 1.b Non-Public Entities General Grant Provisions during the entire project.

Engineering and Geologic Subcontractor (Construction layout/stakeout and technical oversight, construction management, monitoring and reporting) – Pacific Watershed Associates, INC. (PWA), Personnel will support PCFWWRA with heavy equipment contractor selection, project implementation, construction supervision/management and will perform a pre/post-construction monitoring and as-built topographic surveys for the removal of the tide gate & channel reconstruction/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 monitoring and summary reporting pursuant to FRGP contract deliverables.

Personnel Categories: Principal Scientist: Tasks 1-5. Provides technical expertise in developing contractor bid documents, implementation activities, draft & final work plan review, editing & professional guidance for project technicians, scientists & engineers.

Senior Engineer: Tasks 1-5. Lead engineer in overall responsible charge of preparation of all construction documents and specifications, construction oversight, site surveys & monitoring/reporting requirements. Ensures compliance with Professional Engineers Act (California Business and Professions Code 7800).

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

Staff Geologist/Project Manager: Task 1-5. Licensed geologist in support of preparation of construction documents, construction management, site surveys & monitoring/reporting requirements. In charge of project management as it relates to staffing needs & 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).

Senior Geologist (Paleontologist): Task 2. Conducts pre-construction paleontological survey for CEQA.

Staff Biologist: Tasks 2, 4 and 5. Conducts botanical inventory to establish floristic baseline for revegetation plan. Sources plant/planting material locally or onsite. Prepare/revise and implement invasive species management plan. Stake out revegetation plan on-ground and oversee planting efforts. Collects and enters

field data into electronic database(s) as necessary. Monitors revegetation efforts annually for up to three years and develops annual status reports.

Staff Fisheries Biologist: Tasks 2, 4 and 5. Conducts pre-construction habitat evaluations, macroinvertebrate identification, eDNA sampling for salmonids and euryhaline species, and water quality sampling. Conducts post-construction monitoring through habitat evaluations and macroinvertebrate identification, eDNA sampling for salmonids and euryhaline species, and water quality sampling. Data collected will be provided in annual status reports and entered into electronic database(s) as necessary. Working in a coordinated effort with Fisheries Biologist Subcontractor for sampling efforts and locations and creating a complete database and comprehensive final evaluation of the biological findings and biological functions of the completed project.GIS/CAD Staff: Tasks 2-5. 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): Task 2. This subcontractor will be responsible for performing sensitive cultural resource surveys prior to construction.

Wildlife Biologist CEQA Subcontractor: Task 2. A qualified biologist will be selected to perform spotted owl, willow flycatcher, &/or any other sensitive bird surveys if necessary prior to construction.

Fisheries Biologist Subcontractor (Ross Taylor & Associates, (RTA)): Task 3-5. Principal Investigator & Field Staff are available to assist construction contractors with fisheries & amphibian relocation services associated with fish passage improvement projects or any streamside projects that require relocation of fish prior to construction and/or dewatering of stream segments. Services include: coordination with state & federal fishery agencies, capture & relocation of fish & amphibians, & completion of required state & federal reporting.

Heavy Equipment & Labor Contractor: Task 4. Implementation. The equipment and labor contractor will construct the project. Additionally, the equipment contractor will maintain temporary fish barriers & flow diversion during construction. Personnel categories include: Excavator, Dozer, Loader, Scraper, Dump Truck, Water Truck & Compactor operators, & 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 chosen through a rigorous selection process after the grant contract is signed.

Materials:

Materials that are required for project management include vehicle mileage, 1602 permit fee, and supplies. PCFWWRA Supplies may include meeting materials, field supplies, and external professional printer services for design plans and project reports. Materials for implementation also include LWD trees, Rock for ballast, threaded rebar including washers and nuts, trees and plants, seed, straw, waddles, fencing materials, culvert and couplings.

