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1-19-0278

(GARY/PLAZA & HUMBOLDT COUNTY)

JUNE 12, 2020

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APPENDIX A
CDP Application No. 1-19-0278

Substantive File Documents

- California Coastal Commission. August 12, 2015 (November 7, 2018 update). [Sea Level Rise Policy Guidance Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits.](#)
- CDP Application File No. 1-19-0278
- Griggs, G, Árvai, J, Cayan, D, DeConto, R, Fox, J, Fricker, HA, Kopp, RE, Tebaldi, C, Whiteman, EA (California Ocean Protection Council Science Advisory Team Working Group). "[Rising Seas in California: An Update on Sea-Level Rise Science.](#)" California Ocean Science Trust, April 2017. Sacramento, CA.
- Humboldt County certified Local Coastal Program
- Laird, Aldaron. January 2018. Humboldt Bay Area Plan Sea Level Rise Vulnerability Assessment. Prepared for Humboldt County. Trinity Associates, Arcata, CA.
- Laird, Aldaron, Brian Powell. 2013. Humboldt Bay shoreline inventory, mapping, and sea level rise vulnerability assessment, with an Addendum: Shoreline Vulnerability Ratings. Prepared for the State Coastal Conservancy.
- Northern Hydrology & Engineering. (2015, April). Humboldt Bay: Sea level rise, hydrodynamic modeling, and inundation vulnerability mapping – Final report. Prepared for the State Coastal Conservancy and Coastal Ecosystems Institute of Northern California.
- Ocean Protection Council (OPC). 2018. [State of California Sea-Level Rise Guidance: 2018 Update.](#)

APPENDIX B
CDP Application No. 1-19-0278

Mitigation Monitoring and Reporting Program adopted by the County of Humboldt
with its approval of Conditional Use Permit No. 18-026 on May 2, 2019
(State Clearinghouse #2019012046)

In addition to the conditions of Coastal Development Permit 1-19-0278, the following mitigation measures are required:

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
Biological Resources	4.1 Isolation of the work area on Cochran Creek and construction shall only occur between July 1st and October 31st when freshwater inflow to Cochran Creek and Quail Slough is at its lowest and when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction.	Project Developer	County of Humboldt	During construction
Biological Resources	4.2 Surveys of freshwater habitat by a qualified biologist for fish, amphibian, and reptile species of concern shall occur two weeks prior to disturbance activities in the areas to be de-watered.	Project Developer	County of Humboldt	Prior to construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
Biological Resources	4.3 On Cochran Creek a fish screen barrier will be installed upstream of the culvert under Myrtle Avenue to prevent fish from moving into the work area. The tide gate at the mouth of Cochran Creek on Fay Slough will be closed to prevent fish from entering the work area. The supervising biologist will oversee selecting suitable block nets and their installation. The upstream most block net will be installed first to prevent movement of fish into the work area. Fish will be captured moving upstream from the tide gate pool, with anticipated reach lengths of 150-300 ft before an additional block net is installed to isolate areas that have been cleared from upstream habitats still holding fish.	Project Developer	County of Humboldt	During construction
Biological Resources	4.4 Fish capture and relocation of fish and herpetofauna will occur in accordance with CDFW and NMFS protocols and guidelines to avoid impacts to sensitive species.	Project Developer	County of Humboldt	During construction
Biological Resources	4.5 Stream flow diversion and dewatering of Cochran Creek and Quail Slough will follow isolating the work area and fish relocation. The project will be dewatered in accordance with CDFW and NMFS protocols and guidelines to avoid impacts to fish and herpetofauna species. Potential locations of dewatering activities and depicted on the example dewatering plan (see sheet CX). Flow diversion and channel	Project Developer	County of Humboldt, CDFW and NMFS	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	<p>construction dewatering will be implemented to maintain a dry work site for the duration of construction. All work areas will be dewatered to accommodate excavation in areas of expected high groundwater. Dewatering of Cochran Creek will be done at the upstream end of the Project by either screened gravity flow or mobile pump, and discharge either into the in-board ditch that drains to Redmond Creek, or directly into Fay Slough. A mobile pump with an approved fish screen and pipe system will be utilized to dewater the work area and divert the construction water from Cochran Creek to Quail Slough. To dewater Quail Slough, a coffer dam with a pump and pipe system will collect and divert seepage and treated water during construction in the downstream end of Cochran Creek, into the either the in-board ditch that drains to Redmond Creek, or directly into Fay Slough. Prior to the start of construction, the contractor will develop a dewatering plan for approval by the Project Team that demonstrates compliance with CDFW and NMFS protocols and guidelines, and all Permit requirements.</p>			
<p>Biological Resources</p>	<p>4.6 Reintroduction of stream flow will occur by unbolting the tide gate and removing the downstream cofferdams at low tide. Diverted stream flows will be slowly reintroduced into the dewatered area by leaving a silt barrier, silt bag, or equivalent protective measure in place to allow</p>	<p>Project Developer</p>	<p>County of Humboldt, CDFW and NMFS</p>	<p>During construction</p>

