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STAFF REPORT: MATERIAL AMENDMENT

Amendment Application No.: **1-08-012-A1**

Applicant: **Northcoast Regional Land Trust**

Location: Along Wood Creek and Freshwater Slough, on the north side of Myrtle Avenue, approximately 3,500 feet west of the intersection of Freshwater Road and Myrtle Avenue, at 5555 Myrtle Avenue, approximately two miles northeast of Eureka, Humboldt County (APN 402-291-15).

Description of Previously Approved Project: Phase 1 Restoration - Restoration of tidal hydrology and brackish marsh habitat across 23 to 29 acres of diked former tidelands (seasonal freshwater wetlands) and enhancing 4,500 square feet of juvenile salmonid freshwater rearing habitat along Wood Creek by (1) excavating 2,450 cubic yards of material along 3,900 feet of historic tidal channels within diked former tidelands; (2) excavating 300 cubic yards of berm material along the north bank of Wood Creek; (3) enhancing freshwater habitat on Wood Creek by excavating 380 cubic yards of material to expand and enhance juvenile salmonid freshwater rearing habitat; (4) replacing a culvert crossing on Wood Creek with a "flatcar" bridge; (5) placing approximately 3,200 cubic yards of excavated material on-site within diked former tidelands to recreate high marsh surfaces and tidal hummocks; (6) removing an existing tidegate on Wood Creek to allow for tidal inundation to the

	tidal marsh restoration area; (7) sealing a defunct Waterman tidegate located south of the main Wood Creek tidegate in the Freshwater Slough dike; (8) revegetating the tidal marsh restoration area with appropriate native species; and (9) relocating the western alignment of the existing agricultural fence.
Proposed Amendment:	Undertake adaptive management within and adjacent to the Phase 1 restoration area by (1) spreading approximately 5,500 cubic yards of fill across 6.8 acres of existing degraded pastureland; (2) spreading approximately 1,380 cubic yards of fill material across 1.2 ac. of previously restored marsh habitat; and (3) constructing 10 sills within previously restored tidal channels.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

Commission staff recommends approval of Coastal Development Permit (CDP) Permit Amendment Request 1-08-012-A1 with conditions.

On October 17, 2008, the Commission approved with conditions CDP 1-08-012 authorizing the "Wood Creek Tidal Marsh Enhancement Project" (also referred to as the "Phase 1" restoration project) on the subject property located along Freshwater Slough and Wood Creek two miles northeast of the City of Eureka. The approved project involved restoring tidal hydrology and brackish marsh habitat across 23 acres of diked former tidelands (seasonal freshwater wetlands) and maintaining and enhancing 4,500 square feet of juvenile salmonid summer rearing habitat along Wood Creek. As designed, an additional 6.8-acre area of grazed seasonal wetlands adjacent to the 23-acre brackish marsh restoration area would receive limited tidal action during monthly high tides while continuing to accommodate grazing activities. In its approval of CDP 1-08-012, the Commission found that the Phase 1 restoration project would restore degraded habitat for a variety of marine resources, including federally listed salmonids, as mandated by the requirements of Sections 30230 and 30231 to maintain and enhance marine resources and sustain the biological productivity of coastal waters. At the same time, the Commission acknowledged that the project would result in the conversion of approximately 13.5 acres of nonprime, seasonal agricultural land inconsistent with the provisions of Section 30242 of the Coastal Act. The Commission found that the project presented a true conflict between Section 30242 and Sections 30230 and 30231 of the Coastal Act and invoked the conflict resolution policies of Section 30007.5 of the Coastal Act, finding that the habitat restoration needed to maintain marine resources and sustain biological productivity would be more protective of coastal resources than avoiding the project's agricultural impacts.

The applicant undertook the permitted Phase 1restoration work over three summers from 2008-2010. The final monitoring report (submitted in 2015) indicated that the restoration project met all of the performance standards required by the permit including, but not limited to, the following: (1) the tidal cycle was successfully restored to the entirety of the restoration area; (2) water quality (i.e., levels of salinity, dissolved oxygen, temperature, and pH) in Wood Creek was improved to provide suitable rearing habitat for juvenile salmonids; and (3) a predominance of native brackish marsh vegetation successfully established across the majority of the restoration area. Although the restoration project was successful in meeting its performance standards, the unanticipated trapping of tidal waters resulted in the unforeseen formation of salt pannes in an adjacent 6.8-acre wetland pasture used for seasonal grazing, which not only damaged brackish marsh habitat values, but led to the discharge of highly saline warm water into the salmon habitat along Wood Creek, damaging its water quality and habitat value for salmon.

The applicant now is proposing to undertake adaptive management activities within and adjacent to the Phase 1 restoration area to better maintain water quality and habitat for marine resources while providing for seasonal grazing in the 6.8-acre wetland pasture adjoining the Phase 1 restoration area. Specifically, the applicant proposes to place fill material within: (1) portions of the 6.8-acre wetland pasture adjacent to the Phase 1 restoration area used for seasonal grazing; (2) brackish marsh habitat previously restored under Phase 1; and (3) tidal channels previously restored under Phase 1. Staff believes that the proposed wetland fill is permissible under Section 30233(a)(6) for "restoration purposes" and is mandated by the requirements of Section 30231 of the Coastal Act that the biological productivity and the quality of coastal waters appropriate to maintain optimum populations of marine organisms shall be maintained. Specifically, the proposed restoration is needed to help maintain marine resources by restoring brackish marsh habitat and assisting in the recovery of listed salmonid species including coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout.

Staff also believes that the proposed habitat restoration project would not result in the conversion of grazing lands as it would also provide for seasonal grazing in the 6.8 acre wetland pasture adjoining the Phase 1 restoration area. The applicant has proposed restoration of the 6.8-acre wetland pasture in a manner that would both provide for seasonal grazing as well as accommodate restoration of the site to high brackish marsh and provide for the ongoing protection of the downstream salmonid habitat by: (i) instituting a controlled rotational grazing regime using paddocks to confine livestock to a maximum intensity of 25 cows per 4.5-acre paddock for a maximum of 5 days to ensure vegetation heights remain at or above the 3-inch height threshold, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing; (ii) monitoring grazing and removing cows once vegetation is grazed to the 3-inch height threshold; and (iii) limiting grazing to the dry season period of May 15 through October 15.

To further ensure that restoration of the 6.8-acre wetland pasture would occur in a manner that would both provide for seasonal grazing as well as accommodate restoration of the site to high brackish marsh and provide for the ongoing protection of the downstream salmonid habitat, staff recommends adding new Special Conditions 9-11, which, among other requirements, would require the applicant to implement specified limitations on, and best practices for, livestock

grazing within the 6.8-acre brackish marsh restoration area, both during the 5-year monitoring period as well as after completion of the 5-year monitoring period. The motion to adopt the staff recommendation of approval with special conditions is found on page 6.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** the proposed amendment to Coastal Development Permit No. 1-18-012 subject to the conditions set forth in the staff recommendation.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in conditional approval of the permit and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves the coastal development permit amendment on the grounds that the development as amended and subject to conditions, will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit amendment complies with the California Environmental Quality Act because feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the amended development on the environment.

II. STANDARD AND SPECIAL CONDITIONS

Standard Conditions 1-5 and Special Conditions Nos. 1-8 of CDP 1-08-012 remain in full force and effect. See Appendix B for the text of all the original permit conditions. **Special Conditions 9 through 11 are new special conditions added to the CDP as amended.** The new added conditions are listed below. New language appears as **bold double-underlined**.

9. Submission of Final Revised Planting and Monitoring Program

a. PRIOR TO COMMENCEMENT OF CONSTRUCTION OF DEVELOPMENT AUTHORIZED BY COASTAL DEVELOPMENT PERMIT AMENDMENT 1-08-012-A1, the Applicant shall provide, for the review and approval of the Executive Director, a final revised planting and monitoring plan for the combined 8-acre brackish marsh restoration area comprising both the pasture and non-pasture lands generally depicted on Page 6 of 7 of Exhibit 4. The final revised plan shall conform with the plan prepared by the Northcoast Regional Land Trust titled "Phase 1 Adaptive Management Area Wood Creek Aquatic Habitat Enhancement Project" dated May 2016, as modified by the Applicant's updated project description dated July 20, 2016, except that the plan shall be revised to include all of the following:

i. A final revised grazing monitoring plan consistent with the requirements of Special Condition 10;

ii. A fencing plan showing the type and location of wildlife-friendly fencing that shall be used to exclude cattle and other agricultural activities from the brackish marsh restoration area consistent with Special Condition 10;

iii. Interim success criteria for total vegetation cover and total native plant cover to help ensure that the restoration area will attain the approved final performance standards of at least 90% total plant cover and at least 50% cover by native plants within the brackish marsh restoration area. Interim success criteria shall be developed for all of the following:

(1) The plan shall specify success criteria for Year 2 for total vegetation cover and total native plant cover (i.e., specify coverages to be attained by the end of the second year following restoration implementation);

(2) The plan shall include contingency interim success criteria to be monitored in Years 3 and 4 if the Year 2 interim success criteria are not met; and

(3) The plan shall include criteria for assessing effects of grazing on vegetation performance goals consistent with Special Condition 10(a)(vi) below;

iv. Provisions for completion of a wetland delineation within the restored brackish marsh areas in the 5th-year following completion of restoration activities to verify the wetland status of the fill areas within the pasture and within the previously restored brackish marsh habitat;

v. Requirements for remediation should the restoration area(s) not meet the approved performance standards, which include, but are not limited to: (1) establishment of hydrologic conditions to support brackish tidal marsh in the restoration areas; (2) a minimum of 90% total plant cover and 50% native plant cover in the restored brackish marsh habitats by Year 5; and (3) that the 6.8-acre fill area within the pasture and the 1.2-acre fill area within the previously-restored brackish marsh delineate as brackish marsh wetlands based on a final wetland delineation. Remediation shall include a requirement that the permittee submit a remediation plan to the Executive Director that recommends further action and provides a timeline for additional monitoring and reporting. The remediation plan and results of post-remediation monitoring shall be processed as an amendment to this CDP, unless the Executive Director determines that no amendment is legally required.

vi. A reporting program for submittal of hard copies of all required monitoring reports to the Executive Director with the following minimum contents and according to the following schedule: (1) annual monitoring reports that include the dates, methods, and results of maintenance activities and monitoring, including an assessment of restoration success relative to the established criteria shall be provided by December 31st of each monitoring year beginning in the first calendar year following completion of the authorized restoration work; (2) a final monitoring report that includes, in addition to the annual monitoring dates, methods, and results, an assessment of the restoration success overall relative to the approved final performance standards identified in subsection (iii) above shall be provided by December 31st of the 5th-monitoring year following completion of the authorized restoration work; and

(3) pre- and post-grazing monitoring reports consistent with Special Condition 10.

b. The permittee shall plant and monitor the project site in accordance with the approved final plan. No changes to the approved final plan may occur without an amendment to this permit unless the Executive Director determines that no amendment is legally required.

10. Grazing Monitoring Plan and Grazing Limitations within the Brackish Marsh Restoration Area

a. PRIOR TO COMMENCEMENT OF CONSTRUCTION OF DEVELOPMENT AUTHORIZED BY COASTAL DEVELOPMENT PERMIT AMENDMENT 1-08-012-A1, the Applicant shall provide, for the review and approval of the Executive Director, a final revised grazing monitoring plan ("Revised Plan") for the 5-year monitoring period for the 6.8-acre brackish marsh restoration area generally depicted on Exhibit 4 that indicates whether limited "flash grazing" of the area by livestock will be used as a tool for the control of invasive species during the 5-year monitoring period. If "flash grazing" will occur within the 6.8-acre brackish marsh restoration area generally depicted on Exhibit 4 during the 5-year monitoring period, then the Revised Plan shall conform with the plan prepared by the Northcoast Regional Land Trust titled "Phase 1 Adaptive Management Area Wood Creek Aquatic Habitat Enhancement Project" dated May 2016, as modified by the Applicant's updated project description dated July 20, 2016, except the Revised Plan shall include the following provisions:

i. A fencing plan showing the design and location of fencing to be used to exclude all other agricultural activities from the 6.8-acre brackish marsh restoration area. The fencing shall be wire livestock fencing with sufficient openings above the ground to allow for the passage of small mammals and other small wildlife.

ii. Following implementation of restoration activities and for the duration of the monitoring period, each instance of grazing (hereafter "grazing event") within the 6.8-acre brackish marsh restoration area shall follow the pre-grazing and post-grazing monitoring protocols for tidal pooling and plant coverage thresholds specified below.

iii. During restoration of the 6.8-acre brackish marsh area, a grazing event may occur within the 6.8-acre brackish marsh restoration area only after the interim success standards have been met for minimum total plant coverage and for minimum native plant coverage consistent with Special Condition 9(a)(iii) above and only under the following grazing limitations: (1) there is no tidal inundation within the 6.8-acre brackish marsh restoration area; (2) at least 5 days have passed since tidal inundation has occurred in the area or the ground is sufficiently dry to minimize the potential for ground disturbance; (3) no rain is forecast and no tides are predicted for the area for the duration of the grazing event; and (4) grazing shall be monitored and cows shall be removed once vegetation is grazed to 3 inches in height, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing.

iv. Prior to instituting a grazing event within the 6.8-acre brackish marsh restoration area, pre-grazing quantitative monitoring of coverage of tidal pooling within the 6.8-acre brackish marsh restoration area shall occur 1 to 2 days after a spring tide event that is high enough to inundate at least 80% of the 6.8-acre brackish marsh restoration area.

v. After each grazing event within the 6.8-acre brackish marsh restoration area, post-grazing quantitative monitoring of the coverage of tidal pooling within the 6.8-acre brackish marsh restoration area shall occur 1 to 2 days after the first high tide event that is high enough to inundate at least 80% of the 6.8-acre brackish marsh restoration area.

vi. The Revised Plan shall specify that quantitative vegetation monitoring shall occur in each monitoring year following a grazing event to assess the status of the approved vegetation performance goals identified in the final planting and monitoring plan required by Special Condition 9. Minimum success criteria for each year following a grazing event shall demonstrate both (1) that total coverage of plants in the 6.8-acre brackish marsh restoration area is equal to or greater than the total plant coverage recorded prior to the previous year's grazing event(s); and (2) that the total coverage of native plants in the 6.8-acre brackish marsh restoration area is equal to or greater than the total native plant coverage recorded prior to the previous year's grazing event(s).

vii. The Revised Plan shall include a reporting program for submittal of hard copies of all required monitoring reports to the Executive Director with the following minimum contents and according to the following schedule: (1) pre-grazing monitoring reports shall be provided at least one week prior to planned grazing events in the 6.8-acre brackish marsh restoration area during the 5-year restoration monitoring period and shall include evidence of compliance with subsection (iii) above and shall include a quantitative estimate of pre-grazing tidal pooling consistent with subsection (iv) above; (2) post-grazing monitoring reports shall be provided within 90 days of completion of the post-grazing monitoring and shall document the post-grazing tidal pooling coverage consistent with subsection (v) above.

viii. If post-grazing monitoring shows that there has been an increase in coverage of tidal pooling by more than 10% above the documented pre-grazing tidal pooling coverage: (1) a biologist shall assess the brackish marsh habitat and provides recommendations for remediation; (2) the permittee shall provide a supplemental grazing and monitoring plan ("Supplemental Plan") that includes recommendations for (A) remediation of any habitat areas damaged by grazing as recommended by a qualified biologist, and (B) appropriate changes to the grazing limitations of subsection (iii) above within the restored brackish marsh habitat to avoid impacts to brackish marsh habitat from continued grazing in the future; and (3) the Supplemental Plan shall be processed as an amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

b. After the restoration and 5-year monitoring periods have concluded, and after any required Supplemental Plan has been prepared and processed pursuant to Subsection (a)(viii) above, grazing the 6.8-acre brackish marsh restoration area

generally depicted on Exhibit 4 shall occur consistent with the best grazing practices proposed in the addendum to the CDP amendment application submitted by the Northcoast Regional Land Trust dated July 20, 2016, as modified by this condition. The intent of the proposed best grazing practices is to ensure the ongoing protection of the downstream salmonid habitat and the maintenance of the biological productivity of the restored brackish marsh restoration area. The best grazing practices shall include the following: (i) grazing within the 6.8-acre restoration area shall occur using a controlled rotational grazing regime and paddocks to confine livestock to a maximum intensity of 25 cows per 4.5-acre paddock for a maximum of 5 days in a manner that ensures vegetation heights remain at or above 3 inches, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing; (ii) grazing shall be monitored and cows shall be removed once vegetation is grazed to 3 inches in height; (iii) grazing shall be limited to the dry season period of May 15 through October 15; and (iv) grazing shall occur consistent with all applicable recommendations set forth in the Supplemental Plan required by Subsection (a)(viii) above.

c. The permittee shall undertake development in accordance with the approved Revised and Supplemental Plans as well as the best grazing practices identified herein. No changes to any of these grazing requirements, including but not limited to any increase in the intensity of grazing or change in the timing of grazing events, may occur without an amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

11. Construction Responsibilities for Development Authorized Under CDP Amendment No. 1-08-012-A1:

a. Timing of Construction: Construction shall occur only between July 1st and November 15th and only when the ground surface is dry, except as provided below, to minimize ground disturbance and reduce the potential for stormwater runoff occurring during construction. Any grading, excavation, and other earth-moving activities conducted between October 15th and November 15 shall be subject to the following conditions: (i) Upon the onset of precipitation at the project site, all work shall cease and shall not recommence until the predicted chance of rain is less than 40 percent for the Eureka area based on National Weather Service forecasts. (ii) The work site(s) shall be winterized between work cessation periods by installing stormwater runoff and erosion control barriers around the perimeter of each construction site to prevent the entrainment of sediment into coastal waters. (iii) Adequate stocks of stormwater runoff and erosion control barrier materials shall be kept onsite and made available for immediate use;

b. Heavy Equipment BMPs: (i) Fuels, lubricants, and solvents shall not be allowed to enter coastal waters. (ii) All equipment shall be inspected for leaks prior to commencing work. (iii) Spill kits equipped with enough material to provide preliminary containment for a volume of material that can reasonably be expected to spill shall be maintained on the site. (iv) A registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call. (v) Any accidental spill shall be rapidly contained and cleaned up. (vi) There shall

be no on-site fueling or washing of heavy equipment, and stationary equipment shall be positioned over drip pans to collect any inadvertent leaks that may occur. (vii) Development shall minimize land disturbance during construction by confining the project footprint to the maximum extent feasible and by using only designated access corridors to and between work sites. (viii) Construction access paths through areas having wet or soft soils shall use heavy synthetic mats or other acceptable non-toxic materials that can be readily laid down and immediately removed following construction;

c. Fish and Water Quality Protection: (i) In-channel work (i.e., installation of sills and temporary sediment plugs within previously restored tidal channels) shall be performed during periods of low tides only and after fish relocation has been completed under the supervision of a qualified fisheries biologist. (ii) A qualified biologist in consultation with CDFW and NOAA-Fisheries staff shall appropriately use seining, dip nets, electrofishing, or other trapping procedures to transfer aquatic organisms out of the work area to suitable locations downstream in Wood Creek. (iii) Prior to sill construction within the previously restored tidal channels, temporary sediment plugs shall be installed at the mouth of each of the previously restored tidal channels to an elevation of 8.1 feet (NAVD88) to effectively separate channels from the main stem of the creek. (iv) Plugs shall remain in place until construction of the log and earthen sills is complete. (v) Following completion of sill construction plugs shall be removed during the next period of neap tide with daily tides at a maximum of 7 feet (NAVD88) and during rising tides to minimize the potential for water quality impacts within the main stem of the creek.

d. Runoff, Erosion, and Sediment Control BMPs: Development shall minimize site runoff and erosion and the discharge of sediment and other potential pollutants resulting from construction activities (e.g., chemicals, vehicle fluids, petroleum products, cement, debris, and trash) through the use of appropriate temporary BMPs such as mulching, soil binders, erosion control blankets, silt fences, and temporary re-seeding. The use of temporary erosion and sediment control products (such as fiber rolls, erosion control blankets, mulch control netting, and silt fences) that incorporate plastic netting (such as polypropylene, nylon, polyethylene, polyester, or other synthetic fibers) is prohibited in order to minimize wildlife entanglement and plastic debris pollution.

e. Waste Management: (i) During construction, all trash shall be properly contained, removed from the work site, and disposed of on a regular basis to avoid contamination of habitat. (ii) Except as authorized by CDP Amendment No. 1-08-012-A1, no construction materials, debris, or waste of any kind shall be placed or stored where it may be subject to entering coastal waters. (iii) All materials and debris stockpiled onsite shall be contained at all times, and covered with tarps or plastic sheeting during high winds and/or precipitation. (iv) Debris, waste, and other excess material generated by the authorized work shall be lawfully disposed of outside of the coastal zone at an authorized disposal site capable of receiving such materials within 10 days of project completion. (v) Side casting or placing any construction debris or any other debris or waste within any wetland or environmentally sensitive habitat area is prohibited.

III. FINDINGS AND DECLARATIONS

A. BACKGROUND

On October 17, 2008, the Commission approved with conditions CDP 1-08-012 authorizing the "Wood Creek Tidal Marsh Enhancement Project" on the subject property, known as Freshwater Farms Reserve,[1] located along Freshwater Slough and Wood Creek just outside the City of Eureka (Exhibits 1-2). The approved project, also known as the "Phase 1" restoration project (Exhibit 3 and Appendix B), involved restoring tidal hydrology and brackish marsh habitat across 23 acres of diked former tidelands (seasonal freshwater wetlands/seasonally grazed pasturelands) and enhancing 4,500 square feet of juvenile salmonid rearing habitat along Wood Creek, a small perennial stream that flows into Freshwater Slough through a muted tide gate system. In addition to the habitat restoration authorized under CDP 1-08-012, the applicant reserved approximately 20 acres of lands on the property for continued agricultural use (seasonal cattle grazing).

The Phase 1 restoration project had significant overall habitat restoration benefits for a variety of marine resources, including enhanced and restored habitat for at least three federally-listed marine fish species [coho salmon (*Oncorhynchus kisutch*), steelhead trout (*O. mykiss*), and tidewater goby (*Eucyclogobius newberryi*)]. In its approval of CDP 1-08-012, the Commission found that the Phase 1 restoration project would restore degraded habitat for a variety of marine resources, including three species of federally listed salmonids, consistent with the mandates of Sections 30230 and 30231 to maintain and enhance marine resources and sustain the biological productivity of coastal waters. At the same time, the Commission acknowledged that the project would result in the conversion of approximately 13.5 acres of nonprime, seasonal agricultural land inconsistent with the provisions of Section 30242 of the Coastal Act. The Commission found that the project presented a true conflict between Section 30242 and Sections 30230 and 30231 of the Coastal Act and invoked the conflict resolution policies of Section 30007.5 of the Coastal Act, finding that the habitat restoration necessary to maintain and enhance marine resources and sustain biological productivity would be more protective of coastal resources than avoiding the project's agricultural impacts (the Adopted Findings for CDP 1-08-012 are included as Appendix B).

The Commission granted its approval of CDP 1-08-012 subject to eight special conditions, including a condition requiring specified monitoring. Special Condition 1 of the CDP required submittal of a final monitoring plan for the restoration areas for review and approval by the Executive Director prior to the issuance of the coastal development permit. The final monitoring plan was required to outline a method for measuring and documenting the improvements in habitat value and diversity at the site over the course of five years following project completion. Furthermore, Special Condition 1 required the final monitoring plan to include provisions for remediation to ensure that the goals and objectives of the tidal marsh restoration project are met.

The applicant undertook the permitted restoration work over three summers from 2008-2010. Monitoring began in part in 2009 (hydrology monitoring) and continued through 2014. The final (5^{th}-year) monitoring report was submitted to the Executive Director in the spring of 2015.

[1] See http://ncrlt.org/projects#freshwater.

Monitoring included data collection and success thresholds in the restoration area for topography, hydrology, water quality, vegetation, and fisheries. The final monitoring report indicated that the restoration project met all of the performance standards required by the permit for each monitoring element, including, but not limited to, the following: (1) the tidal cycle was successfully restored to the entirety of the restoration area; (2) water quality (i.e., levels of salinity, dissolved oxygen, temperature, and pH) in Wood Creek was improved to provide suitable rearing habitat for juvenile salmonids; and (3) a predominance of native brackish marsh vegetation was successfully established across the majority of the restoration area.

B. AMENDMENT DESCRIPTION AND PURPOSE

Although the restoration project succeeded in meeting its performance standards, the unanticipated trapping of salt waters on adjacent agricultural land resulted in the unforeseen formation of salt pannes in a 6.8-acre wetland pasture area used for seasonal grazing, which not only damaged brackish marsh habitat values but led to the discharge of highly saline warm water into the salmon habitat along Wood Creek, damaging its water quality and habitat value for salmon. The applicant is now proposing to undertake adaptive management activities within and adjacent to the Phase 1 restoration area to better maintain water quality and habitat for marine resources, including federally listed salmonids while still providing for seasonal grazing in the 6.8-acre wetland pasture adjoining the Phase 1 restoration area and in pasture lands elsewhere on the property. Specifically, the applicant proposes to (1) place approximately 5,500 cubic yards of fill material at a depth of 2.5 inches to 1.6 feet across the 6.8 acre wetland pasture area used for seasonal grazing to eliminate the salt pannes that developed in this area adjacent to the original Phase 1 area and restore the area to brackish marsh; (2) place approximately 1,380 cubic yards of fill material at a depth of 2.5 inches to 1.4 feet across 1.2 acres of brackish marsh habitat previously restored under Phase 1 to redirect drainage of tidal waters away from the freshwater channel habitat for the benefit of salmonids; and (3) construct three log sills and seven earthen sills (using a total of ~70 cubic yards of material) within the tidal channels previously restored under Phase 1to better enhance habitat for salmonids.

The source of the fill material for the proposed adaptive management activities would be from a companion project, the Phase 2 restoration project, which the applicant plans to simultaneously undertake elsewhere on the property under the direction of the NOAA-Restoration Center's Community-Based Restoration Program. The Phase 2 restoration project is included in the project reviewed by the Commission under Consistency Determination CD-021-13, which the Commission concurred with in May of 2013.[2] Phase 2 involves additional restoration of juvenile salmonid rearing habitat through the excavation of a network of channel and pool features on approximately 5 acres of the property along upper Wood Creek.

Further detail about each adaptive management element proposed under this CDP amendment application and its purpose is discussed below.

Restoration of the 6.8-acre grazed brackish marsh area adjacent to the Phase 1 project area. The stated purpose of the fill placement within the 6.8 acres of wetland pasture used for seasonal grazing is to restore high brackish marsh habitat in a manner that will sustain the

[2] See http://documents.coastal.ca.gov/reports/2013/5/Th11a-5-2013.pdf.

biological productivity of and improve water quality in the upper portion of Wood Creek, including within the previously-restored off-channel salmonid pond downslope from the proposed fill area, while still providing for seasonal grazing.

As planned under the original project, the restoration of the tidal cycle to the habitat restoration area of the property in 2009 under the original restoration project resulted in the approximately monthly tidal inundation (tidally inundated approximately 1% of the year) of a 6.8-acre portion of the adjoining 20-acre freshwater wetland pasture reserved for seasonal grazing. While the frequency and extent of tidal inundation of this portion of the pasture was consistent with the permitted restoration design (see Exhibit 3), according to the final monitoring report for the restoration project, "…the project had a greater impact on vegetation within the adjacent agricultural land than was expected, resulting in the establishment of mudflat and invasive species across several acres." As described in the hydrology report completed in support of this permit amendment application (Exhibit 5):

> *One unforeseen outcome of the Phase I project was the formation of salt pannes on agricultural land adjacent to the Phase I project area. Salt pannes are shallow depressions typically found landward side of tidal marshes. The depressions flood at high tide trapping salt water. Where depressions exposed to direct sunlight, evaporation occurs driving salinity levels to Euhaline (30-40 ppt) and Hyperhaline (> 40 ppt) conditions. High salinity and low dissolved oxygen lead to vegetation die-back. As of early 2015, approximately 3 acres of the Freshwater Farms Reserve agricultural pastureland have converted to a combination of pannes and non-native species and approximately 3 more acres were trending in that direction.*
>
> *We theorize that the pannes formed as a result of differences in vegetation management in grazed areas and the area reserved for salt marsh. Vegetation heights in the grazed pasture areas remained low. The vegetation in the adjacent ungrazed salt marsh became quite thick and grew to heights of one to three feet. When flooded by high tides, salt water became trapped in depressions in the pasture areas. Drainage from the pasture areas was limited by the thick vegetation on the salt marsh reserve. The salinity of the trapped water increased due to evaporation, killing the existing vegetation and increasing the depths of the shallow depressions. This resulted in positive feedback and the trapping of more salt water and the growth of pannes.*
>
> *We conducted site observations of the pannes on July 2, 2015 during spring tides. North Spit tide stages were at 3.5 feet. Wood Creek was at low flow. The pannes were flooded from previous high tides and were not draining in between tides. Peak stage in the pond exceeded 7.5 feet on July 1, 2015. The pannes contained few to none vascular vegetation. Many of the pannes contained thick mats of algae. Using a hand-held salinity monitor, we measured salinity levels of 32 ppt in the pannes within the pasture. Water temperatures exceeded 22 degrees Celsius. Recall that salinity in Wood Creek is at brackish levels. The high salinity levels and water temperatures in the pannes are a strong indication that the water is trapped and not being exchanged or flushed. Recall that wells 6 and 7, which are located adjacent to the pannes, have salinity levels of 12-18, which is another indication that the pannes are trapping salt water.*

Furthermore, due to the prevalence of invasive species and unvegetated highly saline "salt pannes" across the area, the 6.8 acres of wetland pasture is not representative of or functioning as typical high-elevation brackish marsh habitat (i.e., marsh habitat at the upper end of the tidal reach, ~7-8 ft. NAVD88). Existing high brackish marsh habitats around Humboldt Bay typically are more densely vegetated with a mix of native saline-tolerant hydrophytic grasses and herbs such as tufted hairgrass (*Deschampsia cespitosa*), meadow barley (*Hordeum brachyanterum*), silverweed (*Potentilla anserina* ssp. *pacifica*), and various other species. Thus, the proposed placement of fill within the 6.8 acre wetland pastureland used for seasonal grazing is designed to restore appropriate topographic elevations to support functional high brackish marsh habitat that supports an appropriate coverage and density of native brackish marsh vegetation, primarily salt water tolerant hydrophytic grasses and herbs.

The proposed fill placement within the 6.8-acre wetland pasture used for seasonal grazing is also designed to improve water quality downstream within Wood Creek, including within the off-channel pond constructed as part of the Phase 1 restoration project. The applicant restored this approximately 4,500-square-foot off-channel pond along Wood Creek to provide suitable rearing habitat (i.e., low-velocity aquatic habitat off the main creek channel) for juvenile coho salmon, steelhead trout, coastal cutthroat trout, and other fish species. Juvenile coho and steelhead, both of which are federally protected species under the Endangered Species Act, typically spend a year or more rearing in freshwater (and, if available, estuaries) before smolting (undergoing changes necessary to enter saltwater). The fish species are extremely sensitive to water quality and can persist only within aquatic habitat that meets certain parameters for temperature, salinity, dissolved oxygen, and pH (among other requirements).

Currently, the off-channel pond restored under the Phase 1 project is not providing optimum habitat quality for juvenile salmonids during certain times of the year as it often contains high levels of salt, algae, and warm ponded water resulting from the inflow of warmer and highly saline water originating from (1) drainage southward from the salt panne areas into the pond during high tide events, and (2) tidal overflow from the Phase 1 tidal channels draining southward at higher tides into Wood Creek at and around the restored off-channel pond. Under optimal conditions, the upper portion of Wood Creek around the restored pond is significantly cooler and less saline than Freshwater Slough (located approximately one-third of a mile downstream), thereby providing critical high-quality rearing habitat for juvenile salmonids. The proposed fill placement within the 6.8-acre wetland pasture used for seasonal grazing is designed to direct tidal drainage westward towards the previously restored tidal channels downstream and away from the higher quality (cooler, less saline) upstream rearing areas, including the off-channel pond.

Prior to placing the fill within the area, the applicant plans to disc the site to remove the existing invasive species and prepare the soil for the fill contouring. The applicant proposes to plant the area both by broadcast seeding (using a mix of native brackish marsh species) and hand-planting of native marsh grass plugs. The proposed Planting and Monitoring Plan (Exhibit 7) as modified by the Applicant's updated project description dated July 20, 2016 would plant the marsh restoration areas with a mix of regionally appropriate native brackish marsh plants installed in

different areas (referred to as "macroplots"), depending on hydrologic and saline influence of the particular area.

As proposed, cows could be allowed to "flash graze" the restoration area during the planned five-year restoration and monitoring period under specified circumstances and with the sole intent of invasive plant control. If flash grazing for invasive plant control would occur during the five-year restoration and monitoring period, cows would only be allowed in the area when the ground is dry and when no rain is forecasted and after revegetation has reached at least 75% coverage (with at least 10% coverage of native plants). Tidal pooling in the area would be quantified both before and after grazing to determine if there is an increase in pooling over a specified amount of the pre-grazing pooling. Fencing would be erected within the restoration area to contain a maximum of 10 cows across half of the restoration area (approximately 3.5 acres) at a time. Grazing would be monitored and cows would be removed once vegetation is grazed to 3 inches in height, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing. The applicant would monitor the success of the restoration project for five years, including proposed qualitative and quantitative vegetation monitoring and hydrology monitoring.

Once the restoration site has been successfully restored, the applicant proposes to resume grazing in the 6.8-acre restoration area under a permanent controlled rotational grazing regime in conjunction with the remaining 11 acres of pasture land on the property in a manner that would help ensure the ongoing protection of the downstream salmonid habitat and the maintenance of the biological productivity of the restored brackish marsh restoration area. The proposed long-term best grazing practices include (i) conducting controlled rotational grazing using paddocks to confine livestock to a maximum intensity of 25 cows per 4.5-acre paddock for a maximum of 5 days to ensure vegetation heights remain at or above the 3-inch height threshold, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing;[3] (ii) monitoring grazing and removing cows once vegetation is grazed to the 3-inch height threshold; and (iii) limiting grazing to the dry season period of May 15 through October 15 only.

Enhancement of brackish marsh habitat previously restored under Phase 1. In addition to the proposed fill placement within the degraded brackish wetland pasture, the applicant also proposes to place approximately 1,380 cubic yards of fill across approximately 1.2-acre of previously restored brackish marsh habitat south of the pastureland. The subject site was restored to brackish marsh habitat under the Phase 1 restoration project. However, similar to the degraded wetland pasture described above, this portion of the restored brackish marsh contains expansive unvegetated, highly saline salt pannes caused by pooling of trapped tidewaters that don't effectively drain back to the downstream channels following high tide events (Exhibit 6). The intent of the fill placement within this portion of the previously restored brackish marsh would be to help direct tidal drainage westward towards the previously restored tidal channels downstream and away from the higher quality upstream rearing areas within Wood Creek, including the off-channel pond, as explained above for the proposed pasture wetland fill. Prior to

[3] According to the Washington State University Cooperative Extension, maintaining grass at a minimum height of three inches at the time of rotation will prevent grass from dying, causing bare spots and muddy conditions (see https://www.premier1supplies.com/img/newsletter/05-22-14-goat/PastureGrazingMgmt.pdf).

fill placement, the applicant would disc the site to prepare the soil then plant the area with appropriate native marsh species (Exhibit 7). The proposed Planting and Monitoring Plan discussed above would also address the revegetation of this area.

Aquatic habitat enhancement within the tidal channels previously restored under Phase 1. Finally, the applicant proposes to construct three log "sills" (habitat features) and seven earthen sills (using a total of ~70 cubic yards of earthen material) within the tidal channels previously restored under Phase 1. The sills are intended to enhance fish habitat by creating pools that remain shallowly flooded at low tides, thus creating refugia for nursery fish and other aquatic species. The sills also will prevent stranding of fish during seasonal and tidal changes. To minimize disturbance to Wood Creek and to create dry conditions in the upstream work area where sills would be installed, the applicant proposes to install temporary sediment plugs at the mouth of each of the four previously restored channels. Temporary sediment plugs would be filled to 8.1 feet (NAVD88), which is high enough in elevation to effectively separate channels from the main stem of the creek. Temporary plugs would remain in place until construction of the log and earthen sills is complete. To minimize water quality impacts from plug removal, plugs would be removed during periods of neap tides, when peak daily tides do not exceed 7 feet, and during periods of rising tides, when flood tides will push water up the channels and away from the main stem of the creek where fish may be present.

C. STANDARD OF REVIEW

The project site is located in the Commission's retained permit jurisdiction. The County of Humboldt has a certified LCP, but the site is within an area shown on State Lands Commission maps over which the State retains a public trust interest. Therefore, the standard of review that the Commission must apply to the project is the Chapter 3 policies of the Coastal Act.