PWA will have vehicle mileage, field supplies, survey materials including lath, nails, flagging, paint and total station, water quality meter and hydrologic meter rental. Small office supplies will be used to complete the project including: photographic supplies, field maps, mylar overlays for field maps, photo duplication for final reports, copying/binding for final reports, report maps, phone, fax, email, handouts for the outreach component, postage, mapping and printing of design drawings.

The project also includes equipment rental fees and material costs related to fish relocation (.e.g. electrofishing gear, seine net, 3in. centrifugal pump, hardware cloth, rebar, t-posts.).

Heavy equipment and labor contractors will require construction and erosion control materials to complete the project. These include LWD trees, rock for ballast, threaded rebar including washers and nuts, trees, plants, seed, straw, waddles, fencing materials, culvert and couplings. These materials may be obtained from the Grantee. They will also need fuel and lubricants for vehicles and equipment.

Tasks:

Task 1 – Meeting and Contract 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. All reporting and billing will be timely and pursuant the contract and regulatory guidelines. 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.

Task 2 – Permit Development:

PCFWWRA will submit the necessary permit applications including but not limited to: CDFW LSAA 1602, ACOE 404 Permit, SWRCB 401 Certification, Coastal Development Permit/Consistency Determination, NOAA BO, SWRCB Construction General Permit, Humboldt County Grading and Streamside Management Permit. CDFW's FRGP may include programmatic coverage for the LSAA and SWRCB 401 Certification under their Regional General Permit. PCFWWRA will conduct vegetation mapping, special status plant and natural communities' surveys, and assessment of wetland vegetation.

PWA, Archeological CEQA Subcontractor and Wildlife Biologist CEQA Subcontractor will conduct the necessary paleontological, archeological, wildlife, and wetland delineation. This data will be provided to PCFWWRA to incorporate into the necessary permit applications and CEQA submittal requirements.

PCFWWRA, PWA, and the Archeologist and Wildlife Biologist subcontractors will perform all pre-project cultural resource, sensitive plant surveys and wetland delineations prior to construction. The Qualified Wildlife Biologist subcontractor will perform all pre-project sensitive bird surveys, if necessary, for spotted owl, willow flycatcher, and any other species required for environmental compliance. The Paleontologist will perform surveys and evaluate the site significant paleontological resources. For all sensitive resources, the following subtasks will be performed within the designated project area: (a) Identify and document significant occurrences of sensitive species/wetlands/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 3 – Heavy Equipment and Labor Selection:

PCFWWRA will select qualified contractors based upon their work experience and qualifications. PWA will assist PCFWWRA with the selecting qualified contractor(s). This task includes attending one telephone conference call meeting where contractor specifications and requirements will be addressed. PCFWWRA and PWA will attend one on-site consultation meeting organized to describe the project to prospective contractors and prepare a response to project-related questions. PWA Project Manager and Principal Scientist will work with PCFWWRA in the evaluation of contractor's experience, equipment and personnel, and selection of the contractor. PCFWWRA will contract with a qualified heavy equipment contractor and coordinate construction of the project.

Task 4 – Construction and Construction Oversight:

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, ponds, and left/right streambank configurations, LWD structure locations, and removal of the tide gate. In addition, spoil regrading areas will be staked and delineated. Finally, once grading operations are completed revegetation locations will delineated for plant placement. 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.

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

4.3 Construction: Oversight: PWA Project Manager, Principal, and Technical 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 and Principal will evaluate and select suitable salvaged backfill material for streambank and floodplain construction, and ensure the materials are compacted to design standards. PWA Project Manager will notify PCFWWRA to order and schedule for delivery required rock and materials. PWA Project Manager and Technical Staff will oversee materials stockpiling and evaluate and maintain 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 restored channel/ponds. During the course of construction, PWA will check the constructed grades of the restored channel and be available to clarify the intent of the design plans, when necessary. The project team will schedule and attend 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 make field changes, if necessary.