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	<p>water to slowly seep through while filtering fine sediments to the maximum extent possible. When removing the upstream cofferdam and block net, flows will gradually be restored to the channel to avoid a surge of water that could cause erosion or scouring. During the reintroduction of stream flows, the directing biologist and contractor will continuously visually monitor the water flow to ensure that no downstream scour or erosion takes place.</p>			
<p>Biological Resources</p>	<p>4.7 Construction activities shall occur only when the area is dry and when adult red-legged frogs are not expected to be present.</p>	<p>Project Developer</p>	<p>County of Humboldt, CDFW and NMFS</p>	<p>During construction</p>
<p>Biological Resources</p>	<p>4.8 Western pond turtle surveys shall be carried out by a qualified biologist along tidal margins two weeks prior to commencement of ground disturbing activities. Surveys shall be utilized to locate and flag western pond turtle nests with eggs, or to remove hatchlings and adults that may be present in the stream reaches above the existing tidal zone below first diversion. Any active nests located shall be left undisturbed until hatchlings have emerged or have been relocated to suitable areas outside of the area of disturbance; similarly, adults will also be relocated. No existing freshwater ponds shall be impacted by the project.</p>	<p>Project Developer</p>	<p>County of Humboldt, CDFW</p>	<p>Prior to construction</p>