D. OTHER APPROVALS

Humboldt County. The County approved a conditional use permit for the proposed project on December 18, 2014.

Humboldt Bay Harbor, Recreation, and Conservation District. The District confirmed that no permit is required for the proposed adaptive management and restoration activities.

State Lands Commission. Although the project site is subject to the public trust, jurisdiction of the tidelands on the property was granted by the SLC to the Harbor District pursuant to a legislative grant. Thus, there is no need for SLC approval of the amended development.

California Department of Fish and Wildlife (CDFW). The Department requires a Streambed Alteration Agreement (SAA) pursuant to Section 1603 of the California Fish and Game Code for the proposed work within the tidal channels. The department issued Agreement No. 1600-2016-0063-R1 on May 31, 2016 for the proposed project.

North Coast Regional Water Quality Control Board. The Regional Board requires a water quality certification (WQC) for the proposed work pursuant to Section 401 of the Clean Water

Act and/or the Porter-Cologne Water Quality Control Act. The Board issued a water quality certification for the project on June 20, 2016.

U.S. Army Corps of Engineers. The Corps has regulatory authority over the proposed work in the tidal channels under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 1344) and/or Section 404 of the Clean Water Act. Section 10 of the Rivers and Harbors Act regulates structures or work in navigable waters of the United States. Section 404 of the Clean Water Act regulates fill or discharge of materials into waters and ocean waters. On April 19, 2016 the Corps determined that the project qualified for coverage under Nationwide Permit (NWP) No. 3 (Maintenance) and NWP 27 (Aquatic Habitat Restoration, Establishment, and Enhancement Activities).

E. RESTORATION OF MARINE RESOURCES, BIOLOGICAL PRODUCTIVITY, AND PERMISSIBLE FILLING OF WETLANDS

Section 30230 of the Coastal Act states as follows:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states as follows:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30233 of the Coastal Act states, in applicable part, as follows:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> …
>
> *(6) Restoration purposes.*
>
> …

> *(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary…*

As described above, the proposed permit amendment involves the placement of fill across existing brackish wetland, including approximately (1) 5,500 cubic yards of material across 6.8 acres of wetland pasture used for seasonal grazing, (2) 1,380 cubic yards of material across 1.2 acres of previously restored brackish marsh habitat, and (3) 70 cubic yards of earthen material and additional large woody material within previously restored tidal channels.

When read together as a suite of policy directives, Sections 30230, 30231, and 30233 set forth a number of different limitations on what types of projects may be allowed in coastal wetlands. For analysis purposes, the limitations applicable to the subject project can be grouped into four general categories or tests. These tests require that projects that entail the dredging, diking, or filling of wetlands demonstrate that (a) the purpose of the filling, diking, or dredging is for one of the seven uses allowed under Section 30233; (b) the project has no feasible less environmentally damaging alternative; (c) feasible mitigation measures have been provided to minimize adverse environmental effects; and (d) the biological productivity and functional capacity of the habitat shall be maintained and enhanced where feasible.

Allowable Use

As explained in detail below, the proposed filling of brackish wetlands is for "restoration purposes" allowable under Coastal Act Section 30233(a)(6).

Neither the Coastal Act nor the Commission's administrative regulations contain a precise definition of "restoration." The dictionary defines "restoration" in terms of actions that result in returning an article "back to a former position or condition," especially to "an unimpaired or improved condition."[4] The particular restorative methods and outcomes vary depending upon the subject being restored. For example, the Society for Ecological Restoration defines "ecological restoration" as "the process of intentionally altering a site to establish a defined indigenous, historical ecosystem. The goal of the process is to emulate the structure, function, diversity, and dynamics of the specified ecosystem."[5] However, within the field of "wetland restoration" the term also applies to actions taken "in a converted or degraded natural wetland that result in the reestablishment of ecological processes, functions, and biotic/abiotic linkages and lead to a persistent, resilient system integrated within its landscape"[6] that may not necessarily result in a return to historic locations or conditions within the subject wetland area. Implicit in all of these varying definitions and distinctions is the understanding that the restoration entails returning something to a prior state. Consequently "restoration," as contrasted with "enhancement," encompasses not only reestablishing certain prior conditions but also reestablishing the processes that create those conditions. In addition, most of the varying definitions of restoration imply that the reestablished conditions will persist to some degree, reflecting the homeostatic natural forces that formed and sustained the original conditions before being artificially altered or degraded.

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[4] Merriam-Webster's Online Dictionary, http://www.merriam-webster.com/dictionary/restoration

[5] "Definitions," *Society of Ecological Restoration News*, Society for Ecological Restoration; Fall, 1994

[6] *Position Paper on the Definition of Wetland Restoration*, Society of Wetland Scientists, August 6, 2000

Moreover, finding that proposed dredging and filling constitutes "restoration purposes" must be based, in part, on evidence that the proposed project will be successful in improving habitat values. Should the project be unsuccessful at increasing and/or enhancing habitat values, or worse, if the proposed dredging and filling impacts of the project actually result in long term degradation of the habitat, the proposed project would not be for "restoration purposes."

Thus, to ensure that a proposed restoration project achieves its stated habitat enhancement objectives, and therefore can be recognized as being for "restoration purposes," the project must demonstrate that: (1) it either entails a return to or re-establishment of former habitat conditions, or it entails actions taken that will result in the reestablishment of landscape-integrated ecological processes and/or abiotic/biotic linkages associated with estuarine habitats; and (2) there is a reasonable likelihood that the identified improvements in habitat value and diversity will result; and (3) once re-established, it has been designed to provide the desired habitat characteristics in a self-sustaining, persistent fashion independent of the need for repeated maintenance or manipulation to uphold the habitat function.

As explained below for each proposed project element involving diking, dredging, or filling of coastal wetlands and waters, the Commission finds that the proposed project constitutes "restoration purposes" consistent with Section 30233(a)(6) of the Coastal Act:

1. Restoration of 6.8 acres of grazed brackish marsh habitat adjacent to the Phase 1 restoration area. As discussed above, the primary purpose of the placement of approximately 5,500 cubic yards of fill within the 6.8-acre wetland pasture used for seasonal grazing is for restoration of habitat with two objectives: (i) to redirect tidal drainage away from Wood Creek to sustain the biological productivity of and improve water quality in the upper portion of Wood Creek on the property and within the previously restored off-channel salmonid pond downslope from the proposed fill area; and (ii) to restore high brackish marsh habitat in the 6.8 acre wetland pasture used for seasonal grazing in a manner that supports an appropriate coverage and density of native high brackish marsh vegetation. Juvenile coho and steelhead, both of which are federally protected species under the Endangered Species Act, typically spend a year or more rearing in freshwater (and, if available, estuaries) before smolting (undergoing changes necessary to enter saltwater). The fish species are extremely sensitive to water quality and can persist only within aquatic habitat that meets certain parameters for temperature, salinity, dissolved oxygen, and pH (among other requirements). Currently, the off-channel pond restored under the Phase 1 project is not providing optimum habitat quality for juvenile salmonids during certain times of the year as it often contains high levels of salt, algae, and warm ponded water resulting from the inflow of warmer and highly saline water originating from (1) drainage southward from the salt panne areas into the pond during high tide events, and (2) tidal overflow from the Phase 1 tidal channels draining southward at higher tides into Wood Creek at and around the restored off-channel pond. Under optimal conditions, the upper portion of Wood Creek around the restored pond is significantly cooler and less saline than Freshwater Slough (located approximately one-third of a mile downstream), thereby providing critical high-quality rearing habitat for juvenile salmonids. Juvenile salmonid summer rearing habitat in particular is a limited habitat type in the region, as the availability of cool water/low saline pools is limited

during the relatively long dry season (approximately June through October). The proposed fill placement within the 6.8-acre wetland pasture used for seasonal grazing would be designed to direct tidal drainage westward towards the previously restored tidal channels downstream and away from the higher quality (cooler, less saline) upstream rearing areas, including the off-channel pond. The proposed development is needed to help maintain marine resources within Humboldt Bay by restoring brackish marsh habitat and assisting in the recovery of listed salmonid species.

According to information from the U.S. Fish and Wildlife Service (FWS), in the Humboldt Bay region it is estimated that approximately 10,000 acres of tidal marsh (including salt marsh and brackish marsh habitats) were present prior to human development. Since the mid-1800's, most of what was likely to have been historic tidal marsh has been diked or filled and has been reduced to a total area of around 900 acres, a reduction of at least 87 percent. The FWS has indicated that restoration of tidal marsh habitats around the Bay is a high priority, as tidal marsh restoration is important for the protection, enhancement, and restoration of native fish, wildlife, and plant communities, some of which are dependent on tidal marsh for their existence. In past permit actions on wetland restoration projects around Humboldt Bay, the Commission has acknowledged that, in general, restoring areas that have historically supported tidal marsh is preferable when the physical conditions of a site present such an opportunity.

Historically, the project site occupied the upper zone of tidal marshland surrounding the perimeter of Humboldt Bay and its tidal mudflats prior to the construction of the Northwestern Pacific Railroad and Highway 101 seaward of the site beginning over 100 years ago and prior to being diked, drained, and muted through tidegate installation. The project area is shown as "tidal marsh" on the 1870 U.S. Coast and Geodetic Survey Map, which delineated pre-development tidal marsh boundaries around the bay. Historically, the area likely supported transitional brackish marsh habitat at the interface of tidal flux intermixing with freshwater input (from Freshwater and Wood Creeks).

According to the Biological Assessment prepared for the Phase 1 restoration project,[7] brackish marsh habitat is even more limited than salt marsh habitat in the Humboldt Bay region. Brackish marsh habitat represents a transitional interface between salt marsh and freshwater marsh, where salinity levels are relatively low, but the habitat still is tidally influenced. Typical brackish marsh vegetation in the Humboldt Bay region is dominated by tufted hairgrass, Lyngbye's sedge, and other species. One of the few remaining relatively pristine examples of brackish marsh habitat occurs along Fay Slough, approximately one mile north of the project site. This area was used as a reference site for the design phase of the Phase 1 restoration project.

The restoration of the tidal cycle to the property in 2009 under the Phase 1restoration project resulted in the approximately monthly tidal inundation (tidally inundated approximately 1% of the year) of a 6.8-acre portion of the 20-acre freshwater wetland pasture reserved for seasonal grazing. While the frequency and extent of tidal inundation of this portion of the pasture was consistent with the permitted restoration design,

[7] McBain & Trush, Inc. October 2007.

according to the final monitoring report for the restoration project, "…the project had a greater impact on vegetation within the adjacent agricultural land than was expected, resulting in the establishment of mudflat and invasive species across several acres." Furthermore, due to the prevalence of invasive species and unvegetated highly saline "salt pannes" across the area, the affected land is neither representative of, nor functioning as, typical high-elevation brackish marsh habitat. Thus, the proposed placement of fill within the 6.8-acre wetland pasture used for seasonal grazing would restore appropriate topographic elevations to support functional brackish marsh habitat that supports an appropriate coverage and density of native brackish marsh vegetation, which in turn will sustain the biological productivity of and improve water quality in the upper portion of Wood Creek on the property, including within the previously-restored off-channel salmonid pond downslope from the proposed fill area.

2. Enhancement of 1.2 acres of brackish marsh habitat previously restored under Phase 1. Similar to the degraded wetland pasture described above, a 1.2-acre portion of the site restored to brackish marsh habitat under the Phase 1 restoration project contains expansive unvegetated, highly saline salt pannes caused by pooling of trapped tidewaters that don't effectively drain back to the downstream channels following high tide events. The intent of the placement of approximately 1,380 cubic yards of fill within this portion of the previously restored brackish marsh is to help direct tidal drainage westward towards the previously restored tidal channels downstream and away from the higher quality upstream rearing areas within Wood Creek, including the off-channel pond, as explained above for the proposed pasture wetland fill. As with the pasture wetland discussed above, the subject site historically occupied the upper zone of tidal marshland surrounding the perimeter of Humboldt Bay and its tidal mudflats prior to being diked, drained, and muted through tide gate installation.

3. Enhancement of aquatic habitat within tidal channels previously restored under Phase 1. The intent of the proposed earthen and wood fill material in the channels is to enhance fish habitat by creating pools that remain shallowly flooded at low tides, thus creating refugia for nursery fish and other aquatic species. The proposed sills also will prevent stranding of fish during seasonal and tidal changes. As previously discussed, in addition to the sills themselves, the applicant proposes to install temporary sediment plugs at the mouth of each of the four previously restored channels. Temporary sediment plugs will be filled to 8.1 feet (NAVD88), which will be high enough in elevation to effectively separate channels from the main stem of the creek. The temporary plugs will remain in place until construction of the log and earthen sills is complete. In order to minimize water quality impacts from plug removal, the plugs will be removed during periods of neap tides, when peak daily tides do not exceed 7 feet, and during periods of rising tides, when flood tides will push water up the channels and away from the main stem of the creek where fish may be present.

The Commission finds that the proposed restoration elements described above that are designed to achieve the habitat restoration objectives also described above are mandated by the requirements of Section 30231, which mandates that the biological productivity and the quality of coastal waters appropriate to maintain optimum populations of marine organisms shall be

maintained. The Commission further finds that the proposed placement of fill within the 6.8-acre wetland pasture used for seasonal grazing, within previously restored brackish marsh, and within previously restored tidal channels for the restoration of brackish wetland and aquatic habitats described above is permissible under Section 30233(a)(6) for "restoration purposes."

This finding that the proposed project constitutes "restoration purposes" is based, in part, on the assumption that the project will be successful in increasing tidal habitat values and enhancing freshwater salmonid habitat. Should the project be unsuccessful at increasing habitat values, or worse, if the proposed filling impacts of the project actually result in long term degradation of the habitat, the proposed filling would not actually be for "restoration purposes." To ensure that the proposed project achieves the objectives for which it is intended, the applicant has proposed a Planting and Monitoring Plan for the proposed adaptive management area (Exhibit 7, with updates to the proposed seed mix in Exhibit 8). The plan proposes to plant the marsh restoration areas with a mix of regionally appropriate native brackish marsh plants. Different plants would be planted in different areas (referred to as "macroplots") depending on hydrologic and saline influence of the particular area. As proposed, the applicant may allow cows to "flash graze" the restoration area during the planned five-year restoration and monitoring period under specified circumstances, with the sole intent of invasive plant control. If flash grazing for invasive plant control would occur during the five-year restoration and monitoring period, cows would only be allowed in the area when the ground is dry and when no rain is forecasted and after revegetation has reached at least 75% coverage (with at least 10% coverage of native plants). Tidal pooling in the area would be quantified both before and after grazing to determine if there is an increase in pooling over a specified amount of the pre-grazing pooling. Fencing would be erected within the restoration area to contain a maximum of 10 cows across half of the restoration area (approximately 3.5 acres) at a time. Grazing would be monitored and cows would be removed once vegetation is grazed to 3 inches in height, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing.[8] The applicant would monitor the success of the restoration project for five years, including proposed qualitative and quantitative vegetation monitoring and hydrology monitoring.

Once the restoration site has been successfully restored, the applicant proposes to resume grazing under a permanent controlled rotational grazing regime in the 6.8-acre brackish marsh restoration area in conjunction with the remaining 11 acres of pasture land on the property using specified limitations to ensure the ongoing protection of the downstream salmonid habitat and the maintenance of the biological productivity of the restored brackish marsh restoration area. The proposed long-term best grazing practices include (i) instituting a controlled rotational grazing regime using paddocks to confine livestock to a maximum intensity of 25 cows per 4.5-acre paddock for a maximum of 5 days to ensure vegetation heights remain at or above the 3-inch height threshold; (ii) monitoring grazing and removing cows once vegetation is grazed to the 3-

[8] According to the Washington State University Cooperative Extension, maintaining grass at a minimum height of three inches at the time of rotation will prevent grass from dying, causing bare spots and muddy conditions. Ensuring a minimum grass height of at least 3 inches provides confidence that the grass will remain productive and functionally support the biological services of the high marsh ecosystem, such as sediment capture, water filtration, nutrient uptake, plant growth, and wildlife habitat (see https://www.premier1supplies.com/img/newsletter/05-22-14-goat/PastureGrazingMgmt.pdf).

inch height threshold; and (iii) limiting grazing to the dry season period of May 15 through October 15 only.

The Commission finds that grazing limitations within the restoration area are critical to the protection of water quality in Wood Creek downstream and to increasing tidal habitat values within the restoration area. The grazing limitations on the use of flash grazing during the restoration and monitoring period and on the permanent grazing activities after restoration of the site are needed to prevent the formation of salt pannes, which, as the hydrology report prepared by the U.S. Fish and Wildlife Service documents (Exhibit 5), occurred after implementation of the Phase 1 restoration project. As documented in the hydrology report produced by the U.S. Fish and Wildlife Service for the project (Exhibit 5), the highly saline salt pannes were believed to have been formed

> *…as a result of differences in vegetation management in grazed areas and the area reserved for salt marsh. Vegetation heights in the grazed pasture areas remained low. The vegetation in the adjacent ungrazed salt marsh became quite thick and grew to heights of one to three feet. When flooded by high tides, salt water became trapped in depressions in the pasture areas. Drainage from the pasture areas was limited by the thick vegetation on the salt marsh reserve. The salinity of the trapped water increased due to evaporation, killing the existing vegetation and increasing the depths of the shallow depressions. This resulted in positive feedback and the trapping of more salt water and the growth of pannes… The high salinity levels and water temperatures in the pannes are a strong indication that the water is trapped and not being exchanged or flushed.*

As previously discussed, best grazing practices recommend[9] maintaining vegetation at a minimum height threshold of 3 inches to prevent drying, bare spots, and muddy conditions. Ensuring a minimum grass height of at least 3 inches provides confidence that the grass will remain productive and functionally support the biological services of the high marsh ecosystem, such as sediment capture, water filtration, nutrient uptake, plant growth, and wildlife habitat In addition, according to the Natural Resources Conservation Service FarmASyst Environmental Stewardship for Farmers guide[10]:

> *Uncontrolled grazing presents other disadvantages, but the primary concern is the loss of vegetative cover due to frequent grazing, trampling, or grazing the plants too close to the soil. This often weakens root systems and exposes and compacts the soil. These degradations to soil quality can increase the soil erosion and nutrient losses from pastures and can, in turn, pollute surface waters.*

While some of the grazing limitations proposed for flash grazing during the restoration and monitoring period and the monitoring methods and protocols proposed in the planting and monitoring plan are adequate, in some cases, as detailed below, they do not go far enough to ensure that the restoration project will be successful in increasing tidal habitat values while providing for seasonal grazing:

[9] Ibid.
[10] http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_046596.pdf.

- The planting and monitoring plan as proposed includes no fencing plan for separating the remaining pasture area from the restoration area. Without a fencing plan, it is not understood what type of fencing would be used to separate the pasture area from the restoration area, where the fencing would be located, and whether or not it would be "wildlife friendly" to allow for the passage of small mammals and other small wildlife.
- As proposed the planting and monitoring plan includes no interim success criteria to help ensure that development of the restoration site will successfully attain the specified final performance goals, which include a minimum of 90% total plant cover and 50% native plant cover in the restored brackish marsh habitats by year 5.
- As proposed, the planting and monitoring plan includes no provisions for completion of a wetland delineation within the restored brackish marsh restoration area to confirm that the fill placement for restoration does not inadvertently convert wetland habitat to upland habitat.
- The plan as proposed includes no requirements for remediation should the restoration project not meet the approved success criteria within five years.
- The proposed plan lacks specifications on when and what type of monitoring information must be reported to the Executive Director during the 5-year monitoring period.
- As previously discussed, the plan as proposed includes allowance for only limited grazing (referred to as "flash grazing") during the 5-year monitoring period within the 6.8-acre restoration area as a tool for the management of invasive species under specified circumstances, including: (i) cows would only be allowed in the area when the ground is dry and when no rain is forecasted and after revegetation has reached at least 75% coverage with at least 10% coverage of native plants; (ii) tidal pooling would be quantified both before and after grazing, and if there is an increase in pooling over a specified amount of the pre-grazing pooling, then flash grazing would cease for the year; (iii) fencing would be erected within the restoration area to contain a maximum of 10 cows across half of the restoration area (approximately 3.5 acres) at a time; and (iv) grazing would be monitored and cows would be removed once vegetation is grazed to 3 inches in height. However, the specified circumstances proposed for flash grazing during the 5-year restoration and monitoring period are inadequate for all of the following reasons:

    - While the grazing plan proposes to not allow cows to access the 6.8-acre restoration area during periods when high tides are inundating the area, the plan does not specify how soon following tidal inundation of the area grazing would be allowed to resume within the restoration area. A measureable standard is needed that will assure that sufficient time has passed to allow for the ground to dry out and better resist ground disturbance from livestock.

    - The proposed grazing plan includes no details on when tidal pooling would be monitored (e.g., how many days after a tidal event of a particular threshold), which is necessary for accurate comparison of pre-grazing and post-grazing tidal

pooling in the area in order to gauge any significant grazing impacts on tidal pooling in the restoration area.

- The proposed grazing plan includes no provisions for monitoring grazing effects on vegetation success goals.

- As proposed, the grazing plan specifies that if there is an increase in tidal pooling over 50% of the pre-grazing pooling, then flash grazing would cease for that year. This 50% threshold would potentially allow for large swaths of tidewater to collect in the restoration area, which in turn could lead to the formation of salt pannes and water quality impacts in the downstream salmonid rearing habitat, as previously discussed. A smaller threshold than 50% is needed to ensure that any tidal pooling problems are detected early before significant impacts results. In addition, the plan as proposed includes no provisions for remediation if a problem with tidal pooling is detected, but only proposes cessation of grazing for that particular grazing season.

- Finally, the proposed plan lacks specifications on when and what type of monitoring information must be reported to the Executive Director during the 5-year monitoring period when flash grazing may occur.

To ensure that the proposed amended development will be successful in increasing tidal habitat values and improving water quality as proposed, the Commission imposes new Special Conditions 9 and 10. Special Condition 9 requires submittal of a final revised planting and monitoring plan for the Executive Director's review and approval prior to commencement of any development authorized by this CDP amendment. The revised plan shall conform to the proposed plan (Exhibit 7), except it shall be revised to include (1) a grazing monitoring plan consistent with the requirements of Special Condition 10 (described below); (2) a fencing plan showing the type and location of wildlife-friendly fencing that shall be used to exclude cattle and other agricultural activities from the brackish marsh restoration area; (3) interim success criteria for total vegetation cover and total native plant cover to help ensure that the restoration area will successfully attain the approved final performance standards of at least 90% total plant cover and at least 50% cover by native plants within the brackish marsh restoration area; (4) provisions for completion of a wetland delineation within the restored brackish marsh areas in the 5th-year following completion of restoration activities to verify the wetland status of the fill areas within the pasture and within the previously restored brackish marsh habitat; and (5) requirements for remediation should the restoration area(s) not meet the approved performance standards.

Special Condition 10 requires that a final grazing monitoring plan for the restoration and monitoring of the 6.8-acre pasture portion of the brackish marsh restoration area be submitted for the review and approval of the Executive Director that conforms to the applicant's proposed grazing monitoring protocol (Exhibits 7), except that revised protocols shall be included in the final grazing plan for pre-grazing monitoring and post-grazing monitoring of tidal pooling to ensure that if flash grazing activities occur, such activities are not adversely affecting the brackish marsh habitat through the creation of excessive salt pannes and/or inhibition of vegetation performance goals. The applicant has proposed that grazing cease for the current year

if post-grazing monitoring indicates that the amount of tidal pooling in the affected area has increased more than 50% above the amount documented in the pre-grazing monitoring of tidal pooling. Special Condition 10 changes this standard to 10%, which will allow any problems with tidal pooling to be detected early enough before significant habitat and water quality impacts occur. The 10% standard ensures that the areas that could potentially transform into salt pannes from tidal pooling caused by grazing will not be substantial.

Special Condition 10 also requires, in subsection (a)(viii), that if tidal pooling beyond the specified threshold is detected (1) a biologist shall assess the brackish marsh habitat and provide recommendations for remediation; (2) the permittee shall provide a supplemental grazing and monitoring plan that includes recommendations for (i) remediation of any habitat areas damaged by grazing as recommended by a qualified biologist, and (ii) appropriate changes to the grazing limitations allowed by the condition within the restored brackish marsh habitat to avoid impacts to brackish marsh habitat from continued grazing in the future. The supplemental grazing and monitoring plan shall be processed as a permit amendment.

To further protect water quality and the brackish marsh habitat being restored, Special Condition 10 also requires that the limitations on and best practices for livestock grazing within the brackish marsh restoration area proposed by the applicant (see Exhibits 7 and 8) over the flash grazing during the 5-year restoration and monitoring period be implemented. The limitations on flash grazing required during the monitoring period include: (1) there shall be no tidal inundation in the area; (2) there shall be no rain and no tides predicted for the area for the duration of the grazing event; (3) a maximum of 10 cows shall be allowed to graze within the brackish marsh restoration area during a grazing event to further minimize ground disturbance and the potential for creation of depressions that could increase tidal pooling; and (4) grazing shall be monitored and cows shall be removed once vegetation is grazed to 3 inches in height, which is the minimum height required to prevent vegetation drying out and to prevent bare spots from developing. The special condition also imposes the additional limitation that at least 5 days shall have passed since tidal inundation has occurred in the area or the ground must be sufficiently dry to minimize the potential for ground disturbance. Though not proposed by the applicant, this additional requirement provides a measureable standard that will assure that sufficient time has passed to allow for the ground to dry out and better resist ground disturbance from livestock.

To clarify implementation of the monitoring program during the five year restoration and monitoring period, Special Condition 10 also requires a program for (a) the submittal of monitoring reports for the review and approval of the Executive Director, (b) halting grazing if any increase in tidal pooling that occurs after a grazing event exceeds the 10% standard, and (c) prohibiting the resumption of grazing until a supplementary grazing mitigation plan is submitted as a permit amendment request. The supplementary grazing mitigation plan must include recommendations for (i) remediation of any habitat area damaged by grazing and (ii) changes to the grazing limitations to better protect the brackish marsh from impacts of future grazing. Through these requirements, the grazing regimen during the 5-year monitoring period would be adjusted to ensure that if flash grazing of the site occurs, it is not conducted in a manner that would cause damage to the brackish marsh habitat to be restored.

Moreover, to ensure the ongoing protection of the downstream salmonid habitat and the maintenance of the biological productivity of the restored brackish marsh restoration area while also providing for seasonal grazing, Special Condition 10-b requires the applicant to institute the long-term best grazing practices within the restoration area that the applicant has proposed (Exhibit 8). As previously discussed, these best grazing practices include (i) instituting a controlled rotational grazing regime using paddocks to confine livestock to a maximum intensity of 25 cows per 4.5-acre paddock for a maximum of 5 days to ensure vegetation heights remain at or above the 3-inch height threshold; (ii) monitoring grazing and removing cows once vegetation is grazed to the 3-inch height threshold; and (iii) limiting grazing to the dry season period of May 15 through October 15 only. As previously discussed, according to the Washington State University Cooperative Extension, maintaining grass at a minimum height of three inches at the time of rotation will prevent grass from dying, causing bare spots and muddy conditions. The proposed paddock system provides a practical means of implementing this limitation. Avoiding grazing during the wet season will minimize the erosive effects of cow hooves. Furthermore, the proposed planting plan, which will have been implemented during the five-year restoration and monitoring period, includes an appropriate mix of high brackish marsh grasses, which are adapted to grazing. Finally, the condition requires that any changes in the specified grazing limitations, including, but not limited to any increase in the intensity of grazing or change in the timing of grazing events, shall require an amendment to this coastal development permit.

Lastly, Special Condition 11 requires adherence to various construction responsibilities to protect water quality and surrounding habitats. These include measures related to timing of construction, best management practices (BMPs) for heavy equipment use in the area, various fish and water quality protection measures, runoff and erosion control BMPs, and waste management BMPs.

For all of the reasons discussed above, the Commission finds that as conditioned the proposed filling of brackish wetlands is for "restoration purposes" allowable under Coastal Act Section 30233(a)(6).

Alternatives

The second test set forth by the Commission's dredging and fill policies is that the proposed dredge or fill project must have no feasible less environmentally damaging alternative. Coastal Act Section 30108 defines "feasible" as "…capable of being accomplished in a successful manner within a reasonable period of time taking into account economic, environmental, social, and technological factors." In this case, alternatives that have been identified include the "no project" alterative and alternative methods of enhancing aquatic habitat in the tidal channels previously restored under Phase 1.

- No project alternative: The no project alternative would maintain the status quo within the subject pasture, marsh, and channel wetlands in the project area, which, as discussed above, are not functioning optimally. This alternative would not result in necessary habitat and water quality improvements proposed under the proposed project. Due to the formation of other unvegetated highly saline salt pannes within areas of the restored brackish marsh wetlands, the affected land is not representative of or functioning as typical high-elevation brackish marsh habitat. In addition, the 6.8-acre brackish marsh restoration area would remain as barren wetlands/degraded pasture land and would not be

restored to high quality brackish grazed wetland. Furthermore, the quality of the off-channel pond downstream from the area is at times degraded by the poor-quality of the water draining southwards from the pooled salt panne areas that have formed both within the brackish marsh wetlands previously restored under Phase 1 and in the 6.8-acre brackish marsh restoration area adjacent to the stretch of the creek where the off-channel pond is located. With respect to the tidal channels previously restored under Phase 1, as discussed above, the intent of the sills is to enhance fish habitat by creating pools that remain shallowly flooded at low tides to increase fish habitat and to prevent stranding of fish during seasonal tidal changes. These improvements would not happen under the no project alternative. Thus, the no project alternative is not a feasible less environmentally damaging alternative to the proposed project as conditioned.

- Aquatic habitat enhancement alternatives: There are a couple of alternatives to the proposed fill placement within the tidal channels previously restored under Phase 1, which, as previously discussed, will enhance fish habitat by creating pools that remain shallowly flooded at low tides to increase fish habitat and to prevent stranding of fish during seasonal tidal changes. First, instead of fill placement within the channels for fill construction, an alternative would be to dredge the channels deeper across a larger area ensure that the channels remain permanently flooded during periods of low tide. Channels would need to be excavated to below 2 feet (NAVD88), which would involve 2 to 3 feet of excavation. This alternative would have a much larger footprint, thereby resulting in much greater initial disturbance of wetland habitat. In addition, this alternative would generate much larger quantity of excess soils which would necessitate hauling the soils to a suitable disposal site, thereby increasing carbon emissions from truck hauling. A second alternative would be to excavate segments of channels to create in-line pools, which would create similar features to the placement of sills, but again, would require a larger excavation footprint and more excess soil spoils. Therefore, these alternatives are not feasible less environmentally damaging alternatives to the proposed project as conditioned.

The Commission finds that there is no less environmentally damaging feasible alternative to the amended development as conditioned, as required by Section 30233(a).

Feasible mitigation measures

The third test set forth by the Commission's dredging and fill policies is that the proposed dredge or fill project must include feasible mitigation measures to minimize adverse environmental effects consistent with Section 30233 and protect and maintain marine resources and the biological productivity and quality of coastal waters consistent with Sections 30230 and 30231. As the proposed amended development will involve the use of heavy equipment within and around coastal wetlands and waters, the project has the potential for adverse environmental effects related to water quality, surrounding habitats, and special-status fish:

- Measures to Protect Water Quality and Surrounding Habitats: The applicant proposes to implement a number of water quality and habitat protection measures as part of the project, including, in part: (1) limiting construction to the period between July 1st and October 31st and when the ground surface is dry to reduce the chance of stormwater

runoff occurring during construction; (2) implementing appropriate erosion and sediment control best management practices (BMPs) to protect and stabilize soils and channel banks and to control stormwater runoff; (3) ensuring heavy equipment used in construction will be in good condition and inspected for leakages and, if necessary, repaired prior to commencement of work; (4) prohibiting on-site fueling or washing of heavy equipment, and positioning stationary equipment over drip pans to collect any inadvertent leaks that may occur; (5) using heavy synthetic mats or other acceptable non-toxic materials that can be readily laid down and immediately removed following construction for temporary construction access paths through areas having wet or soft soils to minimize erosion and ground disturbance; (6) minimizing the overall disturbance footprint to the maximum extent practicable; and (7) performing in-channel work (i.e., installation of sills) at low tides. The Commission adds Special Condition 13 to require adherence to these and other appropriate construction responsibilities during construction to protect water quality and surrounding habitats.

- Measures to protect fish: Construction of the log and earthen sills in the previously restored tidal channels requires separating the channel work areas from the main stem of Wood Creek downstream. The applicant proposes to install temporary sediment plugs at the junction of each of the four tidal channels with the main stem of wood creek. The applicant proposes to perform this work only during periods of low tides and only after fish relocation has been completed under the supervision of a qualified fisheries biologist in consultation with CDFW and NOAA-Fisheries staff. Fish relocation proposes to use seining, dip nets, electrofishing, or other appropriate trapping procedures to transfer fish out of the work area to suitable habitat downstream in Wood Creek. Special Condition 13(c) requires that the project be undertaken using appropriate measures to protect fish as proposed.

The Commission finds that the amended development as conditioned provides feasible mitigation measures to minimize adverse environmental effects as required by Section 30233(a).

Maintenance and enhancement of habitat values

The fourth test set forth by Sections 30230, 302331, and 30233 of the Coastal Act is that any approved dredging or filling in coastal wetlands must maintain and enhance the biological productivity and functional capacity of the habitat where feasible. As discussed in the above findings, the conditions of the permit as amended will ensure that the amended development will not have significant adverse impacts on wetlands or water quality. These include Special Conditions 9-11 ensuring that the proposed amended development will be successful in increasing brackish marsh habitat values and not only protecting but also improving water quality. The project's purpose in part is to restore and enhance the biological productivity of coastal wetlands and waters, and conditions of the permit will ensure that the site is monitored for achievement of these goals. Therefore, the Commission finds that the amended development, as conditioned, will maintain and enhance the biological productivity and functional capacity of the habitat consistent with the fourth general limitation set forth by Sections 30230, 30231, and 30233.

Conclusion

The Commission thus finds that the amended development, as conditioned, is for an allowable use, that there is no feasible less environmentally damaging alternative, that feasible mitigation measures are provided to minimize adverse environmental effects and that wetland and aquatic habitat values will be maintained and enhanced. Therefore, the Commission finds that the amended development, as conditioned, is consistent with Sections 30230, 30231, and 30233 of the Coastal Act.

F. AGRICULTURAL LANDS

Coastal Act Sections 30241 and 30242 require the protection of prime agricultural lands[11] and sets limits on the conversion of all agricultural lands to non-agricultural uses. Coastal Act Section 30241 states:

> *The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following:*
>
> *(a) By establishing stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses.*
>
> *(b) By limiting conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses or where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development.*
>
> *(c) By permitting the conversion of agricultural land surrounded by urban uses where the conversion of the land would be consistent with Section 30250.12*
>
> *(d) By developing available lands not suited for agriculture prior to the conversion of agricultural lands.*
>
> *(e) By assuring that public service and facility expansions and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality.*

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[11] Coastal Act Section defines "prime agricultural land" through incorporation-by-reference of paragraphs (1) through (4) of Section 51201(c) of the California Government Code. Prime agricultural land entails land with any of the follow characteristics: (1) a rating as class I or class II in the Natural Resource Conservation Service land use capability classifications; or (2) a rating 80 through 100 in the Storie Index Rating; or (3) the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture; or (4) the ability to normally yield in a commercial bearing period on an annual basis not less than two hundred dollars ($200) per acre of unprocessed agricultural plant production of fruit- or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years.

[12] The portion of referenced Section 30250 applicable to this project type and location [sub-section (a)] requires that, "*New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.*"

> *(f) By assuring that all divisions of prime agricultural lands, except those conversions approved pursuant to subdivision (b), and all development adjacent to prime agricultural lands shall not diminish the productivity of such prime agricultural lands.*

Coastal Act Section 30242 states:

> *All other lands suitable for agricultural use shall not be converted to nonagricultural uses unless (l) continued or renewed agricultural use is not feasible, or (2) such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Any such permitted conversion shall be compatible with continued agricultural use on surrounding lands.*

In addition, Coastal Act Section 30250, cited above, requires consideration of the cumulative impacts of development (defined in Coastal Act Section 30105.5) as follows:

> *"Cumulatively" or "cumulative effect" means the incremental effects of an individual project shall be reviewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.*

Coastal Act Section 30250 states in pertinent part:

> *(a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.*

The subject property, historically comprised of the outer fringe of estuarine habitats associated with Humboldt Bay, was reclaimed for agricultural purposes in the 19th-century. Freshwater Farms was, in fact, Humboldt County's first Grade A Dairy.[13] The property includes the historic Graham-Long Dairy Barn, an approximately 8,400-square-foot agricultural structure originally built in 1910. The property is planned and zoned for Agricultural Exclusive uses under the Humboldt County LCP. Currently, the pastureland on the property is being leased to a local rancher for seasonal cattle grazing. However, the types of agricultural activities that may be feasibly undertaken at the site are limited by the property soils, the low relief of the area, and the relatively shallow water table.