Implementation: 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 Lower Little River Off-Channel Coho Habitat Improvement Design Project. Any deviations from these Plans and Special Provisions MUST obtain prior

written approval from the PWA Project Engineer and PCFWWRA prior to taking place. It is expected that earthen channel reconstruction, tide gate removal, pond construction, site stabilization and revegetation efforts including temporary access for construction will take several months. Heavy equipment (e.g. excavator, bulldozer, dump truck(s)) 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.

Construction Closeout: Punch list walkthrough: When the project is near substantial complete, PWA, PCFWWRA, the Owner, and Contractor will walk the site and identify any items needing modification or completion. 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.

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.

Task 5 – Pre/Post Construction Monitoring and Reporting:

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.

Physical monitoring plan: Physical monitoring of the targeted species and targeted time period of project use will be conducted in the Lower Little River Off-Channel Coho Habitat Improvement Design Project area. The monitoring plan will cover pre-construction conditions and the first and second post-construction seasons. The monitoring plan will be composed of the following components:

Physical habitat evaluations: PWA Fisheries Biologist will conduct a preconstruction habitat inventory of the project area and in Little River following the methodologies as described in Part II and P art III of the CA Restoration Manual. A post-construction replicate habitat inventory survey will be made to comparatively evaluate the change in habitat. Quantifying the change in habitat suitability will provide meaningful information with respect to addressing the identified limiting factors and useable habitat area for coho species at age. These aquatic structural changes will also be correlated with changes relating to biological differences, in particular coho salmon but also other vertebrates and invertebrate species, and changes in water quality to include salinities.

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. Photographic monitoring will continue to occur for a minimum of 2 years following construction completion. The intent of the photographic monitoring is to visually evaluate project components including excavated features, hydraulic structures, and revegetation efforts.

Hydraulic monitoring: (PWA) A minimum of 2 pre- and post-construction hydraulic cross sections will be surveyed within the project area. One will be located just upstream (~50ft) from the existing tide gate and one (1) other will be located upstream approximately mid-way up the linear ditch channel. Additional cross section(s) may be included in the monitoring effort as deemed necessary by CDFW or the Project Engineer. Hydraulic cross sections will be monitored for average velocity, surface water elevation and water depth through a variety of average daily exceedance flow events (i.e., 25%, 50% and 75%). Because future hydrologic conditions remain unknown, some flexibility in monitoring events need to be maintained. Hydraulic monitoring will continue to occur for a minimum of 2 years following construction completion. The intent of the hydraulic monitoring effort is to confirm design outcomes of active connectivity of excavated offchannel features and to better understand the timing, extent, and performance of project area hydraulics.

Water quality monitoring: (PWA) Pre-, during- and post-construction water quality monitoring will be conducted within the project area. A monitoring site array will be developed that includes mainstem Little River upstream from the influence of the unnamed tributary channel, the unnamed tributary channel just upstream from the existing tide gate and at least 2 additional locations upstream to the County road crossing at Crannell Road. Additional water quality sampling locations will be established, as necessary, after project construction to evaluate water quality constituents at varying depth and distances from the Little River confluence. Water quality monitoring parameters may include but may not necessarily be limited to, dissolved oxygen, temperature, salinity, turbidity, and pH. Water quality monitoring will be conducted during dewatering activities, quarterly and will continue to occur for a minimum of 2 years following construction completion. The intent of the water quality monitoring is to better understand the water chemistry changes as they relate to project implementation

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and to preemptively identify any water quality attributes that may be an area of concern with respect to suitability for the target species and other aquatic vertebrates and invertebrates utilizing the diverse habitats within the project reach.