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
Biological Resources	4.9 If work must be completed during the nesting season (prior to August), a qualified biologist shall conduct preconstruction surveys of all ground disturbance areas to verify absence of nesting migratory birds in the project area within two weeks prior to vegetation removal and the start of construction. If nesting migratory birds are found in the project construction area during the preconstruction surveys, they shall be avoided with an appropriate buffer area until the young birds have fledged. Buffers shall be 250 ft. for raptors, 100 ft. for threatened and endangered species, 50 ft. for other special-status bird species; however, buffers may be modified after consultation with, and agreement by CDFW.	Project Developer	County of Humboldt, CDFW	Prior to construction
Biological Resources	4.10 Vegetative disturbance shall be contained within the limits of grading and kept to a minimum area.	Project Developer	County of Humboldt	Prior to and during construction
Cultural Resources	5.1 If potential archaeological or paleontological resources are encountered during project subsurface construction activities or geotechnical testing, all work within 50 ft of the find shall be stopped, and a qualified archaeologist shall be contacted to evaluate the find, determine its significance, and identify any required mitigation. The applicant shall be responsible for implementing the mitigation prior to construction activities being re-started at the discovery site.	Project Developer	County of Humboldt	Prior to construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
Cultural Resources	5.2 If project related geotechnical excavations become necessary, as a result of final design, and those excavations are to be more than one ft deep, then the THPOs of each local native American tribe, as noted above, will be contacted and given the date and time of excavations so that a cultural monitor may be present to observe for the presence of buried archaeological materials.	Project Developer	County of Humboldt	Prior to construction
Geology and Soils	6.1 Construction shall only occur between July 1st and October 31st when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction and when Cochran Creek and Quail Slough inputs are at summer baseflow thresholds.	Project Developer	County of Humboldt	During construction
Geology and Soils	6.2 Placement of fill in the project area shall occur when the area is not inundated by water.	Project Developer	County of Humboldt	During construction
Geology and Soils	6.3 Dewatering measures shall be in place to bypass any discharge from entering the work site.	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.1. Heavy equipment used in the project shall be in good condition and shall be inspected for leakage of coolant and petroleum products and repaired, if necessary, before work is started	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.2 Equipment operators shall be trained in the procedures to be taken should an accidental spill occur.	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
Hazards and Hazardous Materials	8.3 Prior to the onset of work the contractor shall prepare a plan for the prompt and effective response to any accidental spills.	Project Developer	County of Humboldt	Prior to construction
Hazards and Hazardous Materials	8.4 Absorbent materials designed for spill containment and cleanup shall be kept at the project site for use in case of an accidental spill.	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.5 Refueling of equipment shall occur within the staging area or a minimum of 150 ft away from stream channels or perennial wetlands. All refueling will occur on a pad to capture any drips or spills.	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.6 If equipment must be washed, washing shall occur off-site.	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.7 Stationary equipment shall be positioned over drip pans.	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.8 Equipment on site during construction shall be required to have emergency spill cleanup kits immediately accessible in the case of any fuel or oil spills.	Project Developer	County of Humboldt	During construction
Hazards and Hazardous Materials	8.9 Staging, fueling and maintenance of equipment shall be conducted only in in staging areas or no closer than 150 ft from open water or	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	in any location where hazardous material spills could become entrained in flowing water.			
Hydrology and Water Quality	9.1 Construction shall only occur between July 1st and October 31st when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction and when background freshwater inputs are at summer baseflow thresholds. Excavated materials shall not be stockpiled over winter. Sediment control measures shall be in place while materials are being stockpiled to minimize sediment and pollutant transport from the project site.	Project Developer	County of Humboldt	During construction
Hydrology and Water Quality	9.2 Placement of fill in the project area shall occur when the area is not inundated by water.	Project Developer	County of Humboldt	During construction
Hydrology and Water Quality	9.3 Excavation shall include handling of saturated soils. Saturated soils shall be dewatered and/or transported saturated in a manner that prevents excess discharge or spillage of soils or water within the construction access areas. A silt fence shall be installed around the perimeter of temporary stockpiles of saturated soils to prevent runoff from leaving the site.	Project Developer	County of Humboldt	During construction
Hydrology and Water Quality	9.4 During construction, a silt fence shall be deployed to isolate work areas from existing channels, and to trap suspended sediment that might leave the construction site if stormwater runoff were to occur. If the silt fence is not	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	adequately containing sediment, the construction activity shall cease until remedial measures are implemented that prevent sediment from entering the waters below.			
Hydrology and Water Quality	9.5 No construction materials, debris, or waste, shall be placed or stored where it may be allowed to enter or be washed by rainfall into waters of the U.S./State.	Project Developer	County of Humboldt	During construction
Hydrology and Water Quality	9.6 Following completion of excavation, placement of fill, and grading, all ground to the limits of disturbance (except newly constructed streambeds, pond beds, and tidally inundated areas) above 6 ft shall be treated for erosion prior to the onset of precipitation capable of generating run-off or the end of the yearly work period, whichever comes first. Treated areas that are not exposed to tidal influence shall be mulched with at least 2 to 4 inches of certified weed-free straw mulch with wheat or other straw for riparian and wetland areas and rice straw for uplands and use of a seed mix with coverage equivalent to 100 lbs/acre of barley seed and appropriate riparian vegetation for immediate erosion control. No annual (Italian) ryegrass (<u>Lolium multiflorum</u>) shall be used.	Project Developer	County of Humboldt	During construction
Hydrology and Water Quality	9.7 All temporary fill, synthetic mats and silt fences shall be removed from wetlands and waters of the U.S./State immediately on cessation	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	of construction. Biodegradable geotextile fabrics shall be used, where possible.			
Hydrology and Water Quality	9.8 Soil and material stockpiles shall be properly protected to minimize sediment and pollutant transport from the construction site.	Project Developer	County of Humboldt	During construction
Hydrology and Water Quality	9.9 The following BMPs (California Storm Water Quality Association Storm Water Best Management practice (BMP) Handbook for Construction 2003) shall be implemented to prevent entry of storm water runoff into the excavation site, the entrainment of excavated contaminated materials leaving the site, and to prevent the entry of polluted storm water runoff into coastal waters during the transportation and storage of excavated contaminated materials: EC-2 Preservation of Existing Vegetation. The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site. To the extent feasible, and consistent with the project's design, goals, and objectives, some existing vegetation will be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	<p>desirable vegetation for shade and erosion control (CSWQA 2003).</p> <p>EC-6 Straw Mulch. Straw mulch is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established. Where appropriate, weed-free straw mulch will be used for erosion control on disturbed areas until soils can be prepared for permanent vegetation. Straw mulch is also used in combination with temporary and/or permanent seeding strategies to enhance plant establishment (CSWQA 2003).</p> <p>EC-7 Geotextile and Mats. Mattings are commonly applied on short, steep slopes where erosion hazard is high and vegetation will be slow to establish. Mattings are also used on stream banks where moving water at velocities between 3 ft/s and 6 ft/s are likely to wash out new vegetation, and in areas where the soil surface is disturbed and where existing vegetation has been removed. Where appropriate, matting may also be used when seeding cannot occur (e.g., late season construction and/or the arrival of an early rain season). Erosion control matting will be considered in portions of the project area where soils are fine grained and potentially erosive (CSWQA 2003).</p> <p>EC-8 Wood Mulching. Wood mulching is suitable for disturbed soil areas requiring temporary</p>			