Not prime agricultural land

The subject property contains no "prime agricultural land" as defined by the government code:

[13] See State Coastal Conservancy 2015: http://scc.ca.gov/webmaster/ftp/pdf/sccbb/2015/1503/20150326Board03F_Freshwater_Farms_Nature_Trail.pdf.

- Based on information derived from the Natural Resources Conservation Service (NRCS),[14] the majority of the soils in the project area are mapped as Occidental, 0-2 percent slopes. This soil series consists of very deep, very poorly drained, saline, silty clay loam soils on reclaimed salt marshes and tidal marshes on alluvial plains. They are identified as hydric soils and recognized as having several impediments to extensive agricultural uses. According to the NRCS, natural vegetation for this soil type is estimated to have been "perennial grasses, rushes, and sedges and salt tolerant varieties of same." As a result, the NRCS has assigned Class VII classification to the project site soils as a locale which has "severe limitations that reduce the choice of plants or require special conservation practices, or both." The NRCS classifies these soils as "Not prime farmland."

- According to Soils of Western Humboldt County, California,[15] the soils have a Storie Index rating between 36 and 49 (prime soils have a Storie Index rating between 80 and 100).

- The project site supports only 0.33 Animal Unit Months (AUMs) per acre, which, according to the County's farm advisor, is typical of low-lying, poorly drained, saltwater intruded, and flood-prone soils along the northern reclaimed fringes of Humboldt Bay. This is below the minimum one animal unit per acre threshold required for classification as prime.

- With regard to the site's potential qualification as prime agricultural land based upon its potential for commercial fruit or nut crop production at specified minimal yields, due to the high bulk density of the soils underlying the project site and the relatively shallow water table, fruit and berry crops suitable for the North Coast's temperate setting are restricted to areas further inland.

Therefore, the Commission finds that the soils at the project site do not meet any of the four criteria for the definition of prime agricultural soils, and development of the restoration and enhancement project.

Protection of lands suitable for agricultural use

The subject non-prime agricultural land property is located within a rural area and is not located on the periphery of an urban area where conversion of agricultural land may occur consistent with the provisions of Coastal Act section 30241. Therefore, the agricultural lands on the subject property are instead governed by Coastal Act section 30242.

Coastal Act Section 30242 protects lands suitable for agricultural use even if such lands are not prime agricultural lands. Specifically, non-prime agricultural lands located away from the periphery of urban areas may not be converted to non-agricultural use unless continued or renewed agricultural use is not feasible, or such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Although, as

[14] From: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.

[15] McLaughlin & Harradine 1965.

stated above, the land is not considered "prime," cattle grazing (though limited by seasonal inundation and pasture quality) has been a primary agricultural use on the property's agricultural land. The proposed project would not result in a conversion of agricultural land, because this use is proposed to continue, and renewable, in the future.

The areas proposed for brackish marsh restoration are largely inundated with stormwater runoff each winter and have such saturated soils that much of the area is not available for grazing for approximately six months each year (November through April). In the summer, these areas are grazed by cattle and can continue to be grazed after project completion using the best grazing practices that the applicant has proposed, including (i) instituting a controlled rotational grazing regime using paddocks to confine livestock to a maximum intensity of 25 cows per 4.5-acre paddock for a maximum of 5 days to ensure vegetation heights remain at or above the 3-inch height threshold; (ii) monitoring grazing and removing cows once vegetation is grazed to the 3-inch height threshold; and (iii) limiting grazing to the dry season period of May 15 through October 15 only. The purpose of the proposed best grazing practices is to ensure the ongoing protection of the downstream salmonid habitat and the maintenance of the biological productivity of the restored brackish marsh restoration area while also providing for seasonal grazing on the property.

Therefore, the Commission finds that the proposed habitat restoration project would not result in the conversion of grazing lands. Therefore, the proposed project is consistent with Section 30242 of the Coastal Act.

G. PROTECTION OF ARCHAEOLOGICAL RESOURCES

Section 30244 of the Coastal Act states the following:

> *Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

The project area is located within the ethnographic territory of the Wiyot Indians. Wiyot settlements existed along Humboldt Bay and along the banks of many of the streams and sloughs in this area. A cultural resources investigation report was prepared for the Phase 1 restoration project and concluded that the restoration work is unlikely to affect cultural or historic resources on the site. Nevertheless, to ensure protection of any archaeological or cultural resources that had the potential to be unearthed during construction, the Commission attached Special Condition 6 to the original permit. This condition requires that if an area of cultural deposits is discovered during the course of the project, all construction must cease and a qualified cultural resource specialist must analyze the significance of the find. To recommence construction following discovery of cultural deposits, the applicant is required to submit a supplementary archaeological plan for the review and approval of the Executive Director to determine whether the changes are de minimis in nature and scope, or whether an amendment to this permit is required.

The proposed amended development will involve some soil disturbance within the pasture that is proposed to be restored to brackish marsh. As the area proposed for disturbance was not

previously excavated as part of the Phase 1 project, and as soil disturbance may inadvertently unearth previously undiscovered archaeological deposits, the Commission requires that Special Condition 6 be reimposed as a condition of this CDP amendment to remain in full force and effect. Therefore, the Commission finds that the amended project as conditioned is consistent with Coastal Act Section 30244, as the amended development will include mitigation measures to ensure that the development will not adversely impact archaeological resources.

H. PUBLIC ACCESS

Coastal Act Sections 30210, 30211, and 30212 require the provision of maximum public access opportunities, with limited exceptions. Coastal Act Section 30210 requires in applicable part that maximum public access and recreational opportunities be provided when consistent with public safety, private property rights, and natural resource protection. Section 30211 requires in applicable part that development not interfere with the public's right of access to the sea where acquired through use (i.e., potential prescriptive rights or rights of implied dedication). Section 30212 requires in applicable part that public access from the nearest public roadway to the shoreline and along the coast be provided in new development projects, except in certain instances, such as when adequate access exists nearby or when the provision of public access would be inconsistent with public safety. In applying Sections 30211 and 30212, the Commission is limited by the need to show that any denial of a permit application based on these sections or any decision to grant a permit subject to special conditions requiring public access is necessary to avoid or offset a project's adverse impact on existing or potential public access.

Until recently, no existing public access to the shoreline was available in the project area. The land trust recently completed some public access improvements on the property (a nature trail and boating put-in on Freshwater Slough) under CDP 1-11-023 approved April 17, 2015.[16] However, the proposed project does not involve any changes or additional restrictions to existing public access that would interfere with or reduce public access and recreational opportunities. Thus, the Commission finds that the amended development will have no significant adverse effect on public access, and the amended development as proposed without new public access is consistent with the public access policies of the Coastal Act.

I. CALIFORNIA ENVIRONMENTAL QUALITY ACT

The County of Humboldt, as the lead agency, adopted a Mitigated Negative Declaration for the "Wood Creek Estuary, Tidal Marsh, and Fish Access Enhancement Project; Freshwater, Humboldt County, California" on September 4, 2008. The County adopted an addendum to the environmental document to cover the additional habitat enhancements, including the Phase 2 restoration work, on December 18, 2014.

Section 13096 of the Commission's administrative regulations requires Coastal Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirement of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are any feasible

[16] http://documents.coastal.ca.gov/reports/2015/4/f9a-4-2015.pdf

alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on conformity with Coastal Act policies at this point as if set forth in full. As discussed above, the project as proposed to be amended has been conditioned to be consistent with the policies of the Coastal Act. No public comments regarding potential significant adverse environmental effects of the project amendment were received prior to preparation of the staff report. As specifically discussed in these above findings, which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been required. As conditioned, there are no feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impacts which the activity may have on the environment. Therefore, the Commission finds that the proposed amended development, as conditioned to mitigate the identified impacts, can be found to be consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A
SUBSTANTIVE FILE DOCUMENTS

File for Coastal Development Permit No. 1-08-012

File for Coastal Development Permit No. 1-08-012-A1

2016 project submittal for the Phase 2 Wood Creek Aquatic Habitat Enhancement Project by NOAA-Restoration Center to Commission staff for coverage under Consistency Determination CD-021-13.

Websites: http://ncrlt.org/projects#freshwater
http://documents.coastal.ca.gov/reports/2013/5/Th11a-5-2013.pdf
http://www.merriam-webster.com/dictionary/restoration
http://scc.ca.gov/webmaster/ftp/pdf/sccbb/2015/1503/20150326Board03F_Freshwater_Farms_Nature_Trail.pdf
http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm
http://documents.coastal.ca.gov/reports/2015/4/f9a-4-2015.pdf
http://documents.coastal.ca.gov/reports/1999/7/F5b-7-1999.pdf
https://www.premier1supplies.com/img/newsletter/05-22-14-goat/PastureGrazingMgmt.pdf
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_046596.pdf.

Society for Ecological Restoration. Fall 1994. Society of Ecological Restoration News.

Society of Wetland Scientists. August 6, 2000. Position Paper on the Definition of Wetland Restoration.

McBain & Trush, Inc. October 2007. Wood Creek Tidal Marsh Enhancement Project Biological Assessment. Arcata, CA.

McLaughlin, J. & F. Harradine. 1965. Soils of Western Humboldt County, California.

Humboldt County Local Coastal Program

APPENDIX B
ADOPTED FINDING FOR CDP 1-08-012
(Approved 10/17/08)

CALIFORNIA COASTAL COMMISSION
NORTH COAST DISTRICT OFFICE
710 E STREET • SUITE 200
EUREKA, CA 95501-1865
VOICE (707) 445-7833
FACSIMILE (707) 445-7877

Hearing Date: October 17, 2008
Commission Action: **Approved with Conditions**

ADOPTED FINDINGS

APPLICATION NO.: **1-08-012**

APPLICANT: **Northcoast Regional Land Trust**

AGENT: Redwood Community Action Agency, Attn: Don Allan

PROJECT LOCATION: Along Wood Creek and Freshwater Slough, on the north side of Myrtle Avenue, approximately 3,500 feet west of the intersection of Freshwater Road and Myrtle Avenue, at 5555 Myrtle Avenue, approximately two miles northeast of Eureka, Humboldt County (APN 402-291-15).

PROJECT DESCRIPTION: Restore tidal hydrology and brackish marsh habitat across 23 to 29 acres of diked former tidelands (seasonal freshwater wetlands) and enhancing 4,500 square feet of juvenile salmonid freshwater rearing habitat along Wood Creek by (1) excavating 2,450 cubic yards of material along 3,900 feet of historic tidal channels within diked former tidelands; (2) excavating 300 cubic yards of berm material along the north bank of Wood Creek; (3) enhancing freshwater habitat on Wood Creek by excavating 380 cubic yards of material to expand and enhance juvenile salmonid freshwater rearing habitat; (4) replacing a culvert crossing on Wood Creek with a "flatcar" bridge; (5) placing approximately 3,200 cubic yards of excavated material on-site within diked former tidelands to recreate high marsh surfaces and tidal hummocks; (6) removing an existing tidegate on Wood Creek to allow for tidal inundation to the tidal marsh restoration area; (7) sealing a defunct Waterman tidegate located south of the main Wood Creek tidegate in the Freshwater Slough dike; (8) revegetating the tidal marsh restoration area with appropriate native species; and (9) relocating the western alignment of the existing agricultural fence.

GENERAL PLAN DESIGNATION: Agricultural Exclusive (AE), 1 dwelling unit per 20-60 acres.

ZONING DESIGNATION:	Agricultural Exclusive, Minimum lot size: 60 acres with Flood Hazard and Transitional Agricultural Lands Combining Zones (AE-60/F,T); and Natural Resources with Coastal Wetlands Combining Zone (NR/W).
APPROVALS RECEIVED:	(1) Humboldt County Conditional Use Permit No. 07-22 (2) U.S. Army Corps of Engineers Clean Water Act Section 404 and Rivers and Harbors Act Section 10 Nationwide Permit (NWP) Nos. 3 (Maintenance) and 27 (Aquatic Habitat Restoration, Establishment, & Enhancement Activities) (authorized pending CDP approval) (3) California Department of Fish and Game CFGC Sec. 1603 Streambed Alteration Agreement No. R-1-08-0103 (4) Humboldt Bay Harbor, Recreation, & Conservation District Permit No. 08-01
OTHER APPROVALS REQUIRED:	North Coast Regional Water Quality Control Board Clean Water Act Section 401 Water Quality Certification
SUBSTANTIVE FILE DOCUMENTS:	(1) Mitigated Negative Declaration for the "Wood Creek Estuary, Tidal Marsh, and Fish Access Enhancement Project" (adopted by the Humboldt County Planning Commission on September 4, 2008) (2) *Wood Creek Tidal Marsh Enhancement Project Biological Assessment*, Prepared by McBain & Trush, Arcata, CA, October 2007 (3) *Wood Creek Tidal Marsh Design Report*, Prepared by Jeff Anderson & Associates, Arcata, CA, February 2008 (4) Humboldt County Local Coastal Program

STAFF NOTES

1. Adopted Findings

The Commission approved Coastal Development Permit No. 1-08-012 with conditions at its October 17, 2008 meeting. At the meeting, staff presented an addendum that made certain changes to the written staff recommendation dated October 3, 2008. First, staff revised the recommendation to recommend approval of the applicant's request to waive the balance of four thousand four hundred dollars ($4,400) due on the application fee for the permit request. The

applicant requested that the fee be reduced to six hundred dollars ($600.00), which is what the filing fee was at the time that the applicant both applied for the public grant funds that are supporting the proposed project and downloaded the application fee schedule from the Commission's website on February 26, 2008. The applicant was unaware of the increase in permit fees until they subsequently submitted the permit application on March 19, 2008 – five days after the Commission's new fee schedule became effective. The Commission found it appropriate to reduce the fee in this case because (a) the proposed project would have significant overall habitat restoration benefits for a variety of marine resources, (b) the proposed project is funded entirely by public agency grant funds, and (c) when applying for the subject grant funds, the applicant did not anticipate the significant increase to the Commission's application fee schedule that would affect the total amount of funds needed to finance the project. The Commission found this combination of circumstances is unlikely to reoccur and therefore would not have a significant cumulative effect on the total amount of application fees collected by the Commission or on the Commission's budget. Therefore, recommended Special Condition No. 9, which would have required submittal of the balance of the application fee if the fee waiver request had not been granted, was deleted.

Second, staff revised Special Condition 4-B of the staff recommendation, which originally required that the permittee complete revegetation of the restoration area within 60 days of project completion. After reviewing the October 3, 2008 staff recommendation, the applicant requested a change to the condition to allow planting to occur in the optimal season for planting in the restored brackish marsh habitat, which generally is late winter or early spring. As the applicant expects to complete construction activities in late August 2009, the condition as originally written would require planting to be completed in the fall, which is not optimal. If planted in the fall, the plants to be installed would sit dormant until the spring and would be subjected to winter high flows and flooding without the benefit of having any root growth to anchor them. The Commission adopted the revised special condition as recommended by staff. Thus, the condition was revised to allow revegetation of the restoration area to occur closer to the time that the installed plants will enter into a growth cycle to allow their roots to become better established, which generally is March to May.

The Commission adopted the staff recommendation as modified by the addendum in its entirety. The following resolutions, conditions, and findings were adopted by the Commission on October 17, 2008 upon conclusion of the public hearing.

1. Jurisdiction and Standard of Review

The project site is located in the Commission's retained permit jurisdiction. The County of Humboldt has a certified LCP, but the site is within an area shown on State Lands Commission maps over which the State retains a public trust interest. Therefore, the standard of review that the Commission must apply to the project is the Chapter 3 policies of the Coastal Act.

I. RESOLUTIONS

A. RESOLUTION FOR APPROVAL OF COASTAL DEVELOPMENT PERMIT NO. 1-08-012 AS CONDITIONED

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either: (1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment; or (2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

B. RESOLUTION FOR WAIVER OF APLICATION FEE

The Commission hereby approves the permit application fee reduction for Coastal Development Permit No. 1-08-012 to six hundred dollars ($600.00).

II. STANDARD CONDITIONS: See Appendix A.

III. SPECIAL CONDITIONS:

1. Final Restoration & Enhancement Monitoring Program

A. **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-08-012**, the applicant shall submit for review and approval of the Executive Director, a final detailed restoration and enhancement monitoring program designed by a qualified biologist for monitoring of the brackish marsh restoration and juvenile salmonid summer rearing habitat enhancement sites (i.e., 23- to 29-acre brackish marsh restoration area and 4,500-square-foot salmonid rearing habitat). The monitoring program shall at a minimum include the following:

1) Performance standards that will assure achievement of the restoration goals and objectives set forth in Coastal Development Permit (CDP) Application No. 1-08-012 as summarized in the Findings IV.B, “Project Description;”

2) Provisions for submittal within 30 days of completion of the initial restoration and enhancement work of (a) “as built” plans demonstrating that the initial restoration and enhancement work has been completed in accordance with the approved restoration and enhancement program, and (b) an assessment of the initial biological and ecological status of the “as built” restoration/enhancements. The assessment shall include an analysis of the attributes that will be monitored pursuant to the program, with a description of the methods for making that evaluation;

3) Provisions to ensure that the restoration and enhancement sites will be remediated within one year of a determination by the permittee or the Executive Director that monitoring results indicate that the sites do not meet the goals, objectives, and performance standards identified in the approved restoration/enhancement program and in the approved final monitoring program;

4) Provisions for monitoring and remediation of the restoration and enhancement sites in accordance with the approved final restoration and enhancement program and the approved final monitoring program for a period of five (5) years;

5) Provisions for submission of annual reports of monitoring results to the Executive Director by November 1 each year for the duration of the required monitoring period, beginning the first year after submission of the "as-built" assessment. Each report shall include copies of all previous reports as appendices. Each report shall also include a "Performance Evaluation" section where information and results from the monitoring program are used to evaluate the status of the wetland restoration/enhancement project in relation to the performance standards;

6) Provisions for submission of a final monitoring report to the Executive Director at the end of the five-year reporting period. The final report must be prepared in conjunction with a qualified wetlands biologist. The report must evaluate whether the enhancement site conforms with the goals, objectives, and performance standards set forth in the approved final restoration and enhancement program. The report must address all of the monitoring data collected over the five-year period.

B. If the final report indicates that the restoration and enhancement project has been unsuccessful, in part, or in whole, based on the approved goals and objectives set forth in CDP Application No. 1-08-012 as described in Findings IV.B "Project Description," the applicant shall submit a revised or supplemental restoration and enhancement program to compensate for those portions of the original program which did not meet the approved goals and objectives set forth in CDP Application No. 1-08-012 as described in Finding IV.B "Project Description." The revised enhancement program shall be processed as an amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

C. The permittee shall monitor and remediate the wetland restoration and enhancement sites in accordance with the approved monitoring program. Any proposed changes from the approved monitoring program shall be reported to the Executive Director. No changes to the approved monitoring program shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines no amendment is legally required.

2. <u>Construction Responsibilities</u>

The permittee shall comply with the mitigation measures listed in the Mitigated Negative Declaration completed for the project, except as modified herein. Construction-related

requirements shall include, but shall not be limited to, the following Best Management Practices (BMPs):

A. No construction materials, debris, or waste shall be placed or stored where it may be subject to entering coastal waters or wetlands;

B. Any and all debris resulting from construction activities shall be removed from the project site within 10 days of project completion and disposed of at an authorized location;

C. All grading activities shall be conducted during the dry season period of June 1 through November 15; any grading activity conducted between October 16 and November 15 shall be subject to the following conditions:

1) All work shall cease upon the onset of precipitation at the project site and shall not recommence until the predicted chance of rain is less than 50 percent for the Eureka area portion of the Redwood Coast segment of the National Weather Service's forecast for Northwestern California;

2) The work site(s) shall be winterized between work cessation periods by installing stormwater runoff and erosion control barriers around the perimeter of the construction site to prevent the entrainment of sediment into coastal waters; and

3) Adequate stocks of stormwater runoff and erosion control barrier materials shall be kept onsite and made available for immediate use.

D. Construction activities within and adjacent to the creek shall only be performed during low tide and when soils are sufficiently dry so that sediment is not discharged into coastal waters;

E. If rainfall is forecast during the time construction activities are being performed, any exposed soil areas shall be promptly mulched or covered with plastic sheeting and secured with sand bagging or other appropriate materials before the onset of precipitation;

F. Any debris discharged into coastal waters shall be recovered immediately and disposed of properly;

G. Any fueling and maintenance of construction equipment shall occur within upland areas outside of environmentally sensitive habitat areas or within designated staging areas. Mechanized heavy equipment and other vehicles used during the construction process shall not be stored or re-fueled within 100 feet of coastal waters; and

H. Fuels, lubricants, and solvents shall not be allowed to enter the coastal waters or wetlands. Hazardous materials management equipment including oil containment booms and absorbent pads shall be available immediately on-hand at the project site, and a registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call. Any accidental spill shall be rapidly contained and cleaned up.

3. <u>Final Storm Water Pollution Prevention Plan</u>

A. **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-08-012**, the applicant shall submit for the review and approval of the Executive Director a final Storm Water Pollution Prevention Plan that substantially conforms to the draft plan prepared by Redwood Community Action Agency, dated July 25, 2008 (Exhibit No. 11).

B. The permittee shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

4. Site Revegetation

The wetland restoration and enhancement sites shall be revegetated as proposed and shall comply with the following standards and limitations:

A. Only native plant species shall be planted. All proposed plantings shall be obtained from local genetic stocks within Humboldt County. If documentation is provided to the Executive Director that demonstrates that native vegetation from local genetic stock is not available, native vegetation obtained from genetic stock outside of the local area may be used. No plant species listed as problematic and/or invasive by the California Native Plant Society, the California Invasive Plant Council, or as may be identified from time to time by the State of California, shall be employed or allowed to naturalize or persist on the site. No plant species listed as a "noxious weed" by the governments of the State of California or the United States shall be utilized within the property;

B. All planting shall be completed by the end of the first full optimal planting season (generally March 1 to May 1) that occurs after completion of construction;

C. The use of rodenticides containing any anticoagulant compounds, including, but not limited to, Bromadiolone, Brodifacoum or Diphacinone shall not be used.

5. Implementation of Sensitive Plant & Fish Species Mitigation Measures

The permittee shall undertake all development authorized by CDP No. 1-08-012 in accordance with the measures and protocols proposed in the application [summarized in Findings IV-B and IV-C below and included within the final Mitigated Negative Declaration for the project, the Wood Creek Tidal Marsh Enhancement Project Biological Assessment dated October 2007, the NOAA-Fisheries informal consultation letter dated July 11, 2008 (File No. 2008/04085), the U.S. Fish and Wildlife Service informal consultation letter dated April 30, 2008 (File No. 81331-2008-I-0217), and the Department of Fish and Game Streambed Alteration Agreement issued for the project (#R-1-08-0103)] to ensure minimization of impacts to Lyngbye's sedge, Tidewater goby, sensitive salmonids, and sensitive fish critical habitat within and around the project area.

6. Protection of Archaeological Resources

A. If an area of historic or prehistoric cultural resources or human remains are discovered during the course of the project, all construction shall cease and shall not recommence except as provided in subsection (B) hereof, and a qualified cultural resource specialist shall analyze the significance of the find.

B. A permittee seeking to recommence construction following discovery of the cultural deposits shall submit an archaeological plan for the review and approval of the Executive Director.

   1) If the Executive Director approves the Archaeological Plan and determines that the Archaeological Plan's recommended changes to the proposed development or mitigation measures are *de minimis* in nature and scope, construction may recommence after this determination is made by the Executive Director.

   2) If the Executive Director approves the Archaeological Plan but determines that the changes therein are not *de minimis*, construction may not recommence until after an amendment to this permit is approved by the Commission.

7. North Coast Regional Water Quality Control Board Approval

PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-08-012, the applicant shall provide to the Executive Director a copy of a permit or other permission issued by the North Coast Regional Water Quality Control Board, or evidence that no permit is required. The applicant shall inform the Executive Director of any changes to the project required by the Board. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

8. State Lands Commission Review

PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-08-012, the applicant shall submit to the Executive Director, a written determination from the State Lands Commission that:

A. No State lands are involved in the development; or

B. State lands are involved in the development and all permits required by the State Lands Commission have been obtained; or

C. State lands may be involved in the development, but pending a final determination an agreement has been made with the State Lands Commission for the project to proceed without prejudice to that determination.

IV. FINDINGS & DECLARATIONS

The Commission hereby finds and declares as follows:

A. Environmental Setting

The project area is located along Freshwater Slough approximately two miles northeast of Eureka (Exhibit Nos. 1 and 2). The 54-acre project parcel abuts the southern dike of Freshwater Slough along its northern boundary, Myrtle Avenue along its southern and southwestern boundaries, and private property to the east. Wood Creek, a small, perennial, salmonid-bearing stream, flows through the southern portion of the property and empties into Freshwater Slough on the western edge of the project area (Exhibit No. 3). Historically (prior to the construction of the Northwestern Pacific Railroad and Highway 101 beginning over one hundred years ago), the project site occupied the upper zone of tidal marshland surrounding the perimeter of Humboldt Bay and its tidal mudflats (Exhibit No. 4). According to the Biological Assessment prepared for the project (McBain & Trush, Inc. October 2007), these upper marsh zones were characterized by an intermix of freshwater sources (e.g., creeks) with salt marsh habitat resulting in transitional brackish marsh habitat.

A dike that skirts the northern edge of the project area along Freshwater Slough for approximately 1,900 feet separates the tidal slough from the diked former tidelands which make up the bulk of the project area. These diked former tidelands currently function as seasonal freshwater wetlands dominated mostly by nonnative grasses such as velvet grass (*Holcus lanatus*), creeping bentgrass (*Agrostis stolonifera*), and perennial ryegrass (*Lolium perenne*) (Exhibit No. 5).

At the western end of the project area, Wood Creek drains into Freshwater Slough through a concrete box weir (3 feet wide by 50 feet long by 8 feet deep) and wooden top-hinged tidegate. The tidegate allows the creek to drain at lower stages of the tide but prevents all but a small volume of leakage water from Freshwater Slough during higher stages of the tide from entering Wood Creek. There are two additional Waterman tidegates on each side of the Wood Creek tidegate that were installed to help drain the pasture, but both are currently leaky and dysfunctional.

Approximately 1,400 feet upstream of the Wood Creek tidegate, an existing access road with a culverted crossing of the creek allows cattle to access the site for seasonal grazing during the dry months of the year (Exhibit No. 5). The culvert at the crossing has concrete rubble armoring the banks and creek bottom, which function as a grade control and near total salinity barrier. Thus, the portion of creek downstream of the crossing is subject to significantly more tidal influence than the portion of creek above the crossing. Vegetation along the creek reflects the amount of tidal influence received. Lyngbye's sedge (*Carex lyngbyei*) and other brackish marsh vegetation line the lower creek channel. The upper (~900 feet of) creek channel (from the access road to the Myrtle Avenue culvert) has become moderately aggraded and colonized by cattail (*Typha latifolia*) and bulrush (*Scirpus acutus*). Some Hooker's willow (*Salix hookeriana*) plants line the banks of the upper creek channel.

The project area supports various sensitive species and environmentally sensitive habitat areas including Lyngbye's sedge, Tidewater goby, Chinook salmon, Coho salmon, Steelhead, Coastal cutthroat trout, brackish marsh, and freshwater emergent wetlands (see Table 1 below).

The project site includes two different zoning designations: Agriculture Exclusive (60-acre minimum parcel size) with Flood Hazard and Transitional Agricultural Lands Combining Zones) and Natural Resources with a Coastal Wetlands Combining Zone (see Exhibit No. 6, which shows agricultural lands and non-agricultural lands on the property). The project area currently supports approximately 33.5 acres of agricultural land.

The project site is not located within a designated highly scenic area or coastal view area, but public vantage points along Myrtle Avenue do afford views of the site.

B. Project Description

The "Wood Creek Tidal Marsh Enhancement Project," which is funded in part by grants from the Department of Fish and Game, NOAA-Fisheries, the U.S. Fish & Wildlife Service, the Natural Resources Conservation Service, the Nature Conservancy, and the State Coastal Conservancy (for the property purchase), involves restoring tidal hydrology and brackish marsh habitat across 23 to 29 acres of diked former tidelands (seasonal freshwater wetlands) and enhancing 4,500 square feet of juvenile salmonid summer rearing habitat along Wood Creek through the following project components (and see Exhibit No. 7 for design plans):

1. Excavating 2,450 cubic yards of material along 3,900 feet of historic tidal channels within diked former tidelands: Exhibit No. 7 shows the locations of the proposed channels to be constructed in the project area. The excavation footprint would be approximately 0.7-acre, but slough channel excavation and tidal hummock creation (see No. 5 below) will result in the creation of 23 acres of brackish marsh. Excavation and backfilling will be performed using an excavator and backhoe in the dry pasture (diked former tidelands/seasonal agricultural wetlands) during the dry season. Slough channel excavations would begin at the downstream end of each channel, and the heavy equipment would traverse the seasonal wetland pasture only within the footprint of the eventual excavated channel so as to minimize disturbance to the adjacent seasonal wetland. Where the new tidal channels join Wood Creek, a small plug of dirt would be left in place until all the channels and pool (see No. 3 below) are dug and other construction elements are completed, after which the plug would be carefully removed to allow tidewater to access the new channels. A minimum of four large woody debris habitat structures would be constructed within the proposed tidal slough channels to provide aquatic habitat diversity (e.g., velocity breaks, scour holes, cover structure, etc.), primarily for tidewater goby and juvenile salmonids. Typically the log structures will be buried in the tidal channel and embedded into the banks so that they remain in place. Each habitat structure may be anchored by a 1-ton to 2-ton boulder if necessary. Log structures may also be installed to provide grade control in strategic locations (e.g., at the entrance to the proposed pool described in No. 3 below) to prevent downcutting. Tidal pools also would be constructed within the restored tidal channels in some areas to further enhance aquatic habitat values.

2. Excavating 300 cubic yards of berm material along the north bank of Wood Creek: The purpose of removing this berm material is to allow for tidal inundation to the tidal marsh restoration area in the diked former tidelands (seasonal freshwater wetlands). See page 2 of Exhibit No. 7 for details.

3. Enhancing juvenile salmonid summer rearing habitat along Wood Creek by excavating 380 cubic yards of material to form a pool: See Exhibit No. 7 for details. The purpose of the pool is to expand and enhance juvenile salmonid summer rearing habitat along the portion of Wood Creek that will remain predominantly fresh. The proposed pool would usually contain freshwater, but at certain times of the year the pool may become brackish depending on the salinity gradient in Wood Creek, the function of the salinity sill described below, the volume of groundwater flow delivered to the pool, and the frequency of flushing from the upstream catchment. The upper approximately 900 feet of creek channel (from the access road crossing to the Myrtle Avenue culvert) has become moderately aggraded and colonized by cattail and bulrush. The Department of Fish and Game has recently documented valuable juvenile salmonid summer rearing habitat in the creek in an existing pool located at the mouth of the Myrtle Avenue culvert (see Exhibit No. 5). Rearing habitat that provides a cool water/low salinity refuge for fish during summer when salinity levels in lower Wood Creek are highest is important. The size of the new expanded pool would be approximately 4,500 square feet with a pool depth of 2.8 feet.

4. Replacing a culvert crossing on Wood Creek with a "flatcar" bridge: The existing access road/cattle crossing consists of an old culvert and fill material. The existing crossing would be excavated to the extent needed to remove the old culvert (approximately 70 cubic yards), the sides of the culvert excavation area will be laid back to a 2 to 1 (horizontal to vertical) slope or less, and the existing vegetation at the crossing will be skimmed, stockpiled, and replaced on the exposed fill outside the channel edges for erosion control. The purpose of leaving some of the existing fill in place is to maintain its existing function as a "salinity sill" to maintain the habitat quality (salinity and temperature) of the existing freshwater pool in Wood Creek located upstream of the crossing (at the mouth of the Myrtle Avenue culvert). As noted previously, this pool has recently been documented by the Department of Fish and Game as valuable juvenile salmonid summer rearing habitat, as it provides a cool water/low salinity refuge for fish during summer when salinity levels in lower Wood Creek are highest (for more discussion, see Finding IV-C below).

   A 50-foot-long "flatcar" bridge spanning the 20-foot-wide creek reach would be installed to replace the old culvert that is to be removed. The bridge deck would be approximately 1 foot higher in elevation than the surrounding pasture elevation. The bridge would be set on and anchored to concrete abutments (2-feet-wide by 3-feet-high and 12-feet-long with 2-foot-deep abutments) located entirely out of and away from the creek channel. The left bridge abutment would be placed on an existing graveled road. Due to the length of the bridge, the right abutment may be able to be installed directly onto the pasture ground (i.e., no approach ramps). To minimize impacts to aquatic species and water quality, an approximately 100-foot-long section of the creek channel would be dewatered with coffer dams, fish screens

would be installed upstream and downstream, and salmonids would be removed using minnow traps, seine nets, and (if salinity and conductivity conditions are conducive) electrofishing. Any exposed ground along or beyond the channel margins would be covered with sterile rice straw as mulch for erosion control. Work in the creek would occur during low tide intervals only. Excess debris from the old crossing would be disposed of at the City Garbage transfer station on West Hawthorne Street in Eureka.

5. Placing approximately 3,200 cubic yards of excavated material on-site within diked former tidelands to recreate high marsh surfaces and tidal hummocks: All of the excavated material (described in numbers 1-3 above) would be placed in the tidal marsh restoration area to create topographic diversity in the form of high marsh habitat and tidal hummocks (see Exhibit No. 7). The apices of the eight proposed tidal hummocks mirror those found along Fay Slough (approximately one mile north of the project site), which was used as a reference site for the proposed project design. Hummocks would be constructed at elevations appropriate to support tufted hairgrass (*Deschampsia cespitosa*) and other native brackish marsh plant species. The area to be enhanced through slough channel excavation (see No. 1 above) and tidal hummock creation is 23 acres.

6. Removing an existing tidegate on Wood Creek to allow for tidal inundation to the tidal marsh restoration area: The tidegate to be removed is wooden top-hinged tidegate on a concrete box weir (3 feet wide by 50 feet long by 8 feet deep). Currently the wooden flap and concrete structure inhibit the full tidal and stream-flow flushing that would normally occur at the confluence of Wood Creek and Freshwater Slough. Only the wooden flap and not the entire concrete structure would be removed (as removal of the latter would allow tidal inundation to productive agriculture land on the property and surrounding properties, as explained below). Removal of the wooden flap would increase the flushing capacity at the site due to the increased tidal prism and overall water volume allowed to pass through the moderately constricted mouth of Wood Creek. Removal of the wooden tide gate would occur after all other construction elements have been completed, including removal of the dirt plugs between the newly created tidal channels and Wood Creek (see No. 1 above). After the tidegate is removed, the total area of wetlands to be tidally enhanced (converted from seasonal freshwater) is approximately 23 acres, with a proposed mean higher high water (MHHW) elevation of 6.1 feet (NAVD88). The mean maximum monthly water (MMMW) elevation (proposed 7.6 feet NAVD88) could inundate up to 29 acres of diked former tidelands (currently seasonal freshwater wetlands).

7. Sealing a dysfunctional Waterman tidegate located south of the main Wood Creek tidegate in the Freshwater Slough dike: The existing Waterman tidegate is attached to a 2-foot-diameter culvert and is no longer functional, as it is rusted, leaky, unstable, and poses future risks (e.g., compromise of the Freshwater Slough dike and flooding of adjoining properties or Myrtle Avenue). The tidegate culvert would be opened up (approximately 2 square feet) from the top using hand tools and filled and sealed with concrete. The concrete would be mixed on site by hand and set by hand. Provisions would be made so that no uncured concrete comes into contact with the wetted channel. The work would occur during a single low tide cycle.

8. Revegetating the 23-acre tidal marsh restoration area with a combination of native species plugs (across approximately 11.5 acres), seeding (across approximately 4.5 acres), and passive revegetation (across approximately 7 acres): The stated goals of the revegetation are to (1) promote the recovery of desirable plant species and marsh types and minimize invasive species by planting the preferred species assemblages at appropriate hydrologic and elevation zones; (2) minimize surface erosion in areas disturbed by construction activities; and (3) evaluate different revegetation methods that area intended to achieve recovery of desirable marsh types. See Exhibit No. 8 for more details.

   - Plugs of Lyngbye's sedge (*Carex lyngbyei*) and tufted hairgrass (*Deschampsia cespitosa*) would be installed on maximum 18-inch to 24-inch centers across approximately 11.5 acres of the tidal marsh restoration area (see Exhibit Nos. 8 & 9).
   - Seeding of Lyngbye's sedge and tufted hairgrass would be applied at a rate of 155 lbs/acre across approximately 4.5 acres of the tidal marsh restoration area (see Exhibit Nos. 8 & 9).
   - Passive revegetation is proposed for the remaining approximately 7 acres of the tidal marsh restoration area. The applicant proposes to manually remove any invasive dense-flowered cordgrass (*Spartina densiflora*) plants that colonize the restoration area immediately upon detection.