Biological monitoring plan: Biological monitoring of the targeted species and targeted time period of project use will be conducted in the Lower Little River Off-Channel Coho Habitat Improvement Design Project area. The monitoring plan will cover pre-construction conditions and the first and second post-construction seasons. The monitoring plan will be composed of the following components:

Revegetation: (PWA) Vegetation monitoring will be done to measure the success of revegetation efforts, assess natural recruitment, and to alert managers about anything requiring action (e.g. invasive species that need to be removed or a need for remedial revegetation actions). The goal will be to ensure adequate recovery by native riparian and wetland plant species. The main objectives will be to determine whether 80% cover by native plants has been achieved within three years and to evaluate the effectiveness of revegetation efforts. Tasks will include an annual assessment of the % survival and vigor of planted species; plot-based evaluation of plant species composition and abundance; photographs taken at established photopoint locations; and reporting. Vegetation monitoring will be conducted annually in spring and/or summer for a minimum of three years. Monitoring reports will be submitted annually.

Vegetation monitoring will be designed to provide a cost-effective quantitative means of evaluating whether adequate cover by native plant species has been achieved and whether the level of invasive plants warrants treatment. Parameters to be monitored are: 1) % survival by planted propagules; 2) vertical growth of planted shrubs/trees; 3) overall vigor and signs of herbivory; 4) plant species composition and cover; 5) total cover by native plant species; and 6) total cover by invasive plant species over a three year-period. We will use a combination of sampling techniques. Using geospatial information collected at the time of planting, the location of all planted shrubs/trees will be relocated to determine whether the plant survived, to measure growth, and to evaluate vigor and signs of herbivory. To assess plant species composition and cover, plots will be placed along transects within areas impacted by project implementation. Photographs will be taken at established photopoint locations each year.

Wetlands: (PWA and PCFWWRA) Wetland monitoring will be done to evaluate the response of wetlands to project implementation and to quantify any changes in wetland acreage resulting from project implementation. The goal will be to ensure no net loss to wetland resources. The main objectives will be to determine whether there has been a decline in the total acreage of wetlands and to document conversions from one wetland type to another. Tasks will include measurements of groundwater and/or surface water elevation; an evaluation of hydrophytic vegetation; photographs taken at established photopoint locations; and reporting, for a minimum of three years. Wetland monitoring will be conducted annually in spring and/or summer for a minimum of three years. Monitoring reports will be submitted annually.

Wetland monitoring will be designed to provide a cost-effective quantitative means of evaluating wetlands following protocols in the Corps of Engineers Wetlands Delineation Manual (ACOE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (WMVC Supplement, ACOE 2010). Additionally, wetlands identified within the project area will be characterized using the Cowardin classification system (Cowardin 1979). Parameters to be monitored are: 1) groundwater and/or surface water elevations; 2) wetland conversions; and 3) changes in wetland acreage over a three year-period. Wetland monitoring will involve sampling of water table elevations using monitoring wells or piezometers; and assessment of hydrophytic vegetation using similar techniques as the pre-implementation wetland delineation.

Fish: (Ross Taylor and Associates) Conduct post-construction mark-recapture population estimates temporally within the newly constructed habitats monthly from December to June for at least two years after the off-channel habitat construction is completed. Spatially the sampling locations will be within the constructed off-channel ponds at identified locations with the depth and complex cover areas designed specifically for coho juveniles. The methods and protocols employed will be consistent with other CDFW mark-recapture studies in the watershed (Wallace et al. 2015; Wallace 2017). Through seining and passive trapping capture coho juveniles will be marked with PIT tag and released (American Fisheries Society 2013); the inlet will be temporarily screened off to prevent escape. 24 hours later, the areas will be re-sampled using the same methods and the temporary screen at the inlet removed; water quality parameters (pH, DO, and temperature) will also be collected for the sampling efforts. The processing and handling of all captured fish will follow methods consistent with CDFW methods (Duffy 2006; Wallace et al. 2015). All captured coho will be scanned with a PIT tag reader to determine the re-capture proportion vs. unmarked coho captured, and this data will be analyzed for population estimates throughout sampling time frame (Johnson et al. 2007). These sampling efforts will be conducted in conjunction with the PWA aquatic biological sampling described below and thus the sampling design will be the same for all data collected with respect to fish, water quality and macroinvertebrates within the constructed off-channel habitat. By designing for coordinated post-treatment spatial and temporal sampling efforts the data will provide meaningful. comparative insights with respect to coho population size for the sampling years and changes, occupancy timing during the sampling time frame, and relative growth over time from the re-captured marked coho.