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	<p>protection until permanent stabilization is established. The primary function of wood mulching is to reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff (CSWQA 2003). Vegetation removed during construction will be chipped on-site and reused as erosion control mulch where feasible and appropriate.</p> <p>EC-9 Earth Dikes and Drainage Swales. The temporary earth dike is a berm or ridge of compacted soil, located in such a manner as to divert stormwater to a sediment trapping device or a stabilized outlet, thereby reducing the potential for erosion and offsite sedimentation. Where appropriate, earth dikes will also be used to divert runoff from off site and from undisturbed areas away from disturbed areas and to divert sheet flows away from unprotected slopes (CSWQA 2003).</p> <p>EC-10 Velocity Dissipation Devices. Velocity dissipation devices can be used whenever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. Outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble, which is placed at the outlet of a pipe or channel to prevent scour of the soil caused by concentrated,</p>			

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	<p>high velocity flows (CSWQA 2003). During the time of construction, the Elk River has typically low (zero mis or close thereto) velocities. However, in the event of a significant summer/early fall rain event, the contractor will be prepared to mitigate potential erosion control impacts from storm peak velocities with a velocity dissipate device (e.g. on the dewatering bypass for the in-channel work components).</p> <p>SE-1 Silt Fences. Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. Where appropriate, they will be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion. Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls (CSWQA 2003).</p> <p>NS-5 Clear Water Diversion. Clear water diversion consists of a system of structures and measures that intercept clear surface water runoff upstream of a project, transport it around the work area, and discharge it downstream with minimal water quality degradation from either the project construction operations or the construction of the diversion (CSWQA 2003).</p>			