   The seeds and plugs would be obtained from Freshwater Farms Nursery, a local wetland plant nursery located adjacent to the project parcel. The plant material would be of local genetic stock gathered from adjacent stands of the applicable species. The revegetation is would be implemented during the fall/winter months to take advantage of the seasonal rains.

9. Relocating the western alignment of the existing agricultural fence: The proposed fencing would be the same as the existing fencing, except the western fence line would be moved eastward to accommodate the proposed restoration activities (see Exhibit No. 5). The corner posts would require three posts and two braces. End-braced posts would be needed at the culvert crossing near the access entrance to the property. Wooden posts would be placed every 150 feet between the braced stretch posts, and metal "T" posts would be inserted at 50-foot centers. The posts would be 4-inch pressure treated posts, 8 feet long, and set or driven at least 2 feet into the soil. Three strands of smooth high tensile wire would be strung on the posts using electric fence insulators and ratchet tighteners at one end of each wire span for easy tightening. A metal gate 12 feet to 14 feet in length would be installed at the culvert crossing/entrance to the field. A 12-volt battery powered electric fence charger would be installed to energize the fence. The fence would be designed to allow both for wildlife passage (small animals and amphibians to pass under and deer to jump over) and cattle exclusion (to protect the restoration area)

The project would have significant overall habitat restoration benefits for a variety of marine resources, as summarized in Table 1 below. The project would, however, result in the conversion of approximately 13.5 acres of nonprime, seasonal agricultural land to restored tidal channels and brackish marsh habitat (see Finding IV-F below).

Table 1. Summary of acreages & enhancements proposed for the 54-acre project area.

Habitat/Species	Approximate Size of Project Area Habitat	Notes
Brackish Marsh	1.4 acres (existing) 23 acres (proposed)	The project will result in an **increase** of approximately 21 acres through the conversion of existing diked former tidelands (seasonal freshwater wetlands).
Lyngbye's sedge *Carex lyngbyei*	1 acre (existing) 13 acres (proposed)	The project will result in an **increase** of ~12 acres (see Exhibit No. 9)
Tidewater goby *Eucyclogobius newberryi*	0.02-acre (existing) 0.8-acre (proposed)	The project will result in an **increase** of ~0.78 acres.
Chinook salmon *Oncorhynchus tshawytsha*	2,300 feet (existing) 6,200 ft (proposed) 4,500 ft^2 (proposed)	The project will result in an **increase** of ~3,900 feet of winter rearing habitat and ~4,500 square feet of summer rearing habitat.
Coho salmon *O. kisutch*	2,300 feet (existing) 6,200 ft (proposed) 4,500 ft^2 (proposed)	The project will result in an **increase** of ~3,900 feet of winter rearing habitat and ~4,500 square feet of summer rearing habitat.
Steelhead *O. mykiss*	2,300 feet (existing) 6,200 ft (proposed) 4,500 ft^2 (proposed)	The project will result in an **increase** of ~3,900 feet of winter rearing habitat and ~4,500 square feet of summer rearing habitat.
Coastal cutthroat trout *O. clarki clarki*	2,300 feet (existing) 6,200 ft (proposed) 4,500 ft^2 (proposed)	The project will result in an **increase** of ~3,900 feet of winter rearing habitat and ~4,500 square feet of summer rearing habitat.
Agricultural land	33.5 acres (existing) 20 acres (proposed)	The project will result in the conversion of approximately 13.5 acres of agricultural land (to tidal marsh habitat) and a **decrease** of ~5 animal unit months (AUM), from approximately 20 to 15 AUMs.

The applicant proposes to construct an approximately 2,800-foot-long temporary access road designed around the perimeter of the project area, through the seasonal wetland pasture. A secondary existing access road from the neighboring parcel (owned by Rick Storre) may also be utilized for occasional access. All equipment and material staging would take place within the project construction boundary. The only materials proposed to be staged would be large wood for use as instream habitat structures. Any equipment refueling would occur in the upland area next to Myrtle Avenue. Geotex mats and crushed rock would be temporarily placed in any pasture wet areas to minimize compaction during construction activities. Silt fencing and other erosion control measures would be installed as needed to reduce silt and turbidity runoff from

Wood Creek during construction. To prevent salmonids and other estuarine fish species from moving into the site during construction, fish screens would be installed on Wood Creek during ebb tide, downstream of the tidegate and upstream of the proposed pool expansion/excavation site on Wood Creek.

The applicant has submitted a Compliance and Performance Monitoring Plan (dated April 2008; Exhibit No. 10), which outlines a preliminary monitoring plan for construction and compliance, physical site features, vegetation, and fisheries. The applicant also has prepared a preliminary Storm Water Pollution Prevention Plan (Exhibit No. 11).

The applicant proposes various mitigation measures to avoid or minimize project impacts on the environment, which are included in the Mitigated Negative Declaration prepared for the project (Exhibit No. 12) and are required to be implemented as a condition of approval of the Conditional Use Permit issued by the County for the project. In addition, the Commission notes that the applicant has been or will be issued several other permits and associated authorizations for the project that contain terms and conditions for avoiding or minimizing impacts to coastal resources and the environment (see "Other Approvals" listed on page 2).

C. Restoration of Marine Resources, Biological Productivity, and Permissible Filling, Dredging, & Diking of Wetlands

1. Applicable Coastal Act Policies and Standards

Coastal Act Section 30230 states as follows:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.* [Emphasis added.]

Coastal Act Section 30231 states as follows:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.* [Emphasis added.]

Coastal Act Section 30233 provides as follows, in applicable part:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible*

mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

…

(6) Restoration purposes

…

(*c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary*… [Emphasis added.]

2. Consistency Analysis

The proposed project will convert 23 to 29 acres of existing seasonal freshwater wetlands to tidal marsh. Many of the project components include activities that could be characterized as the placement of fill, dredging, or diking of a wetland. However, the project does not result in any loss of overall wetland habitat area. The same amount of wetland area exists before and after implementation of the project.

Coastal Act Sections 30230 and 30231 require, in part, that marine resources and coastal wetlands be maintained and enhanced. These policies also call for restoration of marine resources, coastal waters, streams, wetlands, and estuaries where feasible.

When read together as a suite of policy directives, Sections 30230, 30231, and 30233 set forth a number of different limitations on what types of projects may be allowed in coastal wetlands. For analysis purposes, the limitations applicable to the subject project can be grouped into four general categories or tests. These tests require that projects that entail the dredging, diking, or filling of wetlands demonstrate that:

a. That the purpose of the filling, diking, or dredging is for one of the seven uses allowed under Section 30233;

b. That the project has no feasible less environmentally damaging alternative;

c. That feasible mitigation measures have been provided to minimize adverse environmental effects; and

d. That the biological productivity and functional capacity of the habitat shall be maintained and enhanced where feasible.

Each category is discussed separately below.

a. Permissible Use for Fill

The first test set forth is that any proposed filling, diking, or dredging in wetlands must be for an allowable purpose as specified under Section 30233 of the Coastal Act. The relevant category of use listed under Section 30233(a) that relates to the proposed project is subcategory (6), "restoration purposes."

The project involves restoring tidal hydrology and brackish marsh habitat across 23 to 29 acres of diked former tidelands (seasonal freshwater wetlands) and enhancing 4,500 square feet of juvenile salmonid summer rearing habitat along Wood Creek by (1) excavating 2,450 cubic yards of material along 3,900 feet of historic tidal channels within diked former tidelands; (2) excavating 300 cubic yards of berm material along the north bank of Wood Creek; (3) enhancing juvenile salmonid summer rearing habitat on Wood Creek by excavating 380 cubic yards of material; (4) replacing a culvert crossing on Wood Creek with a "flatcar" bridge; (5) placing approximately 3,200 cubic yards of excavated material on-site within diked former tidelands to recreate high marsh surfaces and tidal hummocks; (6) removing an existing tidegate on Wood Creek to allow for tidal inundation to the tidal marsh restoration area; (7) sealing a dysfunctional waterman tidegate located south of the main Wood Creek tidegate in the Freshwater Slough dike; (8) revegetating the tidal marsh restoration area with appropriate native species; and (9) relocating the western alignment of the existing agricultural fence.

Neither the Coastal Act nor the Commission's administrative regulations contain a precise definition of "restoration." The dictionary defines "restoration" in terms of actions that result in returning an article "back to a former position or condition," especially to "an unimpaired or improved condition."[1] The particular restorative methods and outcomes vary depending upon the subject being restored. For example, the Society for Ecological Restoration defines "ecological restoration" as "the process of intentionally altering a site to establish a defined indigenous, historical ecosystem. The goal of the process is to emulate the structure, function, diversity, and dynamics of the specified ecosystem."[2] However, within the field of "wetland restoration," the term also applies to actions taken "in a converted or degraded natural wetland that result in the reestablishment of ecological processes, functions, and biotic/abiotic linkages and lead to a persistent, resilient system integrated within its landscape"[3] that may not necessarily result in a return to historic locations or conditions within the subject wetland area.

Implicit in all of these varying definitions and distinctions is the understanding that the restoration entails returning something to a prior state. Wetlands are extremely dynamic systems in which specific physical functions such as nutrient cycles, succession, water levels, and flow patterns directly affect biological composition and productivity. Consequently "restoration," as contrasted with "enhancement," encompasses not only re-establishing certain prior conditions but also reestablishing the processes that create those conditions. In addition, most of the varying definitions of restoration imply that the reestablished conditions will persist to some degree, reflecting the homeostatic natural forces that formed and sustained the original conditions before being artificially altered or degraded, and will not promptly return to the pre-restored state.

Moreover, finding that proposed diking, filling, and dredging constitutes "restoration purposes" must be based, in part, on evidence that the proposed project will be successful in restoring habitat values. Should the project be unsuccessful at increasing and/or enhancing habitat values,

[1] Merriam-Webster's Collegiate Dictionary, Tenth Edition

[2] "Definitions," *Society of Ecological Restoration News*, Society for Ecological Restoration; Fall, 1994

[3] *Position Paper on the Definition of Wetland Restoration*, Society of Wetland Scientists, August 6, 2000

or worse, if the proposed diking, filling, and dredging impacts of the project actually result in long term degradation of the habitat, the proposed diking, filling, and dredging would not actually be for "restoration purposes." These two characteristics are particularly noteworthy to restoration grant program administrators in reviewing funding requests to ensure that the return on the funding investment is maximized and liabilities associated with unwanted side effects of the project are minimized.

Thus, to ensure that the project achieves its stated habitat restoration or enhancement objectives, and therefore be recognized as being for "restoration purposes," the project must demonstrate that: (1) it either entails (a) a return to, or re-establishment of, former habitat conditions, or (b) entails actions taken in a converted or degraded natural wetland that will result in the re-establishment of landscape-integrated ecological processes, and/or abiotic/biotic linkages associated with wetland habitats; (2) there is a reasonable likelihood that the identified improvements in habitat value and diversity will result; and (3) once re-established, it has been designed to provide the desired habitat characteristics in a self-sustaining, persistent fashion independent of the need for repeated maintenance or manipulation to uphold the habitat function.

The components of the proposed project that include filling, diking, or dredging of wetlands for the proposed restoration are discussed below. Those components that contribute to the tidal marsh restoration are discussed first followed by those components that contribute to the juvenile salmonid summer rearing habitat restoration.

(1) Tidal Marsh Restoration Components:

The components of the project that involve filling, diking, or dredging of existing wetlands for tidal marsh restoration include the following: (1) excavating 2,450 cubic yards of material along 3,900 feet of historic tidal channels within diked former tidelands; (2) excavating 300 cubic yards of berm material along the north bank of Wood Creek; (3) placing approximately 3,200 cubic yards of excavated material on-site within diked former tidelands to recreate high marsh surfaces and tidal hummocks; (4) replacing the culverted crossing of Wood Creek with a flatcar bridge; and (5) relocating the western alignment of the existing agricultural fence.

As described in more detail above in Finding No. IV-B, the project proposes to excavate approximately 0.7-acre of diked former tidelands (seasonal freshwater wetlands) along historic tidal channels to restore tidal hydrology to the area in conjunction with (among other project components) tidegate removal at the mouth of Wood Creek, berm removal, tidal hummock construction, replacing the culverted crossing of Wood Creek with a flatcar bridge, and relocating the western alignment of the existing agricultural fence. Approximately 3,200 cubic yards of excavated material will be placed in diked former tidelands to create topographic diversity in the form of high (brackish) marsh habitat and tidal hummocks. The project design will enable tidewater inundation to between 23 acres (MHHW) and 29 acres (MMMW) of diked former tidelands.

The proposed restoration of approximately 23 to 29 acres of tidal marsh habitat in the project area is within an area that was historically subject to the tidal influence of Humboldt Bay. As

described above in Finding No. IV-B, historically (prior to the construction of the Northwestern Pacific Railroad and Highway 101 beginning over one hundred years ago), the project site occupied the upper zone of tidal marshland surrounding the perimeter of Humboldt Bay and its tidal mudflats prior to being diked, drained, and muted through tidegate installation. The project area is shown as "tidal marsh" on the 1870 U.S. Coast and Geodetic Survey Map (see page 7 of the October 2007 Biological Assessment for the project), which delineated pre-development tidal marsh boundaries around the bay. Historically, the area likely supported transitional brackish marsh habitat at the interface of tidal flux intermixing with freshwater input (from Freshwater and Wood Creeks).

According to information from the U.S. Fish and Wildlife Service (FWS), in the Humboldt Bay region it is estimated that between 7,000 and 8,700 acres of tidal marsh (including salt marsh and brackish marsh habitats) were present prior to human development (more recent estimates [Pickart 1988] place the historic tidal marshes closer to 10,000 acres). Since the mid-1800's, most of what was likely to have been historic tidal marsh has been diked or filled and has been reduced to a total area of around 900 acres, a reduction of at least 87 percent. The FWS has indicated that restoration of tidal marsh habitats around the Bay is a high priority, as tidal marsh restoration is important for the protection, enhancement, and restoration of native fish, wildlife, and plant communities, some of which are dependent on tidal marsh for their existence. In past permit actions on wetland restoration projects around Humboldt Bay, the Commission has acknowledged that, in general, restoring areas that have historically supported tidal marsh is preferable when the physical conditions of a site present such an opportunity.

According to the Biological Assessment prepared for the project (McBain & Trush, Inc. October 2007), brackish marsh habitat is even more limited than salt marsh habitat in the Humboldt Bay region. Brackish marsh habitat represents a transitional interface between salt marsh and freshwater marsh, where salinity levels are relatively low, but the habitat still is tidally influenced. Typical brackish marsh vegetation in the Humboldt Bay region is dominated by tufted hairgrass, Lyngbye's sedge, and other species. One of the few remaining pristine examples of brackish marsh habitat occurs along Fay Slough, approximately one mile north of the project site. This area was used as a reference site for the design phase of the "Wood Creek Tidal Marsh Enhancement Project."

As explained above, due to the subject site's location between two freshwater sources – Freshwater Slough, which is seasonally dominated by freshwater runoff from Freshwater Creek, and Wood Creek – the project area historically supported transitional brackish marsh habitat. Therefore, the Commission finds that the proposed creation of 23 to 29 acres of brackish marsh habitat is mandated by the requirements of Section 30230 that marine resources shall be maintained, enhanced, and where feasible, restored. The Commission further finds that the proposed dredging of 0.7 acres of seasonal wetlands and placement of 3,200 cubic yards of fill within seasonal wetlands for the restoration of 23 to 29 acres of brackish marsh habitat is permissible under Section 30233(a)(6) for "restoration purposes."

As discussed above, this finding that the proposed project constitutes "restoration purposes" is based, in part, on the assumption that the proposed project will be successful in increasing tidal

marsh habitat values. Should the project be unsuccessful at increasing brackish marsh habitat values, or worse, if the proposed dredging and filling impacts of the project actually result in long term degradation of the habitat, the proposed diking, filling, and dredging would not actually be for "restoration purposes." To ensure that the proposed project achieves the objectives for which it is intended (*i.e.*, for the restoration of 23 acres of tidal marsh), the Commission attaches Special Condition No. 1. This condition requires the applicants to submit a final monitoring plan for review and approval by the Executive Director prior to the issuance of the coastal development permit. The final monitoring plan is required to outline a method for measuring and documenting the improvements in habitat value and diversity at the site over the course of five years following project completion. Furthermore, Special Condition No. 1 requires the final monitoring plan to include provisions for remediation to ensure that the goals and objectives of the tidal marsh restoration project are met.

(2) Juvenile Salmonid Summer Rearing Habitat Restoration Components:

The project proposes to expand and enhance juvenile salmonid summer rearing habitat by creating a 4,500-square-foot pool along Wood Creek (excavating 380 cubic yards of material for a pool depth of 2.8 feet) upstream of the existing crossing. The upper approximately 900 feet of creek channel (from the access road crossing to the Myrtle Avenue culvert) has become moderately aggraded and colonized by cattail and bulrush. The proposed pool expansion on the creek would enhance degraded aquatic habitat for the benefit of juvenile salmonids.

Historically, the area upstream of the access road that crosses Wood Creek has supported more freshwater marsh and freshwater aquatic habitats than tidally influenced, saline habitats because the existing culvert and fill crossing, which was installed decades ago, acts as a salinity barrier on the creek. Furthermore, this area is situated at the outer extreme of historic bay tidelands, which, as discussed above, was a transitional habitat between freshwater and tidal habitats. The delineation between freshwater and tidal habitats likely was not distinct. The proposed pool would usually contain freshwater, but at certain times of the year the pool may become brackish depending on the salinity gradient in Wood Creek, the function of the salinity sill described below, the volume of groundwater flow delivered to the pool, and the frequency of flushing from the upstream catchment. Because the "salinity sill" road crossing maintains the low-saline, low-temperature freshwater habitats that are available upstream, the Wood Creek area upstream of the access road crossing and downstream of the Myrtle Avenue culvert currently and historically has supported valuable summer rearing habitat for juvenile salmonids. As a partially brackish habitat, the juvenile salmonid summer rearing habitat is a type of marine resource.

The project is designed to add both brackish marsh habitat and habitat for salmon rearing, both of which are dramatically reduced in the region over historic levels. The proposed enhancements are needed to help restore habitat diversity within Humboldt Bay and assist in the recovery of listed salmonid species including Coho salmon, Chinook salmon, Steelhead, and Coastal cutthroat trout. Juvenile salmonid summer rearing habitat in particular is a limited habitat type in the region, as the availability of cool water/low saline pools is limited during the relatively long dry season (approximately June through October).

Therefore, the Commission finds that the proposed juvenile salmonid summer rearing habitat enhancements are consistent with the definition of restoration and constitute filling and dredging for restoration purposes consistent with Section 30233(a)(6), because the proposed enhancements entail actions taken in converted or degraded natural wetlands that will result in the reestablishment of landscape-integrated ecological processes associated with wetland habitats that historically existed in the area. The Commission further finds that as the proposed juvenile salmonid habitat enhancements will maintain and enhance marine resources and the biological productivity of coastal waters, the proposed improvements are mandated by the requirements of Sections 30230 and 30231.

As discussed above, this finding that the proposed project constitutes "restoration purposes" is based, in part, on the assumption that the proposed creation of a 4,500-square-foot pool along Wood Creek will be successful in enhancing juvenile salmonid summer rearing habitat values. Should the project be unsuccessful at increasing juvenile salmonid habitat values, or worse, if the proposed dredging impacts of the project actually result in long term degradation of the habitat, the proposed diking, filling, and dredging would not actually be for "restoration purposes." To ensure that the proposed project achieves the objectives for which it is intended (*i.e.*, for the enhancement of 4,500 square feet of juvenile salmonid rearing habitat), the Commission attaches Special Condition No. 1, which (as described above) requires the applicants to submit a final monitoring plan to outline a method for measuring and documenting the improvements in habitat value and diversity at the site over the course of five years following project completion.

b. Alternatives Analysis

The second test set forth by the Commission's dredging and fill policies is that the proposed dredging or fill project must have no feasible less environmentally damaging alternative. Coastal Act Section 30108 defines "feasible" as follows:

> *"Feasible" means capable of being accomplished in a successful manner within a reasonable time, taking into account economic, environmental, social, and technological factors.*

Alternatives to the proposed project that were examined include (1) the no-project alternative; and (2) alternative sites; and (3) alternative methods. As explained below, each of these alternatives are infeasible and/or do not result in a project that is less environmentally damaging than the proposed project.

(1) No-Project Alternative

The "no project" alternative would maintain the *status quo* of the site and would not restore 23 to 29 acres of tidal marsh habitat and 4,500 square feet of juvenile salmonid freshwater rearing habitat as proposed. Excavation of 3,900 feet of historic tidal channels (2,450 cubic yards of material) would not occur, and recreation of high marsh habitats through the placement of 3,200 cubic yards of fill for tidal hummocks would not occur. Additionally, excavation of 380 cubic yards of freshwater marsh for the expansion and enhancement of a 4,500-square-foot habitat pool on Wood Creek would not occur. Existing conditions in the majority of the project area include mostly degraded seasonal freshwater wetlands (diked former tidelands), a portion of which are

used for seasonal cattle grazing. Existing conditions in the freshwater portion of Wood Creek upstream of the existing access road consist of limited habitat for juvenile salmon, primarily restricted to the mouth of the Myrtle Avenue culvert.

Under the "no project" alternative, the land would continue to be used, in part, for seasonal agricultural grazing (as it would under the proposed project) and native plant nursery stock, but there would be no restored and improved habitat for marine resources. Furthermore, the biological productivity of the coastal wetlands and waters would not be improved, including improved wetland habitat value for a diversity of sensitive plant and animal species and habitats, including Lyngbye's sedge, Tidewater goby, Chinook salmon, Coho salmon, Steelhead, Cutthroat trout, brackish marsh, and others. Accordingly, taking into consideration the economic, environmental, and social factors, the no project option is not a feasible less environmentally damaging alternative.

(2) Alternative Sites

Much of the historic tidelands surrounding Humboldt Bay have been diked, drained, and converted to agriculture and other use types (e.g., public facilities, commercial and industrial development, etc.), and restoration and enhancement could theoretically occur on other parcels around the bay if there were willing landowners. However, at this time the applicant is the only landowner who has proposed the project and who is willing to contribute to the grant funds available for the project. Additionally, only certain sites (such as the subject site) around the bay are available for brackish marsh restoration, because historically this habitat type occurred at the outer fridges of historic tidelands where freshwater input (e.g., from adjacent creeks and seasonal runoff) intermixed with tidal flux to create a transitional brackish habitat. Furthermore, the majority of the land in immediate proximity to Humboldt Bay and its tributaries where restoration of these habitat types is possible is itself wetland by nature. Therefore, implementing the project at an alternative location is not a feasible less environmentally damaging alternative.

(3) Alternative Methods

Instead of implementing the project as proposed, the applicant could (a) grade the marsh plain rather than excavate channels to allow tidal channels to form, (b) excavate fewer or more tidal channels than proposed, (c) not construct tidal hummocks as proposed, and/or use other restoration methods than those proposed.

(a) *Grading the marsh plain rather than excavating channels*:

Rather than carving 3,900 feet of tidal channels, the applicant instead could grade the entire 23-acre marsh plain down to the proper elevation to allow for natural tide channel formation once the Wood Creek tidegate is removed. The area proposed for tidal marsh restoration is currently at or near the mean higher high water (MHHW) tidal datum and grades to upland. According to the hydraulic analysis and design report prepared for the project (Jeff Anderson & Associates, February 2008), tidal channel initiation typically occurs on unvegetated mudflats, which are inundated with water over a significant portion of the tidal cycle with adequate depths and erosive force to carve channels. Tidal channel networks may redevelop naturally if an adequate tidal prism is delivered to the site when tidal action is restored. The tidal prism required to cut

channels typically requires the marsh plain surface to be close to the mudflat colonization elevation (which is between mean tide level and mean high water). However, if the substrate is compacted (such as the case with past agricultural operations on the subject site), channel development may be limited due to increased resistance to erosion. Furthermore, channels will not reestablish on marsh plain surfaces near MHHW because the tidal prism does not produce high enough erosive forces to cut channels. Additionally, on the subject site the concrete weir portion of the Wood Creek tidegate mutes the upper end of the tidal curve and thus limits the erosive power of high tides, which would impede channel development. Finally, this approach would require a significantly higher volume of material be dredged from the existing diked former tidelands than the proposed alternative. As proposed, the project has been designed to provide an adequate tidal prism to the site and a base channel network that will promote the evolution of a complex drainage system to support an ecologically rich and diverse community.

(b) *Excavating more or fewer channels than proposed*:

According to the hydraulic analysis and design report prepared for the project (Jeff Anderson & Associates, February 2008), the proposed tidal channels are based on historic maps of Wood Creek, connectivity of existing channels and ponds, and empirical relations that define the number of channel branches that generally compose a network of a given order. The proposed channel network design is based on the size of the tidal marsh restoration area, which will support a 4^{th}-order slough channel. Reoccupation of other slough channels was not incorporated into the design for various reasons. First, full tidal inundation cannot be restored to the site without increasing tidal flooding on adjacent properties. Second, reestablishing channel branches at the upper end of the Wood Creek channel would require excavation of the creek channel through existing valuable juvenile salmonid freshwater summer rearing habitat and also would increase salinity levels on adjacent agricultural properties. Third, some of the smaller historic channels have been obscured by levee and berm construction and subsequently have developed new drainage patters. The proposed project has been designed to enhance the established drainages in the area. Finally, excavating the channel network beyond the proposed alternative would conflict with the applicant's management objective to sustain agricultural use of a portion of the property that is currently leased to a local cattle rancher.

(c) *Not constructing tidal hummocks as proposed*:

Implementing the project without constructing tidal hummocks (through the placement of approximately 3,200 cubic yards of excavated material on-site) would result in less topographic diversity of the marsh plain surface. Topographic diversity provides the highest potential for diversity of native plant species and microhabitats that are valuable to wildlife. The proposed hummocks also will be the proper elevations necessary support the desired brackish marsh habitat.

(d) *Not relocating the western fence alignment*:

The relocation of the fence technically requires the placement of fill in the form of the installation of the fence posts into seasonal wetlands. However, this fill is essential to ensure that full restoration of brackish marsh habitat is achieved and maintained because without it, cattle would roam unimpeded over the restoration area and trample and destroy the restored habitat. As the fence currently exists in another alignment and is only being relocated, this component of

the project will not result in significant amounts of new fill and affects only approximately 100 square feet of seasonal freshwater wetland habitat.

(e) *Conclusion*:

Therefore, for all of the above reasons, implementing the project using alternative methods or designs is not a feasible less environmentally damaging alternative.

(4) Conclusion

For all of the reasons discussed above the Commission finds that there is no less environmentally damaging feasible alternative to the development as conditioned, as required by Section 30233(a).

c. Feasible Mitigation Measures

The third test set forth by Section 30233 is whether feasible mitigation measures have been provided to minimize adverse environmental impacts. The proposed development would be located within and around coastal waters and wetlands. Depending on the manner in which the proposed project is conducted, the significant adverse impacts of the project may include (1) impacts to water quality in the form of sedimentation or debris entering coastal waters and wetlands; (2) introduction (through re-planting) of exotic invasive plants species that could compete with native vegetation and negate the habitat improvements they would provide; (3) use of certain rodenticides that could deleteriously bio-accumulate in predator bird species; and (4) impacts to sensitive plant species (Lyngbye's sedge) and animal species (various fish species). Overall, the project would restore and enhance wetland habitat values and would produce generally beneficial environmental effects. However, the proposed project has been conditioned to ensure that habitat restoration and enhancement does result and that potentially significant adverse impacts are minimized. The potential impacts and their mitigation are discussed below in the following sections.

(1) Water Quality Impacts

The proposed restoration and enhancements are being undertaken to restore and enhance marine resources and the biological productivity of coastal wetlands and waters. The existing brackish marsh in and around the project area provides habitat for sensitive plant species such as Lyngbye's sedge. Freshwater Slough and Wood Creek provide habitat for various sensitive fish species (including tidewater goby and various salmonids) and a suite of macro-invertebrates and other marine organisms. The surrounding seasonal wetlands (diked former tidelands) provide habitat for a wide assortment of terrestrial organisms, most notably several environmentally sensitive avian species such as the Northern harrier (*Circus cyaneus*), White-tailed kite (*Elanus leucurus*), Great blue heron (*Ardea herodias*), and Snowy egret (*Egretta thula*).

Potential adverse impacts to both existing and to-be-restored/enhanced fish and wildlife habitat-related water quality could occur in the form of sedimentation or other pollutants adversely affecting coastal waters. In compliance with requirements of the necessary Regional Water Quality Control Board (RWQCB) permit for the project, the applicant has prepared a Storm

Water Pollution Prevention Plan (SWPPP) (draft version, dated July 25, 2008) (Exhibit No. 11), which lists six main objectives: (1) identify all pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges associated with construction activity; (2) identify non-stormwater discharges; (3) identify, construct, implement, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction; (4) develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs); (5) identify a sampling and analysis strategy and sampling schedule for discharges from construction activity which discharge directly into CWA Section 303(d) Water Bodies [water bodies listed as impaired for sedimentation under Clean Water Act Section 303(d)]; and (6) for all construction activity, identify a sampling and analysis strategy and sampling schedule for discharges that have been discovered through visual monitoring to be potentially contaminated by pollutants not visually detectable in the runoff.

To ensure that adverse impacts to water quality do not occur from construction activities or from entrainment of sediment into stormwater runoff from bare, disturbed ground in and around the project area, the Commission attaches Special Condition Nos. 2 and 3. Special Condition No. 2 requires the applicants to undertake the development pursuant to certain construction responsibilities. These include, but are not limited to, the following: (a) no construction materials, debris, or waste are to be placed or stored where they may enter coastal waters; (b) all construction debris is to be removed and disposed of in an approved location; (c) the construction window shall be limited to the dry season (June 1- November 15), and any grading between October 16 and November 15 shall only be conducted if conditions remain dry, the predicted chance of rain is less then 30 percent, and appropriate BMPs are in place; (d) construction activities adjacent to the creek and slough shall only be performed at low tide and when soils are sufficiently dry so that sediment is not discharged into streams; (e) if rainfall is forecast during the time construction activities are being performed, any exposed soil areas shall be promptly mulched or covered with plastic sheeting and secured with sand bagging or other appropriate materials before the onset of precipitation; (f) any debris discharged into coastal waters shall be recovered immediately and disposed of properly; (g) any fueling and maintenance of construction equipment shall occur within upland areas only outside of environmentally sensitive habitat areas or within designated staging areas; and (h) fuels, lubricants, and solvents shall not be allowed to enter the coastal waters or wetlands, hazardous materials management equipment including oil containment booms and absorbent pads shall be available immediately on-hand at the project site, and any accidental spill shall be rapidly contained and cleaned up. The Commission attaches Special Condition No. 3 to ensure that the project is undertaken according to the proposed erosion and runoff control specifications and other Best Management Practices. Special Condition No. 3 requires the applicants to submit, prior to issuance of the permit for the review and approval of the Executive Director, the final version of the RWQCB-approved SWPPP that substantially conforms to the draft version dated July 25, 2008. The condition further requires that development is implemented in accordance with the approved final plan.

(2) Introduction of Exotic Invasive Plants

The use of non-invasive plant species adjacent to environmentally sensitive habitat areas (ESHAs) is critical to protecting such areas from disturbance. If invasive species are planted adjacent to an ESHA they can displace native species and alter the composition, function, and biological productivity of the ESHA.

The applicant is proposing to revegetate the 23-acre tidal marsh restoration area with a combination of native species plugs (across approximately 11.5 acres), seeding (across approximately 4.5 acres), and passive revegetation (across approximately 7 acres). The applicant also proposes to eradicate any dense-flowered cordgrass (*Spartina densiflora*) plants (a noxious weed of tidal marsh habitats) currently on site as well as any that colonize the site post project implementation.

To assure that no invasive plant species are seeded in the project area, Special Condition No. 4 prohibits the planting of any plant species listed as problematic and/or invasive by the California Native Plant Society, the California Invasive Plant Council, or as may be identified from time to time by the State of California, shall be employed or allowed to naturalize or persist on the site. Furthermore, no plant species listed as a "noxious weed" by the governments of the State of California or the United States are to be utilized in the revegetation portion of the project. As discussed above, Special Condition No. 1 requires a final monitoring plan to outline a method for measuring and documenting the improvements in habitat value and diversity at the site (including eradicating cordgrass from the area) over the course of five years following project completion.

(3) Use of Anticoagulant-based Rodenticides

To help in the establishment of vegetation, rodenticides are sometimes used to prevent rats, moles, voles, and other similar small animals from eating the newly planted saplings. Certain rodenticides, particularly those utilizing blood anticoagulant compounds such as brodifacoum, bromadiolone and diphacinone, have been found to pose significant primary and secondary risks to non-target wildlife present in urban and urban/wildland areas. As the target species are preyed upon by raptors or other environmentally sensitive predators and scavengers, these compounds can bio-accumulate in the animals that have consumed the rodents to concentrations toxic to the ingesting non-target species. To avoid this potential cumulative impact to environmentally sensitive wildlife species, Special Condition No. 4 contains a prohibition on the use of such anticoagulant-based rodenticides.

(4) Impacts to Sensitive Plant and Fish Species

One rare plant species occurs in the existing brackish habitat in the project area: Lyngbye's sedge (*Carex lyngbyei*). Lyngbye's sedge is considered "rare" by the California Native Plant Society (CNPS List 2.2) and the California Department of Fish and Game (G5/S2.2). Lyngbye's sedge is a perennial species in the Sedge family (Cyperaceae) that grows in brackish or freshwater marsh habitats near sea level primarily along the North Coast of California (from Marin County to Del Norte County). The species is more common outside of California, extending into Oregon and elsewhere. According to the California Natural Diversity Database, there are numerous documented occurrences of the species in the Humboldt Bay region. A 2006

vegetation map produced by the applicant's consultant shows a band of Lyngbye's sedge approximately an acre in size on lower Wood Creek in existing brackish marsh habitat. The project proposes to increase Lyngbye's sedge habitat to approximately 13 acres, and Lyngbye's sedge plugs and seeds are proposed to be planted in the project area.

There are various sensitive fish species that also occur or have the potential to occur in the project area. The Southern Oregon/Northern California Coast Evolutionary Significant Unit (ESU) of Coho salmon and the Coastal California ESU of Chinook salmon are listed under the federal Endangered Species Act (ESA) as "threatened." Chinook salmon (*Oncorhynchus tshawytscha*) spawn in upstream reaches of stream tributaries to Humboldt Bay (e.g., Freshwater Creek), but young fish are believed to spend several months during their first year "rearing" in the estuary. Coho salmon (*O. kisutch*) also spawn in upstream reaches, and their young also spend time in the estuary before first entering the ocean. In addition, adults of both species spend time in the estuary when returning to the basin to spawn, "holding" there while waiting for fall rains to bring river levels up enough to allow upstream migration. As shown in Table 1 above, there is approximately 2,300 feet of existing habitat in the project area for salmonids, and the project proposes to restore an additional 3,900 feet of winter rearing habitat in the form of the excavation of the proposed tidal channels within the proposed tidal marsh restoration area. Summer rearing habitat for juvenile salmonids also has recently been documented by the Department of Fish and Game in the project area in a freshwater pool in Wood Creek at the mouth of the Myrtle Avenue culvert. The applicant proposes to restore an additional 4,500-square-foot pool to provide additional summer rearing habitat.

The third salmonid species of concern in the project vicinity is Steelhead (*O. mykiss*), a seagoing trout. Steelhead have a life history similar to that of Chinook and Coho, although the Steelhead (which is closely related to non-seagoing rainbow trout), find appropriate habitat conditions in smaller streams, and in more upstream reaches than do the larger salmonids. The Northern California Steelhead ESU is presently listed under the federal ESA as "threatened." As shown in Table 1 above, there is approximately 2,300 feet of existing habitat in the project area for Steelhead, and the project proposes to restore an additional 3,900 feet of winter rearing habitat.

An additional fish species of concern in the project area is the Coastal cutthroat trout (*O. clarki clarki*), a resident salmonid in coastal streams in northern California and southern Oregon. This species is a "species of special concern" for the Department of Fish and Game, but is not listed under either the federal or state ESAs. Coastal cutthroat trout have been documented in many streams in the Humboldt Bay basin, and are presumed to be present in all the perennially flowing tributary streams to Humboldt Bay. All of the life requisites for this species are provided by the conditions in the streams in which it resides. As shown in Table 1 above, there is approximately 2,300 feet of existing habitat in the project area for Coastal cutthroat trout, and the project proposes to restore an additional 3,900 feet of winter rearing habitat.