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Aquatic vertebrate composition: (PWA Fisheries Biologist). Biological monitoring for the target species and other salmonids will consist of pre-and postconstruction fish utilization and macroinvertebrate community composition for validation monitoring (American Fisheries Society 2013). The sampling plan will consist of a) salmonid and other species presence and their relative abundance will be passively sampled utilizing eDNA water filtration procedural methodologies as developed by Blankenship and Schumer (2017), and b) macroinvertebrate sampling will follow the methodologies as detailed in Barbour et al. (1999) for both lentic and lotic systems within freshwater and euryhaline ecotones. The sampling design for aquatic biota will include locations spatially distributed instream both upstream and downstream of the project area and within the existing pond area (pre-construction) followed by post-construction sampling for a minimum of two years, at these instream sites and sites within the constructed off-channel area distant from the mainstem and at a minimum of two at different water stratum in the pond. All post-construction sampling will be conducted in tandem with the mark-recapture population estimates made by Ross Taylor and Associates (above). The temporal sampling time frame will include seasonal changes with respect to flows and temperature, and diel tidal peaks (low and high), to capture the juvenile lifecycle utilization and will include a minimum of spring, summer/fall, and winter sampling efforts. These sampling locations will be selected in conjunction with the water quality sampling sites and sampling will also be made concurrently.

The sampling design for concurrent sampling for coho and fish, lamprey, macroinvertebrates, and water quality, at the same locations will provide data for comparable analysis and valuable information to a) evaluate the relationship between the restoration activities and biotic responses, b) provide comparable population estimates for juvenile coho for validation, and population information for the other species monitored through eDNA, and c) quantify the before and after changes in distribution and relative abundance of salmonids, lamprey, and other fish species to include the aquatic organisms essential as forage and ecological processes. The methods, results, and a discussion of the final outcomes will be provided within the final report for this proposed project.

Monitoring reports: (PWA and PCFWWRA) Annual monitoring reports will be submitted following each consecutive post-construction season. Postconstruction conditions will be evaluated and compared to pre-construction existing conditions. Deficiencies identified in the annual reports will include recommendations to mitigate such conditions.

Final project report: (PWA and PCFWWRA) A final project summary report will be completed near the end of the contract term. The following components will be included in the project summary report:

 Actual performance measures per site, as described in the grant agreement.

- As-built drawings that include feature placement, design changes where applicable, alignment, sizes, and quantity of material added.
- Before and after photos of individual feature locations.
- Pre- and post-project longitudinal profiles and cross-sections where channel grade is restored or otherwise modified by the project.
- The results from the aquatic biological monitoring and evaluations of these data to include ecological implications.

SWPPP Reporting: PWA will file a final Notice of Termination (NOT) with the SWRCB upon completion of construction and final stabilization. In addition, daily, weekly, quarterly and rain event SWPPP inspection reports will be completed as required.

Deliverables:

Task 1 – Deliverables: Any and all progress reports, invoices or other documents that are necessary according to CDFW contracting guidelines. Copies of subcontracts Final Landowner Access Agreement CDFW Notification of Lake or Streambed Alteration Application with a check for the cost of the 1600 Progress Report submitted with each invoice Annual Report(s), November 15.

Task 2 – Final project permits including: CDFW LSAA 1602, ACOE 404 Permit, SWRCB 401 Certification, Coastal Development Permit/Consistency Determination, NOAA BO, SWRCB Construction General Permit, Humboldt County Grading and Streamside Management Permit.

Task 3 – On-site consultation meeting(s) with prospective subcontractors. Heavy Equipment Subcontract.