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	<p>Dewatering the in-channel work areas and establishing a flow bypass will serve as the clear water diversion for the project.</p> <p>WM-3 Stockpile Management. Stockpile Management procedures and practices will be designed to reduce or eliminate air and stormwater pollution from stockpiles of soil excavated from in-channel and floodplain areas (CSWQA 2003).</p> <p>WM-9 Sanitary/Septic Waste Management. Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste will be provided via convenient, well-maintained facilities, and arranging for regular service and disposal (CSWQA 2003).</p>			
Noise	<p>12.1 Workers shall be required to wear hearing protection when in the vicinity of or while operating equipment producing noise levels equal to or greater than 85 db. 12.2 Restrict noise from earthmoving and hauling of soils to daytime hours. Hours of construction for outdoor activities exceeding 80 dBA shall be limited to Monday through Friday 7:00 a.m. to 7:00 p.m. and weekends and holidays from 8:00 a.m. to 6:00 p.m. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working</p>	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific.			
Noise	12.2 Restrict noise from earthmoving and hauling of soils to daytime hours. Hours of construction for outdoor activities exceeding 80 dBA shall be limited to Monday through Friday 7:00 a.m. to 7:00 p.m. and weekends and holidays from 8:00 a.m. to 6:00 p.m. Movement and hauling of material and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific.	Project Developer	County of Humboldt	During construction
Noise	12.3 All equipment shall operate with factory-equipped mufflers, and staging areas shall be located as far from residential uses as is practical. These conditions shall be incorporated into project contract specifications.	Project Developer	County of Humboldt	During construction
Noise	12.4 Construction personnel shall conduct all work activities in a manner that minimizes noise generation. A variety of contractor actions are available that will reduce construction noise, including: i) turning off engines on all construction equipment not in active use, ii) shielding noisy equipment with less noisy equipment, and iii)	Project Developer	County of Humboldt	During construction

Impact	Mitigation Measure	Implementation Responsibility	Monitoring/ Reporting Responsibility	Timing
	avoiding high RPM engine operation whenever possible.			
Noise	12.5 Notify commercial property neighbors when activity involving heavy construction equipment is scheduled to occur within 250 ft of occupied structures. Construction personnel shall provide written notification to the adjacent property owners prior to using heavy construction equipment. The written notification shall be provided to each potentially affected property at least 72 hours prior to the start of the activity and shall indicate the approximate duration of time (dates and hours) during which the noise-generating activity is expected to occur.	Project Developer	County of Humboldt	During construction

APPENDIX C
CDP Application No. 1-19-0278

**Proposed Post-Construction Monitoring for the
Cochran Creek and Quail Slough Fish Passage and Habitat Enhancement Project**
(excerpted from a monitoring plan prepared by California Trout for CDFW and other
funding agencies and submitted by the applicant for this CDP application)

Geomorphic Performance Monitoring

Post-implementation geomorphic monitoring will consist of photo-monitoring and topographic surveys of physical conditions (at the same resolution as pre-project mapping).

Photo monitoring points will be established as part of pre-construction activities from established locations that are benchmarked or located with GPS coordinates to ensure consistent and comparable views. Photos will be taken immediately after construction and at regular intervals following construction to document physical response to the project and identify any issues of concern that may require maintenance.

Immediately following construction, a topographic survey of the Project area will be conducted and an as-built surface prepared. The constructed project area will be monitored to observe geomorphic and habitat responses within the reconstructed project features. Monitoring will consist of one annual site visit during the summer low-flow season to conduct detailed geomorphic assessments. Cross sections established during construction will be resurveyed to document response and changes of the constructed surfaces over time. Photos will be used to document the frequency and timing that the off channel areas provide suitable hydraulic conditions for ingress and egress of juvenile salmonids, and if and when the off channel areas become disconnected due to low streamflows or sedimentation at the inlet.

Physical surveys (e.g. geomorphic monitoring during one summer low-flow period each year) will be completed annually following the completion of construction activities **for up to 5 years** (and then biannually through Year 10 pending the availability of funding to support this activity).

Fisheries Performance Monitoring

Post-implementation monitoring efforts will document seasonal patterns of fish species presence and distribution (including juvenile and adult salmonids) in tidally-influenced and freshwater regions in the restored aquatic habitats of Cochran Creek and Quail Slough. It is anticipated that post-project monitoring for salmonids would occur for a minimum of five years, focusing on areas of new or expanded habitat. Annual Monitoring Reports will be provided by December 31 of each year in which monitoring occurs.