Finally, the project area provides habitat for an additional federally listed fish species, the Tidewater goby (*Eucyclogobius newberryi*), a species currently listed as "endangered" under the federal ESA. Tidewater gobies occur in near-estuarine tidal stream bottoms with varying salinities and substrates generally of fine (*i.e.*, silty to clayey mud) materials. In the project area

gobies have been found just inside the dysfunctional Waterman tidegate that is proposed to be sealed in place. Approximately 0.02-acre of goby habitat currently exists in the project area, and the project proposes to create an additional 0.78-acre of goby habitat through restoration activities.

The applicant proposes various measures to minimize impacts to sensitive plant and fish species in the project area. To minimize impacts to Lyngbye's sedge, the applicant proposes to leave existing plants undisturbed, if possible, during excavation and grading activities. If plants cannot be avoided, the applicant proposes to remove plants along with the top 12 inches of topsoil and transplant these "wafers" into the tidal marsh restoration area along new tidal channels at the appropriate finished grade and in the same orientation. If plants will not be immediately transplanted, they will be kept moist and protected until transplantation can occur.

To minimize impacts to sensitive fish species, the applicant proposes to (1) install fish screens upstream and downstream of the project site to minimize the number of fish within the project area during construction activities; (2) dewater and exclude fish from about a 100-foot section of Wood Creek prior to work in the creek through the use of coffer dams or sand bags; (3) capture and relocate any fish that might be present prior to work in the creek (including the damming and dewatering work described above); (4) implement erosion and runoff control BMPs (e.g., silt fences) to minimize water quality impacts that could adversely impact aquatic habitat values; (5) for the dysfunctional Waterman tidegate, a) seal the tidegate in place rather than remove it completely to minimize impacts to Tidewater goby habitat; b) install filter fabric along the levee to prevent dirt from entering goby habitat; c) install fish exclusion nets between the goby habitat and the levee; and c) perform the Waterman tidegate work during one low-tide interval.

Both NOAA-Fisheries and the U.S. Fish and Wildlife Service (FWS) completed informal consultations for the project (for the various salmonids and Tidewater goby respectively). NOAA-Fisheries concluded that the proposed project is not likely to adversely affect Coho, Chinook, Steelhead, or their critical habitats. Although the proposed project would result in an insignificant mobilization of sediment which may kill a small amount of salmonid prey, this sediment release is expected to be temporary, and the newly created habitat is expected to be rapidly colonized with prey species. Salmonids are not expected to be using the area during or immediately following construction, so no salmonids are expected to have reduced growth or survival as a result of the proposed project. NOAA-Fisheries concludes that the proposed project would result in an increase in tidal marsh and slough channel habitat which ill increase the available habitat for salmonids. Similarly, the FWS informal consultation concludes that the proposed project is not likely to adversely affect the Tidewater goby or its critical habitat. The areas where tidal channel excavation is proposed to occur are not currently considered habitat for the goby, and excavation will be completed prior to removal of the berm along Wood Creek and the wooden tidegate on Wood Creek that will allow inundation and potentially goby inhabitation of these areas. Neither NOAA-Fisheries or FWS provided further recommendations or conservation measures to be implemented beyond those proposed by the applicant to minimize impacts to sensitive fish species and critical habitat.

To ensure that the project incorporates all feasible mitigation measures as proposed to minimize all significant adverse effects to sensitive plant and fish species and habitat, the Commission attaches Special Condition No. 5. This special condition requires that the permittee comply with all proposed and agency-recommended mitigation measures to protect Lyngbye's sedge, Tidewater goby, and the various sensitive salmonids and their habitat in the project area.

(5) Conclusion

The Commission finds that, as conditioned, feasible mitigation measures have been provided to minimize adverse environmental effects consistent with Section 30233 of the Coastal Act.

d. Maintenance & Enhancement of Biological Productivity & Functional Capacity

The fourth general limitation set by Section 30233 and 30231 is that any proposed dredging or filling in coastal wetlands must maintain and enhance the biological productivity and functional capacity of the habitat, where feasible.

As discussed above, the conditions of the permit will ensure that the project will not have significant adverse impacts on the water quality of any of the coastal waters in the project area and will ensure that the project construction will not adversely affect the biological productivity and functional capacity coastal waters or wetlands. The project's stated purpose is to restore and enhance the biological productivity of coastal wetlands and waters, and conditions of the permit will ensure that the site is monitored for achievement of these goals. Therefore, the Commission finds that the project, as conditioned, will maintain and enhance the biological productivity and functional capacity of the habitat consistent with the requirements of Sections 30233, 30230, and 30231 of the Coastal Act.

D. Protection of Archaeological Resources

1. Applicable Coastal Act Policies and Standards:

Section 30244 of the Coastal Act states the following:

> *Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

2. Consistency Analysis:

The project area is located within the ethnographic territory of the Wiyot Indians. Wiyot settlements existed along Humboldt Bay and along the banks of many of the streams and sloughs in this area.

A cultural resources investigation report was prepared for the project by Anne King-Smith and Susie Van Kirk. The report concludes that the proposed project is unlikely to affect cultural or historic resources on the site. Additionally, a referral to the North Coastal Information Center

sent by the County during the processing of the conditional use permit for the project recommended project approval.

Nevertheless, to ensure protection of any archaeological or cultural resources that may be unearthed at the site during construction, the Commission attaches Special Condition No. 6. This condition requires that if an area of cultural deposits is discovered during the course of the project, all construction must cease and a qualified cultural resource specialist must analyze the significance of the find. To recommence construction following discovery of cultural deposits, the applicant is required to submit a supplementary archaeological plan for the review and approval of the Executive Director to determine whether the changes are *de minimis* in nature and scope, or whether an amendment to this permit is required.

Therefore, the Commission finds that the proposed project, as conditioned, is consistent with Coastal Act Section 30244, as the development will include mitigation measures to ensure that the development will not adversely impact archaeological resources.

E. Public Access

1. Applicable Coastal Act Policies and Standards:

Coastal Act Sections 30210, 30211, and 30212 require the provision of maximum public access opportunities, with limited exceptions. Coastal Act Section 30210 requires in applicable part that maximum public access and recreational opportunities be provided when consistent with public safety, private property rights, and natural resource protection. Section 30211 requires in applicable part that development not interfere with the public's right of access to the sea where acquired through use (i.e., potential prescriptive rights or rights of implied dedication). Section 30212 requires in applicable part that public access from the nearest public roadway to the shoreline and along the coast be provided in new development projects, except in certain instances, such as when adequate access exists nearby or when the provision of public access would be inconsistent with public safety. In applying Sections 30211 and 30212, the Commission is limited by the need to show that any denial of a permit application based on these sections or any decision to grant a permit subject to special conditions requiring public access is necessary to avoid or offset a project's adverse impact on existing or potential public access.

2. Consistency Analysis:

No existing public access to a beach or shoreline is available in the project area, which is private land that currently supports and will continue to support seasonal agricultural grazing. The proposed project does not involve any changes or additional restrictions to existing public access that would interfere with or reduce the amount of area public access and recreational opportunities. In fact, birdwatching from the surrounding public roadways (Myrtle Avenue) may increase, as the proposed enhancements are expected to benefit waterfowl and other water-associated wildlife.

Therefore, the Commission finds that the proposed project would not have an adverse effect on public access and that the project as proposed is consistent with the requirements of Coastal Act Sections 30210, 30211, and 30212.

F. Conversion of Agricultural Lands

1. Applicable Coastal Act Policies and Standards:

Coastal Act Section 30241 states:

> *The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following:*
>
> *(a) By establishing stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses.*
>
> *(b) By limiting conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses or where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development.*
>
> *(c) By permitting the conversion of agricultural land surrounded by urban uses where the conversion of the land would be consistent with Section 30250.*[4]
>
> *(d) By developing available lands not suited for agriculture prior to the conversion of agricultural lands.*
>
> *(e) By assuring that public service and facility expansions and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality.*
>
> *(f) By assuring that all divisions of prime agricultural lands, except those conversions approved pursuant to subdivision (b), and all development adjacent to prime agricultural lands shall not diminish the productivity of such prime agricultural lands.*

Coastal Act Section 30242 states:

> *All other lands suitable for agricultural use shall not be converted to nonagricultural uses unless (l) continued or renewed agricultural use is not feasible, or (2) such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Any such permitted conversion shall be compatible with continued agricultural use on surrounding lands.*

[4] The portion of referenced Section 30250 applicable to this project type and location [sub-section (a)] requires that, "*New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.*"

In addition, Coastal Act Section 30250 requires consideration of the cumulative impacts of development (defined in Coastal Act Section 30105.5) as follows:

> *"Cumulatively" or "cumulative effect" means the incremental effects of an individual project shall be reviewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.*

Coastal Act Section 30250 states in pertinent part:

> *(a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.*

2. Consistency Analysis:

Coastal Act Sections 30241 and 30242 require the protection of prime agricultural lands[5] and sets limits on the conversion of all agricultural lands to non-agricultural uses.

The subject property is currently being leased to a local rancher for seasonal cattle grazing. Given the fine sediment size generally associated with fluvially deposited soil materials within bays and estuaries, the low relief of the area, the relatively shallow water table, and the limited amount of tillage and organic material or other soils component amendments made to the site over the last century since their reclamation, the site's seasonally waterlogged soils and their high bulk density severely limit the types of agricultural activities that may be feasibly undertaken at the site.

a. Maintaining Maximized Production of Prime Agricultural Land

Based on information derived from the Natural Resources Conservation Service (NRCS), the majority of the soils in the project area (north of the creek) are mapped as Occidental, 0-2 percent slopes (mapping has not been completed for the soils in the project area south of the creek). This soil series consists of very deep, very poorly drained, saline, silty clay loam soils on reclaimed salt marshes and tidal marshes on alluvial plains. They are identified as hydric soils and recognized as having several impediments to extensive agricultural uses. According to the NRCS, natural vegetation for this soil type is estimated to have been "perennial grasses, rushes, and sedges and salt tolerant varieties of same." As a result, the NRCS has assigned Class VII

[5] Coastal Act Section defines "prime agricultural land" through incorporation-by-reference of paragraphs (1) through (4) of Section 51201(c) of the California Government Code. Prime agricultural land entails land with any of the follow characteristics: (1) a rating as class I or class II in the Natural Resource Conservation Service land use capability classifications; or (2) a rating 80 through 100 in the Storie Index Rating; or (3) the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture; or (4) the ability to normally yield in a commercial bearing period on an annual basis not less than two hundred dollars ($200) per acre of unprocessed agricultural plant production of fruit- or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years.

classification to the project site soils as a locale which has "severe limitations that reduce the choice of plants or require special conservation practices, or both." Thus, under the NRCS land capability classification system, the soils at the project site do not meet the first criterion for the definition of prime agricultural soils.

According to Soils of Western Humboldt County, California (McLaughlin & Harradine 1965), the project site contains mostly Bayside silty clay loam soils with 0-3% slopes. The Bayside soils have a Storie Index rating between 36 and 49. Thus, the project area does not qualify as prime agricultural land under the second prong of the Coastal Act's definition.

The third potential qualifying definition of prime agricultural land – the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least 1 animal-unit per acre as defined by the United States Department of Agriculture – similarly does not apply to the project site. Based on correspondence from, Gary Markegard, County Farm Advisor for the U.C. Cooperative Extension, the low-lying, poorly drained, saltwater intruded, and flood-prone soils along the northern reclaimed fringes of Humboldt Bay typically require three acres per animal-unit. Thus, the project site supports only 0.33 Animal Unit Months (AUMs) per acre.

Finally, with regard to the site's potential qualification as prime agricultural land based upon its potential for commercial fruit or nut crop production at specified minimal yields, the project area similarly fails to meet the criterion. Due to the maritime-influenced climate of the western Humboldt County, commercial nut production is precluded along the immediate coastal areas by the significant precipitation and limited number of warm, overcast-free days to allow for full seed maturation. In addition, due to the high bulk density of the soils underlying the project site and the relatively shallow water table, fruit and berry crops suitable for the North Coast's temperate setting are similarly restricted to areas further inland, primarily on uplifted marine terraces and within well developed river floodplain areas with improved drainage and more friable soil characteristics. As a result, fruit and nut production on an economically successful commercial basis is not currently, nor has ever been historically pursued in open coastal environs, such as the project area.

Conclusion

Therefore, based upon the above discussed set of conditions at the project site, the Commission finds that the subject site does not contain prime agricultural soils or livestock and/or crop productivity potential that would otherwise qualify the subject property as "prime agricultural land."

b. Minimizing Conflicts Between Agricultural and Urban Land Uses

Since 2006, seasonal livestock grazing has occurred on approximately 33.5 acres of the property under a lease agreement with a local cattle rancher. According to the applicant, for the 20 years prior to 2006, no agricultural operations were conducted on the property. The proposed project would result in the creation of habitat on portions of the project site that is not suitable for grazing (tidal marsh habitats). Approximately 13.5 acres of the property would be converted

from agricultural use to restored tidal habitats. The number of "animal unit months" (AUMs), which is the amount of forage necessary to feed a mature cow (or its equivalent) for one month, sustained on the property would be reduced from 20 AUMs to 15 AUMs. According to the applicant, the lessee is aware of and in agreement with the proposed restoration project and its effect on available pasture.

Section 30241 requires that conflicts between urban and agricultural land uses be minimized through, among other things, limiting conversions of agricultural lands. Section 30241(b) limits conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses or where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development. Section 30241(c) permits the conversion of agricultural lands surrounded by urban uses where the conversion of the land would be consistent with Section 30250. Finally, Section 30241(d) requires the development of available lands not suited for agriculture prior to the conversion of agricultural lands.

The proposed conversion of 13.5 acres of agricultural lands in the project area constitutes a conversion of agricultural land in an area that is neither located around the periphery of urban areas nor surrounded by urban uses, and the viability of existing agricultural use at the site is not limited by conflicts with urban uses. The project site is located over 1 mile east of the developed portions of Eureka, the nearest urban area, and all of the lands surrounding the project site to the north and east are undeveloped and used primarily either for agricultural uses or natural resources uses. In addition, there are many areas of undeveloped land within the coastal zone around the Humboldt Bay region that are not suitable for agriculture that have yet to be developed. Thus, given this location relative to adjoining land uses, development of the restoration and enhancement project on the currently grazed portions of the site would not be consistent with the limitation on conversion of agricultural lands of Section 30241(b), (c), and (d) and would not serve to minimize conflicts between agricultural and urban land uses.

Conclusion:

For all of the reasons stated above, the Commission finds the permanent loss of the subject 13.5 acres of agricultural land is not consistent with the provisions of Section 30241 cited above.

c. Conversion of "All Other Lands" Suitable for Agricultural Use

Coastal Act Section 30242 protects lands suitable for agricultural use that are not prime agricultural lands or agricultural lands on the periphery of urban areas from conversion to non-agricultural use unless continued agricultural use is not feasible, or such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. In the case of the subject parcel, although the land is not considered "prime," cattle grazing (though limited by seasonal inundation and general pasture quality) is a primary use on the subject site, and this use is proposed to continue in the future. Thus, continued agricultural use is feasible, and conversion of the land to non-agricultural use under the proposed project would not preserve prime agricultural land or concentrate development, which the Coastal Act prescribes as the basis

for allowing conversion. For these reasons, the proposed conversion of agricultural lands in the project area would be inconsistent with the requirements of Coastal Act Section 30242.

G. Conflict Resolution

As noted above, the proposed restoration of tidal marsh habitat in the project area would convert 13.5 acres of agricultural land inconsistent with the provisions of Sections 30241 and 30242. However, as also noted above, to not approve the project would result in a failure to restore marine resources and the biological productivity of coastal wetlands and waters that would be inconsistent with the mandates of Sections 30230 and 30231 of the Coastal Act. Section 30230 mandates that marine resources shall be maintained and enhanced, and where feasible, restored. Section 30231 mandates that the biological productivity of coastal waters appropriate to maintain optimum populations of marine organisms shall be maintained, and where feasible, restored.

1. The Identification of a True Conflict is Normally a Condition Precedent to Invoking a Balancing Approach

As is indicated above, the standard of review for the Commission's decision whether to approve a coastal development permit in the Commission's retained jurisdiction is whether the project as proposed is consistent the Chapter 3 policies of the Coastal Act. In general, a proposal must be consistent with all relevant policies in order to be approved. Put differently, consistency with each individual policy is a necessary condition for approval of a proposal. Thus, if a proposal is inconsistent with one or more policies, it must normally be denied (or conditioned to make it consistent with all relevant policies).

However, the Legislature also recognized that conflicts can occur among those policies (Coastal Act Section 30007.5). It therefore declared that, when the Commission identifies a conflict among the policies in Chapter 3, such conflicts are to be resolved "*in a manner which on balance is the most protective of significant coastal resources* (Coastal Act Sections 30007.5 and 30200(b))." That approach is generally referred to as the "balancing approach to conflict resolution." Balancing allows the Commission to approve proposals that conflict with one or more Chapter 3 policies, based on a conflict among the Chapter 3 policies as applied to the proposal before the Commission. Thus, the first step in invoking the balancing approach is to identify a conflict among the Chapter 3 policies.

2. Identification of a Conflict

For the Commission to use the balancing approach to conflict resolution, it must establish that a project presents a substantial conflict between two statutory directives contained in Chapter 3 of the Coastal Act. The fact that a proposed project is consistent with one policy of Chapter 3 and inconsistent with another policy does not necessarily result in a conflict. Virtually every project will be consistent with some Chapter 3 policy. This is clear from the fact that many of the Chapter 3 policies prohibit specific types of development. For example, section 30211 states that development "*shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization . . .*," and subdivision (2) of section 30253 states that new development "*shall . . . neither create nor contribute significantly to erosion . . . or in any*

way require the construction of protective devices . . . ." Almost no project would violate every such prohibition. A project does not present a conflict between two statutory directives simply because it violates some prohibitions and not others.

In order to identify a conflict, the Commission must find that, although approval of a project would be inconsistent with a Chapter 3 policy, the denial of the project based on that inconsistency would result in coastal zone effects that are inconsistent with some other Chapter 3 policy. In most cases, denial of a proposal will not lead to any coastal zone effects at all. Instead, it will simply maintain the *status quo*. The reason that denial of a project can result in coastal zone effects that are inconsistent with a Chapter 3 policy is that some of the Chapter 3 policies, rather than prohibiting a certain type of development, affirmatively mandate the protection and enhancement of coastal resources, such as sections 30210 ("*maximum access . . . and recreational opportunities shall be provided . . .*"), 30220 ("*Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses*"), and 30230 ("*Marine resources shall be maintained, enhanced, and where feasible, restored*"). If there is ongoing degradation of one of these resources, and a proposed project would cause the cessation of that degradation, then denial would result in coastal zone effects (in the form of the continuation of the degradation) inconsistent with the applicable policy. Thus, the only way that denial of a project can have impacts inconsistent with a Chapter 3 policy, and therefore the only way that a true conflict can exist, is if: (1) the project will stop some ongoing resource degradation and (2) there is a Chapter 3 policy requiring the Commission to protect and/or enhance the resource being degraded. Only then is the denial option rendered problematic because of its failure to fulfill the Commission's protective mandate.

With respect to the second of those two requirements, though, there are relatively few policies within Chapter 3 that include such an affirmative mandate to enhance a coastal resource. Moreover, because the Commission's role is generally a reactive one, responding to proposed development, rather than affirmatively seeking out ways to protect resources, even policies that are phrased as affirmative mandates to protect resources more often function as prohibitions. For example, Section 30240's requirement that environmentally sensitive habitat areas "*shall be protected against any significant disruption of habitat values*" generally functions as a prohibition against allowing such disruptive development, and its statement that "*only uses dependent on those resources shall be allowed within those areas*" is a prohibition against allowing non-resource-dependent uses within these areas. Similarly, section 30251's requirement to protect "*scenic and visual qualities of coastal areas*" generally functions as a prohibition against allowing development that would degrade those qualities. Section 30253 begins by stating that new development shall minimize risks to life and property in certain areas, but that usually requires the Commission to condition projects to ensure that they are not unsafe. Even Section 30220, listed above as an affirmative mandate, can be seen more as a prohibition against allowing non-water-oriented recreational uses (or water-oriented recreational uses that could be provided at inland water areas) in coastal areas suited for such activities. Denial of a project cannot result in a coastal zone effect that is inconsistent with a prohibition on a certain type of development. As a result, there are few policies that can serve as a basis for a conflict.

Similarly, denial of a project is not inconsistent with Chapter 3, and thus does not present a conflict, simply because the project would be less inconsistent with a Chapter 3 policy than some alternative project would be, even if approval of the proposed project would be the only way in which the Commission could prevent the more inconsistent alternative from occurring. For denial of a project to be inconsistent with a Chapter 3 policy, the project must produce tangible, necessary enhancements in resource values over existing conditions, not over the conditions that would be created by a hypothetical alternative. In addition, the project must be fully consistent with the Chapter 3 policy requiring resource enhancement, not simply less inconsistent with that policy than the hypothetical alternative project would be. If the Commission were to interpret the conflict resolution provisions otherwise, then any proposal, no matter how inconsistent with Chapter 3, that offered even the smallest, incremental improvement over a hypothetical alternative project would necessarily result in a conflict that would justify a balancing approach. The Commission concludes that the conflict resolution provisions were not intended to apply based on an analysis of different potential levels of compliance with individual policies or to balance a proposed project against a hypothetical alternative.

In addition, if a project is inconsistent with at least one Chapter 3 policy, and the essence of that project does not result in the cessation of ongoing degradation of a resource the Commission is charged with enhancing, the project proponent cannot "create a conflict" by adding on an essentially independent component that does remedy ongoing resource degradation or enhance some resource. The benefits of a project must be inherent in the essential nature of the project. If the rule were to be otherwise, project proponents could regularly "create conflicts" and then demand balancing of harms and benefits simply by offering unrelated "carrots" in association with otherwise-unapprovable projects. The balancing provisions of the Coastal Act could not have been intended to foster such an artificial and manipulatable process. The balancing provisions were not designed as an invitation to enter into a bartering game in which project proponents offer amenities in exchange for approval of their projects.

Finally, a project does not present a conflict among Chapter 3 policies if there is at least one feasible alternative that would accomplish the essential purpose of the project without violating any Chapter 3 policy. Thus, an alternatives analysis is a condition precedent to invocation of the balancing approach. If there are alternatives available that are consistent with all of the relevant Chapter 3 policies, then the proposed project does not create a true conflict among Chapter 3 policies.

In sum, in order to invoke the balancing approach to conflict resolution, the Commission must conclude all of the following with respect to the proposed project before it: (1) approval of the project would be inconsistent with at least one of the policies listed in Chapter 3; (2) denial of the project would result in coastal zone effects that are inconsistent with at least one other policy listed in Chapter 3, by allowing continuing degradation of a resource the Commission is charged with protecting and/or enhancing; (3) the project results in tangible, necessary resource enhancement over the current state, rather than an improvement over some hypothetical alternative project; (4) the project is fully consistent with the resource enhancement mandate that requires the sort of benefits that the project provides; (5) the benefits of the project are a function of the very essence of the project, rather than an ancillary component appended to the project

description in order to "create a conflict; " and (6) there are no feasible alternatives that would achieve the objectives of the project without violating any Chapter 3 policies.

An example of a project that presented such a conflict is a project approved by the Commission in 1999 involving the placement of fill in a wetland in order to construct a barn atop the fill, and the installation of water pollution control facilities, on a dairy farm in Humboldt County (CDP #1-98-103, O'Neil). In that case, one of the main objectives of the project was to create a more protective refuge for cows during the rainy season. However, another primary objective was to improve water quality by enabling the better management of cow waste. The existing, ongoing use of the site was degrading water quality, and the barn enabled consolidation and containment of manure, thus providing the first of the four necessary components of an effective waste management system. Although the project was inconsistent with Section 30233, which limits allowable fill of wetlands to eight enumerated purposes, the project also enabled the cessation of ongoing resource degradation. The project was fully consistent with Section 30231's mandate to maintain and restore coastal water quality and offered to tangibly enhance water quality over existing conditions, not just some hypothetical alternative. Thus, denial would have resulted in impacts that would have been inconsistent with Section 30231's mandate for improved water quality. Moreover, it was the very essence of the project, not an ancillary amenity offered as a trade-off, that was both inconsistent with certain Chapter 3 policies and yet also provided benefits. Finally, there were no alternatives identified that were both feasible and less environmentally damaging.

3. The Proposed Project Presents a Conflict

The Commission finds that the proposed project presents a true conflict between Chapter 3 policies of the Coastal Act. The proposed restoration of tidal marsh and juvenile salmonid summer rearing habitats would convert agricultural land in a manner inconsistent with the provisions of Sections 30241 and 30242 of the Coastal Act. However, to not approve the project would result in a failure to maintain and enhance marine resources and the biological productivity of coastal waters that would be inconsistent with the mandates of Sections 30230 and 30231 of the Coastal Act. Section 30230 mandates that marine resources shall be maintained and enhanced, and where feasible, restored. Section 30231 mandates that the biological productivity of coastal waters appropriate to maintain optimum populations of marine organisms shall be maintained.

As a partially brackish habitat, the juvenile salmonid summer rearing habitat is a type of marine resource. The project is designed to add both brackish marsh habitat and habitat for salmon rearing, both of which are dramatically reduced in the region over historic levels. The proposed enhancements are needed to help restore habitat diversity within Humboldt Bay and assist in the recovery of listed salmonid species including Coho salmon, Chinook salmon, Steelhead, and Coastal cutthroat trout.

As discussed above in Finding IV-C, historically (prior to the construction of the Northwestern Pacific Railroad and Highway 101 beginning over one hundred years ago), the project site occupied the upper zone of tidal marshland surrounding the perimeter of Humboldt Bay and its

tidal mudflats prior to being diked, drained, and muted through tidegate installation. The project area is shown as "tidal marsh" on the 1870 U.S. Coast and Geodetic Survey Map (see page 7 of the October 2007 Biological Assessment for the project), which delineated pre-development tidal marsh boundaries around the bay. Historically, the area likely supported transitional brackish marsh habitat at the interface of tidal flux intermixing with freshwater input (from Freshwater and Wood Creeks). Since the mid-1800's, most of what was likely to have been historic tidal marsh has been diked or filled and has been reduced to a total area of around 900 acres, a reduction of at least 87 percent. The FWS has indicated that restoration of tidal marsh habitats around the Bay is a high priority, as tidal marsh restoration is important for the protection, enhancement, and restoration of native fish, wildlife, and plant communities, some of which are dependent on tidal marsh for their existence. The majority of the original habitat has been replaced with grazed seasonal wetlands that provide far less habitat values and functions than those provided by the array of wetland habitat types that originally existed at the site.

Although the proposed project is inconsistent with the requirements of Sections 30241 and 30242 that protect productive agricultural land and limit the conversion of agricultural land, denial would preclude achieving Sections 30230's and 30231's mandates for protection and maintenance of marine resources and biological productivity. In addition, it is the very essence of the project, not an ancillary amenity offered as a trade-off, that is both inconsistent with certain Chapter 3 policies and yet also provides benefits. Finally, as discussed below, there are no alternatives identified that were both feasible and less environmentally damaging.

a. Alternatives Analysis

As noted above, a true conflict among Chapter 3 policies would not exist if there are feasible alternatives available that are consistent with all of the relevant Chapter 3 policies. Alternatives that have been identified include (a) alternative sites, (b) alternative methods or configurations of project features, and (c) the "no project" alternative. These various alternatives are discussed below.

(1) Alternative Sites

Restoration of the former habitat conditions that existed on a site prior to manipulation by humans within the meaning of Sections 30230 and 30233(a) of the Coastal Act is inherently site specific. As discussed previously, implicit in the common definition of restoration is the understanding that the restoration entails returning something to a prior state. A site cannot be returned to a prior state by performing wetland enhancement or creation work at some other site. However, as also discussed previously, restoration is also defined as reestablishing ecological processes, functions, and biotic/abiotic linkages that lead to a persistent, resilient system integrated within its landscape that may not necessarily result in a return to historic locations or conditions with the subject wetland area. Thus, restoration of ecological processes, functions, and biotic/abiotic linkages at an alternative location within the landscape of the particular wetland system involved could under certain circumstances be found to be consistent with Sections 30230 and 30233(a) of the Coastal Act. However, no such feasible alternative location other than the project site exists in this case. Nearly the entire 54-acre project parcel is agricultural land, so there is no other location on the parcel where the restoration could be carried

out that would not result in a conversion of agricultural land inconsistent with Sections 30241 and 30242 of the Coastal Act. Similarly, if restoration of another site to restore a combination of brackish marsh and tidal channel habitats was considered, no feasible off-site locations that would not result in conversions of agricultural land inconsistent with Sections 30241 and 30242 have been identified. Much of the land surrounding Humboldt Bay that could support the habitat types to be restored has been diked, drained, and cleared for agricultural purposes, and thus the proposed site is one of the few locations where the proposed restoration project could occur consistent with Section 30233(a)(6) as discussed above (Finding IV-C). Therefore, implementing the project at an alternative location is not a feasible alternative that is consistent with all relevant Chapter 3 policies.

(2) Alternative Configuration of Project Features

Feasible restoration of the site is not dependent on the exact site plan or configuration of tidal marsh restoration proposed by the applicant. Other configurations of these features could be successful at re-establishing ecological processes, functions, and biotic/abiotic linkages that lead to a persistent, resilient system integrated within its landscape consistent with the definition of restoration for which diking, dredging, and filling is allowed pursuant to Section 30233 of the Coastal Act and which Section 30230 mandates to occur if feasible. For example, rather than removing just the wooden flap of the existing tidegate on Wood Creek, the applicant instead could remove the entire concrete structure (which is 3 feet wide by 50 feet long by 8 feet deep) as well, thereby restoring tidal inundation to an even greater area than proposed. According to the hydraulic analysis and design report prepared for the project (Jeff Anderson & Associates, February 2008), the concrete weir portion of the existing tidegate on Wood Creek mutes the water level in the project area at high tides. This alternative configuration or layout of the project, and many other alternative configurations (see alternative methods discussed in Finding IV-C above), would achieve similar results. However, none of these alternative configurations would avoid conversion of agricultural lands to habitat in a manner inconsistent with Sections 30241 and 30242 of the Coastal Act. No feasible use of tidal marsh habitat for agricultural purposes has been identified. As the use of any portion of these areas for restoration of tidal marsh would preclude agricultural use and convert agricultural land, no alternative configuration of the project site would avoid conversion of agricultural land either actively used for agricultural purposes or capable of being used for such purposes, inconsistent with Sections 30241 and 30242 of the Coastal Act. The proposed project has been designed to restore tidelands and tidal marsh habitats across 23 to 29 acres while simultaneously sustaining agricultural production on 19 acres of the property (which equates to approximately 15 animal unit months), protecting valuable existing upstream summer rearing habitat for juvenile salmonids, and protecting adjacent properties from tidal inundation.

Therefore, the Commission finds that none of the alternative configurations of the restoration project are a feasible alternative that is consistent with all Chapter 3 policies.

(3) "No Project" Alternative

The "no project" alternative would maintain the *status quo* of the site and would not restore 23 to 29 acres of tidal marsh habitat and 4,500 square feet of juvenile salmonid summer rearing habitat

as proposed. Existing conditions on the project site consist of actively used agricultural land (farmed seasonal wetlands) used for seasonal cattle grazing. Under the "no project" alternative, the land would continue to be used for seasonal agricultural grazing (as it would under the proposed project), but there would be no restored and improved habitat for marine resources, and the biological productivity of the coastal wetlands and waters would thus not be restored. Existing habitats for Lyngbye's sedge, brackish marsh, rearing salmonids, and tidewater goby would continue to be limited on the site. Therefore, the Commission finds that the "no project" alternative would have significant impacts to coastal resources that would be inconsistent with Section 30230's mandate to, where feasible, restore marine resources and maintain and improve biological productivity. Therefore, the "no project" alternative is not a feasible alternative that is consistent with all relevant Chapter 3 policies.

b. Conclusion

As discussed above, none of the identified alternatives to the proposed project would be both feasible and consistent with all relevant Chapter 3 policies. The Commission further finds that based on the alternatives analysis above, the proposed project as conditioned is the least environmentally damaging feasible alternative, and therefore the project is consistent with the requirements of Section 30233(a) that the proposed fill project has no feasible less environmentally damaging alternative.

4. Conflict Resolution

After establishing a conflict among Coastal Act policies, Section 30007.5 requires the Commission to resolve the conflict in a manner that is on balance most protective of coastal resources.

In this case, the Commission finds that the impacts on coastal resources from not constructing the project would be more significant than the project's agricultural conversion impacts. Denying the project because of its inconsistency with Sections 30241 and 30242 would avoid the conversion of 13.5 acres of agricultural grazing land. The Commission further finds that as the proposed juvenile salmonid habitat enhancements will maintain and enhance marine resources and the biological productivity of coastal waters, the proposed improvements are mandated by the requirements of Sections 30230 and 30231. Approving the development would restore habitats (tidal channels and brackish marsh) around Humboldt Bay that have been tremendously reduced over the past century consistent with Sections 30230 and 30231. As a partially brackish habitat, the juvenile salmonid summer rearing habitat is a type of marine resource. The project is designed to add both brackish marsh habitat and habitat for salmon rearing, both of which are dramatically reduced in the region over historic levels. The proposed enhancements are needed to help restore habitat diversity within Humboldt Bay and assist in the recovery of listed salmonid species including Coho salmon, Chinook salmon, Steelhead, and Coastal cutthroat trout. The Commission finds that the restoration of 23 to 29 acres of tidal channels and brackish marsh habitat, which would maintain and enhance marine resources necessary to maintain the biological productivity of existing degraded wetlands, would be more protective of coastal resources than the impacts of the conversion of 13.5 acres of agricultural land (the loss of approximately 5 animal unit months).

As discussed above in Finding IV-C, to ensure that the maintenance and enhancement of marine resources and of the biological productivity of coastal waters that would enable the Commission to use the balancing provision of Section 30007.5 is achieved, the Commission attaches Special Condition Nos. 1 through 6. These conditions require that the applicant submit various final plans, including a final restoration and enhancement monitoring plan and a final SWPPP. Additionally, Special Condition No. 2 requires that the applicant carry out the project in accordance with various construction protocols to ensure the protection of coastal waters and wetlands, Special Condition No. 4 requires revegetation of the site to be carried out according to specified standards and limitations, Special Condition No. 5 requires implementation of sensitive plant and fish species mitigation measures, and Special Condition No. 6 requires that archaeological resources shall be protected. The Commission finds that without Special Condition Nos. 1 through 6, the proposed project could not be approved pursuant to Section 30007.5 of the Coastal Act.

5. Mitigation for Agricultural Impacts

As stated above, the conflict resolution provisions of the Coastal Act require that the conflict be resolved in a manner that on balance is the most protective of significant coastal resources. To meet this test, in past actions where the Commission has invoked the balancing provisions of the Coastal Act, the Commission has found it necessary to mitigate adverse impacts on coastal agricultural resources to the maximum extent feasible. The applicant has not proposed any mitigation to compensate for the loss of agricultural land caused by the project.

The Commission finds that in this particular case because (1) the project proposes to re-establish prior habitat conditions and the processes that create those conditions in a converted and degraded natural wetland (agricultural land), and all of the agricultural land to be converted will be used solely for this purpose; (2) the project, as conditioned, will result in significant improvements in habitat value and diversity in a self-sustaining, persistent fashion independent of the need for repeated maintenance or manipulation to uphold the habitat function; (3) the agricultural land being converted is low quality, available only on a seasonal basis, and does not possess any of the characteristics of "prime agricultural land" as defined by Section 51201(c) of the California Government Code (see Finding IV-F above); and (4) approximately 20 of the 33.5 acres of land on the parcel currently in agricultural production will be retained for agricultural production, no agricultural mitigation is necessary to compensate for the conversion of 13.5 acres of agricultural land (the loss of approximately 5 animal unit months) for the restoration of 23 to 29 acres of tidal marsh habitats.

H. Other Agency Approvals

The project requires review and authorization by the U.S. Army Corps of Engineers. Pursuant to the Federal Coastal Zone Management Act, any permit issued by a federal agency for activities that affect the coastal zone must be consistent with the coastal zone management program for that state. Under agreements between the Coastal Commission and the U.S. Army Corps of Engineers, the Corps will not issue a permit until the Coastal Commission approves a federal

consistency certification for the project or approves a permit. In a letter dated July 31, 2008, the Corps authorized approval of the project under Nationwide Permit Nos. 3 (Maintenance) and 27 (Aquatic Habitat Restoration, Establishment, & Enhancement Activities). The project also received a Streambed Alteration Agreement from the Department of Fish and Game and a permit from the Humboldt Bay Harbor, Recreation, and Conservation District (see "Approvals Received" page 2). Additionally, the project requires, but has not yet received, a Clean Water Act Section 401 Water Quality Certification from the North Coast Regional Water Quality Control Board. To ensure that the project ultimately approved by the Board is the same as the project authorized herein, the Commission attaches Special Condition No. 7, which requires the applicant to submit to the Executive Director evidence of the Board's approval of the project prior to permit issuance. The condition requires that any project changes resulting from the Board's approval not be incorporated into the project until the applicant obtains any necessary amendments to this coastal development permit.