Task 4 – One construction kickoff meeting and weekly construction progress meetings. Construction of the project including: Site grading, removal of the tide gate, installation of LWD structures, final stabilization, and revegetation.

Task 5 – Post-construction as-built drawings. Monitoring reports. Final project summary report. SWPPP monitoring reports and Notice of Termination.

Timelines:

Task 1 – 3/1/2021 to 4/1/2025Task 2 – 3/31/2021 to 6/1/2023Task 3 – 3/31/2021 to 8/31/2023Task 4 – 6/15/2023 to 10/15/2024Task 5 – 3/31/2023 to 3/31/2025

Additional Requirements:

The Grantee 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 & 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 Grantee and the Grantor Project Managers. All habitat improvements will follow techniques described in the *California Salmonid Stream Habitat Restoration Manual.*



Map 1. Project Location Topographic Map, Lower Little River Off-Channel Coho Habitat Improvement Design Project, Humboldt County, California (Crannell 7.5' quadrangle; USGS; 2010). Grantee: Pacific Coast Fish, Wildlife and Wetlands Restoration Association



Map 2. Watershed Map, Lower Little River Off-Channel Coho Habitat Improvement Design Project, Humboldt County, California (Crannell 7.5' quadrangle; USGS; 2010). Grantee: Pacific Coast Fish, Wildlife and Wetlands Restoration Association





California Natural Diversity Database

 Query Criteria:
 Quad IS (Crannell (4112411) OR Arcata North (4012481) OR Arcata North (4012481)

 Comparison
 Span>Arcata North (4012482) OR Bald Hills (4112328) OR Panther

 Creek (4112318) OR Blue Lake (4012388))

Possible species within the Crannell and surrounding quads for 1723407 - Lower Little Ricer Off-Channel Coho Habitat Improvement Project, Humboldt County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia umbellata var. breviflora	PDNYC010N4	None	None	G4G5T2	S2	1B.1
pink sand-verbena						
Antrozous pallidus	AMACC10010	None	None	G5	S3	SSC
pallid bat						
Aplodontia rufa humboldtiana	AMAFA01017	None	None	G5TNR	SNR	
Humboldt mountain beaver						
Arborimus albipes	AMAFF23010	None	None	G3G4	S2	SSC
white-footed vole						
Arborimus pomo	AMAFF23030	None	None	G3	S3	SSC
Sonoma tree vole						
Ardea herodias	ABNGA04010	None	None	G5	S4	
great blue heron						
Ascaphus truei	AAABA01010	None	None	G4	S3S4	SSC
Pacific tailed frog						
Astragalus umbraticus	PDFAB0F990	None	None	G4	S2	2B.2
Bald Mountain milk-vetch						
Bombus caliginosus	IIHYM24380	None	None	G4?	S1S2	
obscure bumble bee						
Bombus occidentalis	IIHYM24250	None	Candidate	G2G3	S1	
western bumble bee			Endangered			
Brachyramphus marmoratus	ABNNN06010	Threatened	Endangered	G3G4	S1	
marbled murrelet						
Bryoria spiralifera	NLTEST5460	None	None	G1G2	S1S2	1B.1
twisted horsehair lichen						
Cardamine angulata	PDBRA0K010	None	None	G4G5	S3	2B.1
seaside bittercress						
Carex arcta	PMCYP030X0	None	None	G5	S1	2B.2
northern clustered sedge						
Carex lenticularis var. limnophila	PMCYP037A7	None	None	G5T5	S1	2B.2
lagoon sedge						
Carex leptalea	PMCYP037E0	None	None	G5	S1	2B.2
bristle-stalked sedge						
Carex lyngbyei	PMCYP037Y0	None	None	G5	S3	2B.2
Lyngbye's sedge						
Carex saliniformis	PMCYP03BY0	None	None	G2	S2	1B.2
deceiving sedge						
Carex viridula ssp. viridula	PMCYP03EM5	None	None	G5T5	S2	2B.3
green yellow sedge						





Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Castilleja ambigua var. humboldtiensis	PDSCR0D402	None	None	G4T2	S2	1B.2
Humboldt Bay owl's-clover						
Castilleja litoralis	PDSCR0D012	None	None	G3	S3	2B.2
Oregon coast paintbrush						
Castilleja mendocinensis	PDSCR0D3N0	None	None	G2	S2	1B.2
Mendocino Coast paintbrush						
Cerorhinca monocerata	ABNNN11010	None	None	G5	S3	WL
rhinoceros auklet						
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chloropyron maritimum ssp. palustre	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
Point Reyes salty bird's-beak						
Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal and Valley Freshwater Marsh						
Coptis laciniata	PDRAN0A020	None	None	G4?	S3?	4.2
Oregon goldthread						
Discelium nudum	NBMUS2E010	None	None	G4G5	S1	2B.2
naked flag moss						
Elanus leucurus	ABNKC06010	None	None	G5	S3S4	FP
white-tailed kite						
Empetrum nigrum	PDEMP03020	None	None	G5	S1?	2B.2
black crowberry						
Emys marmorata	ARAAD02030	None	None	G3G4	S3	SSC
western pond turtle						
Entosphenus tridentatus	AFBAA02100	None	None	G4	S4	SSC
Pacific lamprey						
Erethizon dorsatum	AMAFJ01010	None	None	G5	S3	
North American porcupine				0.774	00	0.0
Erigeron bloomeri var. nudatus Waldo daisy	PDAS13M0M2	None	None	G514	53	2B.3
Erysimum menziesii	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Menzies' wallflower						
Erythronium oregonum	PMLIL0U0C0	None	None	G4G5	S2	2B.2
giant fawn lily						
Erythronium revolutum	PMLIL0U0F0	None	None	G4G5	S3	2B.2
coast fawn lily						
Eucyclogobius newberryi	AFCQN04010	Endangered	None	G3	S3	SSC
tidewater goby						
Eumetopias jubatus	AMAJC03010	Delisted	None	G3	S2	
Steller (=northern) sea-lion						
Fissidens pauperculus	NBMUS2W0U0	None	None	G3?	S2	1B.2
minute pocket moss						





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Fratercula cirrhata	ABNNN12010	None	None	G5	S1S2	SSC
tufted puffin						
Gilia capitata ssp. pacifica	PDPLM040B6	None	None	G5T3	S2	1B.2
Pacific gilia						
Gilia millefoliata	PDPLM04130	None	None	G2	S2	1B.2
dark-eyed gilia						
lliamna latibracteata	PDMAL0K040	None	None	G2G3	S2	1B.2
California globe mallow						
Juncus nevadensis var. inventus	PMJUN011Z5	None	None	G5T3T4	S1	2B.2
Sierra rush						
Kopsiopsis hookeri	PDORO01010	None	None	G4?	S1S2	2B.3
small groundcone						
Lampetra richardsoni	AFBAA02090	None	None	G4G5	S3S4	SSC
western brook lamprey						
Lasionycteris noctivagans	AMACC02010	None	None	G5	S3S4	
silver-haired bat						
Lathyrus japonicus	PDFAB250C0	None	None	G5	S2	2B.1
seaside pea						
Lathyrus palustris	PDFAB250P0	None	None	G5	S2	2B.2
marsh pea				_	_	_
Layia carnosa	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
beach layia				_	_	_
	PMLIL1A0G0	Endangered	Endangered	G1	S1	1B.1
				<u></u>	<i></i>	
Lycopodiella inundata	PPLYC03060	None	None	G5	S1	2B.2
		News	Neze	05	00	
	PPL1C01080	None	None	Go	53	4.1
		Nana	Nono	0405	6460	
	IIVIDI V 27 020	None	none	6465	3132	
Martos caurina humboldtonsis		Proposed	Endangered	C5T1	C1	990
Humboldt marten	AWAJFUTUTZ	Threatened	Lindangered	6511	51	330
Moneses uniflora		None	None	G5	S 2	2B 2
woodnymph		None	NONE	05	52	20.2
Montia howellii		None	None	G3G4	S2	2B 2
Howell's montia		None	None	0004	02	20.2
Mvotis evotis	AMACC01070	None	None	G5	S 3	
long-eared myotis	,					
Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Coastal Salt Marsh						
Northern Foredune Grassland	CTT21211CA	None	None	G1	S1.1	
Northern Foredune Grassland			-			