Objective 1:

Document spatial and seasonal use patterns of presence and distribution for juvenile salmonids and other fish species utilizing tidally-influenced regions of Cochran Creek and Quail Slough, and in freshwater habitats upstream of tidal influence in the Cochran Creek watershed.

Objective 2:

Document adult salmonid spawning activity in anadromous accessible reaches of Cochran Creek after installing a side-hinge tide gate that increases opportunity for adult fish passage.

Monitoring Timeframe: 01/01/2021 -12/31/2030

Fisheries monitoring will be conducted **for a total of 5 years**, during the first ten years after restoration using methods described in Wallace and Allen (2009), focusing on areas of new or expanded habitat.

Sampling Season/Frequency

Fisheries sampling, using beach seines and/or baited minnow traps to detect fish species presence will occur at fixed and non-fixed locations within the Cochran Creek and Quail Slough tidal freshwater ecotone.

Seine/Minnow Traps:

January through June; 1 sampling day per month, 6 months per year.

Spawner Surveys:

December through May; 1-2 surveys per month, 6 months per year.

Monitoring techniques will consist of using baited minnow traps and beach seines to capture, handle, and release various life stages and species. Spawning surveys will also occur during the appropriate season, although captures of any life stages are not anticipated during spawning surveys.

Sampling will not occur if ambient water temperatures exceed 21°C. In all cases buckets used for holding fish will be filled with clean ambient source water, and equipped with battery-operated bubbler units that will ensure re-circulation of oxygen-rich water throughout processing of captured specimens.

A biologist will visually monitor numbers of captured fish held in each bucket to ensure low densities of animals (< 15 juvenile salmonids). In the event that many fish are captured, or that there is a delay in field processing, held specimens will be relocated to a flow-through mesh-net bag anchored nearby in the source stream/water body, while safely away from survey activities. Any captured non-salmonid fish, and adult salmonids will be identified to species, counted, and then released back to the source area immediately following recovery from handling.

Fish will be closely observed in an anesthetic bath of Alka –Seltzer Gold (aspirin free) brand sodium bicarbonate (NaHCO₃) until loss of equilibrium is achieved but operculum movement is still present. The lowest concentration of sodium bicarbonate that will permit safe handling will be used and will range from 1 to 2 tablets per gallon of fresh river water depending on fish size and water temperature. The bicarbonate material will be allowed to completely dissolve before fish are added to the anesthetic bath. Salmonid fry and juveniles will be anesthetized in groups of 3-5 fish, and larger parr and smolts will be anesthetized in groups of 1-3 fish. Salmonids should be able to be handled after 1-2 minutes in the anesthetic bath and will be processed immediately following loss of equilibrium. A product called Stress Coat will be added to the anesthetic solution as needed to combat stress from loss of the protective slime layer during handling. Fish will be allowed to recover in 5 gallon buckets of aerated fresh river water until normal behavior is observed. Water temperature in the recovery bucket will be monitored and maintained to be within 2 degrees of the ambient river temperature.

Juvenile salmonids will be placed individually onto a wetted Plexiglas measuring board and measured to the nearest mm fork length, then transferred to a wetted container on an electronic scale and individually weighed to the nearest 0.01 gram. Following processing, fish will immediately be transferred to recovery buckets filled with clean ambient source water, and equipped with battery-operated bubbler units that will ensure recirculation of oxygen-rich water to facilitate recovery of equilibrium. Following adequate recovery time, all processed fish will be released unharmed back to the site of their capture.

Vegetation Performance Monitoring

Revegetation monitoring will be conducted in late spring **for three years** after Project construction with a target of 80% survivability. A monitoring report will be prepared defining the proposed vegetation management work plan to be conducted in the summer and early fall (such that replanting will be in the ground and benefit from the winter rains). The work plan will incorporate field notes and maps to define the actions that will be carried out in subsequent years. Issues addressed in the work plan will include areas where replantings will occur, densities, including weed and invasive species management if appropriate to achieve reestablishment.