I. Public Trust Lands

The project site is located in an area subject to the public trust. Therefore, to ensure that the applicant has the necessary authority to undertake all aspects of the project on these public lands, the Commission attaches Special Condition No. 8, which requires that the project be reviewed and where necessary approved by the State Lands Commission prior to the issuance of the coastal development permit.

J. Waiver of Application Fee

The applicant has requested that the Commission reduce the application fee for the permit request from five thousand dollars ($5,000) to six hundred dollars ($600). The applicant states that the proposed project is entirely funded by public grant funds, and at the time that the applicant (1) applied for those funds, and (2) filled out the application for the subject permit request in March of 2008, the Commission's fee schedule posted on the Commission website listed the filing fee for the development as much lower than the fee due at the time the application was received at the Commission's North Coast District Office. The subject permit application was received on March 19, 2008 – five days after the Commission's new filing fee schedule went into effect on March 14, 2008.

Pursuant to Section 13055(a) of the Commission's regulations, the permit application fee in this case is five thousand dollars ($5,000). Prior to the recent change to the Commission's application fee schedule, which went into effect on March 14, 2008, the application filing fee for the proposed development would have been six hundred dollars ($600).

As a general rule, the Commission does not support application fee waiver requests. The Commission's fee schedule is not directly structured for "at-cost" recovery of the staff time actually spent on applications and thus tends to charge applicants less than the amount of the Commission resources that are expended in processing an application. In other words, application fees are already generally lower than the amount it costs the Commission to process the application. In part, this is in recognition of the larger public service being provided to the

people of the State, including applicants, for a public airing and debate regarding proposed projects in the coastal zone.

In this particular case, however, the Commission finds that as (a) the proposed project would have significant overall habitat restoration benefits for a variety of marine resources; (b) the proposed project is funded entirely by public agency grant funds, and (c) when applying for the subject grant funds the applicant did not anticipate the significant increase to the Commission's application fee schedule, the Commission hereby directs that the permit application fee for CDP No. 1-08-012 be reduced to six hundred dollars ($600), which is what the filing fee was at the time that the applicant applied for the public grant funds that are supporting the proposed project.

K. California Environmental Quality Act

The County of Humboldt, as the lead agency, adopted a Mitigated Negative Declaration for the "Wood Creek Estuary, Tidal Marsh, and Fish Access Enhancement Project; Freshwater, Humboldt County, California" on September 4, 2008.

Section 13906 of the Commission's administrative regulation requires Coastal Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are any feasible alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As discussed above, the proposed project has been conditioned to be consistent with the policies of the Coastal Act. The findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As specifically discussed in these above findings, which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been required. As conditioned, there are no other feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impacts which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

V. EXHIBITS:

1. Regional Location
2. Project Vicinity
3. Aerial Photo
4. Extent of Historic Tidelands
5. Existing Conditions
6. Extent of Existing Agricultural Land

7. Design Plans & Cross Sections
8. Revegetation Plan
9. Existing & Proposed Lyngbye's Sedge Habitat
10. Proposed Monitoring Plan
11. Draft Storm Water Pollution Prevention Plan
12. Excerpt from CEQA Mitigated Negative Declaration (Proposed Mitigation Measures)
13. Fee Waiver Request

APPENDIX A

STANDARD CONDITIONS

1. Notice of Receipt and Acknowledgement. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

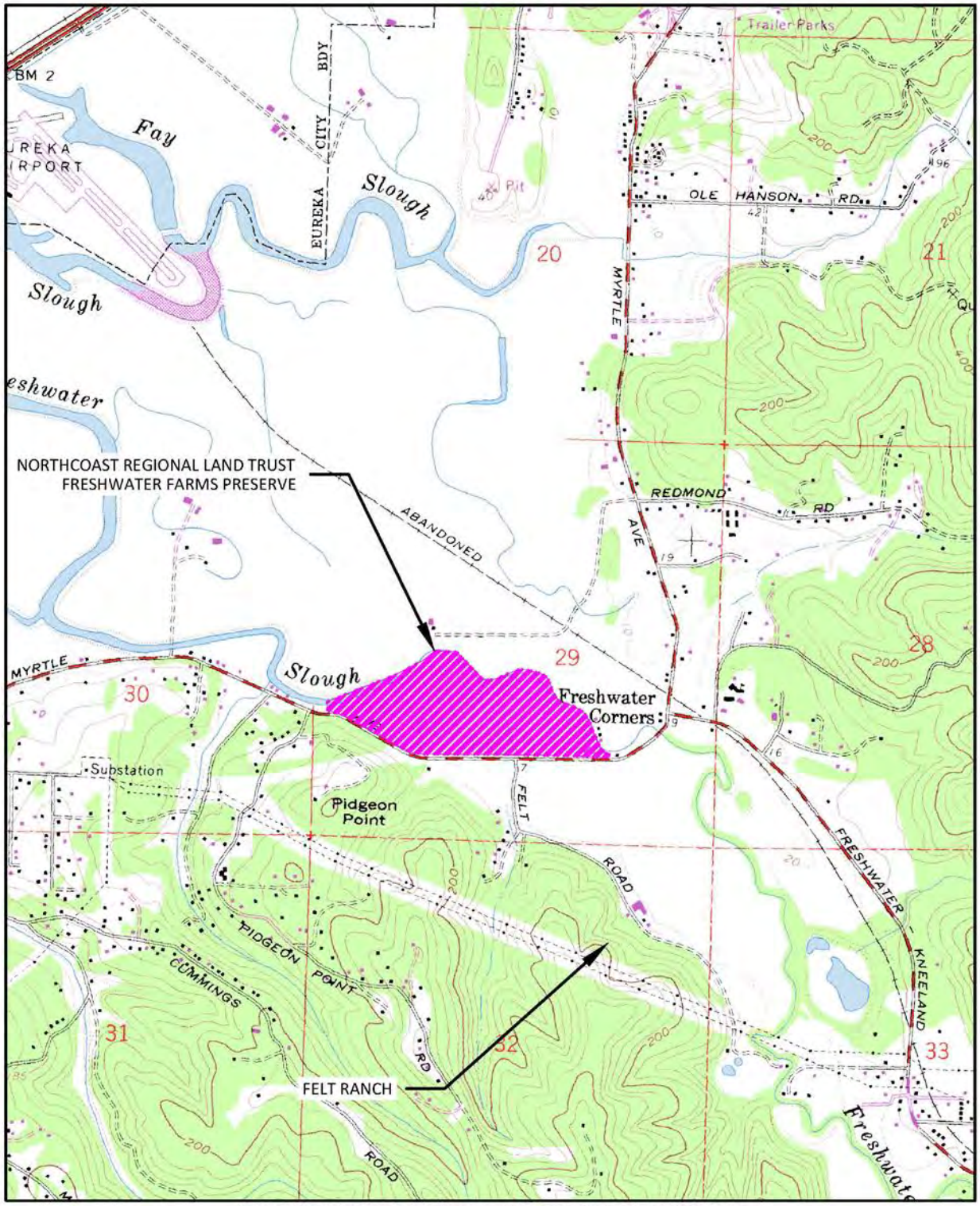
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable amount of time. Application for extension of the permit must be made prior to the expiration date.

3. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director of the Commission.

4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

EXHIBIT N0. 1
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
REGIONAL LOCATION MAP



NORTHCOAST REGIONAL LAND TRUST FRESHWATER FARMS PRESERVE
MAP SOURCE: USGS 7-1/2' QUADRANGLE MAP
SOUTH ARCATA, CA

EXHIBIT N0. 2
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
VICINITY MAP

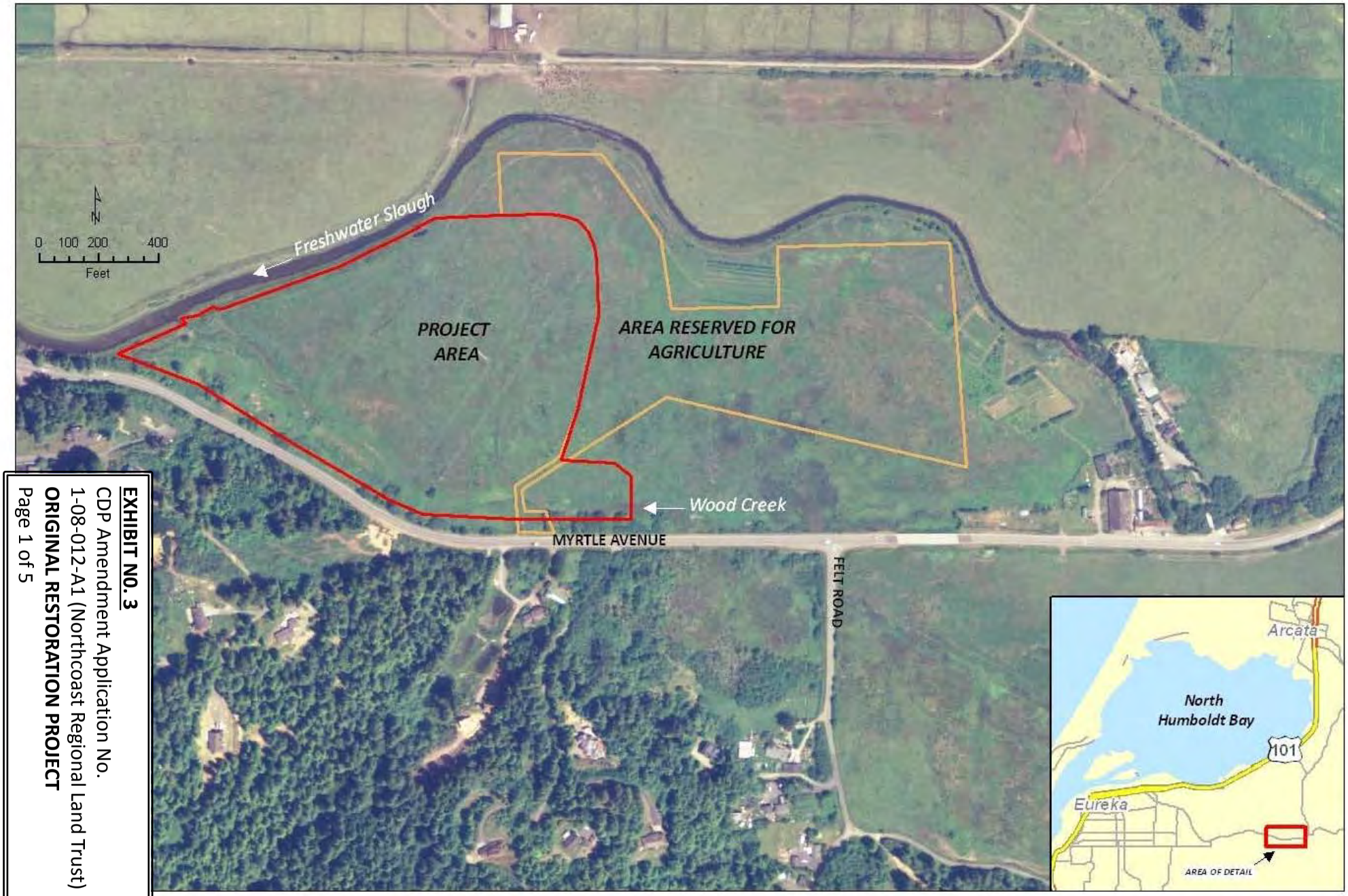
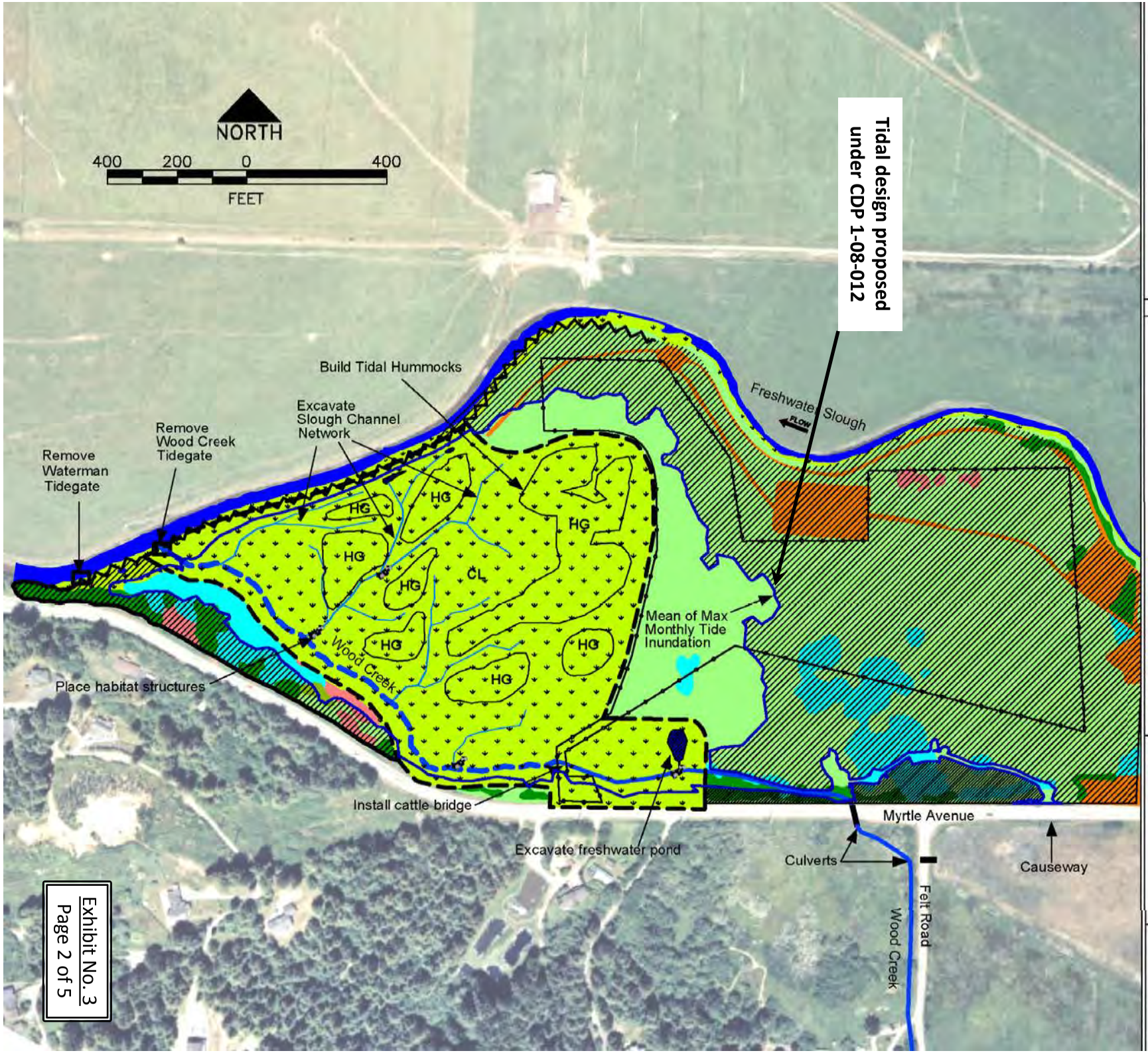


EXHIBIT NO. 3
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
ORIGINAL RESTORATION PROJECT
Page 1 of 5

Figure 1-1. Site map for Wood Creek Tidal Marsh Enhancement Project.



WOOD CREEK TIDAL MARSH ENHANCEMENT PROJECT PROPOSED CONDITIONS

LEGEND

- Tidal marsh
- Freshwater pond
- Freshwater marsh
- Seasonal marsh
- Riparian woodland
- Coastal shrubland
- Exotic
- Human disturbance
- Marsh area to be protected

PATCH TYPES

HG Hairgrass
CL Lyngbye's Sedge

CHANNEL TYPES

- Wood Creek slough channel
- Wood Creek
- Constructed slough channels

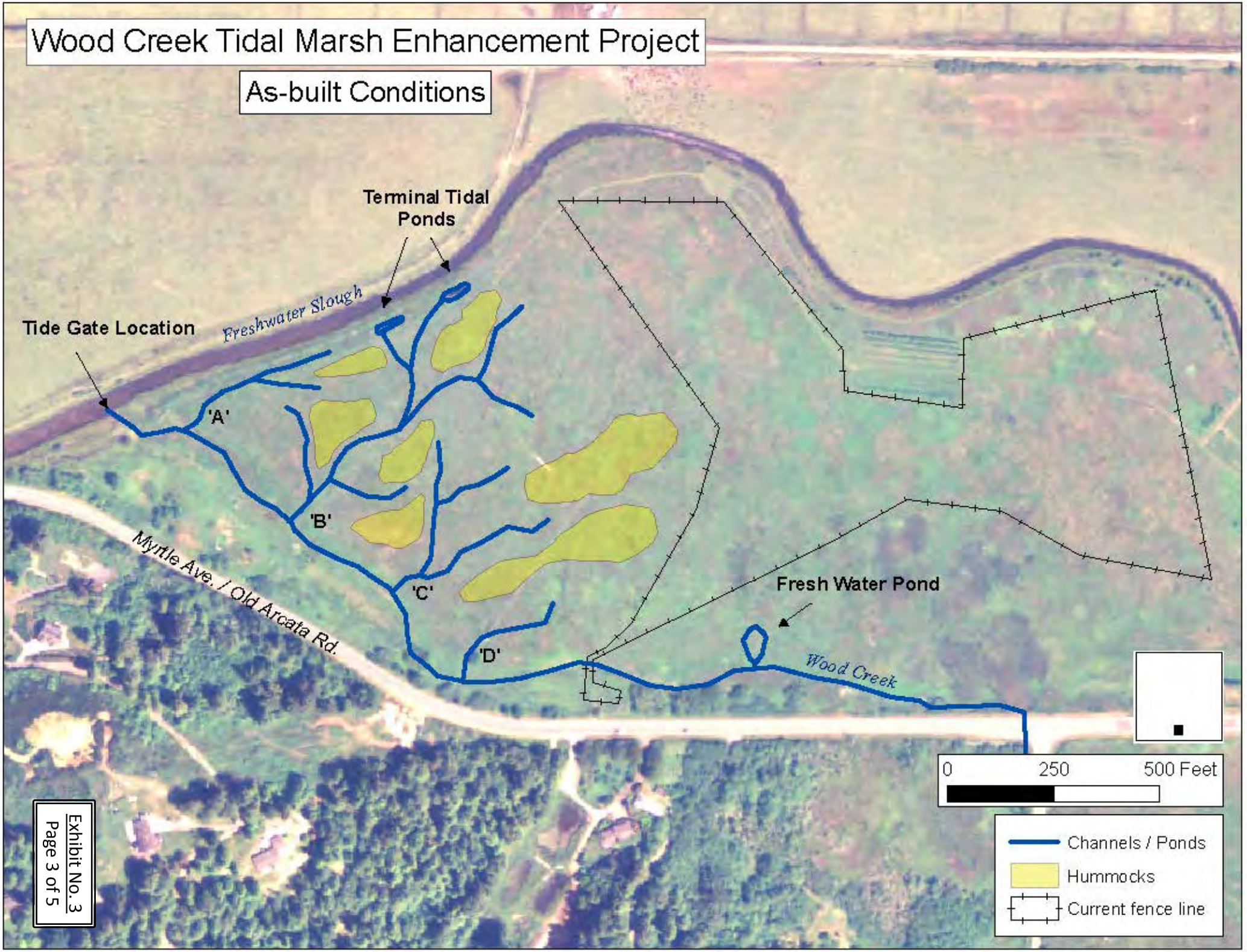
INFRASTRUCTURE AND BOUNDARIES

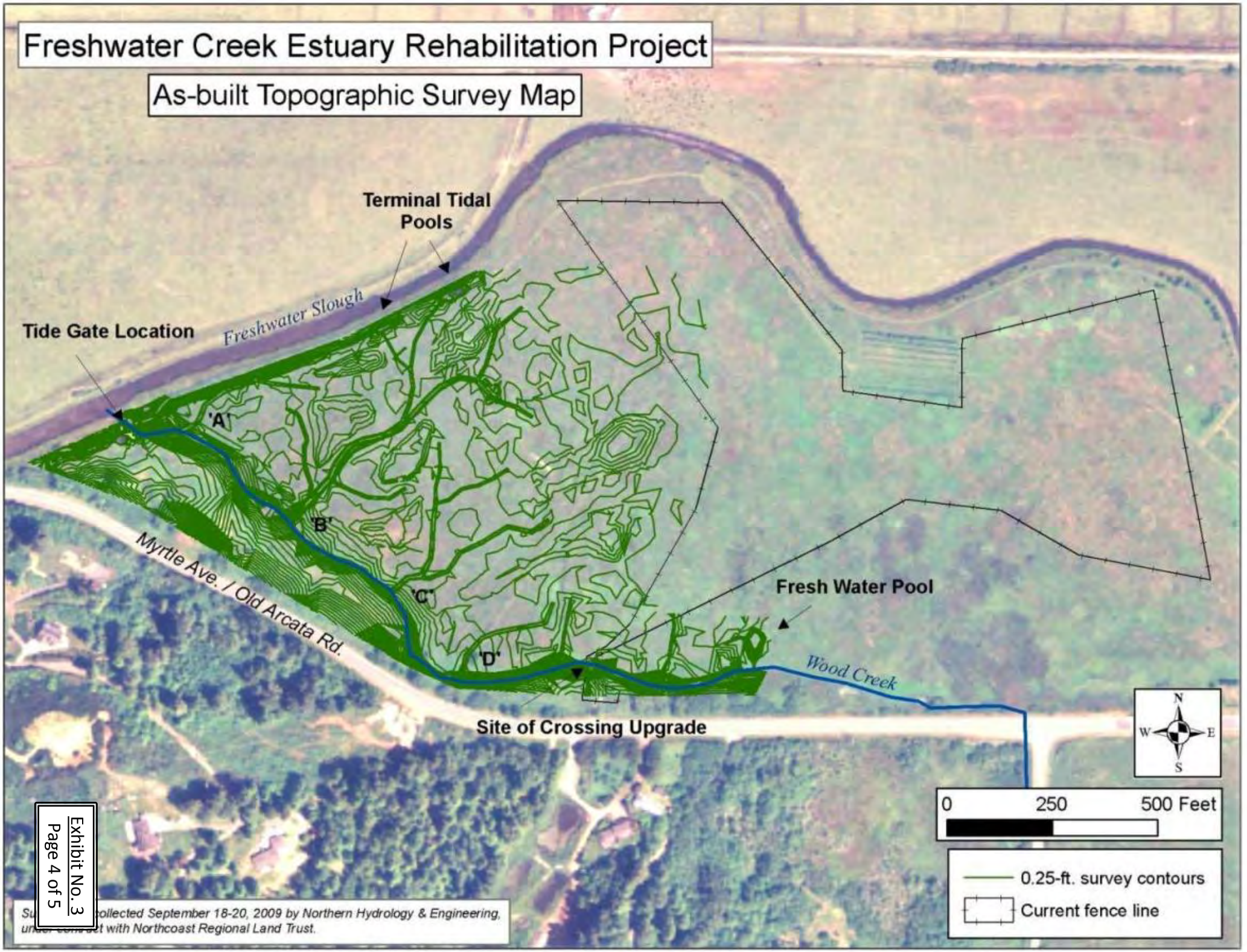
- Construction and Staging
- Pasture fencing
- Existing Dike

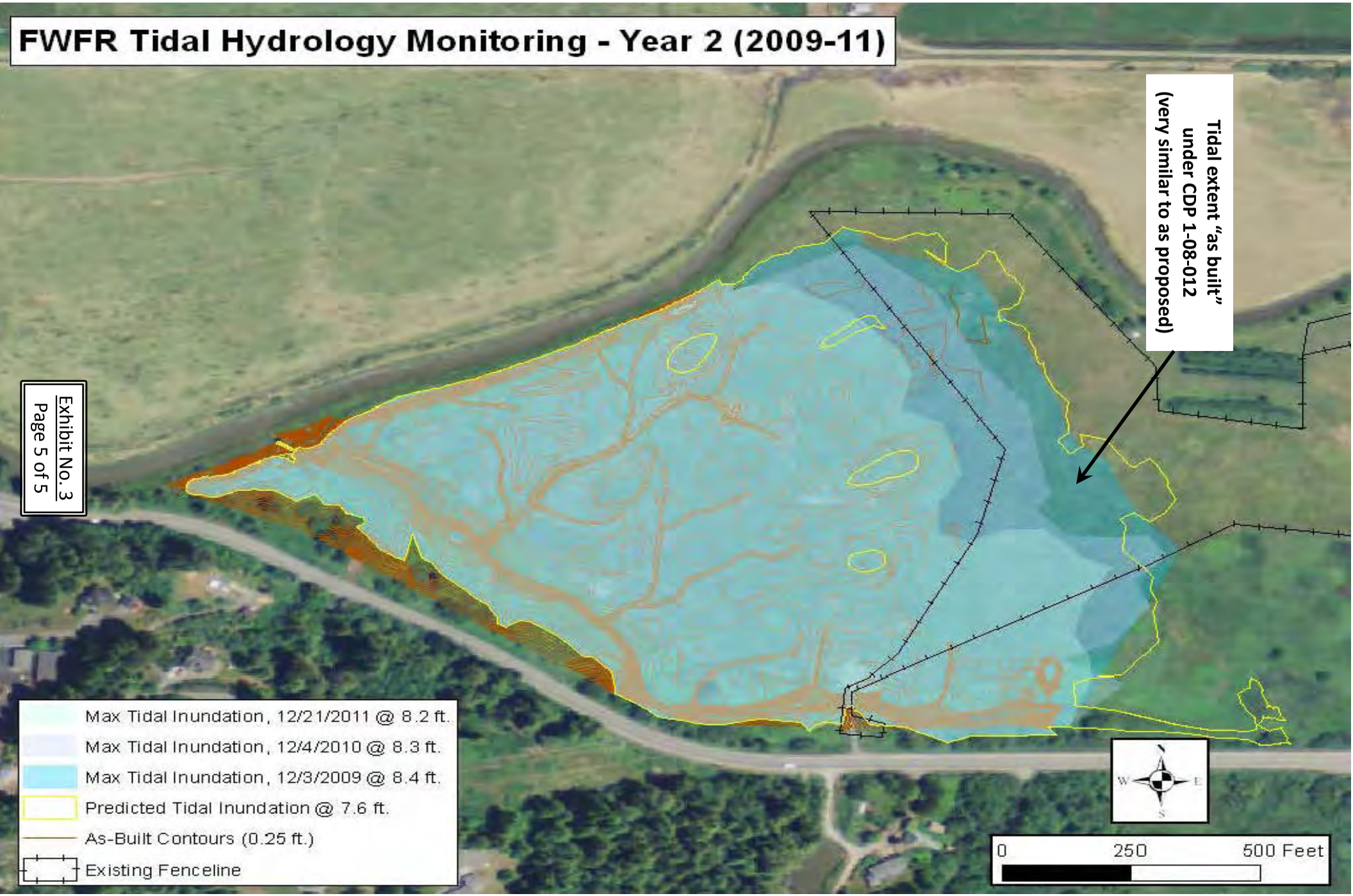
Jeff Anderson & Associates
Engineering – Hydrology – Geomorphology – Water Resources

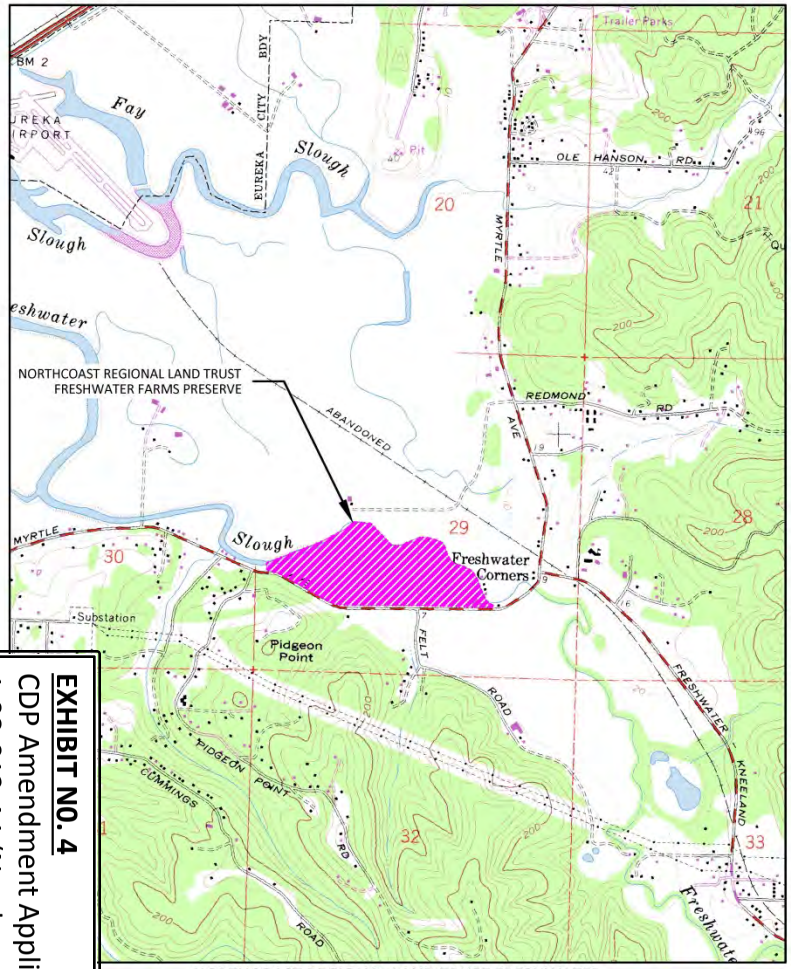
McBain &Trush, Inc.

Prepared for:
Northcoast Regional Land Trust
P.O. Box 398
Bayside, CA 95524


Wood Creek Tidal Marsh Enhancement Project
As-built Conditions
Terminal Tidal Ponds
Freshwater Slough
Tide Gate Location
'A'
'B'
'C'
'D'
Myrtle Ave. / Old Arcata Rd.
Fresh Water Pond
Wood Creek
0
250
500 Feet
Channels / Ponds
Hummocks
Current fence line
Exhibit No. 3
Page 3 of 5


Freshwater Creek Estuary Rehabilitation Project
As-built Topographic Survey Map
Terminal Tidal Pools
Tide Gate Location
Freshwater Slough
'A'
'B'
'C'
'D'
Myrtle Ave. / Old Arcata Rd.
Fresh Water Pool
Wood Creek
Site of Crossing Upgrade
N
W
E
S
0
250
500 Feet
0.25-ft. survey contours
Current fence line
collected September 18-20, 2009 by Northern Hydrology & Engineering,
with Northcoast Regional Land Trust.


FWFR Tidal Hydrology Monitoring - Year 2 (2009-11)
Tidal extent "as built" under CDP 1-08-012 (very similar to as proposed)
Exhibit No. 3
Page 5 of 5
Max Tidal Inundation, 12/21/2011 @ 8.2 ft.
Max Tidal Inundation, 12/4/2010 @ 8.3 ft.
Max Tidal Inundation, 12/3/2009 @ 8.4 ft.
Predicted Tidal Inundation @ 7.6 ft.
As-Built Contours (0.25 ft.)
Existing Fenceline
W
E
S
0
250
500 Feet



NORTHCOAST REGIONAL LAND TRUST FRESHWATER FARMS PRESERVE
MAP SOURCE: USGS 7-1/2' QUADRANGLE MAP
SOUTH ARCATA, CA

0 2000'

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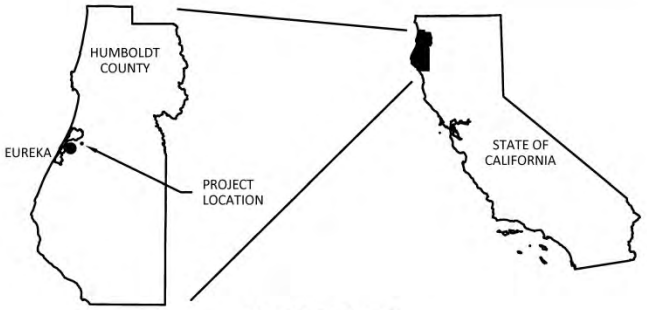

PROJECT LOCATION
(N.T.S.)

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PHASE I ADAPTIVE MANAGEMENT
65% DESIGN PLANS
NORTHCOAST REGIONAL LAND TRUST
FRESHWATER FARMS PRESERVE
HUMBOLDT COUNTY, CA
(NOT FOR CONSTRUCTION)

REGISTERED PROFESSIONAL ENGINEER
CONOR COLMAN SHEA
C 71843
CIVIL
STATE OF CALIFORNIA

U.S. FISH AND WILDLIFE SERVICE
COASTAL PROGRAM
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PREPARED FOR:
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901 SAMOA BLVD.
ARCATA CA 95521
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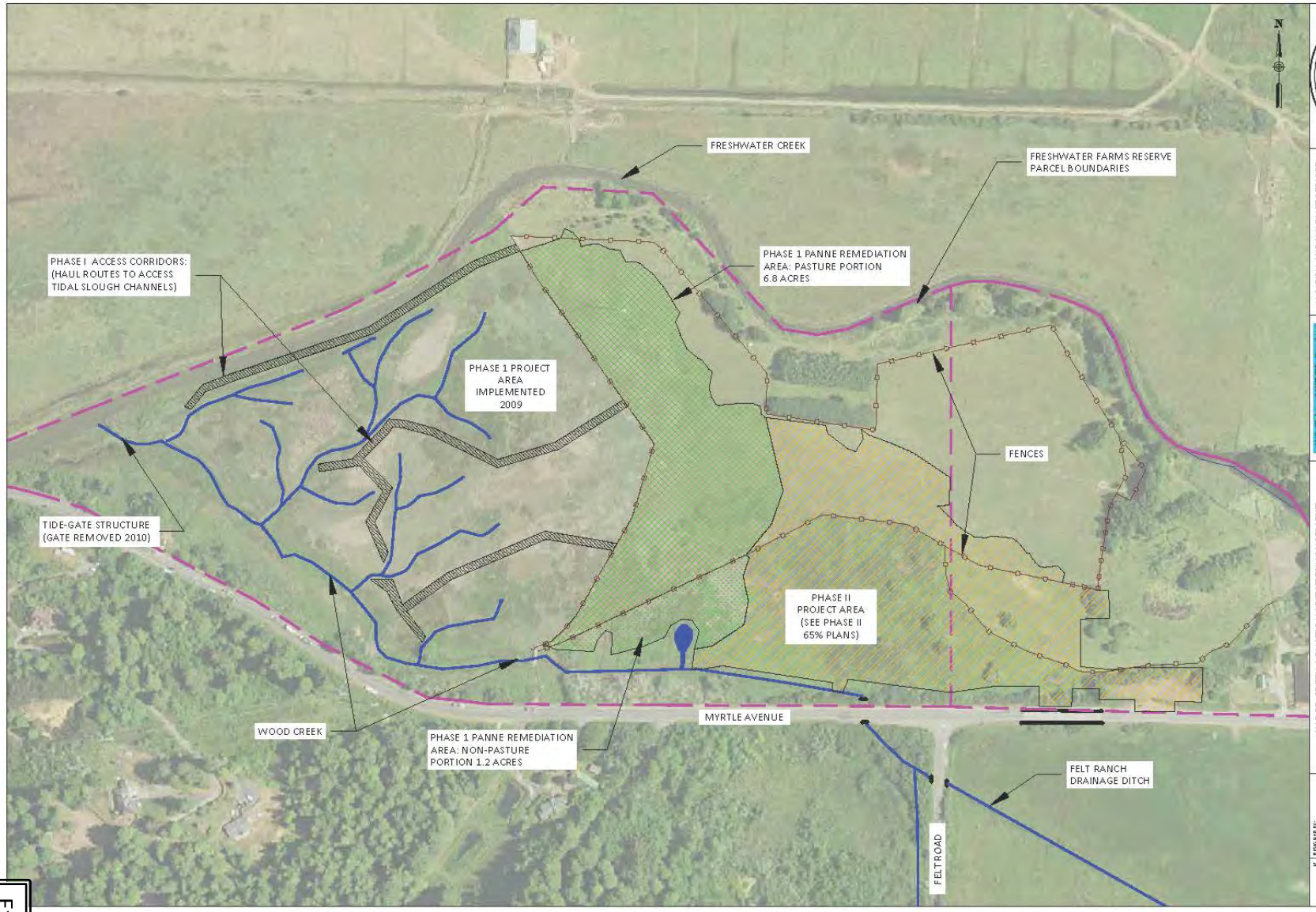
U.S. Fish and Wildlife Service Coastal Program

WOOD CREEK AQUATIC HABITAT ENHANCEMENT
PHASE I ADAPTIVE MANAGEMENT 65% DESIGN PLANS

LOCATION MAP AND TABLE OF CONTENTS

DESIGNED BY: CCS
DRAWN BY: CCS
APPROVED BY: CCS
DATE: 5/31/2016
SHEET NUMBER: 1
NOTES: REVISION 1 - MAY 31, 2016
SCALE: AS INDICATED

EXHIBIT NO. 4
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
PROPOSED ADAPTIVE MANAGEMENT PLANS
Page 1 of 7



REGISTERED PROFESSIONAL ENGINEER
COLMAN SHEA
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U.S. Fish and Wildlife Service
Coastal Program

WOOD CREEK AQUATIC HABITAT ENHANCEMENT
PHASE I ADAPTIVE MANAGEMENT 65% DESIGN PLANS

PHASE I AND PHASE II PROJECT AREA LOCATIONS

DRAWN BY: CCS
CHECKED BY: CCS
APPROVED BY: CCS
DATE: REV. 5/31/2016
SHEET NUMBER: 2

NOTES:
(1) IMAGE SOURCE: 2014 USDA NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
(2) PARCEL DATA - HUMBOLDT COUNTY GIS.