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Nycticorax nycticorax	ABNGA11010	None	None	G5	S4	
black-crowned night heron						
Oceanodroma furcata	ABNDC04010	None	None	G5	S1	SSC
fork-tailed storm-petrel						
Oenothera wolfii	PDONA0C1K0	None	None	G2	S1	1B.1
Wolf's evening-primrose						
Oncorhynchus clarkii clarkii	AFCHA0208A	None	None	G4T4	S3	SSC
coast cutthroat trout						
Oncorhynchus kisutch pop. 2	AFCHA02032	Threatened	Threatened	G4T2Q	S2?	
coho salmon - southern Oregon / northern California ESU						
Packera bolanderi var. bolanderi	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
seacoast ragwort						
Pandion haliaetus	ABNKC01010	None	None	G5	S4	WL
osprey						
Pekania pennanti	AMAJF01021	Endangered	Threatened	G5T2T3Q	S2S3	SSC
fisher - West Coast DPS						
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Piperia candida	PMORC1X050	None	None	G3	S3	1B.2
white-flowered rein orchid						
Plethodon elongatus	AAAAD12050	None	None	G4	S3	WL
Del Norte salamander						
Polemonium carneum	PDPLM0E050	None	None	G3G4	S2	2B.2
Oregon polemonium						
Rallus obsoletus obsoletus	ABNME05011	Endangered	Endangered	G5T1	S1	FP
California Ridgway's rail						
Rana aurora	AAABH01021	None	None	G4	S3	SSC
northern red-legged frog						
Rana boylii	AAABH01050	None	Endangered	G3	S3	SSC
foothill yellow-legged frog						
Rhyacotriton variegatus	AAAAJ01020	None	None	G3G4	S2S3	SSC
southern torrent salamander						
Riparia riparia	ABPAU08010	None	Threatened	G5	S2	
bank swallow						
Romanzoffia tracyi	PDHYD0E030	None	None	G4	S2	2B.3
Tracy's romanzoffia						
Sidalcea malachroides	PDMAL110E0	None	None	G3	S3	4.2
maple-leaved checkerbloom						
Sidalcea malviflora ssp. patula	PDMAL110F9	None	None	G5T2	S2	1B.2
Siskiyou checkerbloom						
Sidalcea oregana ssp. eximia	PDMAL110K9	None	None	G5T1	S1	1B.2
coast checkerbloom						





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Silene scouleri ssp. scouleri	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
Scouler's catchfly						
Sitka Spruce Forest	CTT82110CA	None	None	G1	S1.1	
Sitka Spruce Forest						
Sphagnum Bog	CTT51110CA	None	None	G3	S1.2	
Sphagnum Bog						
Spirinchus thaleichthys	AFCHB03010	Candidate	Threatened	G5	S1	
longfin smelt						
Thaleichthys pacificus	AFCHB04010	Threatened	None	G5	S3	
eulachon						
Trichodon cylindricus	NBMUS7N020	None	None	G4G5	S2	2B.2
cylindrical trichodon						
Usnea longissima	NLLEC5P420	None	None	G4	S4	4.2
Methuselah's beard lichen						
Viola palustris	PDVIO041G0	None	None	G5	S1S2	2B.2
alpine marsh violet						

Record Count: 90