An annual monitoring report will summarize monitoring activities, findings, and recommendations. The annual report will also identify any issues identified by the annual inspection that may warrant maintenance or other types of treatment. In the event that items of concern arise, the report will recommend actions to be initiated to further characterize its impact on project objectives and/or consultation with the appropriate resource agencies to determine if a maintenance action is warranted.

Tidal habitat colonization

Under the Project, tidal channels will be excavated to enhance habitat function and quality. Monitoring of the geomorphic and hydrologic function of enhanced and created wetlands will include an annual preliminary visual reconnaissance of the wetland to

identify potential areas of concern, followed by physical surveys (topographic measurements to include combined cross-sections and longitudinal channel profiles). Surveys will be based on the conditions described in the As-Built survey. The preliminary visual reconnaissance will be conducted during low tide in the early to mid spring, at the termination of the wet season high flows. The physical surveys will help to quantify the height/depth of erosion or sedimentation within the newly constructed channel, floodplain, and off-channel features as well as quantify changes in channel tidal exchange capacity. Cross-section locations will be sited to best document project conditions and potential problem areas and will extend beyond top of channel banks to capture floodplain conditions. The longitudinal slough channel profiles shall be completed with thalweg elevations shot at least every 100 ft, at a minimum. The end points of all cross-sections shall be monumented pursuant to standard methods in order to replicate surveys during future surveys. All survey elevations should be reported in the NAVD88 vertical datum.

Monitoring of the plants installed in wetland areas will consist of ocular determination of percent cover of the planted species. Photos will be taken to document channel conditions during the annual visual reconnaissance and during spring and summer at permanently marked photo-documentation points. Photos will be included in annual monitoring reports and used to determine whether adaptive management actions are warranted. If there are significant changes in elevations or excessive accumulation of vegetation and sediment at survey locations, corrective actions will be evaluated and a solution proposed.

Riparian Vegetation Establishment

The Project involves the replanting of 2.7 acres of riparian vegetation along the tidal berm. This area will be monitored for percent cover of establishing riparian species and to ensure that invasive species do not colonize this area. Success criteria will be established to determine if vegetation is establishing at a rate sufficient to meet the performance measures (80% survivability after three years).

Vegetation monitoring will be conducted over the five year monitoring period. Monitoring will consist of photo monitoring to document the growth of re-vegetated areas. Plants installed in the riparian zone will be monitored in the Spring/Summer each year to determine overall numeric survival and qualitative health and vigor. This will include a byspecies and overall count of individual plants. The health and vigor of each plant will be visually assessed to evaluate its chance of survival and to determine the species with highest percent survival.

Vegetation management necessary to achieve the Project goals may include weed abatement and invasive species management, described in more detail below.

Weed Abatement

Encroachment of nonnative species will be noted and recorded. Weed abatement should be **performed during the 3-year plant establishment period**. If weed

abatement procedures are not sufficient to prevent the colonization of weedy species within the restoration area, the maintenance will continue until such time as weedy species do not present a detriment toward maintaining self-sustaining riparian salt marsh or riparian areas. Weed abatement measures will primarily include mechanical or manual removal.

Tide Gate, Culvert, and Drainage Performance Monitoring

All tide gates and culverts installed as part of the Project design will be inspected annually **for five years** and regularly maintained to ensure that they are functioning as designed. Annual reconnaissance of site-wide drainage will be conducted to identify areas of impacted flow conveyance, ponding and/or erosion and any maintenance recommendations. Regular maintenance and monitoring will follow procedures outlined in the project's BO to protect fish species. After five years, the landowner will assume monitoring and maintenance responsibilities for tide gates, culverts, and drainage features associated with the Proposed Project, and would implement maintenance in accordance with the BO terms and standard operating procedures appropriate for working agricultural lands.

Post-Project Water Quality Monitoring and Reporting

Water quality monitoring will be conducted **once a month for 24 months**. Parameters to be measured include: temperature, dissolved oxygen, pH, and conductivity. Measurements will be conducted using a handheld water quality meter. Results will be included in the annual monitoring report.