Exhibit No. 4
Page 2 of 7

DESIGNED BY: CCS DRAWN BY: CCS APPROVED BY: CCS DATE: REV. 5/31/2016 SHEET NUMBER: 3	WOOD CREEK AQUATIC HABITAT ENHANCEMENT PHASE I ADAPTIVE MANAGEMENT 65% DESIGN PLANS EXISTING TOPOGRAPHY CONTOUR INTERVAL 0.5 FEET - NAVD 1988 DATUM NOTES: (1) TOPOGRAPHY BASED ON SURVEYS CONDUCTED BY USFWS 2013-2015.	U.S. Fish and Wildlife Service Coastal Program	U.S. FISH AND WILDLIFE SERVICE COASTAL PROGRAM 1655 HEINDON ROAD ARCATA, CA 95521 (707) 822-7201 PREPARED FOR: NORTHCOAST REGIONAL LAND TRUST 901 SAMOA BLVD. ARCATA CA 95521 (707) 822-2242	REGISTERED PROFESSIONAL ENGINEER CONOR COLMAN-SHEA C 71643 CIVIL STATE OF CALIFORNIA

WOOD CREEK AQUATIC HABITAT ENHANCEMENT
PHASE I ADAPTIVE MANAGEMENT 65% DESIGN PLANS
PHASE I PROPOSED MARSH ELEVATION RAISE TOPOGRAPHY
CONTOUR INTERVAL 0.5 FEET - NAVD 1988 DATUM
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SHEET NUMBER
4
DATE
REV. 5/31/2016
DRAWN BY:
CCS
CHECKED BY:
CCS
DESIGNED BY:
CCS
SCALE:
U.S. FISH AND WILDLIFE SERVICE
COASTAL PROGRAM
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STATE OF CALIFORNIA
U.S. Fish and Wildlife Service
Coastal Program
N
PHASE I PANNE REMEDIATION
AREA: PASTURE PORTION
- 5500 CY FILL
- 6.8 ACRES
PHASE I PANNE REMEDIATION
AREA: NON PASTURE PORTION
- 1380 CY FILL
- 1.2 ACRES
PROPOSED TOPOGRAPHY
EXISTING TOPOGRAPHY

WOOD CREEK AQUATIC HABITAT ENHANCEMENT
PHASE 1 ADAPTIVE MANAGEMENT 65% DESIGN PLANS
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CONTOUR INTERVAL 0.2 FEET - NAVD 1988 DATUM
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DRAWN BY: CCS
APPROVED BY: CCS
DATE: REV 5/31/2016
SHEET NUMBER
U.S. FISH AND WILDLIFE SERVICE
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STATE OF CALIFORNIA
N
PHASE I PANNE REMEDIATION
AREA: PASTURE PORTION
5500 CY FILL
6.8 ACRES
PHASE I PANNE REMEDIATION
AREA: NON PASTURE PORTION
1380 CY FILL
1.2 ACRES
PROPOSED TOPOGRAPHY
7.9
7.8
7.6
7.4
7.2
7.0

WOOD CREEK AQUATIC HABITAT ENHANCEMENT
PHASE I ADAPTIVE MANAGEMENT 65% DESIGN PLANS

PHASE I PROPOSED MARSH FILL DEPTHS
CONTOUR INTERVAL 0.2 FEET

NOTE:
(1) TOPOGRAPHY BASED ON SURVEYS CONDUCTED BY USFWS 2013-2015.

SCALE:	DESIGNED BY:	DRAWN BY:	APPROVED BY:	DATE:	SHEET NUMBER
	CCS	CCS	CCS	REV. 5/31/2016	6

U.S. FISH AND WILDLIFE SERVICE
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C71843
CIVIL
STATE OF CALIFORNIA

Exhibit No. 4
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Exhibit No. 4
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WOOD CREEK HABITAT ENHANCEMENT PROJECT
HYDROLOGIC WETLAND INDICATORS AND
BASIS OF PHASE I ADAPTIVE MANAGEMENT ELEVATION RANGE

Prepared by:

Conor Shea

U.S. Fish and Wildlife Service
The Coastal Program at Humboldt Bay
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February 2016

INTRODUCTION

The Wood Creek Habitat Enhancement Project (Project) is located on the Freshwater Farms Reserve, due north of Myrtle Avenue at 5851 Myrtle Avenue, and extending toward the confluence of Wood Creek and Freshwater Slough (Figure 1). The property is owned and managed by the North Coast Regional Land Trust (NRLT). NRLT proposes to construct the Wood Creek Phase II Habitat Enhancement Project (Phase II), which is designed to enhance habitat for juvenile Coho salmon, a Federal and state listed species (Southern Oregon/Northern California Coast Unit). The project is also intended to provide habitat for other Federally listed species such as steelhead and the tidewater goby. The Phase II Project consists of constructing channel and pool features which will extend east of the current Wood Creek channel and connect to existing seasonal freshwater flows that move through a causeway under Myrtle Avenue (USFWS, 2015 A). NRLT also proposes to modify portions of the Phase I Habitat Enhancement Project, constructed in 2009, to enhance habitat in response to monitoring observations undertaken since project completion (USFWS, 2015 B). The latter work is the Phase I Adaptive Management Project (Phase I).

The purpose of this report is to summarize the hydrologic investigations that have factored into the design of the Phase II and Phase I projects. The report reviews results of groundwater level and stream level monitoring, computation of tidal datums, salinity observations, and analyses of vegetation responses and vegetation-tidal datum relationships. These analyses lead to classification of wetland areas under existing conditions and the bases of design of the Phase II and Phase I projects

PRIMARY HYDROLOGIC DRIVERS

Water movement and water levels at Freshwater Farms are driven by a complex mixture of riverine inflows, estuarine tides, and groundwater flow. The primary hydrologic drivers include:

- **Wood Creek:** Wood Creek is the primary source of surface water inflow to Freshwater Farms Reserve. Wood Creek enters Freshwater Farms through a four-foot diameter culvert located under Myrtle Avenue (Figure 1). Wood Creek is a permanent stream maintaining small amounts of baseflow through the summer dry season. The drainage area of Wood Creek at Myrtle Avenue is approximately 0.7 square miles (sq. mi.).

- **Freshwater Creek**: Freshwater Farms Reserve is bounded on the north side by Freshwater Creek. Freshwater Farms Reserve is separated from Freshwater Creek by a levee. The levee prevents surface flow entering Freshwater Farms Reserve from Freshwater Creek, but may allow groundwater interchange.

- **Felt Ranch Ditch:** During the winter wet season, Freshwater Farms Reserve occasionally receives inflows through a causeway opening under Myrtle Avenue. The causeway is located east of Wood Creek and Felt Road (Figure 1). The Felt Ranch Ditch on the Felt Ranch property is permanently flooded. During storm events, water levels in

the Felt Ranch overtop containment berms and water flows out of the ditch north towards Myrtle Avenue. Also, during large events, flows overtop the Freshwater Creek levees at the south end of the Felt Ranch and are captured by the Felt Ranch Ditch. A berm blocks overflows from the Felt Ranch Ditch from moving through the causeway into Freshwater Farms Reserve until water levels reach about 9.3 feet NAVD 1988 in elevation[1].

- **Freshwater Slough Tides**: Wood Creek empties into Freshwater Creek through a five-foot wide concrete weir structure at the west end of the project area (Figure 1). The water control structure was originally constructed with a tide-gate in place that allowed flows from Wood Creek to leave, but prevented flows from Freshwater Creek from entering the Freshwater Farms Reserve. The tide-gate was removed in 2009 as part of the Phase I Habitat Enhancement Plan. Removal of the tide-gate allowed restoration of a tidal-driven flow regime in lower Wood Creek. Tidal datums and frequency of inundation are discussed below.

- **Groundwater**: The U.S. Fish and Wildlife Service implemented groundwater level monitoring as part of design investigations for Phase II. Monitoring results are discussed in detail below. The monitoring results show that groundwater levels in the surficial aquifer vary significantly between the winter wet season and dry season. Groundwater levels rise in the fall to within 12-inches of the surface in response (we assume) to decrease evapotranspiration and occasional precipitation events. In the spring, groundwater levels fall several feet in response to diminished rainfall and increase evapotranspiration. Groundwater levels in portions of Freshwater Farms Reserve vary with monthly tidal cycles. Groundwater levels in these areas rise with bi-monthly spring tides and recess during neap tides.

GROUNDWATER AND SURFACE WATER MONITORING

The U.S. Fish and Wildlife Service established a network of groundwater monitoring wells and surface water gages at Freshwater Farms Reserve and the Felt Ranch in 2014 (Figure 2). The network was designed to investigate existing conditions within the Phase II project area, but results are applicable to the Phase I remediation project. The monitoring network consists of seven shallow groundwater wells and three water level gages. Wells 1 and 2 are on the Felt Ranch. A water level gage was placed in the Felt Ranch Ditch as well. These three gages provide data on the movement of water from Felt Ranch towards the causeway under Myrtle Avenue. Wells 3, 4, and 5 were placed in a line on the east side of the Phase II project area. Wells 6 and 7 were placed on the west side. A water level gage was installed in Wood Creek at

[1] All elevations in this report are given in units of feet referenced to the NAVD 1988 vertical datum.

the outlet pool near the Wood Creek culvert under Myrtle Avenue. The third water level gage was placed in the Wood Creek Pond constructed as part of the Phase I project in 2009.

The wells and water level gages were monitored between July 2014 and August 2015 and collected data at six-minute intervals. Complete records were obtained for the Pond Gage and Felt Ranch Ditch Gage. Due to operator error, there is a gap in the record for the other gages from December 23, 21014 until March 23, 2015. Despite the gap, sufficient data was collected to characterize groundwater levels during the winter wet season.

Results for Wells 3, 4, and 5

Wells 3, 4, and 5 represent conditions at the furthest point in the Phase II project area from tidal influence. There is no direct inflow into this area except during the winter when the causeway berm is overtopped. Groundwater levels are responding to direct precipitation and regional shallow groundwater movement.

Groundwater monitoring results for Wells 3, 4, and 5 are shown in Figures 3, 4, 5, and 6. Figure 3 shows the groundwater levels for the period July 10, 2014 to December 23, 2014. Figure 4 shows the groundwater levels for the Period March 23, 2015 to August 26, 2015. Figures 5 and 6 show the same data, except that groundwater levels are shown in depths relative to the ground surface elevation.

The overall pattern of groundwater water levels in Wells 3, 4, and 5 is similar. There is a steady recession during the summer and early fall of 2014, and then levels spike with individual storm events starting in September, accompanied by a steady rise until the ground water is at or near the surface by mid-November. A major precipitation event occurred on December 22 which caused overtopping of the causeway berm and resulted in surface flooding (Figures 3 and 5). In March 2015, water levels are still at or near the surface and remain so until the start of May. Water levels start to recede and continue to recede through August 2015.

The observed water levels in Wells 3, 4, U.S. Army Corps of Engineers (2005) standards for establishing that wetland hydrology is present on a site. The Corps standard requires 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10. The Corps defines the growing season as the period from the last occurrence of sub-28 degree (F) temperatures in the spring to the first occurrence of sub-28 degree (F) temperatures in the fall. Temperatures at Woodley Island (six miles from the project area) rarely fall below 28 and usually are limited to a short period in January. Growing season under the Corp definition can be assumed to extend from late January to late December.

The observed data exceeded the Corps standard for consecutive days. Table 1 list the maximum number of consecutive days that groundwater levels were within 12 inches of the ground surface at Wells 3, 4, and 5. Despite missing the central part of the wet season,

groundwater levels were observed within 12-inches of the surface well in excess of 14-days in both the fall and spring. Most likely, the water levels were within 12-inches of the surface from mid-November through the end of April.

Table 1: Maximum Number Consecutive Days Groundwater Surface Within 12-Inches of Ground Surface At Wells 3, 4, and 5

Observation Period		Well 3	Well 4	Well 5
Start	End			
7/10/2014	12/23/2014	33	39	53
3/23/2015	8/26/2015	37	35	42

The period of observation was occurred during a period of low total precipitation. There were 31.50 inches of rainfall at Woodley Island for the water year starting October 1, 2014 and ending on September 30, 2015. Total annual water year precipitation at Woodley Island for the period 1980 to 2010 exceeded 31.50 inches 75% of the time. Thus, it can be expected that groundwater conditions would meet the Corps standard for wetland conditions more than 50% of observed years.

We conclude from examination of the observed data that the well records at Wells 3, 4, and 5 provide sufficient indicators that groundwater levels produce wetland hydrology conditions.

Results for Wells 6 and 7

Wells 6 and 7 are placed on the east end of the Phase II project area. Figure 7 shows the groundwater levels at Wells 6 and 7 for the period July 10, 2014 to November 14, 2014 superimposed with recorded tide levels at the NOAA North Spit gage. It's apparent that groundwater levels in Wells 6 and 7 are subject to tidal influence. There is daily small scale rise and falls of the water table correlated to North Spit tides. During the summer and early fall, the spring tides associated with the Full Moon exceeded 8.0 feet in elevation. When these tides occurred, water levels in Wells 6 and 7 had a large-scale rise in elevation to rise to or above the ground surface. The rises were followed by a month long recession until the next Full Moon spring tide. After September 2014, groundwater levels remained near the surface through the end of the observation period, possibly as a result of rainfall and reduced evapotranspiration.

Figure 8 shows the groundwater levels at Wells 6 and 7 for the period March 23, 2015 to August 3, 2015 superimposed with recorded tide levels at the NOAA North Spit gage. Groundwater levels in the wells shows the same pattern of small scale daily fluctuations with tides and large

scale rises associated with spring tides. Groundwater levels remain at or near the surface through the end of April and then start to recede between spring tides.

Because of the clear pattern of tidal linkage, water level data loggers in Wells 6 and 7 were replaced with data loggers that recorded conductivity (a measure of salinity) as well as water level. Salinity observations are shown in Figures 9 and 10. Salinity levels remain consistently in the Mesohaline range (defined by Cowardin et al. 1979 as salinity in the range of 5.0 – 18.0 ppt) during the observed periods.

The observations at Wells 6 and 7 indicate a clear linkage with tidal forcing from the tidal inflows from Freshwater Creek. Groundwater levels rise and fall with daily tides. Salinity levels are Mesohaline even during late fall and early spring. Wetland conditions are indicated by month long periods of ground level saturation and regular tidal inundation.

WOOD CREEK TIDAL DATUMS

Figure 11 shows the observed water surfaces in the Wood Creek Pond overlaid over North Spit tide observations. The observation period consisted of uninterrupted six minute observations for the pond extended from July 2, 2014 to August 26, 2015. There is an earth sill at the outlet of the pond that maintains a minimum elevation of about 5.9 feet. There is some fluctuation below the sill elevation due to evaporation. For tides above sill elevation, there is a close correspondence in the magnitude and timing of tide stages. Comparison of the Wood Creek Pond sages with observed stages at North Spit indicates a small amount of muting of the tides at the former tide-gate. Higher high water stages in Wood Creek pond are slightly lower than the corresponding higher high water stages at North Spit during spring tides. During neap tides Wood Creek Pond has higher high water stages than North Spit.

Tidal datums in the Phase II project area were computed using records of water level stages collected in the Wood Creek Pond for the period from August 1, 2014 to July 31, 2015. This represents twelve months, or a full year of observations. The full-year period was selected to represent a representative sample of variations in tides created by the annual cycle of earth rotation around the sun. Because tides vary in height over a 19-year cycle, tidal datums for observations of shorter periods are adjusted by comparison to a suitable control tide station. In this case, North Spit, which has records that extend over several tidal epochs, was used as the control station. The methodology to compute the tidal datums is taken from NOAA CO-OPS (2003) guidance. We used the Direct Method, which is applicable to situations where the lower range of tides is not available, as occurs in upper reaches of tidal marshes, or the sill-controlled Wood Creek Pond. Table 2 lists the computed tidal datums.

Table 2 also lists tidal datums developed by Jeff Anderson and Associates (2008) for the Phase I design.

Table 2: Wood Creek Tidal Datums			
Gage	Computation Method	Elevation of Mean High Water (MHW)	Elevation of Mean Higher High Water (MHW)
North Spit	NOAA Published Datums	5.80	6.51
Wood Creek Pond	Direct Method (NOAA CO-OPS, 2003)	5.80	6.51
Freshwater Slough	NOAA Published Datums	5.92	6.64
Freshwater Slough	Direct Method (NOAA CO-OPS, 2003) – Computed by Jeff Anderson and Associates, 2008	6.03	6.74
Wood Creek Phase I (Projected)	Jeff Anderson and Associates Phase I Design Report	6.0	6.7

Note that while the Wood Creek Pond datums match the North Spit tide gage, they should not be interpreted as equivalent. Peak tides in Humboldt Bay tributaries undergo amplification (increases in stage). This is reflected by the higher stages in Freshwater Creek observed by NOAA and separately by Jeff Anderson and Associates (2008). The tide-gage channel structure at Wood Creek restricts full tides slightly create a muting which reduces tides within the Wood Creek project areas. The observed muting is consistent with the projection of muting made by Jeff Anderson and Associates, 2008.

WOOD CREEK SALINITY OBSERVATIONS

California Department of Fish and Wildlife has monitored salinity levels in Wood Creek since completion of the Phase I construction (Wallace 2014, Wallace 2015). Table 3 lists observations made between July 2014 and April 2015. Table 3 shows several patterns. The first trend is that salinity decreases in the Wood Creek channel moving upstream from the tide-gate. Salinity is in the Mesohaline range (5.0 -18 ppt) at the tide-gate and decreases to the Oligohaline Range (0.5 – 5.0 ppt) near the cattle bridge.

Table 3:
Wood Creek Salinity Measurements (ppt) July 2014 – April 2015
Source: Wallace, 2014; Wallace, 2015

Measurement Date	Salinity Measurement Location									Tide Condition at Measurement
	1: 50' U/S of Tide-gate	2: 300' U/S of Tide-gate	3: 300 D/S of Cattle Bridge	4: At Cattle Bridge	5: 200 D/S of Cattle Bridge	6S: Myrtle Avenue Pool Surface	6B: Myrtle Avenue Pool Bottom	Wood Creek Pond Surface	Wood Creek Pond Bottom	
7/3/2014	5.6	4.0	1.1	0.7	0.4	0.2	18.3	18.5	25.6	3.7' Falling
8/4/2014	12.1	24.6	1.4	0.8	0.5	0.2	26.9	20.4	27.3	4.3' Falling
9/2/2014	7.3	5.8	1.8	0.8	0.8	0.1	25.8	22.3	27.1	5.3' Falling
10/2/2014	13.7	7.2	2.1	0.8	0.7	0.2	19.4	16.6	32.5	4.4' Falling
11/14/2014	15.2	5.1	2.2	1.3	0.9	0.2	11.5	15.8	25.6	3.3' Low Tide
12/3/2014	13.8	15.1	15.3	14.8	14.0	1.0	4.6	10.8	12.8	4.1' Rising
1/9/2015	4.3	1.5	0.8	0.5	0.3	0.1	0.1	2.9	20.6	6.0' Rising
2/3/2015	0.1	0.1	0.5	0.4	0.2	0.1	0.1	4.7	14.1	6.1' Rising
3/3/2015	5.0	2.8	0.7	0.3	0.2	0.1	0.1	3.2	7.1	4.6' Rising
4/2/2015	11.4	8.1	6.2	6.2	1.9	0.7	12.3	18.0	19.3	3.7' Falling

The second trend is the formation of saline pools upstream of channel sills. The Myrtle Avenue pool has high salinity levels at the bottom of the pool, but fresh water on the surface. The Myrtle Avenue Pool receives freshwater inflow from the Wood Creek Culvert. The Wood Creek Pond has high salinity during the dry season, but can turn fresher during the winter wet season. The Woods Creek Pond has a large volume trapped below the sill elevation compared to the amount of flow exchanged during a high tide cycle. Saline water sinks to the bottom and is not flushed by tides.

Cowardin (1979) defines the upstream limit of Estuarine Wetland systems as extending landward to where ocean-derived salts measure less than 0.5 ppt during the low flow period. Under this classification, we classify Wood Creek as an Estuarine System (Cowardin 1979) due to the presence of Mesohaline and Ogliohaline salinity.

VEGETATION MONITORING AND OBSERVATIONS

Vegetation Monitoring

NRLT has coordinated monitoring of the Phase I project are since completion of construction in 2009 (NRLT 2014). After five years of monitoring, the Phase I project area made rapid progress towards the desired outcome of conversion into native saltmarsh. Vegetation change as a response to restored tidal influence appeared to accelerate in 2013 and 2014, with plant species that tolerate salt water increasing in cover relative to those species that do not tolerate salt water. Initial transect surveys recorded that 15% of the dominant plant cover consisted of native species. In 2014, 79% of the dominant plant cover was identified as native. This result appears consistent with the salinity observations.

Salt Pannes

One unforeseen outcome of the Phase I project was the formation of salt pannes on agricultural land adjacent to the Phase I project area. Salt pannes are shallow depressions typically found landward side of tidal marshes. The depressions flood at high tide trapping salt water. Where depressions exposed to direct sunlight, evaporation occurs driving salinity levels to Euhaline (30-40 ppt) and Hyperhaline (> 40 ppt) conditions. High salinity and low dissolved oxygen lead to vegetation die-back. As of early 2015, approximately 3 acres of the Freshwater Farms Reserve agricultural pastureland have converted to a combination of pannes and non-native species and approximately 3 more acres were trending in that direction.

We theorize that the pannes formed as a result of differences in vegetation management in grazed areas and the area reserved for salt marsh. Vegetation heights in the grazed pasture areas remained low. The vegetation in the adjacent ungrazed salt marsh became quite thick and grew to heights of one to three feet. When flooded by high tides, salt water became trapped in depressions in the pasture areas. Drainage from the pasture areas was limited by the thick vegetation on the salt marsh reserve. The salinity of the trapped water increased due to evaporation, killing the existing vegetation and increasing the depths of the shallow

depressions. This resulted in positive feedback and the trapping of more salt water and the growth of pannes.

We conducted site observations of the pannes on July 2, 2015 during spring tides. North Spit tide stages were at 3.5 feet. Wood Creek was at low flow. The pannes were flooded from previous high tides and were not draining in between tides. Peak stage in the pond exceeded 7.5 feet on July 1, 2015. The pannes contained few to none vascular vegetation. Many of the pannes contained thick mats of algae. Using a hand-held salinity monitor, we measured salinity levels of 32 ppt in the pannes within the pasture. Water temperatures exceeded 22 degrees Celsius. Recall that salinity in Wood Creek is at brackish levels. The high salinity levels and water temperatures in the pannes are a strong indication that the water is trapped and not being exchanged or flushed. Recall that wells 6 and 7, which are located adjacent to the pannes, have salinity levels of 12-18, which is another indication that the pannes are trapping salt water.

BASIS OF PHASE I ADAPTIVE MANAGEMENT ELEVATION RANGE

The salt pannes are not meeting project goals to establish salt marsh vegetation. NRLT proposes to convert the pannes to salt marsh by placing fill from the Phase II construction in the pannes to raise ground levels and reduce trapping of salt water between tides. The fill will reduce salt stress on potential plant colonization and reduce trapping of salt water.

The Phase I remediation design (USFWS, 2015 A) places most of the fill so that surface elevations are between 7.5 and 7.9 feet and no fill is placed above elevation 7.9 feet. The elevation range was selected because the NRLT monitoring results and other studies have shown that in Humboldt Bay area marshes that there is a diverse range of mixed marsh salt marsh plants that can establish within this elevation range. The studies include:

Eicher (1987): Eicher (1987) surveyed the distribution of salt marsh vegetation in Humboldt Bay relative to the Mean Lower Low Water tidal datum. We converted height above MLLW to frequency of inundation using observed tide stages at North Spit gage for the 1993-2010 epoch. This data is presented in Figure 12. Eicher (1987) data shows four a composite of four Humboldt Bay marshes shows that Mixed Marsh salt marshes dominate in areas that receive an average of between 0.1 and 1.1 hours of tidal inundation per day. Figure 13 shows a stage-frequency curve for Freshwater Farms Reserve that was developed using the observed data from the Wood Creek Pond. Transposing Eicher (1987) data to Wood Creek using the stage frequency relationship indicates that Mixed Marsh vegetation would dominate between elevations 7.2 and 8.0 feet. The range proposed for the Phase I remediation design (7.5 – 7.9 feet) would support upper mixed marsh plants that include Atriplex patula ssp. Hastata, Distichlis spicata, Limonium californicum, Plantago maritima var. juncoides, Cuscuta salina, Carex Lyngbyei, Grindelia stricta ssp blakei, Spergularia macrotheca, Parapholis spp., and Orthocarpus castillejoides var. humboldtiensis.

NRLT (2014): NRLT (2014) reports on vegetation monitoring conducted since 2009 Phase I construction at Freshwater Farms Reserve. NRLT monitored vegetation through annual surveys of thirteen monumented transects (Transects A through J) with volunteers from the California Native Plant Society – North Coast Chapter. Transects C, D, and H cross hummocks constructed as part of Phase I. Surveys conducted in 2015 by USFWS show that the elevations of the hummocks range between 7.5 and 8.0 feet. The NRLT (2014) surveys of transects C, D, and H shows that the hummocks have been colonized successfully by salt marsh species that include: Atriplex sp., Carex sp., Juncus leseurii, and Leymus triticodes.

Takekawa et al. 2013: The USGS Western Ecological Research Center conducted surveys of Humboldt Bay National Wildlife Refuge marshes in Humboldt Bay to evaluate existing salt marsh vegetation tidal datum relationships (Takekawa et al., 2013). Salt marsh vegetation distribution was surveyed relative to Height above the Mean High Water datum (MHW). Table 4 lists the survey results for selected upper mixed marsh species. Table 4 also lists the range transposed to Wood Creek by adding the observed heights above MHW to the computed Wood Creek MHW elevation of 5.80 feet. The proposed Phase I remediation elevation range falls within the upper range of the observations made by Takekawa et al. (2013).

Table 4: Upper Mixed Marsh Elevation Range from Takekawa et al. 2013

Species	Mean Height	Minimum Height	Maximum Height	Mean Elevation	Minimum Elevation	Maximum Elevation
	(ft)	(ft)	(ft)	(ft NAVD 1988)	(ft NAVD 1988)	(ft NAVD 1988)
Grindelia stricta	1.4	0.2	2.0	7.2	6.0	7.8
Distichlis spicata	0.7	-0.2	2.0	6.5	5.6	7.8
Jaumea carnosa	0.9	-1.5	2.1	6.7	4.3	7.9
Deschampsia cespitosa	1.2	0.4	2.2	7.0	6.2	8.0
Sarcacornia pacifica	0.8	-1.5	2.2	6.6	4.3	8.0

SUMMARY

Groundwater level monitoring demonstrates that Freshwater Farms Reserve Project areas possess hydrologic indicators that exceed Corps standards (U.S. Army Corps of Engineers, 2005) for classification as a wetland. Salinity monitoring demonstrates that current tidal regime creates a transition from Mesohaline Estuarine emergent wetlands to Ogliohaline Estuarine emergent wetlands. Freshwater conditions occur during winter wet season. Salt pannes are

creating Euhaline conditions in grazing areas and preventing the establishment of salt marsh vegetation.

The proposed Phase II project will create an ecotone from Mesohaline Estuarine emergent wetlands to Freshwater emergent wetlands. Phase I remediation work will reduce occurrence of pannes and create ground elevations suitable for establishment of Mesohaline mixed marsh vegetation.

EXHIBIT N0. 6
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
PHOTO OF PROPOSED PASTURE FILL AREA

PLANTING AND MONITORING PLAN

PHASE I ADAPTIVE MANAGEMENT AREA

WOOD CREEK AQUATIC HABITAT ENHANCEMENT PROJECT

Prepared by:

NORTHCOAST REGIONAL LAND TRUST

v. May 2016

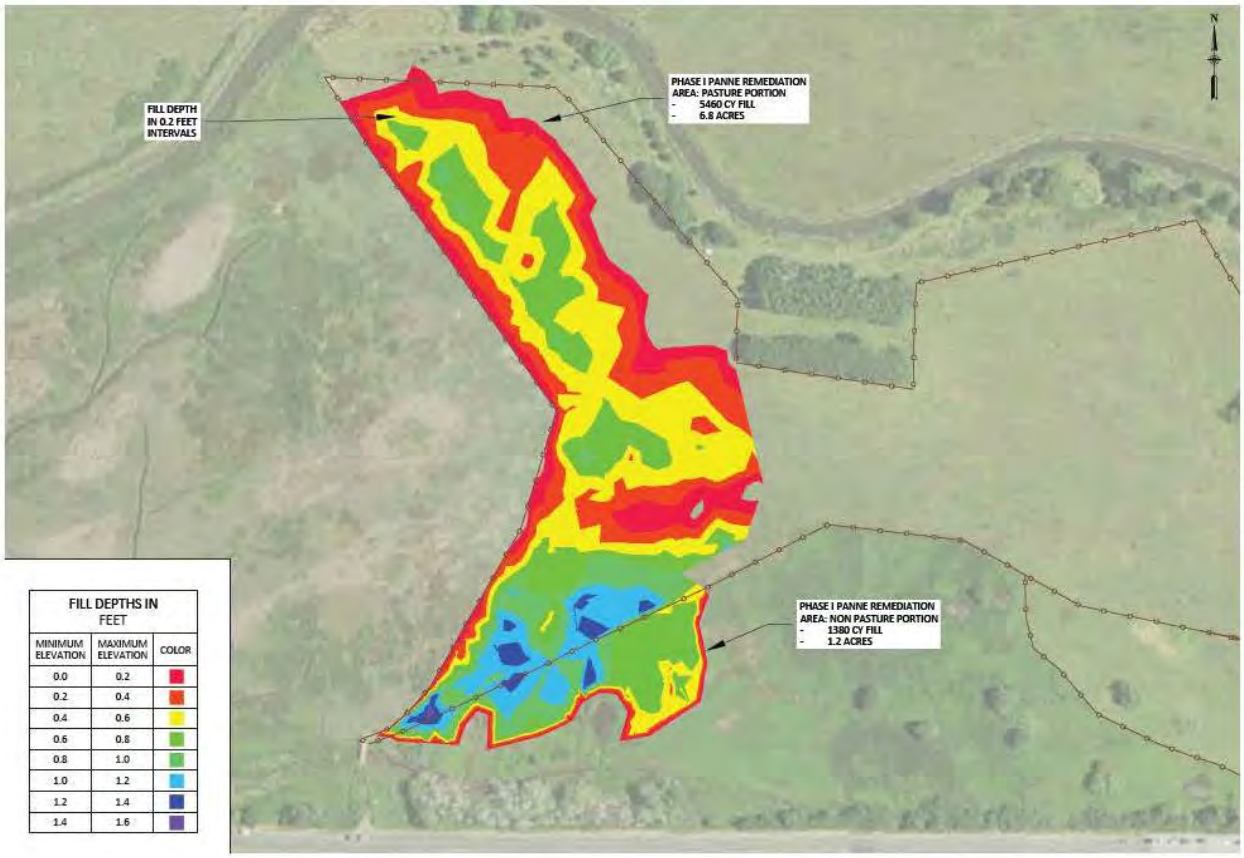
EXHIBIT N0. 7
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
PROPOSED PLANTING & MONITORING PLAN (Excerpt) Page 1 of 16

Introduction and Purpose

An unintended consequence of the Phase I Wood Creek Aquatic Habitat Enhancement Project was the transformation of the western portion of pastoral grassland from a suite of non-native dominant plants to a mud flat salt panne. This area, in addition to a vulnerable low lying area north of the Wood Creek Phase I pond where the salt pannes are spreading, hereafter known as the Phase I Adaptive Management Area (AMA), lies between 7.0-8.0 feet above sea level and is tidally influenced. It is generally believed by scientists and engineers of local agency offices (USFWS and CDFW) that the pannes formed as a result of differences in vegetation management in grazed areas and the area reserved for salt marsh. Vegetation heights in the grazed pasture areas remained low, while the vegetation in the adjacent ungrazed salt marsh became quite thick. When flooded by high tides, salt water became trapped in depressions in the pasture area, and drainage from the pasture was limited by the thick vegetation on the adjacent salt marsh reserve. The salinity of the trapped water increased due to evaporation, killing the existing vegetation and increasing the depths of the shallow depressions. This resulted in positive feedback and the trapping of more salt water and the growth of pannes (Shea 2016)[1].

In order to restore the 8 acres of Phase I AMA into high salt marsh with a significant native plant component, the topography will be reconfigured to allow for functional drainage. A total of 6,840 cubic yards (CY) of fill will be spread over the 8 acres. Fill depths will range from 1.6 feet of fill (purple) to 0.2 feet of fill (red) in order to create the relief necessary for water to drain towards the Wood Creek channels and limit stagnant tidal pools from forming. Designs illustrating the topographical changes can be found as Figure 1 and Figure 2 below.

[1] Shea, C. Wood Creek Habitat Enhancement Project Hydrologic Wetland Indicators and Basis of Phase I Adaptive Management Elevation Range, February 2016.



FILL DEPTHS IN FEET		
MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
0.0	0.2	
0.2	0.4	
0.4	0.6	
0.6	0.8	
0.8	1.0	
1.0	1.2	
1.2	1.4	
1.4	1.6	

Figure 1. Phase I Adaptive Management Area fill depths, contour interval 0.2 feet (Shea 2015).

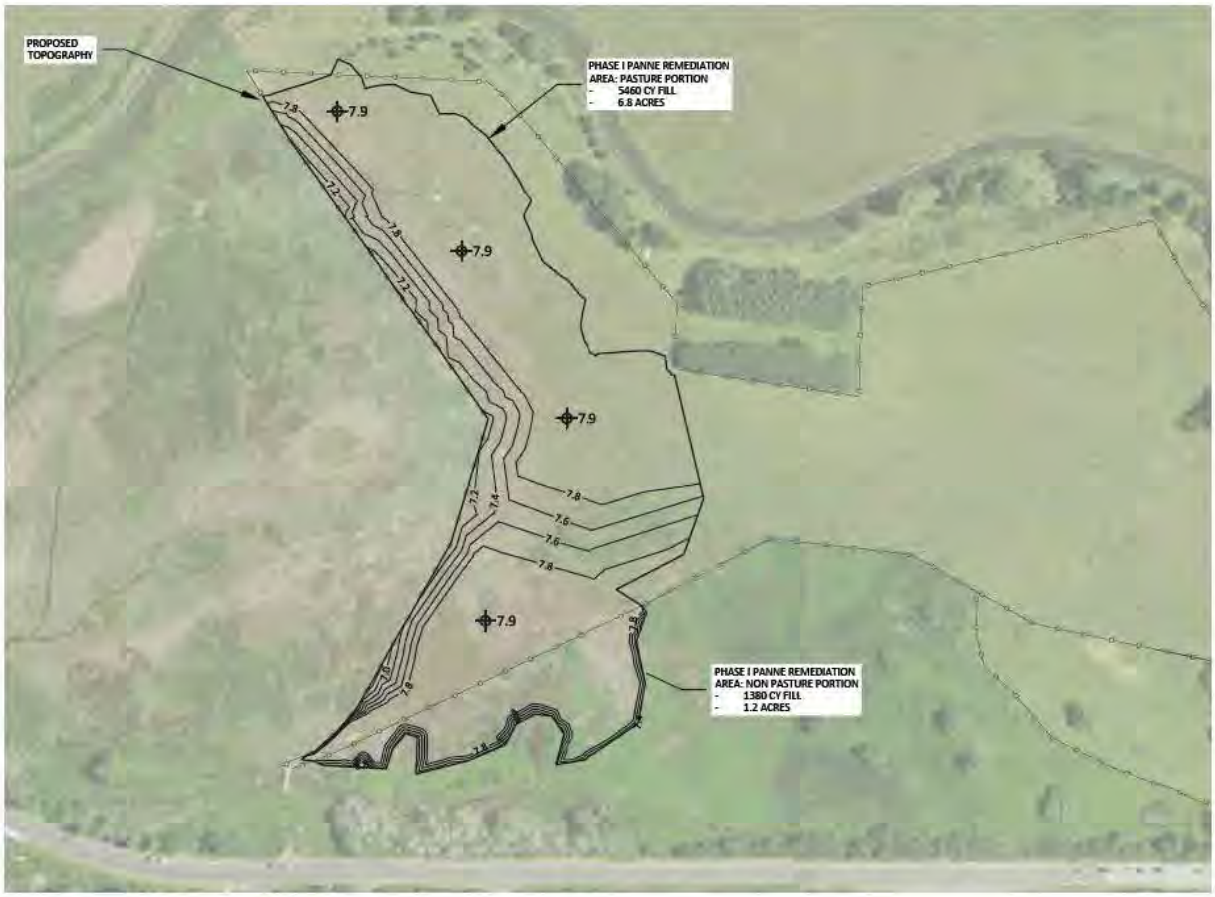


Figure 2. Phase I AMA high marsh elevations (Shea 2015).

Goals and Objectives

Goal 1: To restore high marsh characteristics by establishing vegetation with a native plant component on the 8 acres of land that makes up the Phase 1 AMA.

Objective 1: A mix of native grass seed and plugs will be broadcast and planted within all of the Phase I AMA in the fall 2016. The Phase I AMA will be monitored before the planting and annually (using qualitative measurements) as well as monitored one year, two years and five years (using quantitative measurements) after the initial planting.

Goal 2: To restore high marsh topography and limit pooling of water in the Phase I AMA.

Objective 2: Fill will be added to the Phase I AMA in order to create topographical gradients that limit pooling and facilitate drainage. Fine-scale topographic complexities will be established across this broader gradient. Success will be determined via land managers having the ability to use the Phase I AMA area for grazing after five years.

Goal 3: To monitor and measure the success of the revegetation effort and grazing impacts.

Objective 3: Fencing will surround the Phase I AMA in order to keep cows out of the area. After the Phase I AMA is covered with at least 75% vegetation and 10% native plant coverage, flash grazing may be employed as a management tool for invasive plant abatement. Monitoring will take place before and after flash grazing to qualitatively measure flash grazing impacts. Further details of the flash grazing allowances are explained in the grazing section of this document.

Planting

The project area will be re-contoured using fill from channel excavation in the adjacent Wood Creek Phase II project area in summer 2016, and the Phase I AMA seeded and planted in early fall 2016. In early August the Phase I AMA will be disked at an approximate depth of 8 inches to cut and uproot the non native grasses that currently exist in the pasture. In approximately mid August fill will be spread onto the project area and it is expected that the established non native grasses will grow up through the fill. An additional series of either two or three disking treatments will be done on the property between mid August and early October to cut the non native grasses that have grown through the fill and turn the soil, with the intention of eradicating the non native grasses as much as possible in order to give the native seeds an opportunity to survive. Seeds will be dispersed using the broadcasting or hydroseeding method, and grass plugs planted by hand.

An assortment of native grasses has been selected to populate the Phase I AMA (see Table 1). The native wetland seed mix has been developed by Hedgerow Farms, a northern California nursery specializing in native plants. This mix has demonstrated the persistence of elymus triticoides (creeping wild rye) and hordeum brachyantherum (meadow barley) after 3-5 years. Festuca microstachys (small fescue) acts as a nursery cover crop due to its fast germination, and vigorous immediate growth; it is being considered a substitute for re-green, which is used in a variety of landscape and restoration projects to create an environment more conducive for healthy growth in native plants through displacing space where non-native grasses would otherwise occupy.

Table 1. Plant species incorporated in the re-vegetation effort

Common Name	**Scientific Name**	**Native or Non-native**	**Amount (lbs- approximate)**
Creeping wild rye*	*Elymus triticoides*	Native	10-15
Meadow barley*	*Hordeum brachyantherum*	Native	10-15
Tufted hairgrass*	*Deschampsia cespitosa*	Native	10-15
Wetland native seed mix (including regreen)	*elymus triticoides; elymus glaucus; elymus trachycaulus; hordeum brachyantherum; festuca microstachys (regreen)*	All native	80

*=grass plugs will also be planted, specific number of plugs to be determined.

Macroplot planting zones were determined according to hydrologic and saline influence and the amount of fill expected to be added atop the current landscape (see Figure 3). Within each planting zone, appropriate plants were selected based on expected inundation frequency, likely salinity content and location of existing native and non-native plant stocks. Each acre of land will receive between 15 -20 lbs of total seed, depending on seeding method and a varying amount of planted grass plugs. Table 2 and Figure 3 (below) outlines which grasses will be planted in each macroplot planting zone and where each species will be located.

Table 2. Planting plan within each macroplot planting zone regarding species composition and location

Macroplot Planting Zone	Species	Approximate Amount of seed and plugs and Location within each Zone	Notes
1	A. Seed mix B. Meadow barley (plugs and seed) C. Tufted hairgrass (plugs and seed) D. Creeping wild rye (plugs and seed)	A. Concentrated within the center of the zone (70%). B. Plugs planted and seed distributed along western and eastern boundary (10%) C. Plugs planted and seed distributed along western and eastern boundary (10%) D. Plugs planted and seed distributed along western and eastern boundary (10%)	This macroplot contains much of the salt panne incidentally created in the Wood Creek Phase I project. It is a high priority for NRLT to establish healthy plant communities here in order to enhance biodiversity, support agricultural uses, and to restore high marsh functional productivity.
2	A. Seed mix B. Meadow barley (plugs and seed) C. Tufted hairgrass (plugs and seed) D. Creeping wild rye (plugs and seed)	A. Concentrated within the northern, southern and center of the zone (70%) B. Plugs planted and seed distributed along western and eastern boundary (10%) C. Plugs planted and seed distributed along western and eastern boundary (10%) D. Plugs planted and seed distributed along western and eastern boundary (10%)	This macroplot contains a strategic swale which has been designed to drain water from the field west towards Wood Creek.
3	A. Seed mix	A. Concentrated within the	This location will receive the

	B. Meadow barley (plugs and seed) C. Tufted hairgrass (plugs and seed) D. Creeping wild rye (plugs and seed)	northern and center of the zone (70%) B. Plugs planted and seed distributed along western and eastern boundary (10%) C. Plugs planted and seed distributed along western and eastern boundary (10%) D. Plugs planted and seed distributed along western and eastern boundary (10%)	largest amount of fill; salt pannes are actively forming in this area.
4	A. Seed mix B. Meadow barley (plugs and seed) C. Tufted hairgrass (plugs and seed) D. Creeping wild rye (plugs and seed)	A. Concentrated in the northern, central and eastern portion (70%) B. Plugs planted and seed distributed along southern (10%) C. Plugs planted and seed distributed along southern boundary (10%) D. Plugs planted and seed distributed along southern boundary (10%)	This location is closest to the Wood Creek channel and is expected to be tidally influenced. Plugs will be planted at the southern boundary, and seeds dispersed further from tidal inundation to avoid seed loss.

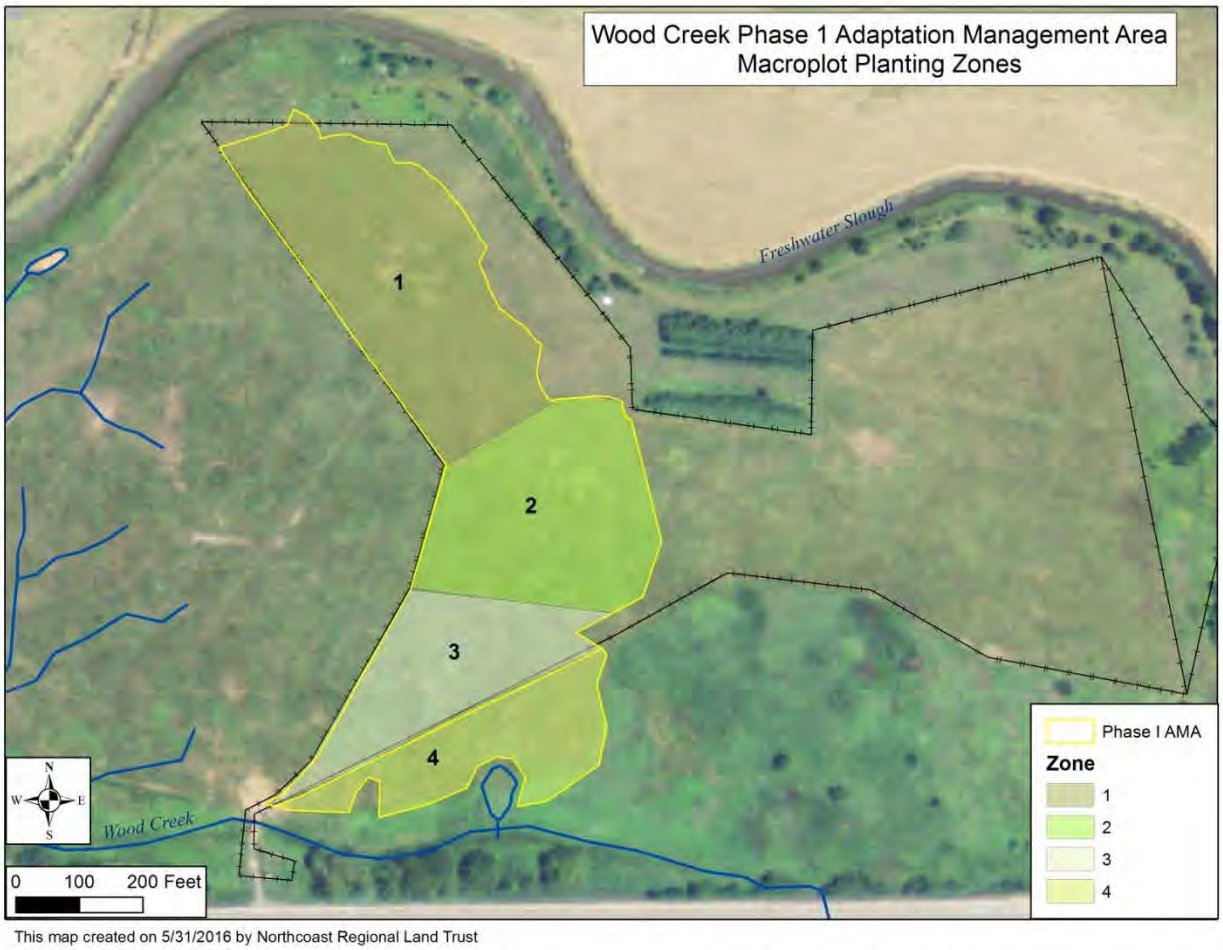


Figure 3. Wood Creek Phase I Adaptation Management Area macroplot planting zones.

Flash Grazing

The high marsh pasture within the property has been supporting approximately 20 cattle seasonally since 2006, using a single open pasture approach. To support plant re-establishment following the AMA contouring and planting efforts, the AMA area will be fenced off to prevent cattle access. After the Phase I AMA is covered with at least 75% vegetation and 10% native plant coverage, flash grazing may be employed as a management tool for invasive plant abatement. Before any flash grazing takes place, the area will be monitored to examine the level (if any) of tidal pooling after a high tide and quantified by percent cover. Monitoring will also take place after flash grazing and a high tide has taken place to examine if the tidal pooling has changed with the accompanied flash grazing; if there is an increase in pooling over 50% of the pre-grazing pooling, then flash grazing would cease for that year. Monitoring would take place again during the following year to gauge the post high tide pooling and post flash grazing pooling with the same prescriptions.

In order for cattle to flash graze the area, the land must be dry, with no expected high tides for the duration of the cattle's expected occupancy, and during a time where rain is not forecasted. Fencing will be erected within the pasture section of the AMA to create two paddocks: each paddock will be

approximately 3.25 acres, and can support up to 10 cows maximum (see Figure 4). The heights of the grasses in each paddock will be monitored, and when the cows have given the paddock a thorough flash grazing to where the grasses look to be about 3 inches, the animals will be removed. According to the Washington State University Cooperative Extension maintaining grass at a minimum height of three inches at the time of rotation will prevent grass from dying, causing bare spots and muddy conditions[2]. Ensuring a minimum grass height of at least three inches provides confidence that the grass will remain productive and functionally support the biological services of the high marsh ecosystem, such as sediment capture, water filtration, nutrient uptake, plant growth and wildlife habitat. Additionally, grazing will be used as a tool to increase the marsh habitat values through invasive weed control: cows will be strategically placed within the appropriate paddock to eat invasive plants and weeds before winter precipitation enables invasive plant establishment for the following year.

The impacts to water quality and biological productivity within the AMA and the adjacent Phase I restored area is dependent on the amount of care and oversight exercised in the rotational flash grazing regime. An important mitigation measure to avoid degrading water quality is to ensure the productivity and capacity of the vegetation. This can be accomplished through a flash grazing regime and adequate monitoring to assure that grass is remaining at a minimum height of three inches. According to the Natural Resources Conservation Service FarmASyst Environmental Stewardship for Farmers guide:

> "Uncontrolled grazing presents other disadvantages, but the primary concern is the loss of vegetative cover due to frequent grazing, trampling, or grazing the plants too close to the soil. This often weakens root systems and exposes and compacts the soil. These degradations to soil quality can increase the soil erosion and nutrient losses from pastures and can, in turn, pollute surface waters[3]."

Northcoast Regional Land Trust will work closely with our grazing lessee to ensure that durable fencing and sound flash grazing practices are instituted and maintained to keep the restored high marsh functionally productive. After year 5 (2021) NRLT and grazing lessee will reassess whether to continue the flash grazing regime within the Phase I AMA or not.

[2] https://www.premier1supplies.com/img/newsletter/05-22-14-goat/PastureGrazingMgmt.pdf

[3] http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_046596.pdf

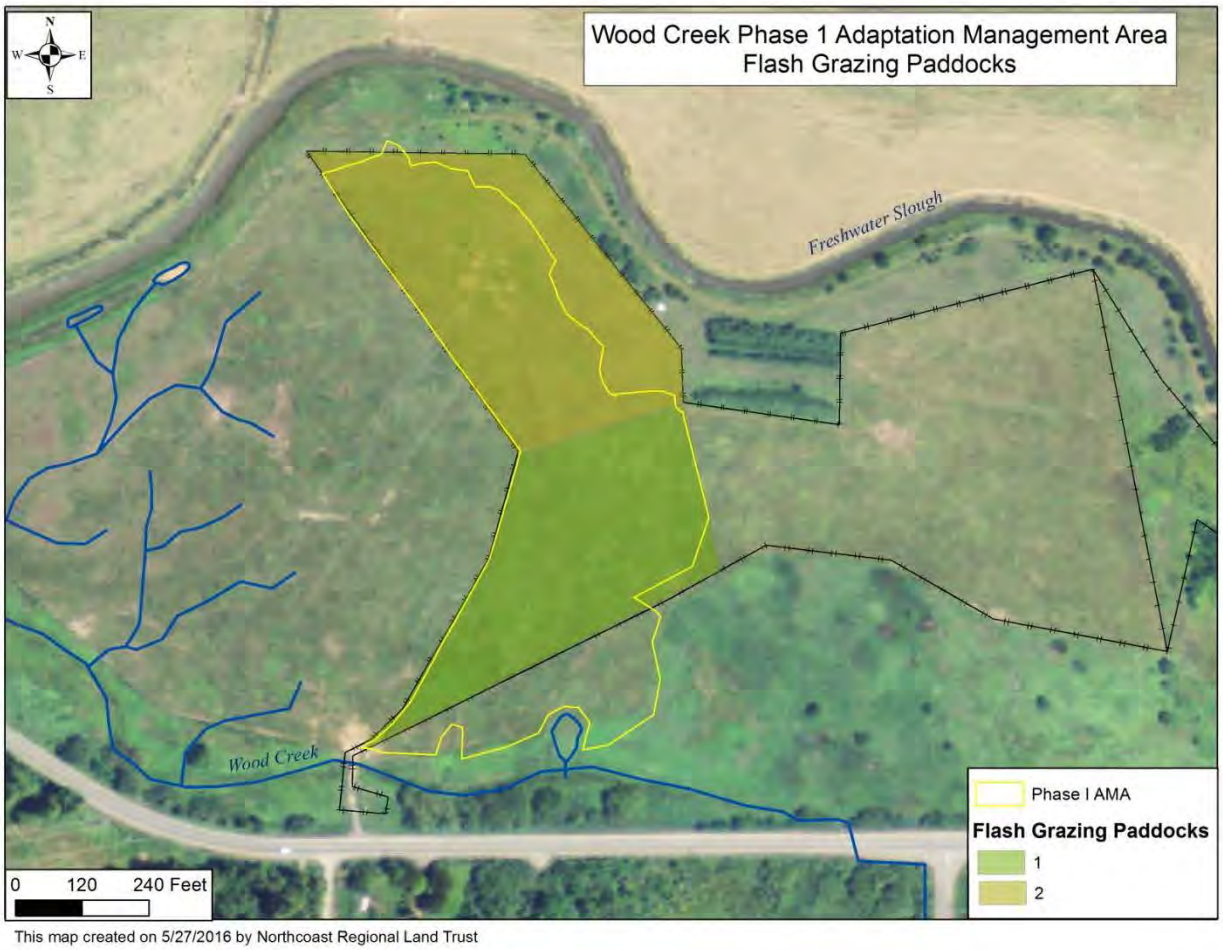


Figure 4. Wood Creek Phase I Adaptation Management Area grazing paddocks.

Vegetation Monitoring

Field techniques for measuring active and passive vegetation will include qualitative photo-monitoring and field observations as well as quantitative vegetation sampling methods using the point intercept method.

Qualitative Methods: Annual qualitative estimations of vegetation cover and relative species cover at the macroplot scale will be derived from field observations and multi-year photo documentation at seven permanent fixed photopoints shown on Figure 5. Field monitors will be trained in plant identification, and when possible, the same individual will monitor the project area annually. Standard field observation data sheets will be developed to prompt field monitor(s) to make consistent qualitative field observations in as quantitative a manner as possible at photopoint locations. Observers will estimate the total vegetation cover within each macroplot.

Photographs will also be taken to record any events that may have a significant effect on the success of enhancement, such as king tides, flood, fire, or vandalism. Photographs will be electronically filed by photopoint number, photo number, and date as transcribed from field notes.

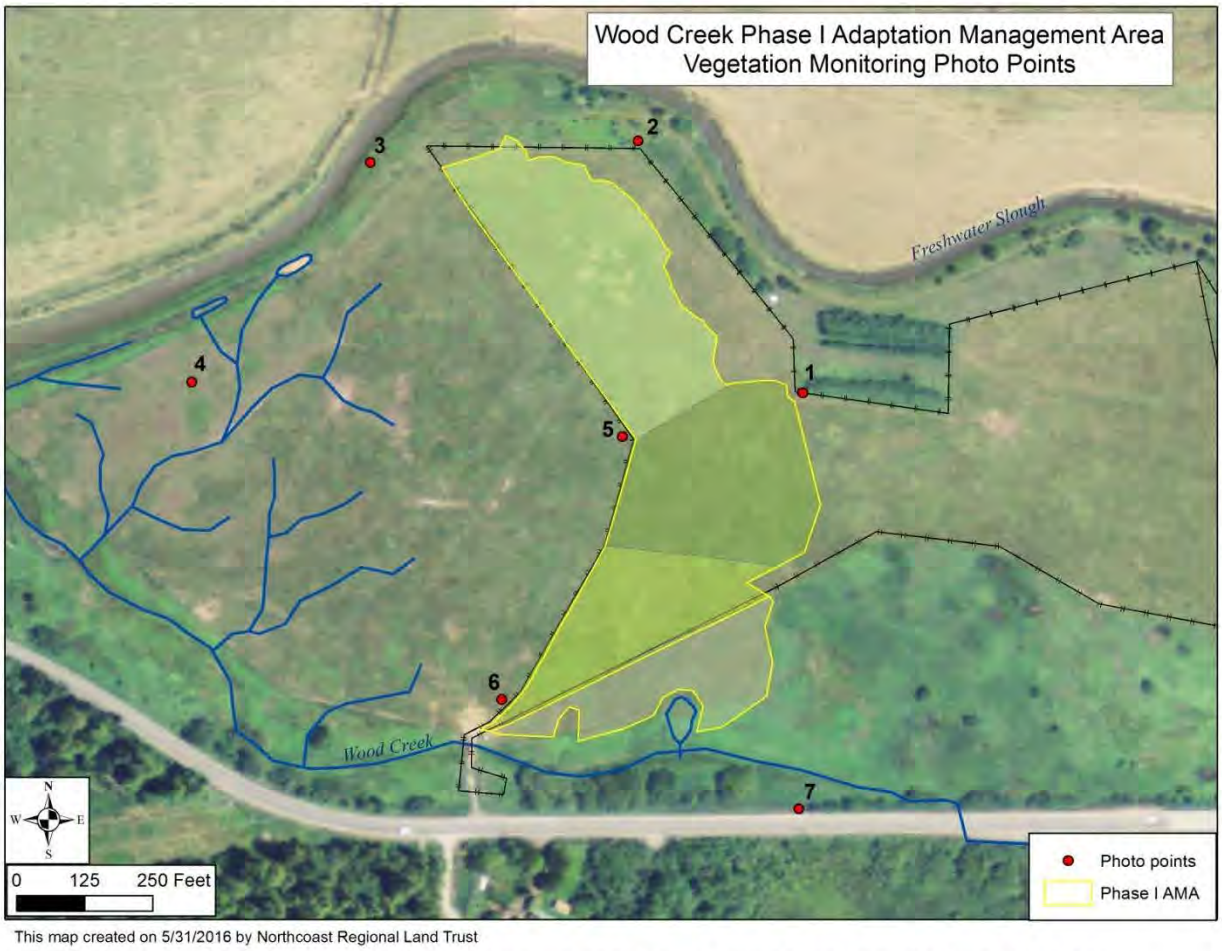


Figure 5. Wood Creek Phase I Adaptation Management Area vegetation monitoring photo points

Quantitative Methods: Quantitative monitoring of vegetative macroplots will take place in year one, year two and year five. It will assess vegetation development along 30 random transects using the point intercept method. Transects will be 50 m, with some transects being shorter (25 m or 10 m) where appropriate. The point intercept method is used to assess changes in plant species cover or ground cover for a macroplot. This method uses a narrow diameter sampling pole or sampling pins, placed at systematic intervals along line transects to sample within plot variation and quantify statistically valid changes in plant species cover and height over time. Plant species or ground cover classes that touch the pin are recorded as "hits" along the transect. Percent cover is calculated by dividing the number of hits for each plant species or ground cover class by the total number of points along a transect. This method is primarily suited for vegetation types less than 3 ft (1 m) in height and is particularly useful for recording ground cover[4].

[4] http://www.fs.fed.us/rm/pubs/rmrs_gtr164/rmrs_gtr164_09_point_inter.pdf

Hydrology, Water Quality and Fish Monitoring

Our partners at U.S Fish and Wildlife Service (USFWS) will be conducting hydrology monitoring, specifically testing groundwater depth and salinity content via wells within the Wood Creek Phase II restoration area and the Phase I AMA. USFWS monitors will use data loggers to monitor water levels continuously through the first year with occasional site inspections also taking place to observe site conditions during the first year. The site visits will occur several times a year with more visits during the wet season. Site visits will include spot measurements of salinity. Additional water level monitoring may be performed in subsequent years depending on initial water level and water quality monitoring results. Topographic surveys will be performed at one year to evaluate changes from as-built conditions. Key features (channel sills, pool depths) may be resurveyed in subsequent years. The sills will be qualitatively monitored periodically (at least twice per year) during low tides to gauge the approximate number of fish present and the general effectiveness of the sills. Figure 6, below, tabulates the physical monitoring plan for the Phase I AMA and Phase II project. Figure 7, below, depicts monitoring well locations in the Phase I Adaptive Management Area.

Qualitative monitoring during king tide events will take place annually during the winter king tide and as possible, the spring king tide and high tide events will be documented with photographs from monitoring point three.

Intra-channel water quality and fisheries monitoring will be completed by CDFW and NOAA within the Wood Creek Phase II project, under the Consistency Determination 021-13 monitoring plan.

Wood Creek Aquatic Habitat Enhancement Project
2016 Physical Monitoring Plan

Location	Project Phase		Period	Monitoring Parameters	Monitoring Objective	Related Project Goal
	I	II				
Gage PC-1	X	X	Year 1 Post Construction Monitoring	Surface Water Elevation and Water Temperature at 6-minute intervals.	Establish record of tidal and streamflow elevation below Phase II project area.	Establish habitat for salmonids. Establish hydrologic conditions to support brackish tidal marsh.
Gage PC-2	X		Year 1 Post Construction Monitoring	Ground/surface Water Elevations and Water Temperature at 6-minute intervals.	Determine post construction frequency, magnitude, and duration of tidal flooding in Phase I project area.	Establish hydrologic conditions to support brackish tidal marsh.
Gage PC-3	X	X	Year 1 Post Construction Monitoring	Ground/surface Water Elevations and Water Temperature at 6-minute intervals.	Determine post construction frequency, magnitude, and duration of tidal flooding at west edge of Phase I project area. Compare with Preconstruction monitoring at Well 7.	Establish habitat for salmonids. Establish brackish tidal marsh.
Gage PC-4		X	Year 1 Post Construction Monitoring	Surface Water Elevation, Temperature and Conductivity at 12-minute intervals.	Establish record of water surface elevations and salinity at lower end of Phase II project area.	Establish habitat for salmonids.
Gage PC-5		X	Year 1 Post Construction Monitoring	Surface water elevations at 6-minute intervals.	Establish record of tidal and streamflow elevation at Myrtle Avenue Pool. Compare with Preconstruction monitoring.	Establish habitat for salmonids. Establish hydrologic conditions to support brackish tidal marsh.
Gage PC-6		X	Year 1 Post Construction Monitoring	Surface Water Elevation, Temperature and Conductivity at 12-minute intervals.	Establish record of water surface elevations and salinity at upper end of Phase II project area.	Establish habitat for salmonids.
Gage PC-7		X	Year 1 Post Construction Monitoring	Ground/surface Water Elevations and Water Temperature at 6-minute intervals.	Determine post construction frequency, magnitude, and duration of tidal flooding at east edge of Phase II project area. Compare with Preconstruction monitoring at Well 3.	Establish habitat for salmonids. Establish hydrologic conditions to support brackish tidal marsh.
Phase II Project Area		X	Year 1 Sill Survey	Water Depth on Sills at Low tides	Determine fish passage potential and water level connectivity at low tides.	Establish habitat for salmonids.
Phase II Project Area	X	X	Year 1 Synoptic Surveys: Performed at spring tides and neap tides twice each between January and May.	Spot measurements of salinity. Observations of water surface connections.	Determine salinity and degree of water surface connections in Phase II area during juvenile salmonid rearing periods. Establish salinity and water surface inundation patterns in Phase I area.	Establish habitat for salmonids. Establish hydrologic conditions to support brackish tidal marsh.
Phase II Project Area		X	End of Year 1, 2, and 5	Survey elevation of sills and pools.	Detect change due to aggradation or degradation.	Determine system stability.

Figure 6. Physical monitoring plan to be performed by USFWS (Shea 2016)

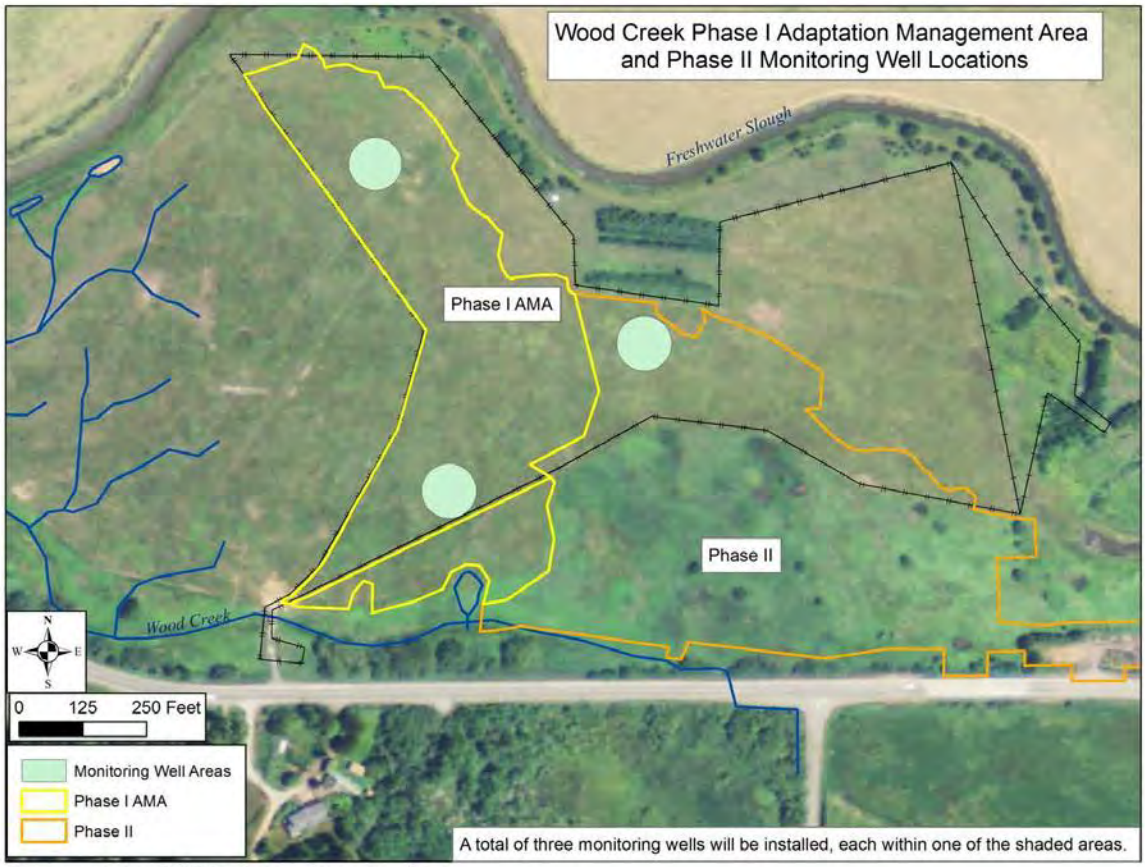


Figure 7. Monitoring well locations in the Phase I AMA.

Data Analysis

Data analysis will be conducted as soon as possible following collection of field data. Minimizing delays between data collection and data analysis provides an opportunity to return to the site to verify any discrepancies encountered in the original data set and to conduct further sampling as necessary before the site evolves significantly. Data analysis will be conducted using standard spreadsheet, data base, and computer applications. Data input will be spot checked and results will be carefully reviewed by the project supervisor. The five year monitoring results will be compared with results from the pre-project monitoring, year one, year two, and the annual qualitative photo monitoring will be compared with results from previous years to evaluate site progress. The water quality, hydrology and fisheries monitoring data from our agency partners will be tabulated and will be incorporated into the year one, year two and year five monitoring reports to evaluate site progress.

Success

The primary success criterion will be the establishment of high marsh vegetation involving a significant native plant component in the context of a historically grazed landscape and the ongoing transition towards mudflat. Two distinct criteria will therefore be used to measure the performance of revegetation measures: 1) total vegetation cover established; and 2) total native species cover established. Project performance relative to both criteria will be measured before the project is implemented, one year, two years and five years after project implementation.

Areas west of and adjacent to the proposed restoration site in the Wood Creek Phase I area are dominated by native plants. Non-native herbaceous vegetation dominates the restoration site itself and adjacent areas to the north and east. The prominence of non-native plants (and particularly grasses) may present a challenge in establishing desired species in restored areas. Hence, total percent cover rather than relative cover by target species is prescribed as the primary success criterion.

Five year performance goal:

- At least 90% total plant cover
- At least 50% native plant cover

Schedule

A pre-project monitoring will take place using both qualitative and quantitative methods in June 2016 and a pre-project baseline conditions report will be compiled, including agency derived data, and submitted to permitting agencies by December 31, 2016. Qualitative vegetation monitoring will be conducted at the site between August and October annually, and quantitative vegetation monitoring will be conducted at the site between August and October one year (2017), two years (2018) and five years (2021) after the plants are seeded to examine the site revegetation success rate. The CDFW will continue their regular water quality and fisheries monitoring in the Wood Creek channel several times per year, and the USFWS will monitor water levels continuously throughout the first year, with

additional site inspections occurring during the first year and potentially more frequently depending on initial water level and water quality monitoring results. Monitoring reports will be prepared following data collection on the first, second and fifth year, and will include all previous years of data collected by CDFW and USFWS for this Phase I AMA and Phase II project, and will be submitted to the permitting agencies by December 31st of each monitoring year.

ADDENDUM TO THE PROPOSED AMENDMENT TO COASTAL DEVELOPMENT PERMIT 1-08-012

July 20, 2016

In addition to the provisions written in the 5/31/2016 Coastal Development Permit Amendment 1-08-012 (CDPA) application which focused on the project components of the Wood Creek Aquatic Enhancement Project – Phase I Adaptive Management Area (the project), Northcoast Regional Land Trust (NRLT) proposes the following land use practices aimed at assuring long term protections to the project outcome:

Rotational Grazing Regime: After the fifth year of project monitoring (2021), a rotational grazing regime may be implemented if all project success criteria has been met, specifically the establishment of 50% native vegetation and no more than a 10 percent increase in pre-grazing tidal pooling within the project area. The 18 acre pasture (including the high brackish marsh restoration area) will be fenced into four 4.5-acre paddocks, and will support no more than 25 cows during the months of May 15 – October 15. The purpose of rotational grazing is to concentrate animals in sections of a pasture, while letting the remaining un-grazed land rest and grow in order to manage and bolster the overall productivity of the pasture. According to the Washington State University Cooperative Extension maintaining grass at a minimum height of three inches at the time of rotation will prevent grass from dying, causing bare spots and muddy conditions[1]. Ensuring a minimum grass height of at least three inches provides confidence that the grass will remain productive and functionally support the biological services of the high brackish marsh ecosystem, such as sediment capture, water filtration, nutrient uptake, plant growth and wildlife habitat.

The Freshwater Farms Reserve property is extremely productive; vegetation grows very fast due to the ample resources present. According to NRCS, the 18 acre pasture can support up to 29.8 cows[2]. A five day rotation of no more than 25 cows within the four 4.5-acre paddocks should ensure grass heights remain at or above the three inch threshold of significance at the time of rotation. This rotation will allow grasses 15 days of rest between grazing instances, which should be adequate given the high productivity of the property. NRLT's long term goal is to institute controlled rotational grazing as a means to steward the ecological productivity of the pasture area, including maintaining the functionality of the high brackish marsh. According to the Natural Resources Conservation Service (NRCS) FarmASyst Environmental Stewardship for Farmers guide:

> "Uncontrolled grazing presents other disadvantages, but the primary concern is the loss of vegetative cover due to frequent grazing, trampling, or grazing the plants too close to the soil. This often weakens root systems and exposes and compacts the soil. These degradations to soil quality can increase the soil erosion and nutrient losses from pastures and can, in turn, pollute surface waters[3]."

[1] https://www.premier1supplies.com/img/newsletter/05-22-14-goat/PastureGrazingMgmt.pdf

[2] http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1097378.pdf

[3] http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_0

EXHIBIT N0. 8
CDP Amendment Application No.
1-08-012-A1 (Northcoast Regional Land Trust)
UPDATED PROJECT DESCRIPTION 7/20/16

Seed Mix Modification: The seed mix of grasses within the project area has been modified to more fully reflect the elevational and hydrologic differences of the project area. The project area has been divided into two segments: higher elevation (7.9 feet above sea level) and lower elevation (7.2-7.8 feet above sea level). The lower elevation area is expected to be wetter more often than the high elevation area. The project's seed mix will consist of:

Higher Elevation Seed Mix (5.75 acres):

Species name	Common name	Seed source
Festuca rubra 'Molate'	Molate red fescue	Contra Costa: Point Molate
Hordeum brachyantherum	Meadow barley	Napa County: Napa/Sonoma Marsh
Deschampsia cespitosa	Tufted hairgrass	N.CA source collected

Lower Elevation Seed Mix (2.5 acres):

Species name	Common name	Seed source
Hordeum brachyantherum	Meadow barley	Napa County: Napa/Sonoma Marsh
Deschampsia cespitosa	Tufted hairgrass	N.CA source collected

This map created on 7/21/2016 by Northcoast Regional Land Trust